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Proceeding of the International Science and Technology Conference “FarEastCon 2020”

October 2020, Vladivostok, Russian
Federation, Far Eastern Federal University



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Preface

The International Scientific Conference “FarEastCon” took place during October 6–9, 2020, in Vladivostok, Russian Federation. This conference was organized by ten universities—Far Eastern Federal University (FEFU, Vladivostok), North-Eastern Federal University (Yakutsk), Amur State University of Humanities and Pedagogy (Komsomolsk-on-Amur), Far Eastern State Transport University (Khabarovsk), Komsomolsk-on-Amur State Technical University (Komsomolsk-on-Amur), Amur State University (Blagoveshchensk), Vladivostok State University of Economics and Service (Vladivostok), Research Institute of Building Physics and Fencing Constructions of the Academy of Construction and Architecture (Moscow), Economic Research Institute of Far Eastern Branch of the Russian Academy of Sciences (Khabarovsk), and Pacific National University (Khabarovsk).

This conference was carried out under financial support of the Far Eastern Federal University, the Russian Foundation for Basic Research as well as informational support of the Institute of Electrical and Electronics Engineers (Russian (Far Eastern) Subsection of IEEE).

This conference represents an informational platform for the accumulation of expert opinion on projects and initiatives that are aimed at the implementation of farsighted scientific research and development; it allows to present scientific and practical achievements to a wide circle of researchers.

Sections of the conference are of interest for the broad range of experts in the sphere of development of innovative solutions and organizing events that increase the efficiency of economic and innovative activities.

The international program committee has selected some papers for publishing in the Smart Technologies and Innovations in Design for Control of Technological Processes and Objects: Economy and Production—Proceeding of the International Science and Technology Conference “FarEastCon-2020”.

FarEastCon is a highquality conference with a competitive submission process. For example, in 2020, FarEastCon only accepted 48% of submitted papers. FarEastCon has a rigorous reviewing process that is similar to the processes used by IEEE. Every submitted paper and poster is subjected to this process.

The main criterion is a judgment of the degree to which the submitted paper contributes substantial new research.

Reviewers rate the paper using a 10-point ranking scale and provide a written evaluation. The written evaluation needs to support the reasoning behind the numeric ranking.

After the review period, there is a discussion period, where all reviewers can see the other reviews.

The organizing committee would like to express our sincere appreciation to everybody who has contributed to the conference. Heartfelt thanks are due to authors, reviewers, participants, and all the team of organizers for their support and enthusiasm which granted success to the conference.

Vladivostok, Russia

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Chapter 1

Simulation-Based Methodical Approach to Applying Managerial Decisions in Innovation



Denis B. Solovev, S. S. Kuzora, and V. Terziev

Abstract Research of innovation has recently come into spotlight. Innovative development involves not only cutting-edge R&D but also effective cooperation of those involved in the process, defining the priorities and tools to be used under the innovation policy, evaluating the performance of innovation. In this context, this research seeks to expand the capabilities of MATLAB-based mathematical modeling when used for assessing the innovation actors. Interim results of the study can be used to make projections for managerial decision making.

1.1 Introduction

Mathematical modeling as a scientific research method has been in the spotlight for many years. Modeling, or simulation, has multiple professional applications, which keeps it relevant. Mathematical models are most commonly used in natural sciences, where they provide formalized descriptions of objects, processes, phenomena, or systems. However, mathematical modeling also finds extensive use in social studies and humanities ('soft sciences'). The difference between hard and soft sciences manifests itself in modeling in the way these two major branches of science handle data formalization. As known, using mathematics for research in social studies and humanities is associated with difficulties relating to the lack and uncertainty of data, qualitative process descriptions, and obtaining empirical results.

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Economics uses mathematical modeling to the greatest extent of any soft science. Economic-mathematical modeling is defined herein as using mathematics to describe an economic object or process so as to build and analyze a theoretical or applied model [1–3]. Such modeling uses a set of mathematical methods and is applicable in such areas as economics, mathematical statistics, control theory, game theory, and system analysis [4].

Consider the properties such economic-mathematical models should have. The most important properties are [5–7]: adequacy (the object should match the model), optimality (data should be sufficient but not excessive), and performance (the model should generate new knowledge). Defining the domain of applying mathematical tools is important, as a mathematical dependency is not always obtainable in a socioeconomic system.

Consider economic-mathematical modeling from the standpoint of control theory, i.e., the theory of principles and methods behind controlling objects, processes, and systems [8, 9]. ‘Control’ has many definitions in literature. One of them is as follows: control consists in exerting a specific action on a system to attain its desired behavior [10]. This definition is in line with the material presented herein on socioeconomic systems. ‘Control’ should also be defined in the context of engineering systems. Lucas V. A. defines the theory of engineering systems control as a scientific area that covers the information systems pertaining to the controls in process facilities [11].

Common control methods are [12–15]:

- Linear, which can be described by differential and difference equations as well as by structural diagrams containing a single nonlinear element, and nonlinear controls, which are described by differential equations, transition functions, and integral and spectral transforms;
- Adaptive control, which can adapt itself to configurational and functional changes in the controlled object;
- Intelligent control, a set of controls based on specific data-driven software that may comprise artificial neural networks, fuzzy sets, fuzzy logic, and machine learning.

These methods can be conventionally divided into two categories: those applicable to socioeconomic systems (intelligent control) and those applicable to engineering systems (linear and nonlinear as well as adaptive controls). Such classification is proposed for this research specifically; however, there are examples of usage that is not in line with these categories [5, 16, 17].

Speaking of economic-mathematical modeling, let us focus on intelligent control, a method based on fuzzy sets and fuzzy logic. This theory has so far become standard for modeling and design in management and decision making [6, 7, 18].

1.2 Fuzzy Logic Toolbox Simulation

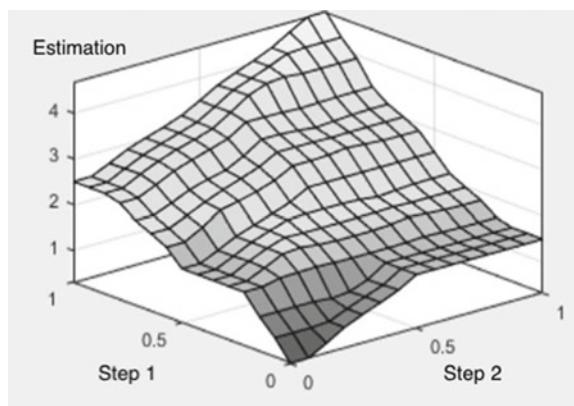
Computerization has heralded cutting-edge methods for mathematical modeling that use special programming languages and/or preexisting automated model templates, including fuzzy sets and fuzzy logic. One important stage was the development of special software, such as MATLAB, Scilab, Orange, GPSS, etc. Using such software accelerates the processing, transfer, and storage of modeling-related data. Advantages include the flexibility of constructing a model, data visualizations, and the variability of the methods such software has to offer [19].

MATLAB is the most advanced of such systems; it is an interactive app for mathematical computing, programming, and modeling in engineering and scientific research [20]. V. P. Dyakonov notes that MATLAB-based simulation is now a popular tool in communication engineering and electronics as well as in signal and data processing, as it gives insight into the math behind such phenomena [7]. Despite the popularity of simulating technical system, this applied software has multiple built-in tools that extend its functionality. In this regard, consider fuzzy logic toolbox and Simulink as tools for economic-mathematical modeling of socioeconomic systems.

To exemplify what could be done in MATLAB using the mentioned tools, consider the results of the authors' previous studies [19–24]. Those papers dwell upon assessing the innovation undertaken by specific actors; such assessment used fuzzy sets and fuzzy logic as implemented in MATLAB. One of the research efforts [19, 22] created a mathematical model for assessing a business incubator, a major actor of innovation; see Fig. 1.1.

For the model, FLT offered two fuzzy inference algorithms: Mamdani and Sugeno. Mamdani inference was used in the case under consideration. The limitations of the algorithms based on FLT alone are as follows: fuzzy-statement rules are difficult to make; modeling results can be only partially visualized; new (not provided by the package) data cannot be integrated.

Fig. 1.1 Fuzzy logic toolbox model for assessing an actor of innovation [22]



While the model is adequate, these limitations hinder the assessment. This is where Simulink comes into play. Note that Simulink can be used as a package that provides tools for mathematical computing, graphical templates, block modeling, interactive use in MATLAB, which creates a synergistic effect of simulation.

1.3 Simulink-Based Simulation

Using MATLAB's interactive features, import data that was used to generate the business incubator assessment model from FLT to the workspace. After that, run Simulink, create a fuzzy logic controller block, and import data from the workspace into it. The output is shown in Fig. 1.2.

As noted above, FLT has a number of limitations when it comes to modeling. The presented Simulink-based model overcomes these limitations, as it can detail fuzzy-statement rules to track the interrelation of all necessary elements, visualize data that fully reflects the simulation process, and integrate the necessary data to obtain new results. While Fig. 1.2 shows the overcome Limitations 1 and 2, Limitation 3 is shown in Fig. 1.3.

Let us algorithmize the model shown in Fig. 1.3.

Step 1. Step 1 is a subsystem that generates a valid value of 0.9.

Step 2. Step 2 is a subsystem that generates a valid value of 0.4.

Step 3. This is a signal that transmits multiple data.

Step 4. Fuzzy logic controller is a block of the model shown in Fig. 1.2.

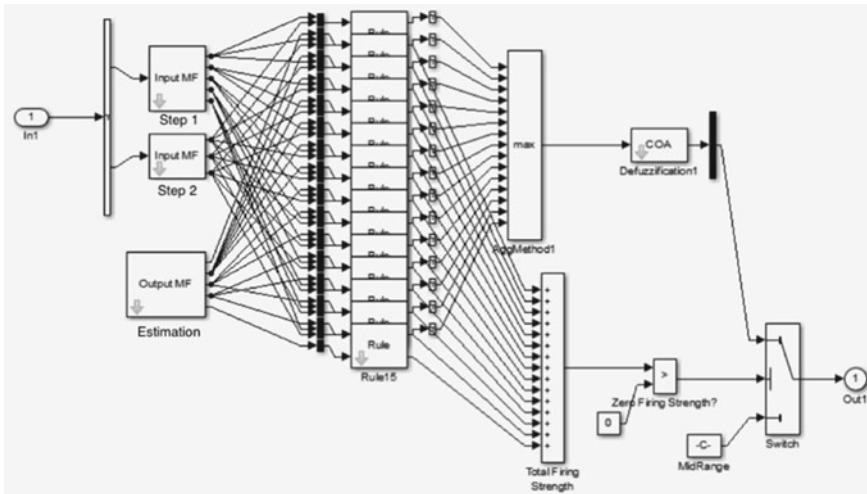


Fig. 1.2 Simulink model for assessing an actor of innovation

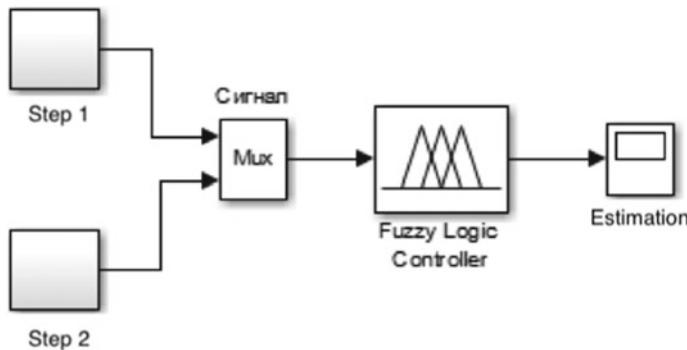


Fig. 1.3 Interactive model for assessing a single actor involved in the innovation infrastructure

Step 5. Inference, i.e., the assessment result in the form of a coordinate system; the value is 3.75.

Thus, the actor has been assessed in two ways. The first used fuzzy logic toolbox, while the second one used Simulink. Aside from addressing the limitations, Simulink produces a more specific assessment, e.g., 3.75 in this case.

Innovation is known to carry a high level of uncertainty, great risks, and challenging assessment of the results; it is also associated with difficulties making projections. All these factors make innovation a specific activity. Besides, the authors hereof stated in [22] that inflation, the key interest rate, the ruble exchange rate, sanctions, etc. are objective factors that affect innovation. This means that the assessment presented above was not adjusted for possible affecting factors, which can be split into external and internal factors.

The authors paper titled methods for evaluating innovation by means of flexible algorithms [23] proposes assigning a coefficient j that adjust the assessment for the effects of each involved input variable. This makes it plausible and advisable to merge the hypothetical basis of this paper and the results of the previous study into a single concept. Figure 1.4 details the proposal.

Remember that the input variables (the number of implemented startups and the startup incubation time) were involved in Step 1. Two other input variables (the number of services provided and the available facilities) were used in Step 2.

In paper [22], the coefficient j was adjusted for the internal factors. For this research, consider what value can such coefficient take due to the influence of external factors; as noted above, the ruble exchange rate is one such factor. The US dollar has for many years been the global trade and reserve currency, which is why it is referred to in the further analysis note that no all the inputs are currency-dependent. This is why assign the coefficient j to the most affected input variable: the facilities.

Associating it with the US dollar is feasible due to:

1. Purchasing office equipment and software.

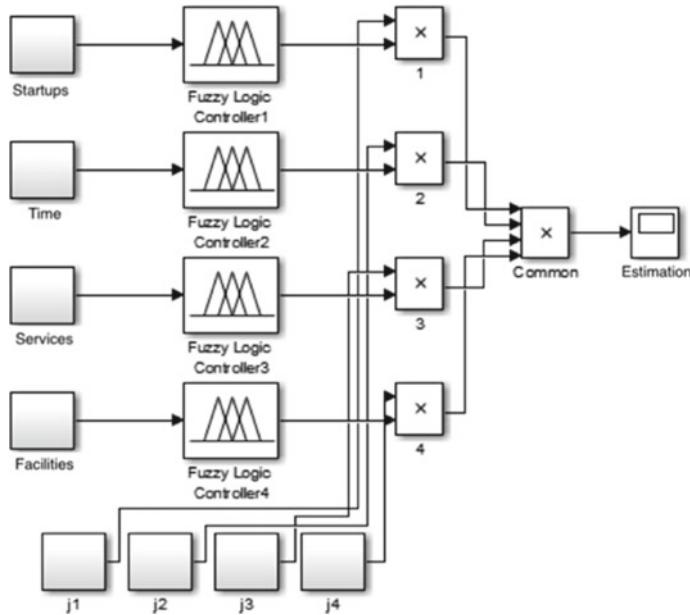


Fig. 1.4 Transformed model for assessing a single actor involved in the innovation infrastructure

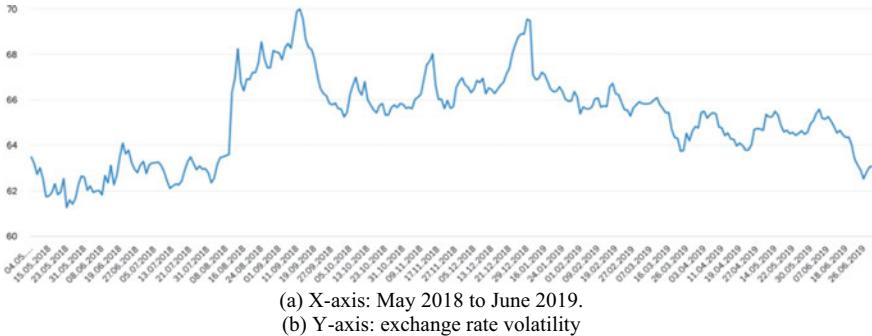
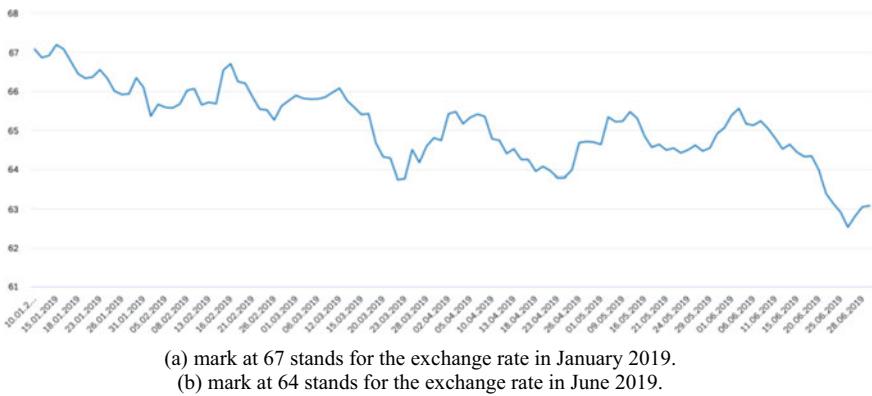
2. Paying for business trips abroad, including any trips taken to participate in internships, conferences, and exhibitions.
3. Buying subscription for scientific articles in similar fields of expertise, as well as paying for the access to electronic resources such as Scopus or Web of Science.
4. Publishing the results obtained by the business incubator in indexed journals.

Speaking of the need to respond to external factors, note that the assessment should not be limited to specific criteria, as different countries may apply different approaches due to using different indicators and having different priorities; besides, innovation strategies and programs are subject to revision [25–27].

1.4 Finding the Weights

Finding the weight of the coefficient j is important. Previous research used relative units ranked from 0.1 to 0.9. To find the weight j of the ‘facilities’ variable, consider the USD-RUB exchange rates in 2019. Figure 1.5 shows the exchange rate curve based on data collected from Bank of Russia.

As shown in Fig. 1.5, one US dollar was worth 64 to 66 Russian rubles from May to June 2019. Its value was 67 to 68 earlier this year. It is only logical to assign $j = 1$ for the beginning of the year, as socioeconomic indicators are readjusted for a variety of changes when the year begins. As the exchange rate is volatile, assign additional

**Fig. 1.5** USD/RUB exchange rate**Fig. 1.6** Finding the weight j of the ‘facilities’ variable

coefficients associated with the exchange rate with an increment of 0.3; see Fig. 1.6 for the results.

From January to June 2019, the indicated varied by 2 to 3 rubles. In this case, the ‘facilities’ variable will have a $j = 1.9$. In terms of facilities, higher j is favorable. Note that $j = 1.9$, while it ranged from 0.1 to 0.9 in the previous assessment. Thus, transform the additional coefficient j while sticking to the ranking-based principle; get $1.9 = > 0.9$.

Now, we have a specific logic for the external and internal factors affecting innovation, and the actor of innovation can be assessed properly. A beforehand note: assigning a coefficient to each input variable is not mandatory, as there are categories that are barely affected by any factor, if at all.

As proposed above in Fig. 1.4, each input variables of a business incubator can be affected by a variety of factors; thus, the startups is assigned a conventional coefficient of 0.9, time is assigned a coefficient of 0.6, services is assigned a coefficient of 0.3,

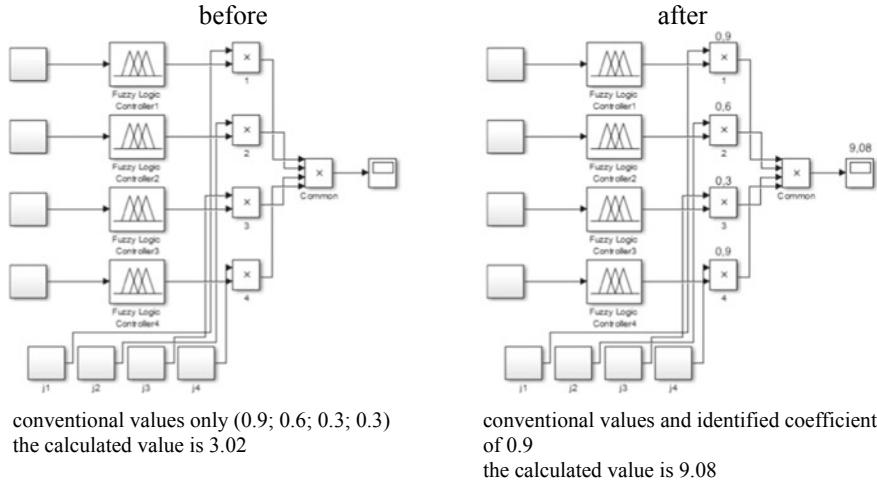


Fig. 1.7 Comparative score

while facilities has 0.9 in view of the above. The assessment results are shown in Fig. 1.7.

Thus, the final assessment score is 9.08. The output obtained in MATLAB in view of the possible affecting factors seems plausibly more objective.

1.5 Projection Methods in Use

Until now, the authors hereof have only been assessing innovation actors to find their performance, innovation activity, and quality of conditions under which they operated. However, such results were not always usable for projecting. The results obtained herein shall now be used to make a projection. The goal is not to dwell upon projection methods and approaches in detail, as that topic requires an article of its own. For space considerations, this paper only gives an introduction.

There are multiple scientifically backed projection methods. Some two hundred researchers in relevant disciplines believe. According to the Institute of Economic Forecasting, Russian Academy of Sciences [27], comprehensive socioeconomic projections use expert assessment methods (heuristic methods), logical modeling, mathematical methods, and normative methods.

Fundamental analysis and process analysis are two common methods used for making currency exchange projections. The methods shall now be described in detail, as they are going to be used further in this research. Fundamental analysis (FA) is analysis of financial and production performance of a company for valuation, whether of the company itself or of its stock. FA essentially boils down to analyzing the global events on a daily basis, as many such events might signal upcoming market changes,

including those in the currency exchange. Such data is available from the Internet or other reliable sources. Process analysis (PA) is a toolkit for making projections by extrapolating former trends and patterns in prices. A projection must be based on complete and thorough price history analysis, including in visual form; after that, the analyst should choose proper PA tools. Combining both methods gives a holistic view of the market situation for more accurate prediction of price changes.

Going back to the coefficient j of the facilities, let us take a look at Fig. 1.5 and apply the FA/PA methodology to project the exchange rate. As of June 15, 2019, FA does not detect any signs of upcoming change in the USD-RUB exchange rate. However, experts note that should oil drop below \$50 per barrel, and the ruble will follow as it is highly dependent on the oil prices. In that case, USD might go as high as 70 rubles [28]. It should be noted that FA is better used for short-term projections, as large-scale global events affect economic figures immediately.

Now consider the popular PA tools. Support and resistance are two metrics that help correctly identify the maximum and minimum prices on the curve of an asset. One of the two projection strategies can apply. Graphic analysis patterns are combinations of price minima and maxima that help make rule-based projections. Trend is another tool; it stands for unidirectional price change, i.e., an upward trend, a downward trend, or a lateral trend. Apply these tools to analyze the USD/RUB pair; see Fig. 1.8 for the results and the discussion below.

In the figure stands for the support and resistance tool, which shows two parallel straight: price maximum and price minimum. As the price of an asset peaks and begins to drop, a withdrawal trend is invoked. According to that trend, the price is expected to continue falling, and the curve in Fig. 1.8 proves that. The second tool is graphic analysis patterns, shown as four lines. This pattern is referred to as Double Apex; the asset price is expected to follow the pattern. Now focus on the third tool that shows a downward trend. To determine when the trend is to end, trace its line. If the line crosses the color opposite to that of the trend, the trend is likely to change. The figure shows the currency exchange rate plotted for until June 15, 2019; the third tool projects the trend to reverse. Two months later, on August 15, 2019, the US dollar reached 65.2 rubles, while it had been 64.3 on June 15. Beside the PA tools, N in Fig. 1.8 stands for a candlestick that indicates a drastic change in

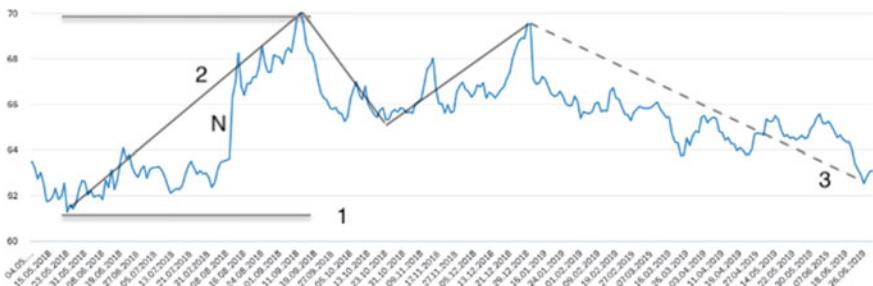


Fig. 1.8 Fundamental and technical analysis tools

exchange rate. N stands for news; this is an example of FA, a case of how the market situation might be affected by large-scale events. With a few exceptions, the ruble always dropped in August over the past twenty years. Chief Economist of the Bank of America for Russia believes that August is the trickiest period when it comes to the ruble exchange rate, given its seasonal nature and the total current transactions. Russian corporations pay dividends in this month, which leads to massive outflow of capital [29].

Thus, FA and PA methods can reliably predict changes in the currency exchange rate. Of course, in some cases, a specific tool might contradict the reality; however, even two fundamentally different methods that detect oppositely valued signals can also contradict the reality. It is also important to remember that only 3 or 4 tools should be used at a time. The case presented herein shows that combining different methods and making optimal use of projection tools result in reasonably accurate projections.

1.6 Conclusions

In conclusion, two key findings should be highlighted:

1. Mamdani and Sugeno fuzzy inference algorithms available in MATLAB and used in a fuzzy logic toolbox/Simulink combination constitute a model and methodology set for assessing innovation actors [30–32], as the transformed model shown in Fig. 1.4 meets the requirements to economic-mathematical models specified in this paper: it is adequate, optimal, performs well, and makes proper use of mathematics.
2. This paper shows that the assessment results obtained herein can be used not only to find the performance, activity, and efficiency of an innovation actor, but also to make predictions for more optimal managerial decisions adjusted for affecting factors.

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Chapter 2

Modeling the Assessment of Readiness of a Territorial Entity of the Russian Federation for Innovation Activities (on the Example of Primorsky Krai)



Denis B. Solovev and S. S. Kuzora

Abstract This study is devoted to a certain aspect of the innovation activity of a territorial entity of the Russian Federation. The authors of this study consider the readiness of a territorial entity for innovation activities, namely such fundamental elements as executive authorities, universities and research organizations, venture financing institutions, anchor companies, and small innovative companies. The abovementioned elements present in the region show the existing potential of the innovation ecosystem, the interaction of participants of the relevant processes, and certain difficulties as well. The paper discusses the innovation hub definition from the point of view of an innovation ecosystem, which has a favorable environment for innovation activities. The theoretical part of the study allows to propose using a modern mathematical modeling means, including fuzzy sets and fuzzy logic theory, to assess the readiness of the Primorsky Krai for innovation activities.

2.1 Introduction

In the era of globalization, humanity suffers from such insoluble problems as diseases, terrorism, poverty and other difficulties that require genuinely new solutions. Important global and domestic social problems in education, safety, ecology, and health-care require changing the traditional economic structure, which is a transition to an innovative path of development.

Currently, a large number of countries around the world are switching to an innovation-driven economy. The reason for this is only the global challenges, but

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also the fact that in conditions of global competition and a high degree of openness of the modern economy, it is impossible to compete with the developed countries in the standard of living and efficiency having only the raw resources extraction vector of economic development in priority, and not ensuring advanced breakthrough development by using the national competitive advantages [1, p. 214].

Today, the leaders of innovative development are countries such as the USA, Switzerland, Israel, Singapore, and South Korea [2]. The economic development vectors of these countries are aimed at creating innovation ecosystems, which are a favorable environment for the development of innovative entrepreneurship, contributing to the economic development of the country as a whole.

2.2 Innovation Hub Concept

One of the common world practices used to develop innovation ecosystems is the creation of innovation hubs. This infrastructure is a favorable environment for close interaction of all participants of the innovation process, which synergistic effect leads to the emergence of new technologies, innovative products, and services.

The concept of an innovation hub is described in a large number of studies by foreign authors [3–5]. For example, according to Michael Porter, University Professor at Harvard, an innovation hub, is a concentration of a critical mass of interconnected companies and institutions in a particular geographical area, including service providers and universities, with their proximity leading to shared benefits due to aggregation of experience and specific resources [6].

Other experts consider innovation hubs as social communities, workspaces, or research centers that provide subject-matter expertise on technology trends, knowledge and strategic innovation management, enabling proactive knowledge exchange between researchers and business experts on one hand and industry, government, and academics on the other hand [7].

Also, innovation hubs can act as functioning markets that bring together the best talents, funds, large corporations, and universities [8] or are territories intended for innovation, where a full cycle from idea generation to its commercialization in the market is made due to the close interaction of all participants of the innovation ecosystem [9].

Ultimately, an innovation hub is primarily an innovation culture, which is based on people who desire to change the world, as well as certain conditions and auxiliary tools that help translate ideas into reality [10].

Despite the existing definitions of an innovation hub, the authors distinguish the following participants of this infrastructure:

1. State

The main task of this element is to stimulate and coordinate other elements to create and develop an innovation ecosystem. To begin with, a modern, high-quality, affordable innovation infrastructure shall be created, close interaction

between business, research, and educational institutions shall be established, an effective innovation policy of the region shall be creative, and innovation activity shall receive legislative support.

2. Universities and research organizations

The main task of educational and research institutions is to provide highly qualified personnel for the region, organize scientific research, and carry out design and experimental developments with their subsequent implementation in practice.

3. Venture funding institutions

Venture funding institutions provide access to funds for new innovative enterprises, as well as projects that are in the early stages of implementation. It is almost impossible to obtain funding from other investors due to the extremely high level of uncertainty about the results. Based on the above, the venture funding mechanism is an extremely important element, necessary for the effective operation of an innovation hub.

4. Innovative infrastructure or service providers

Innovative infrastructure facilities maintain and facilitate innovative processes, helping new ideas to be transformed into an innovative product with subsequent commercialization on the market.

5. Large anchor companies or corporations

Large companies are fundamental participants of the innovation hub system. They act as a magnet attracting small and medium-sized companies to establish production forming dense networks of interconnected technology companies, customers, and suppliers [4]. This interaction contributes to the development of all participants of the innovation hub and gives them a competitive edge over other external companies that are not part of this system.

6. Small innovative companies or startups.

The main task of small innovative companies is to create a bridge between science and production. Small companies are actually the ones who generate new products and technologies by converting knowledge into a commodity.

Let us consider the innovation hub operation algorithm in detail. At its core, innovation hubs are intended to consolidate information from all participants in the innovation ecosystem with its subsequent provision to stakeholders upon request, acting as a center of attraction.

The state “fills” innovation hubs with a regulatory and legal framework, directs financial resources to the development of an innovation environment, and develops all kinds of support mechanisms. Universities and research institutions create a pool of high-tech personnel and conduct scientific research. It is worth noting that human capital assets are the foundation of innovation hubs. The next important participants of innovation hubs are venture funding institutions, which create grant support programs and hold all kinds of tenders to provide the startup community with funding at the early stages of their projects. Small innovative companies generate intellectual property objects—the very goods and services that are the main drivers of economic development in many countries. Innovative infrastructure provides all

kinds of services, such as legal services, accounting, financial accounting, etc. and helps startups to achieve acceleration, as well as to create products and services in the shortest possible time. Large companies generate orders, becoming centers of attraction for small innovative companies.

As a result, each participant of the innovation ecosystem generates its own set of data, which are consolidated into the innovation hub, forming effective links between information, creating synergy, leading to more efficient operation of each participant of the innovation hub.

Currently, the main problem of interaction between the participants of the innovation hub is the exchange and management of information flows, which can be represented in Fig. 2.1.

Each of the presented models has both pros and cons. The advantage of model 1 is the freedom of innovation activities. The innovation hub focuses on the tasks set by the federal government. Also, the lack of direct control by the federal government is

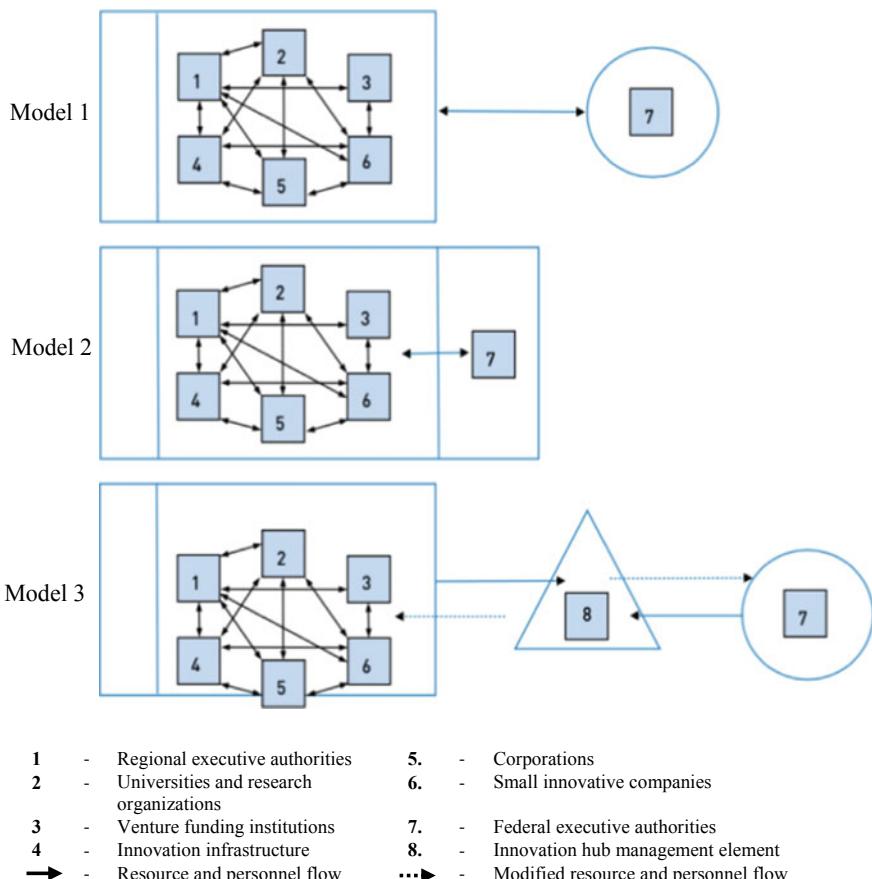


Fig. 2.1 Data exchange channels

both an advantage and a disadvantage. In the first case, the lack of direct control does not constrain innovation, which in turn increases innovation activity within the hub. In the second case, the lack of direct control affects the understanding of the innovation hub problems. Often, the federal government does not have this information and dictates general rules, rather than specifying specific orders for innovation activities, which ultimately does not fully reveal the innovative potential of the hub.

The key aspect of model 2 is that the activities of the federal government are integrated with the hub operation. The advantage of this model is that the federal government sets specific objectives for innovation activities. The information flowing within the hub does not change, and innovation activity is controlled by the federal government. The disadvantage of this model is the lack of freedom for innovation activities, where all the activity of the innovation hub is aimed at fulfilling a specific federal government order, which ultimately leads to a decrease in innovation acceleration.

The third model is combined. This model has a link element between the customer, represented by the federal government, and the innovation hub. This element manages and transfers information from the customer to the hub and back. The advantage of this model is related to information control and management. The downside is that information is often modified or interpreted differently in the process of exchange, and there are no specific orders for innovations as in model 1 as well. The hub operation is based on awareness of state innovation policy, while the federal government is not aware of the possible difficulties of the hub, which may lead to misunderstandings among the interacting participants.

2.3 Innovation Ecosystem of Primorsky Krai

Primorsky Krai is one of the regions of the Russian Federation where the government pays great attention to the innovation development. Resources are attracted from the federal budget to the region for the development of regional innovation infrastructure, the creation of a large scientific and technological center on Russky Island, and the development of small and medium-sized businesses.

The region has an advantageous geographical location. Located at the intersection of land and sea transport routes between Europe and the Asia-Pacific countries, Primorsky Krai is the largest transport and logistics hub in the Far East and an export “window of the Russian Federation to Asia.”

The innovation ecosystem of the region has the form as in the first model and includes the following participants (Fig. 2.2).

Let us briefly describe the contents of Fig. 2.2.

State. In Primorsky Krai, this element is represented by the Government of the Primorsky Krai, the Legislative Assembly of the Primorsky Krai, municipalities and legislative bodies of municipalities.

Innovation infrastructure objects. The region's innovation infrastructure currently includes the following objects:

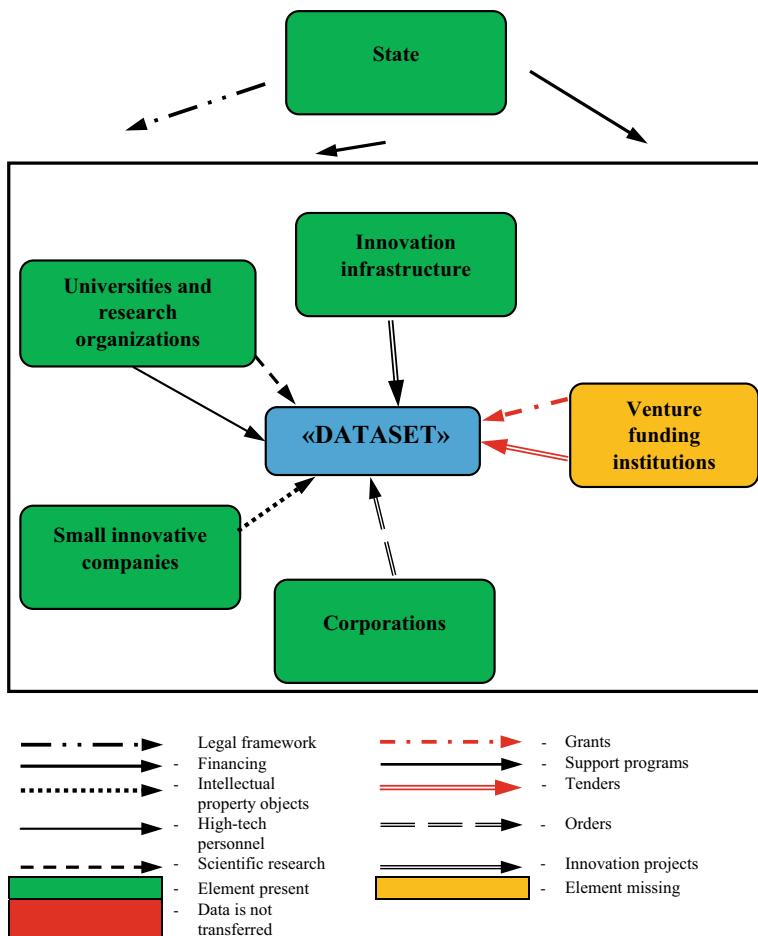


Fig. 2.2 Innovation ecosystem of Primorsky Krai

- “My Business” center—a platform uniting all institutions supporting entrepreneurs in one place, providing services to businesses by “one contact” principle. Entrepreneurs can get complete solutions in one location.
- Technopark Russkiy is a platform for launching and bringing high-tech products, services and technologies to the market due to territorial integration with scientific and educational organizations, as well as a large community of technology entrepreneurs, experts, partners, and investors, using a complex of modern equipment, techniques, and technologies.
- Innovative business incubator of the Vladivostok State University of Economics and Service is an open infrastructure and consulting platform for the development of youth entrepreneurship in the region.

- The Far East office of Skolkovo Foundation—provides grant and investment support, assistance in the development of startups via acceleration, mentoring, and educational programs [11].

Venture funding institutions. Currently, no venture funding institutions are preset on the territory of Primorsky Krai.

Educational and research institutions. In Primorsky Krai, this element is represented by the Far Eastern Federal University, Vladivostok State University of Economics and Service, and the Far Eastern Branch of the Russian Academy of Sciences.

Small innovative companies. In Primorsky Krai, small innovative companies are based on higher educational institutions. The Far Eastern Federal University is superior in this area—more than 69 such enterprises have been created on its base.

Large anchor organizations. The following anchor companies operate in Primorsky Krai:

- Far Eastern Shipbuilding and Ship Repair Center (FESRC JSC). It includes the main ship repair and shipbuilding production facilities of the Far Eastern Federal District.
- Dobroflot Corporate Group is the largest fishing holding in the Far East.
- GreenAgro is the largest manufacturer of high-quality dairy products in Primorsky Krai.
- Ratimir LLC—the largest meat processing plant in the Far East for the production of sausages and meat products.
- Primorskiy Konditer LLC—the largest manufacturer of confectionery products in the Far East.
- MAZDA SOLLERS—a plant for the production of cars of the Japanese brand Mazda.
- Dalpridor PJSC—an instrument-making enterprise specializing in the development, mass production, repair, maintenance and disposal of hydroacoustic systems, equipment in the field of exploration and production of hydrocarbons, aircraft dropped search aids, as well as instrumental equipment for aircraft and ships with ocean monitoring devices.
- Vladivostok Commercial Sea Port is the largest multipurpose port in the Far East, one of the leaders in the stevedoring services market.

Additionally, worth noting are two more large anchor companies operating in the region, which have a great impact on the innovative development of the region:

- PJSC Sberbank actively develops innovative technologies such as artificial intelligence, machine learning, blockchains, and robotics.
- PJSC Rostelecom is a recognized technology leader in innovative solutions in the field of e-government, cybersecurity, cloud computing, healthcare, education, security, housing, and communal services.

Thus, based on the abovementioned, we can conclude that Primorsky Krai has all the necessary conditions for conducting innovative activities in the region. The main

constraints to innovation activity in the region are the lack of control and information management within the hub, lack of specific orders for innovations, as well as lack of understanding of the ongoing processes within the innovation hub.

2.4 Methodology for Innovation Activity Assessment

Searching solutions to the above problems is relevant today, which requires conducting a comprehensive readiness assessment for the innovation hub elements and identifying strengths and weaknesses with subsequent adoption of a non-biased management decision aimed at adjusting the region's innovation policy.

One of the assessment methods includes mathematical modeling using specifically designed software. The advantages of this method are the information processing speed and the benefit of cost minimization. The disadvantage is the average calculation accuracy.

Let us consider some software products for mathematical calculations:

1. MATLAB. A system for automating mathematical calculations, characterized by high-speed computing, which is widely used for solving problems of linear algebra, mathematical modeling, building and solving state equations for dynamic objects and systems. The main advantage of this software is the convenience of modeling and researching various tasks. The included programming language is easy to learn and has a simple and understandable syntax. MATLAB system disadvantages include low environment integration level, as well as certain calculation errors.
2. Mathcad. A software with a user-friendly interface designed for complex mathematical calculations, data visualization, and modeling with a wide range of symbolic computing capabilities. The main advantages are natural mathematical language, clarity, excellent error diagnosis, high calculation accuracy, implementation of many standard functions of computational mathematics, the possibility of symbolic mathematical transformations. The main disadvantages of the software include limited capabilities for existing operators, difficulties of complex algorithm implementations, lack of visualization (construction of visual 3D models).
3. Scilab. A software package for scientific and engineering computing. The main advantages of this software include console-based operation without using a graphical interface, as well as cross-platform support. The main disadvantages include slow performance in certain cases, calculation errors, and weak visualization tools for the obtained results.

Despite all the pros and cons of the abovementioned software, they all have certain differences and are suitable for various tasks. For instance, Mathcad is more suitable for accurate simple calculations without visualization. Scilab is for computations with

result visualization. MATLAB is for implementing fuzzy set and fuzzy logic algorithms. It should also be noted that far more software products exist for mathematical modeling, and we have mentioned only the most used ones.

This study proses a method for a comprehensive assessment of the readiness of Primorsky Krai for innovation activities based on the theory of fuzzy sets and fuzzy logic [11–15]. This theory is considered as one of the most effective assessment methods today in conditions of uncertainty, which allows making balanced management decisions [16–20]. MATLAB software was used as a utility resource for the assessment with the fuzzy logic toolbox package and built-in Mamdani fuzzy logic inference algorithm [21].

2.5 Assessment of Primorsky Krai Readiness for Innovative Activities

Based on the above, we will proceed to assess the readiness of Primorsky Krai for innovation activities. The assessment is proposed to be conducted in three stages:

- (a) Stage 1 (input variables—anchor companies and startups).
- (b) Stage 2 (input variables—universities and innovation infrastructure).
- (c) Stage 3 (Stage 1 and Stage 2 assessment results).

Three stages performing calculations are proposed since when building complex models with three or more input variables, the probability of calculation errors often increase greatly. Furthermore, fuzzy logic toolbox package visualizes the result only for two variables, and when a model is built with a large number of input variables, the visualized result can be significantly distorted, which affects the correctness of the model.

To initiate fuzzy logic toolbox, “fuzzy” command is entered in the MATLAB command line.

Step 1. Input variables “anchor companies” and “startups” are added using Addininput from the Edit menu. The output variable for decision making is assigned the name “Score1.” Let us save the created model under the name “Stage1.” As a result, we get the following structure—two inputs, Mamdani’s fuzzy inference algorithm, one output (Fig. 2.3).

Step 2. Membership functions are assigned to each input and output variable. This procedure is done in the editor. For “anchor companies,” range value of the base variable is set from 0 to 15 (units). The same range is selected for its display range. Let us add three membership functions of type trimf. By sequentially highlighting individual membership functions with the mouse, we assign names—“low,” “medium,” and “high” score. Range value of the base variable is set from 0 to 80 (units). Membership functions are defined in the same way as the “anchor companies” variable. Thus, both variables will be assigned values “low,” “medium,” “high,” as shown in Fig. 2.4.

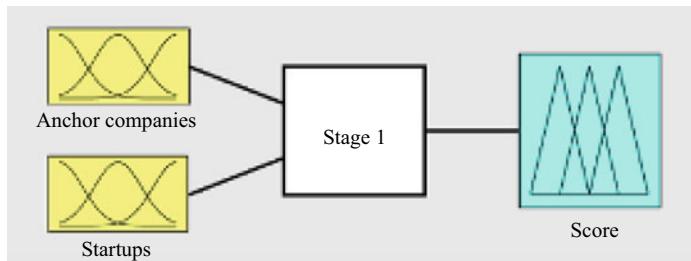
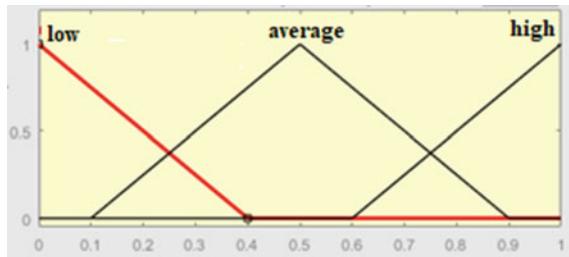


Fig. 2.3 Definition of linguistic variables

Fig. 2.4 Assigning membership functions to variables



Similar membership functions are assigned for “Score1” output variable and range value of the base variable is set from 0 to 5 (points).

Step 3. The final step in model creation is to define a set of rules that define the relationship between input and output variables. To do this, the following rule base is created using the output rules editor: “If the number of anchor companies is low and the number of startups is low, then the assessment score equals one,” etc. The complete rule base is shown in Fig. 2.5.

Step 4. At this stage, by viewing the inference rules, we will set the actual values of the input variables obtained in the course of the analysis of the innovation ecosystem of the Primorsky Territory. The “anchor companies” variable is assigned the value of 10, while the “startups” variable—69. The calculations provide a score of 3.01 points (Fig. 2.6). This value determines the level of readiness of the Primorsky Krai for innovation activities on a scale from 0 to 5.

Step 5. At the final stage, a three-dimensional model is derived using the surface viewing function, which shows the final assessment results for the first stage from two input variables (Fig. 2.7).

The 3D diagram can be used as follows:

1. The involved linguistic variables are compared with each other (“startups” with a value of 69 = Score 3; “anchor companies” with a value of 10 = Score 3).
2. The arithmetic mean is found for the estimated variables $((3 + 3)/2 = 3)$. The obtained result corresponds to the previous assessment (Fig. 2.6).

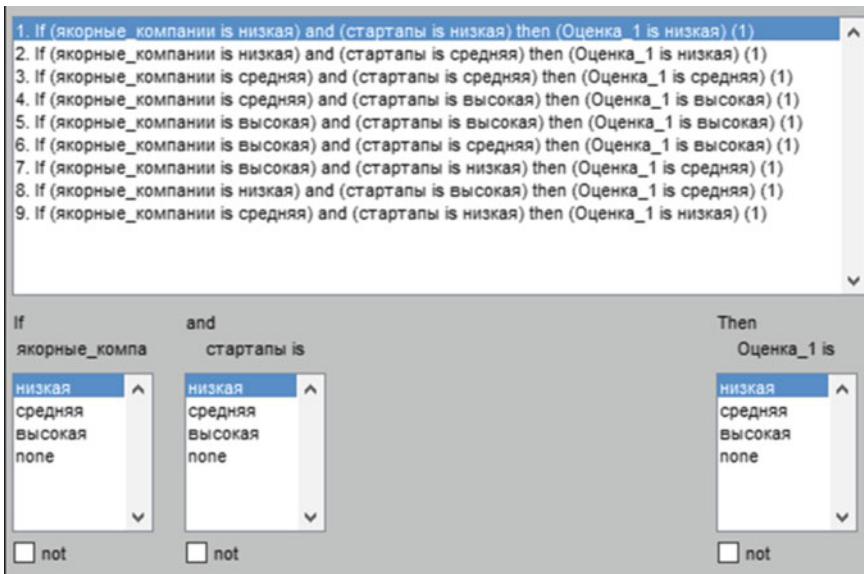


Fig. 2.5 Complete rule base

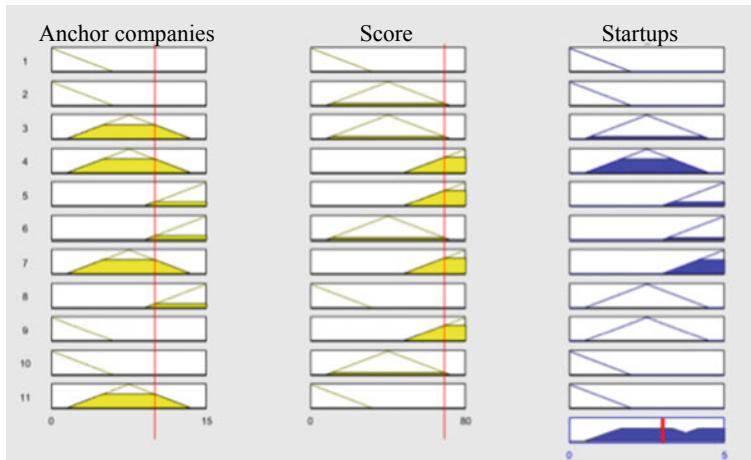
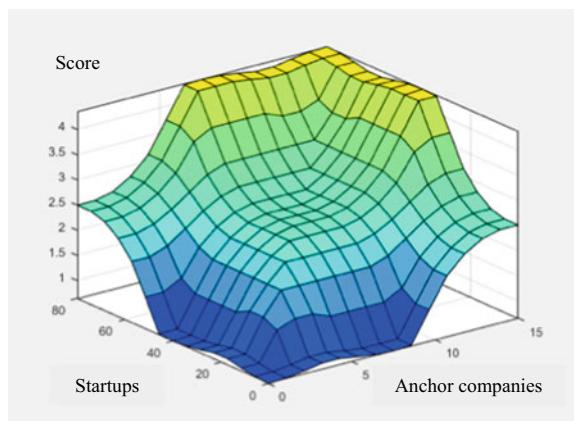


Fig. 2.6 Intermediate assessment results

The 3D assessment model can be used as an auxiliary tool, which allows to get the following information:

- A three-dimensional surface allows to judge the correctness of the specified rules.
- 3D model demonstrates the difference in variable significance.

Fig. 2.7 First stage assessment model



Let us make similar calculations for the second and third stages. For the second stage, the score of 2.5 points is obtained (Fig. 2.8).

The summary result of the final stage is shown in Fig. 2.9, which allows to draw the following conclusion—as of 2020, the readiness of Primorsky Krai for innovation activities is estimated at 2.5 points. This indicator can be interpreted as average.

Having considered an example of assessing the readiness of Primorsky Krai for innovation activities with four main elements, it is proposed to assess the remaining participants of the innovation hub participating in the relevant processes in the future studies.

It is important to note that efficient innovation policy is a fundamental tool aimed at the technological development of any region of the Russian Federation. Large anchor companies, innovative infrastructure, high-tech personnel, actively working startups present in the region allow to follow the modern vector of development. Moreover, a regular assessment of innovation activity helps to identify bottlenecks and to make

Fig. 2.8 Second stage assessment model

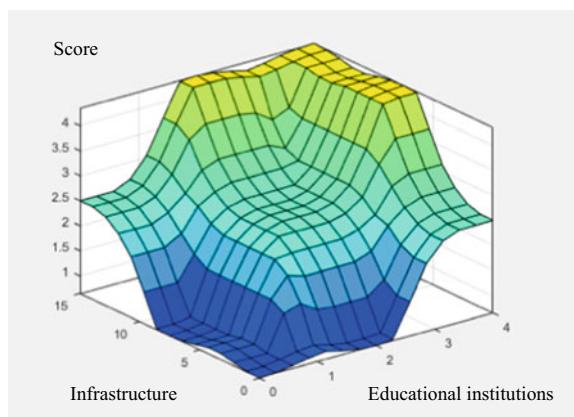
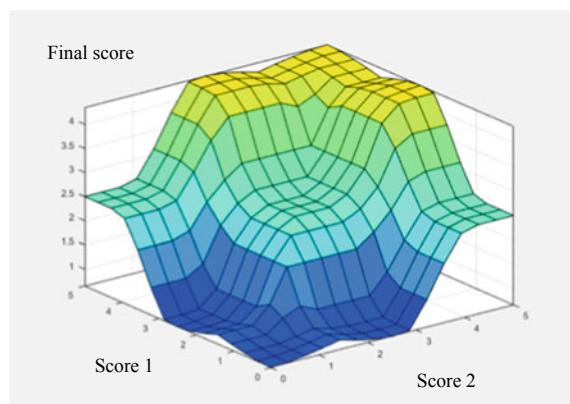


Fig. 2.9 Final stage assessment model



management decisions to eliminate them, adjusting the innovation strategy of the region.

The approach proposed by the authors, based on the mathematical modeling using fuzzy sets and fuzzy logic theory, takes into account the inaccuracy of the data, which allows assessing the studied system in conditions of uncertainty.

2.6 Conclusions

In this study, the authors analyzed foreign experience in the development of innovation ecosystems have considered the “innovation hub” concept, analyzed the innovation ecosystem of Primorsky Krai, and proposed a method for assessing the readiness of a region for innovation activities based on fuzzy sets and fuzzy logic theory using MATLAB software, fuzzy logic toolbox package, and a built-in Mamdani fuzzy inference algorithm.

Based on an assessment example with four fundamental elements of the Primorsky Krai innovation ecosystem, the developed methodology allowed to assess the region’s readiness for innovation activities. The quantitative result of the assessment is 2.5 points, which can be interpreted as the average readiness, while the region was perceived as fully ready for innovation activities at the initial analysis stage. Thus, the proposed assessment method allows assessing the innovation ecosystem of the region more objectively and efficiently, while the obtained assessment result can be used as the base for decisions on the regional innovation policy adjustments.

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Chapter 3

Financial Innovation: The Impact of Mobile Money on Innovative Economic Growth



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Abstract This paper examines the effect of mobile money development on economic growth and development in sub-Saharan Africa (SSA) for 2011–2018 period using the partial least squares (PLS) regression. The causality within and between mobile money development, which include the continuous surge in registered mobile money agents, rapid growth of annual transactions as well as the overall yearly capitalization of mobile money transactions on the sub-Saharan African financial sector development and economy. It was established that mobile money development has a significant impact on economic growth, where GDP per capita was employed as the dependent variable, but the model results may largely depend on the variable used to proxy for economic growth. Also, a significant positive Pearson correlations were found between mobile money activities and financial development as well as GDP, and hence proving that the rise of mobile money activities like number of agents and volume of transactions has an effect on economic development in sub-Saharan African economies per our study model. Mobile money is an alternative mode of banking for the unbanked population; thus, it is not surprising that its expansion and easy access positively affects financial sector growth in the region. Hence, the adoption and development of electronic banking and payment affect the economy through various ways like trade, household consumption and remittances. Although, any policy initiative implemented to encourage and boost this type of payment and banking method may not immediately affect the economy, however, the mobile money system facilitates the pooling of capital and its onward effective allocation to productive sectors, thus promoting and enhancing innovative development in the region.

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3.1 Introduction

Developing economies unlike advanced economies are generally characterized by institutional failures or gaps [1], and these gaps or deficiencies habitually bring about inadequate infrastructure or underdevelopment in major industrial sectors that are vital for economic development. However, contemporary technological innovations generate new platforms and networks in the form of markets or other institutions [2], this also results in the creation of innovative opportunities capable of mitigating institutional gaps. Financial inclusion is a very crucial element of economic growth, but the degree of financial exclusion is very high in developing countries, which are caused by institutional gaps and insufficient infrastructural networks, especially financial infrastructure. Financial exclusion impedes economic growth in developing economies [3], especially in sub-Saharan African economies [4], where until recent technological advancement start to witness rapid development of electronic payment system in the form of mobile money (mobile payment and mobile banking). This development is partly caused by the surge in mobile phone networks and access to internet, thus filling the infrastructure gap through the introduction of mobile money wallets, which are attached to customers cell phone numbers and provides services similar to traditional bank accounts. This helps clients to undertake different financial transactions in relatively cheaper, safe and reliable way, and thus brings about financial inclusiveness by providing a platform for those who previously could have or use traditional bank accounts. Aside that it is assumed that electronic payment, and for that matter mobile money plays a huge role in augmenting money liquidity.

Thus, recent technological advancement has facilitated innovation in new payment systems where transactions are completed, or people trade without using physical cash. A cashless payment eliminates the use of physical cash as a medium of exchange for economic transactions, thereby allowing cashless transfer payments in the form of electronic or non-electronic payment with the help of cheque. But it worth noting that electronic payment is steadily overtaking all the other modes of payment, Liao and Handa [5] argue that, currently, the electronic payment has significantly substituted cheque payments, although this form of payment has not totally led to a full cashless society. Electronic payment comes with a couple of advantages, for instance, Armey et al. [6] think the adoption of electronic payment discourages crimes like robbery etc. unlike traditional usage of physical cash for transactions. Electronic mode of payment makes people hold less physical for trading and this, thus reduces cash related crimes, also Paul and Friday [7] argues that this mode of payment serves a good hygiene for food vendors, especially in Africa where food vendors are confronted with the situation of touching cash and also serving food at the same time.

Electronic payment plays a significant role in individual countries and the global economy as whole, for example, it was estimated, in a research conducted by Moody's Analytics, that from 2008 to 2012 about \$983 billion US dollars was added to gross domestic product of 56 understudied economies through the use of card payment products, and averagely, electronic card payment raised consumption by 0.7% across in those countries. In the same vein, Zandi et al. [8] posited that the global economy

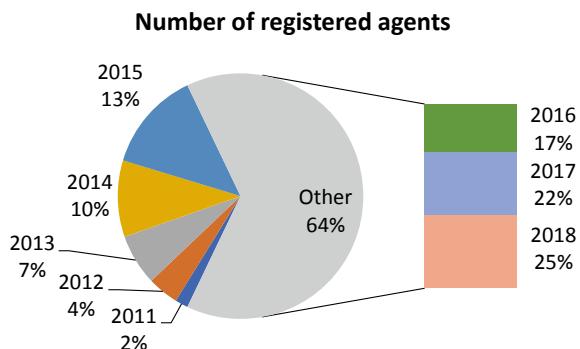
grew, averagely, by 1.8% during the same 2008–2012 period. A cashless trade or transaction is defined by Paul and Friday [7] as the exchange of goods and service either through electronic or cheque payments without the use of physical cash. The concept of Diffusion of Innovation Theory by Rogers [9], which states how the diffusion of innovation occurs in a society over a period of time as the adoption of new innovation is triggered by economic agents through interpersonal networks. This concept can be used to examine the impact of electronic payment on economy since the development or use of electronic payment for transaction would depend on its convenience for consumers and producers for better trade services. Thus, the readiness to adopt any form of payment system other than the traditional cash mode in the society will depend on a number of factors like the type of innovation processes and the kind of innovation adopters. And inasmuch as the diffusion and adoption of any form of new idea or innovation including electronic payment system is subject to approval by the society based on its convenience and reliability, an approval rate of cashless payment varies at each stage of its innovation processes, and also the adoption cashless payment differs from society to society. This study is inspired by the above facts and as such we seek to reveal the readiness of the African society in the adoption of mobile money, the most popular electronic payment system, in the continent and its impact on financial development, hence innovative economic development [10].

The recent thrust in information technology is generally seen to be very significant in alleviating these voids, however, economic literature studying the effectiveness and general economic impact of this process is still scarce, particularly on developing economies like sub-Saharan Africa. Since little is known about the regulatory and institutional policies are required, the sectors could facilitate or serve as catalysts for effective transition from traditional usage of physical cash to cashless transactions as well as the real economic effects. This paper studies the impact or relationship between mobile money and financial development, migrants' remittance and real economic growth.

3.2 Literature Review

Different have made attempts to define electronic payment (see [9, 10]), which [11] defined in it blue book as non-cash preservation of economic resources on a device often used to undertake payments of transactions without the involvement of banks or bank accounts in the payment process, Oginini [12] thinks that by performing a role as a prepaid carrier tool, electronic payment can be seen as the usage of credit and debit cards, ATMs, mobile wallets and other analogous modes for payments of goods and services. Likewise, electronic payment is referred to as a form of payment service that utilizes technologies like ICT, cryptography, telecommunications and integrated circuit cards [13]. In this paper, we see electronic payment to consist of any delivery multichannel, which serves as a platform for the exchange of monetary resources electronically without the use of physical cash, and with or without the

Fig. 3.1 The growth tendency of mobile money agents in sub-Saharan Africa [15] Source Data from GSMA



physical contact of the parties involved. Thus, Scholnick et al. [14] think that the emergence of new electronic payments networks and tools like debit and credits have caused some key changes in retail payments market, which gradually substituting the traditional cash-based payments. In developing economies, particularly in sub-Saharan African countries, mobile money is the most popular payment platform and it has been fast-growing and gaining patronage about households, especially within the retail market in the region. This can be seen in sub-Saharan Africa (SSA), where the number of registered mobile money agents keeps surging from year to year, which is illustrated in Fig. 3.1.

From the above diagram, it is obvious that more and more agents enroll onto the mobile money system every year, with about 64% increase in the last 3 years. Hence, issues pertaining to payment systems and tools are progressively a key point of debate, this has attracted the attention of numerous scholars ranging from financial and banking economics; macroeconomics; monetary theory; to regulatory economics such as [14, 161718192021]. Some of these studies look at the costs and benefits of various electronic payment tools and also examine their prospective effects on pooling of capital and its allocation as well as on economic growth. For example, Berger [16] demonstrates that technological advancement in the financial sector in the form the internet banking and electronic payment technologies bring about significant productivity growth. The transition from cash to cashless instruments is capable of decreasing the costs related to back-office activities that form the bulk of bank operating costs, hence could considerably increase productivity and economies of scale [16]. Figure 3.2 demonstrates the volume of transaction and capitalization of mobile money activities in SSA. It can be seen that the overall annual mobile money transaction keeps surging in the region, which can be attributed to the level of its patronage amongst households due to a couple of factors like easily accessible, the surge of mobile and internet usage, convenience, reliability and cost-effectiveness. Thus, this leads to an increase in total value of mobile money transactions and services, where in 2018 about \$26 billion US was recorded in the region according to GSMA database.

In the same vein, Humphrey et al. [22] and Hasan et al. [19] in their studies noticed how an increased in the use of electronic payment systems, particularly electronic

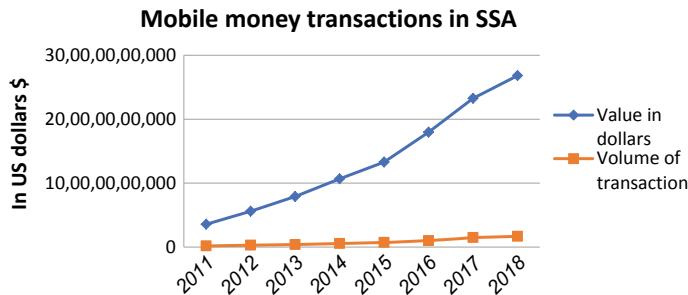


Fig. 3.2 Overall annual mobile money transaction and capitalization in sub-Saharan Africa [15]
Source Data from GSMA

retail-payment instruments are associated with significant improvements in costs and revenue for banks.

This, therefore, involves all forms of electronic transactions including e-cheque payment, which provide the platform for transacting business and the settlement of financial commitments electronically devoid of physically carrying cash in a cashless environment. These platforms, therefore, required certain infrastructure and networks such as internet, roads, power supply, etc. for an efficient and effective functioning to facilitate and ensure quick, safe, and convenient payments. Echekoba et al. [23] highlights some challenges like insufficient power supply, lack of regulatory policies, inadequate critical technological infrastructures and inadequate of socio-cultural backing required for the operation of unified and efficient e-payment system. This was followed by a study, where it was revealed that a transition towards cashless society in Nigeria could bring significant economic benefits, despite the cost saving management resulting from its adoption as well as the high degree of security concerns that it comes with after analyzing the shortcomings, advantages and implications related to electronic banking in country [24].

We think the development of mobile money would boost financial inclusion and also facilitates cashless payments, thus simplifying payments for transactions, which previously could be considered slow, unsafe and inconvenient. Aside that electronic payment is assumed to play enormous role and facilitates rapid economic development [25], however, rate of development of electronic payment varies from country to country subject to various factors. For instance, according to the World Payment Report (2017) cashless payment globally can be seen as a fast-growing industry, especially in emerging markets, where based on the (2014–2015 data) Asia recorded the highest growth with 43.4% and Central Europe, Middle East and Africa witnessed about 16.4% growth and the growth in Europe increased by 0.4%, while the overall volumes of cashless transactions grew over 11% and reached 433.1 billion. At individual country level Finland, Spain, Ireland, Denmark Sweden etc. all witness significant growth, with China recording over 63% growth rate with about 38.1 billion transactions, this thus highlights the major trends of the world non-cash or electronic transactions. It is believed that young people are comfortable with new innovations as

such emerging Asian markets are poised to accelerate the development e-commerce, however, according to Amrish [26] a lot rural places still lack banking system, while those that have access to banking services are gradually migrating from cash to electronic payments.

The adoption of electronic means of payment has a substantial impact on an economy, this was examined and proved by Hock-Han and Hway-Boon [27] in their study of cashless payment and economic growth, specifically, the effects of electronic cards, telegraphic transfers, electronic money and cheques on four European economies, which includes Belgium, Portugal, France, Germany, and Australia, for 2000–2012 period. They concluded that in the short-run the adoption of one kind cashless has influence on other modes of cashless payment, and the impact of cashless payment on economic development largely occurs in the long-run, thus any strategic policies enacted to boost electronic payment cannot be felt immediately.

Also, Hasan et al. [19] highlighted an important correlation between the adoption of cashless retail payment and total economic growth across 27 European countries for the period 1995–2009, and posited that the transition to an effective cashless retail payment could generally encourage consumption and trade, hence economic growth. Meanwhile, it was noticed that there is a relatively low effect of the usage of cheques for payment, credit/debit card payments and transfer of funds on the economy. This was followed by a study by Zandi et al. [8] on how a long-term shift to credit and debit card payments could facilitate economic development in about 56 countries globally, where it was revealed that cashless card payments could boost efficiency and increase consumption in an economy. Studies on the impact of electronic payment on individual country also suggest that electronic payments are vital catalysts to growth, for example, Oyewole et al. [28] revealed that the adoption of non-cash payment in Nigeria will positively impact its trade and growth. While Mieseigha and Ogbodo [29] think adopting non-cash transaction is critical for transparency, accountability and ameliorate financial safety by reducing cash related crimes, and also stimulates the various fundamental components of economic growth and development [30].

3.3 Data and Methodology

Secondary data of sub-Saharan Africa (SSA) was primarily used for this study and it covers the 1980–2018 periods and collected from the database of the World Bank and GSMA database. SPSS software was used to analyze and interpret data, applying linear regression to calculate correlation coefficients in order to examine the effects between variables. Mobile money topic is a very broad field of analysis, and such we employed the following variables for our analysis: dependent variables consist of GDP per capita and financial development index (as a control variable), and mobile money development indicators such number of registered mobile money agents, volume of mobile money transactions, value or capitalization (annual) of mobile money transactions.

Table 3.1 Descriptive statistics

Variable	Obs.	Minimum	Maximum	Mean	Std. deviation
GDP per capita	7	3349.328	3968.675	3676.861	217.487
Number of active agents	7	90,934.000	1,400,815.000	602,561.000	449,809.970
Volume of transactions	7	173,065,536.000	1,670,341,027.000	682,587,003.286	515,963,623.126
Financial development	7	0.144	0.167	0.153	0.008

Source Data extracted from World Bank Data [31] and the State of the Industry Report of GSMA [15]

The following hypotheses were composed in our urge to get to solutions to our research questions (objectives).

H0: Financial intermediations or activities cause economic growth in sub-Saharan Africa.

H1: The growth of mobile money transactions boosts economic development in sub-Saharan Africa.

H2: Remittance facilitates mobile money development in developing economies.

H3: The growth of mobile money platforms in sub-Saharan Africa spurs economic development.

To examine the relationship among the variables in line with our hypotheses, it was necessary to employ the linear regression Eq. (3.1). Thus, this equation is required to test our hypotheses.

$$\text{Economic growth}(y) = \beta_0 + \beta_1(\text{FD})i + \beta_2(\text{Remit})i + \beta_3(\text{MM})i + \varepsilon_i \quad (3.1)$$

To achieve the objective of this study, the data collected was analyzed using statistical techniques like mean, simple percentage, standard deviation and other relevant statistical tools in this study, and the results are presented in the form of tables and graphs. Table 3.1 presents summary statistics of the proxy and control variables used for the study.

3.4 Results and Discussion

The model described in the data and methodology section was employed to test the hypotheses of our study using above parameters. The results of the linear regression contained in tables below show the outcomes of the model where GDP per capita and financial development elements were used as dependent and control variables,

respectively; mobile money development components were treated as explanatory. The correlation parameters amongst all the variables used are illustrated in Table 3.4.

The matrix tests the Pearson correlation between the individual variables. The matrix above shows that there is a significant positive Pearson correlation between GDP per capita and the entire explanatory and control variables used in this study. The test conducted to examine the effect of mobile money development on economic growth gave the following results, which are represented in the model parameters (Table 3.2) and analysis of variation (Table 3.3).

The model parameters indicate the overall suitability and fitness of the model. For instance, the p-values in the models indicate the degree of reliability of the independent variables to predict or affect the dependent, and a value lower than 0.05

Table 3.2 Correlation matrix

	Number of agents	Volume of transaction	Financial development	GDP per capita
Number of active agents	1	0.992	0.993	0.935
Volume of transaction	0.992	1	0.982	0.888
Financial development	0.993	0.982	1	0.951
GDP per capita	0.935	0.888	0.951	1

Table 3.3 Model parameters

Source	Value	Standard error	T	Pr > t	Lower bound (95%)	Upper bound (95%)
Constant	-1171.538	182.782	-6.409	0.008	-1753.232	-589.845
Number of agents	0.001	0.000	21.960	0.000	0.001	0.001
Volume of transaction	0.000	0.000	-27.889	0.000	0.000	0.000
Financial development	31,956.769	1258.778	25.387	0.000	27,950.771	35,962.767

Table 3.4 Analysis of variance

Source	DF	Sum of squares	Mean squares	F	Pr > F
Model	3	283,453.268	94,484.423	810.980	<0.0001
Error	3	349.519	116.506		
Corrected Total	6	283,802.788			

Computed against model $Y = \text{Mean}(Y)$

Source Authors' computation using data World Bank and GSMA dataset

Table 3.5 Model goodness-of-fit and multicollinearity statistics

Statistic	Training set	Validation set	Statistic	Training set	Validation set
Sum of weights	7.000	1.000	DW	1.740	
DF	3.000	-3.000	Cp	4.000	
R^2	0.999		AIC	35.375	
Adjusted R^2	0.998		SBC	35.158	
MSE	116.506		PC	0.005	
RMSE	10.794		Press	6467.942	
MAPE	0.154	0.000	Q^2	0.977	0.000
<i>Multicollinearity statistics</i>					
	Number of agents	Volume of transaction	Financial development index		
Tolerance	0.006	0.015	0.014		
VIF	157.983	67.137	69.211		

Source Authors' computation using data World Bank and GSMA dataset

is required to prove a statistically significant correlation between variables. Also, R -squared indicate the level of variance of the proxy variable for growth explained by the control or independent variables, while the adjusted R -squared value provides a better honest association between the variables.

Based on the Table 3.4, we established that there is no relationship between mobile money development and economic growth was found. Surprising as it may be, however, the p -value of 0.0001 indicates that our model is reliable and significant. The model used for this study has been adequately evaluated using regression statistical analysis tools like goodness-of-fit, which demonstrates the degree of appropriateness and adequacy of the model and makes it possible to be used if it satisfies the assumptions. Table 3.5 demonstrates the statistics of goodness-of-fit and multicollinearity of our linear regression model.

R -square and adjusted R -square, which proves the level significance relationship between economic growth and the independent and control variables used in this particular situation. In the above model, the R -square and adjusted R -squared are 99.9% and 99.8%, respectively. Thus, we accept the hypothesis that mobile money activities and development lead (is a causality) to economic growth in SSA. Other parameters proving the credibility, significance, and reliability of the model results are presented in the appendix section of this paper.

3.5 Conclusion

This study was concentrated on the adoption of cashless system (electronic money), particularly mobile money in sub-Saharan African countries. The evolution in information technology and innovation causes the rapid and huge advancements of cashless payment systems in SSA through mobile devices, thus the name mobile money and banking. The paper provides a comprehensive analysis of the economic impacts and significance of mobile money system in the region. With a regional-level data on mobile money activities and economic development indicator like financial development index and GDP per capita data ranging from 2011 to 2018 across SSA countries. In our model, where GDP per capita was used to proxy for economic growth, we found that mobile money activities have significant positive Pearson correlation with economic growth, and also records a significant high correlation with financial development, which are major drivers of aggregate macroeconomic activities and development globally, and SSA region in particular. Subsequently, in our first model, we found a significant causality between mobile money development and economic growth in SSA, although this may highly depend on the variable used to proxy for economic growth. It is, therefore, evident that the growth of mobile money activities, especially if it easily accessible, would spur overall financial market development, which per our assumption should positively affect trade and consumption, hence must also lead to economic growth. This, therefore, seem to reignite the discourse on the causality between financial development and economic growth. Thus, from a policy perspective, this study backs strategic policies intended to encourage electronic payments and banking, hence initiatives capable of promoting an integrated, interoperable, harmonized mobile money infrastructure would nurture trade and consumption, which may, in turn, benefit the overall economy.

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Chapter 4

Religion and Philosophy: Experience and Perspectives of Interaction



E. F. Kazakov, O. F. Gavrilov, E. O. Gavrilov, and V. I. Markov

Abstract The article combines three authors' approaches to understand the relationship between religion and philosophy. In **the first approach**, it is proved that religion and philosophy, separated from the myth, maintain an internally contradictory but productive relationship with it and with each other. As a result of interaction, philosophical ideas become a prerequisite for religious innovations, and religious meanings—the basis of philosophical reflection, which indicates the common functions of religion and philosophy in the field of preservation and transit of ideas. **The second approach** argues for the commonality and difference between the functions of religion and philosophy in the field of the formation of social forms and spiritual content of man: they can be the basis for both social integration and disintegration. In the era of globalization, when the processes of social disintegration prevail, religion and philosophy fill the worldview void. But in contrast to religious dogmas, philosophical concepts, even excluding, complement each other, actualizing opposite aspects of Truth. In this respect, philosophy is “more” than religion, science, myth, or art. Due to its synthetic nature, it claims to be a new creed. This potential can be used for both constructive and destructive purposes. In **the third approach**, the conclusion about the alienation of philosophical and religious ideas in the process of their assimilation and implementation is proved. Mass consciousness adapts theological and philosophical constructions, distorting not only their essence, but the form of expression. There is a gap between the original religious and philosophical meanings and the real content of the spiritual life of society. This gap paradoxically ensures the

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transition of religious meanings to philosophical ones and vice versa. In this regard, philosophy can act as a religion, and religion as a philosophy, which is expressed in political technologies of social creation and destruction.

4.1 Introduction

The advent of the era of globalization simultaneously means a period of a total destruction of all previously formed forms of the social life. Well-established concepts of reality, value orientations, and development goals are actively reviewed. In this regard, the spiritual needs of the society are addressed to religion and philosophy as means to create the integral images of the reality, fill the everyday life with meaning, and formulate strategies for the development of the society. The problem is that religion and philosophy have different approaches to these tasks, but at the same time are able to interact, which results in a large number of synthetic forms that require understanding. The purpose of this research is to identify the experience of interaction of religion and philosophy and to determine the prospects for their interaction.

4.2 Main Text

4.2.1 First Approach (*Gavrilov E. O., Gavrilov O. F.*)

The existing practice of contrasting religion and philosophy ignores the stable connections, and in a certain sense, the identity of these phenomena. The purpose of this research is to reveal the invariant relations of religion and philosophy in historical retrospect.

First of all, we note that they have a single origin—a myth, but in the course of their evolution they turn out to be forms and ways of its *overcoming* and simultaneously *continuing*. The *overcoming* of myth in religion is accomplished by treating it as superstition, that is, inauthentic faith, and in philosophy as an error, in other words, as a false knowledge. The reason for this assessment was the weak ability of myth to transcend in comparison with religion and philosophy [1, p. 102]. In philosophy, the ability to transcend marked the emergence of a self-aware “I”, which chooses its own mind as the main tool and object of knowledge, and in religion, the radical division of the plane of being into the natural and supernatural.

Both philosophy and religion break the time and meaning isolation characteristic of myth. This feature of the myth is shown in the understanding of time and development as a cycle. Thus, one of the central themes of the myth of M. Eliade considered “eternal return” [2, pp. 21–124], and, according to K. Levi-Strauss, the closeness of the myth is manifested in the idea of the inevitability of the transformation of opposite

phenomena into each other [3, p. 235]. However, the revision of myth, as intellectually, and from a position of faith, has not led to its disappearance or to reduce its impact. Although strategies for overcoming myth in religion and philosophy remain relevant, myth fulfills its historical role as a worldview foundation and exerts its influence on the life of the society.⁴, pp. 118–121; 444–445]. Turning to mythological symbolism, religion rethinks its content, goes beyond the cycle of natural forces.⁴, p. 56]. Nevertheless, as in the case of religion, the continuity of philosophy with myth is realized not only in derivative, indirect forms, but also in the form of attempts to directly connect mythological plots and symbols with philosophical ideas.

As for the continuation of the myth by religion and philosophy, their overcoming it in a certain sense turned out to be imaginary. Thus, paganism is largely subordinated to the logic of myth, and the “break” with mythology in monotheistic and world religions experts tend to consider rather as a selective attitude to it, manifested in the inclusion of selected mythological subjects in the content of the transcendent dimension of reality [see:

Philosophy, rejecting the illogicality of the myth and rejecting the figurative and symbolic shell, maintains a connection with it at the content level, actualizing and conceptualizing its meanings. This is manifested in the categorical and conceptual development of fundamental worldview principles, such as the dichotomous division of reality (G. Hegel) or mythological patterns of the human psyche (K. Jung), and even in the interpretation of myth as the basis of philosophy (F. Nietzsche). Of course, the proximity of myth and philosophy does not mean that they are identical. As A. F. Losev tells: “often, especially now, you can find such street identifications: metaphysics = mysticism, spiritualism = spiritism, religion = metaphysics, metaphysics = spiritualism, or spiritism, transcendent philosophy = transcendental philosophy, religion = idealism; and so on”. On the basis of philosophical savagery, one can invent a thousand more such identifications” [see:

The complex, internally contradictory, but stable appeal of religion and philosophy to the myth, in turn, forces us to understand the nature of the relationship between religion and philosophy, to answer the question about their common and distinctive features. Historical retrospect allows us to distinguish three variants of their interaction: in some cases, they act as *antagonists*, sometimes as *a whole*, less often as phenomena that *do not* outwardly *intersect*. Let us consider each of these options sequentially.

The appearance of philosophy, in fact, marked the beginning of *the opposition* between philosophy and religion. Carrying out an audit of the mythological stories of the Ancient world, philosophy was simultaneously subjected to a critical revision and religious views of this era. The contrast between religion and philosophy is also observed in the decline of Hellenism in the criticism of philosophizing as an element of pagan scholarship by representatives of Christianity and Islam. Thus, Tertullian claims that from pagan “philosophy, the heresies themselves receive incitement” [5, p. 109]. The Renaissance and Modern times, on the contrary, demonstrate a large-scale criticism of religion as a relic of the past (positivism), as a means of domination of one class over another (Marxism), as a vicious ethics (F. Nietzsche, B. Russell). These lines of criticism have been continued in Modern history (R. Dawkins, K.

Hitchens).⁶ p. 7]. It is in this sense that P. Berger's statement that Christianity acted as its own gravedigger is revealed [7, p. 132]. This is not only a statement that the time has come when religion was replaced by secular atheistic teachings, but also the recognition of the latter as a way of implementing Christian ideas, even if, in the language of G. Hegel, in the form of their otherness, as a prerequisite for their possible synthesis. In other words, both philosophy and religion perform the function of preserving and transiting ideas through epochs and cultures, the function of transferring them from the implicit state to the explicit, from the potential to the actual. The processes of spiritual development show that behind philosophical ideas there is clearly or hidden religious experience, and behind religious meanings there is philosophical reflection.

But history knows many facts when philosophy and religion are *one*. Their undivided unity can be observed during the archaic period, when they coexist in a rudimentary state within the framework of myth. As the intellectual abilities of a person differ, this unity is lost, but the resulting division results in the fact that the birth of certain philosophical systems takes the form of religious innovations. Thus, for Pythagoras, mathematics becomes a source of mystical insights, and Heraclitus teaching about the Logos and Plato's about Eidos later becomes an organic part of the Christian and Islamic creeds. Thus, philosophy should be considered not only as a violation of religious tradition, but also as a means of its continuity.

The next large-scale unification of philosophy and religion occurs during the formation of world religions. Philosophy continues to exist as a theology. It solves the fundamental questions of dogmatics and examines particular cases of the application of the creed to life.¹ In Arabic and Western European culture, the separation of philosophy and religion led to the formation of two lines of development of philosophy. The first found expression within the framework of religious dogmatism, and the second—outside the support of dogmatics. The combination of philosophizing with theological speculations to a certain extent contributed to the formation of theocratic and clerical states in the middle ages. In the Renaissance and Modern times, the second version of the development of philosophy was implemented, without turning to theology, which in turn influenced the formation of secular and atheistic states.

Situations when philosophy and religion *do not outwardly intersect* have a corresponding conceptual basis, first, in the formula of dual truth (Averroes, F. Aquinas) and, secondly, in the idea of the discrepancy between the subject and method of religion and philosophy (F. Bacon). The first one brings philosophy closer to religion, and the second separates it from it. Both versions have been repeated many times in history. In general, religion and philosophy have almost always been in some form of interaction. Their divergence often marks qualitative changes in the social order. Here, the interaction of philosophy and religion is preserved, but direct connections between them are replaced by indirect ones. Thus, in Kant's interpretation of the idea of God, protestant theology is seen, reducing the divine influence to ethical imperatives, and G. Hegel's philosophy is an attempt to synthesize religious ideas

¹The ancient Eastern culture is characterized by a different way, which is not associated with the separation of philosophy into an independent sphere.

and philosophy as manifestations of a one entity. And the Bolshevik project of the future, declaring a radical removal of philosophy in its Marxist version from religion, actually turns philosophy into a means of implementing essentially religious ideas. If we still try to consider religion and philosophy in isolation from each other, then religion will be left with only an inexpressible intuitive mystical experience, and philosophy will be left with techniques of abstract rationalization. It is obvious that the one without the other does not exist in religion, in philosophy, or even in science.

If we carefully consider the individual variants of philosophical creativity, we can see their connections not only with religious faith in its broadest sense, but with the religious tradition of a particular people. This means that the philosophy that is formed in the environment of national cultures, to a certain extent, is a continuation of the national religious tradition, as well as the social relations associated with it. The discrepancy between religion and philosophy is an indicator of the transformation of tradition, the implementation of its ideas. It is in this context that we should understand, for example, the criticism of Christianity in the philosophy of F. Nietzsche, who stated that we “seekers of knowledge, we are atheists and anti-metaphysics—we light our torches from the old fire, kindled by a thousand-year-old faith” [Cit. by.:

Thus, the connections between philosophy and religion established above give reason to state that these phenomena, having a common source of origin in the myth, in some ways overcome it, and in some ways continue it, forming an opposition to each other, but at the same time generating synthetic formations. Within of this relationship, there is an intensive exchange of meanings and forms of their expression.

4.2.2 Second Approach (Kazakov E. F.)

Religious projects to save humanity (to date) have been unsuccessful. What is the advantage of philosophy (let's emphasize, not one or another stream, individually, but the philosophical worldview as a whole)? Of course, we can say that there is no philosophy at all, philosophy as a whole; in reality, there are only separate teachings, often unrelated, and even excluding each other. And this is true, as well as the fact that there are “borderline” (integral) theories, a dialogue of different philosophical schools, and the possibility of assimilating ideas from many other streams.

There can be no unified religion, and no unified philosophy. But if every religion claims to know the absolute truth, then philosophical knowledge is initially relative. This makes philosophy a more open system, capable of assimilating diverse ideas, and therefore capable of development, even to the point of self-denial. In contrast to religious postulates, philosophical ideas involve (sometimes consciously provoke) criticism and self-criticism. Therefore, they, even excluding, complement (continue) each other, actualizing opposite aspects of the Truth. Philosophy is more “all-encompassing” and multivector than religion. It includes the religious and the atheistic; the rational and the irrational; the idealist and the materialist; the objective and the subjective; and the absolute and the relative. There is no more “multicolored”

worldview "mosaic". Philosophy is "more" than religion, and science, and myth, and art (as each separately, and all of them together).

It is clear that religious philosophy is extremely close to religion, often differing only in the absence of priests, rituals, and rites. But, strangely enough, materialistic philosophy (Marxist–Leninist teaching in the USSR) can also be a practically full-fledged religion. However, philosophy is also close to religion in general. Philosophy, like religion, seeks to understand the absolute truth. The only difference is that religion claims to know it, and philosophy more often says that the desire for it is infinite. Religion worships those who have come closest to the Truth (the saints), and philosophy "worships" (honors, exalts) those who have grasped the truth (the great thinkers).

The worship of great thinkers and creators also exists in religion. Thus, in *kaodaism* (3 million followers), the poet Li Bo, the playwright V. Shakespeare, scientists L. Pasteur and K. Flammarion, writers V. Hugo and L. Tolstoy, politicians V. Lenin and W. Churchill are considered "saints" [8, pp. 358–360]. Often, religions defend ideas that are also the subject of philosophers' thoughts. Thus, *the Baha'i faith* (about 6 million followers) talks about the legitimacy of an independent search for truth by each person; about the rejection of racial, national, religious, class, political, and gender prejudices; about the creation of a world civilization based on the principles of security, justice, and spirituality [9, pp. 9–14].

So, philosophy can be called (understandably, with many reservations) "religion", since it strives for absolute truth ("by default", accepting its being). This also applies to the agnostic teachings, which are "knowledge of ignorance" (and yet, knowledge); knowledge of dead ends, frustrations, and the limits of knowledge (and yet, knowledge). In contrast to science, philosophy does not strive for partial, concrete, relative, non-valuable knowledge, but for complete, absolute knowledge (the relative is understood as a path to the absolute, or as a facet of it), integral, valuable. In philosophy, as in religion, there is a "worship of authorities" (sometimes with a "minus sign" if they turn into "idols of the theater", according to F. Bacon), the most advanced in understanding the truth.

The moment of faith is also latent in philosophy. When we give preference to one or another great thinker, we rely on our subjective perception, on the persuasiveness of their reasoning (which appears to us as such), and, in the end, on our intuition and faith. We believe in the soundness of the arguments of one or another philosopher, although other teachings–arguments may be no less convincing. We "understand to believe" (P. Abelard), and "believe to understand" (St. Augustine); and these two turns (rational and irrational) comprehension of the world "flow" into one another. We believe in our own righteousness, we believe in our own faith. And there is no contradiction here: if faith is true and knowledge is true, they must converge, presenting themselves as different ways of comprehending (through feeling and discourse) the same world.

Unlike art, religion, and (applied) science, philosophy has no such connection with the market, state ideology, or defense orders. While maintaining its elitism, it has not (to the same extent as they have) become a part of modern popular culture. Dealing, to a large extent, with problems that are abstract from the specifics and

conjecture, it (as well as fundamental science) turned out to be “unnecessary”. And this “bad “appeared to be” good”: philosophy preserved a “pure”, direct, unbiased interest in the knowledge of the deep problems of existence. In this way, it “suffered the right” to be the foundation of the modern worldview.

In human history, there are three main periods: mytho-religious (with the dominant of irrational knowledge)—“thesis”; scientific-positivist (with the dominant of rational knowledge)—“antithesis”; philosophical (integrating irrational and rational knowledge, with the addition of its own novelty or “curvature”—“synthesis”. *Or, quite briefly: religion, science, philosophy.* We can say that this periodization develops the idea of O. Comte, who distinguishes the theological, metaphysical, and positivist stages of history [10, pp. 123–124]. The second stage is not considered by them as independent, it is understood only as a transition (“transit point”) from the first to the third. But if O. Comte considered the positivist stage the highest and last, then, from our point of view, this stage only precedes the philosophical stage.

The metaphysical stage (in the understanding of O. Comte) is similar to the philosophical one (which we distinguish), which also includes the desire for absolute knowledge, the identification of the ultimate essence of things, and a certain degree of speculativeness. But there is a significant difference between these stages: if Comte’s metaphysical stage existed before the “triumph of the Sciences”, then the philosophical stage (having also appeared before the “triumph”)—and after. If the first, by its speculative nature, denies scientific knowledge, the second assimilates both scientific and religious ideas, searching here and there for “grains of truth”, and combining them with each other.

The third stage of Hegel’s “triad” is, to a certain extent, a “return” to the beginning (the “spiral” concept of history). This is the process we are currently experiencing. The postmodern era marked the onset of the stage of “post-science”, “post-truth”. Scientific progress since the Enlightenment has not made life on Earth safer, more humane, or more just. The more chaos increases in the world (on all “fronts”), the more the “niche” of rational (scientific-positivist) narrows, since there is no “formula for chaos”. The increasing powerlessness of the intellect is accompanied by an increasing “outburst” of the unconscious (due to the growth of chaos, and causing it). The reaction to this (and at the same time, the manifestation of this) is the current surge of religiosity, which stimulated (among other things) thinking about the onset of the “new middle ages” [11].

But the “new middle ages” cannot be a new religious stage (history does not develop in a circle), from scientific and technical achievements, humanity will not go anywhere. The next stage of history can only be a “new synthesis” of religious, scientific, and metaphysical thinking, which modern philosophy is called upon to implement.

By according to C. Jaspers, the modern era cannot do without faith, but it will be, to a decisive extent, no longer religious, but philosophical [12, pp. 94–95]. Jasper’s concept of “philosophical faith” allows us to come closer to understanding philosophy as a “new religion”, more precisely, “new old religion”. “Philosophical faith” is a synthesis of rational (logically constructed) and irrational (based on “my” choice, “my” preference, “my” intuition, faith in the truth of “my” worldview). Therefore, it

has a general meaning, provable, and individual, “my”, expressing my personality, my life experience, my preferences. “Philosophical faith” cannot be imposed (it leaves every person free), it can only be understood and consciously accepted by me. “The” philosophical faith” is not final, it is debatable, communicative, multifaceted, dynamic.

The idea of synthesis of science, philosophy, and theology (religion) was developed by V. Solovyov in the “philosophy of unity” [13, pp. 68–69]. The whole world can only be comprehended by the whole person through the whole knowledge. But in our view, we are not talking about an “equal” synthesis of these three ways of perceiving the world. Science and religion (in Hegelian terms) “go to the foundation” of philosophy. The last one, in this case, is understood as the “world tree” of human knowledge, the “roots” of which are myth, religion, art, literature and science; feeding this “tree” with its “juices”, and turning into its “new flesh”.

The “ideal person” of the future is “a person equal to humanity” [14, pp. 751]. An integral perception of the world, “equal” to the world culture, will be organic for it. This is the mission that philosophy is called to fulfill, which is not only the “quintessence of the epoch” in which it exists, but also the “quintessence” of the entire human history of culture.

4.2.3 *Third Approach (Markov V. I.)*

The previous presentation focuses on the content-semantic intersections of philosophy and religion. However, this perspective of the problem is clearly insufficient, at least from the point of view of matching the title of the work. It should clearly include a more sociologized aspect, a predominantly functional aspect. Then the question can be put like this: “Can philosophy, as such, play the role of religion in society in any sense?”.

At first glance, the answer is clear and simple: “of course, not”. After all, philosophy is some how an elite cultural form. And religion, if it is really a religion and not an intellectual sect, must still be mass. And it is not about quantitative parameters. It should be understandable to the masses in spirit and quality. How much of them it will win is another matter.

But quick answers are often lightweight. In the history of culture, we see a number of variations on this theme.

First, any work of the spirit in its movement to people undergoes the so-called “alienation of the idea” (the author’s formulation). This process is described in detail in the monograph [15, pp. 127–137]. Even a vague idea is already distorted, and in this sense begins to gradually become alien to its primary appearance, even when it is formed into words. And these are the familiar torments of creativity. The second stage is the transformation into an external word, the choice associated with this—the written or oral word. Both options are not easy. The spoken word perishes or remains in distorted retellings. Writing turns into a dead dogma and is also distorted over the centuries and among different peoples, strata, and individuals. Not to mention the fact

that the author himself again experiences the agony of turning such beautiful ideas into common words, and painfully observing that they often change the very essence of his thoughts. The deeply religious P. Chaadaev gives interesting arguments about sacred texts in his "Philosophical letters". While recognizing the disciplining role of the Bible, he says that by codifying the spirit, the written text narrows it in advance. "Nothing delays religious thought so much...as a book; nothing makes it so difficult for religious thought to be firmly established in the human soul" [16, p. 148]. Further, Chaadaev already emphasizes the aspect of perception of the text. It was addressed to a certain circle of people of its time and cannot in principle be equally understood in other epochs and among other peoples. It is inevitably subject to very arbitrary interpretations [16, p. 149]. F. Tyutchev emphasizes the author's inner, tragic side of this.

How can a heart expression find?
How should another know your mind?
Will he discern what quickens you?
A thought once uttered is untrue.

Thus, any product of the human spirit is inevitably alienated, trying to reach people. And, probably, it is the observation in the history of such a tragedy of the spirit that leads M. Horkheimer to total nihilism, when he claims that the translation of ideal aspirations into practical activity in general is a symptom of a cultural crisis [17, p. 14]. And he hints at the mechanisms of such a crisis: "What is determined by the mass is always directed against the individual" [17, p. 83]. T. Adorno echoes him, when he quite originally distinguishes two types of materialism: social, expressing disbelief that an idea can correct the injustice of the world, and scientific, distrust of the idea as something artificial, fictional, projection, and not authenticity [18, p. 171].

But what is the specific nature of the alienation of philosophical thought?

K. Marx, who insisted on the practical significance of philosophy, expressed his hopes in the famous formula "Theory becomes a material force when it takes possession of the masses". But in our time the poet I. Guberman answered him:

Heading sections, factions, parties, classes,
Their leaders never understood.
That idea, "thrown into the masses",
Was a hussy, by the soldiers screwed.

Yes, Marx, of course, would not have recognized his ideas in the mind of, for example, Makar Nagulnov. And it was precisely such Makars who actually did the work of revolution predicted by Marx. Moreover, it was the philosophical level of his ideas that was completely removed from the heads of practical workers. There are still ideological patterns.

Therefore, history itself shows that philosophy can perfectly become a kind of (pseudo) religion. But... at the expense of its transformation into a schematized and primitivized ideology.

The ideas of the French Enlightenment philosophers also, “embodied” in the masses and the consciousness of their leaders, gave rise to a rather absurd and even comical cult of the Supreme Being in their revolutionary rites and festivals. The logic of its creation is very significant. First there were repressive measures against Christianity, then the cult of Reason was declared, and then everything led to the creation of a new pseudo-religious cult. This just reflects the logic of the promotion of philosophical ideas to the masses initially.

Thus, when the question of alienation of ideas is raised in the sphere of philosophy, it is first of all striking that there is a huge gap in the elite spirit of philosophizing and the potential level of perception of these ideas by the masses.

But this is in general terms. A more specific sociological analysis shows other possibilities. The mastery of the broad masses is required in terms of the implementation of ideas precisely in revolutionary coups, and it is there that the maximum alienation is observed. But there is also an option for reforming society. Then the situation is somewhat different. Ideas, including philosophical ones, can be introduced for a long time and influence the consciousness of the elite, or at least part of it. Then the path of the spirit movement includes the following stages:

- The birth of a certain circle of theses in a small circle of intellectuals at first;
- Their spread and conquest of a significant part of the spiritual elite;
- Expanding of the influence on the political elite (partly on the economic elite, which is able to perceive these ideas);
- Already the political elite, using the levers of power, the media begins to reform society in accordance with the spirit of these ideas.

This way is possible in principle. However, even here there are their own but..

The fact is that in this version, elite ideas can be so at odds not only with the level of perception of the masses, but also with their vital interests that reforms of this kind can only be implemented at the level of manipulation of consciousness. All these processes were studied in depth in the works of A. Gramsci, and in their application to modern science are shown in the works of Kara-Murza [19].

An interesting subject for reflection in this aspect is the Russian “perestroika” and subsequent reforms. A special sign—they were based on ideas that came from an external, foreign circle of intellectuals and were introduced in the form of the ideology of liberalism through the media. Naturally, the philosophical liberalism of Locke and his other “founding fathers” bears little resemblance to the modern politicized and ideologized version of it. But it was in the Russian environment, which was completely alien to him, that this teaching began to acquire some features of pseudo-religion. For example, there are memorable dates and events—in Moscow, marches are held on the anniversary of the death of Boris Nemtsov. This is almost a rite. A Pantheon of hero-martyrs has been formed, dogmas are becoming more and more rigid, and the works of a number of Western thinkers (von Hayek, K. Popper, etc.) are becoming almost sacred books. And, most importantly, everything is based on faith, ideological faith. And no real facts of the collapse of the embodiments of the liberal idea, in principle, do not change anything. But these ideas did not become a mass pseudo-religion, remaining at the level of a rather closed sect.

However, all these arguments take into account only a strict, purely European, purely rationalistic understanding of philosophy itself. But there are also broader options, which are often referred to in Eastern worldview teachings [20, pp. 54–55]. If they are included in the concept of “philosophy”, then the question of the possibility of merging with religion in general becomes almost unproblematic. The history of the East itself shows that the worldview originally teachings of Confucius, the Buddha, soon acquired the signs of a religious cult. And already in this capacity they have joined the daily life of the people. And already in this capacity they have joined the daily life of the people. The entire depth of the teachings remained the property of sages and monks.

Thus, the socio-cultural cross section of the stated problems clearly demonstrates that the initial content-semantic proximity of philosophical and religious teachings allows their mutual transitions in real life and, in many respects, even functional complementarity.

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Chapter 5

Psychological Distance in the Social Contacts of Modern Youth with Different Levels of Internal Conflict in Value-Semantic Sphere of Personality



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Abstract The article presents the results of an empirical study of psychological distance in relation to different social groups of young people with different levels of intrapersonal contradictions. The study sample consisted of 235 people aged 16–24. The psychological distance in social contacts was measured using A. B. Kupreychenko's method. The method estimates the “psychological distance” value between the respondent and 18 social groups on a five-point scale. Intrapersonal contradictions were estimated using the method of E. B. Fantalova, namely «Level of correlation of “value” and “accessibility” in different life spheres» (LCVA). The results analysis showed that social distance in youth is characteristic of people with a high level of dissociation in the value-semantic sphere. Contrary to them, their peers with a low level of dissociation are more likely to expand their social space through closer ties and relationships with others.

5.1 Introduction

In modern society, as many sociologists and political scientists point out, there is an aggravation of crisis phenomena and an increase in uncertainty. A modern person undergoes a variety of stressful effects.

As a result a person faces the task of finding a way to overcome difficult life situations, to deactivate the psyche traumatizing effects, to adapt to the changing conditions of the social environment. The difficulties in adapting to the social environment may lead, as a consequence, to confrontation between the elements of the person's internal structure, which manifests itself in the intrapersonal conflict. As Khasanova and Vechko note [1], constant competition in the conditions of the universal struggle

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of everyone against everyone results in hostility of the individual toward others and constant discontent with oneself.

The causation of intrapersonal conflict in the framework of foreign psychological concepts is explained in different ways: as a clash of desire for wish satisfaction and security (A. Adler, E. Fromm, K. G. Jung); as a contradiction of “neurotic needs”, the satisfaction of which entails the frustration of others (S. Freud); as a contradiction that arises in a person between conscious, but false self-esteem, which a person acquires during his life, and self-esteem at an unconscious level (K. Horney); as an unrealized need of a person for self-actualization (C. Rogers, V. Frankl); as a result of acute dissatisfaction of deep and relevant motives and personal relationships (K. Lewin), etc.

In Russian psychology, an intrapersonal conflict is considered as a mental state of personal experience associated with the inability to satisfy a need due to internal contradictions. E. P. Ilyin connects the intrapersonal conflict with the emotional stress that occurs in a person as a result of a difficult obstacle to achieving a goal [2]. E. B. Fantalova defines an intrapersonal conflict as the “gap” in the system between the need to achieve inherently significant values and the possibility of such an achievement in reality (dissociation of “value” and “accessibility” in different life spheres) [3].

The researches by Russian psychologists, such as V. N. Kasatkin, A. A. Bochaver, S. K. Nartova-Bochaver, V. V. Solodnikov, I. V. Solodnikova, N. E. Kharlamenkova, R. M. Shamionov et al., indicate that the more differentiated are the ways a person interacts with the world, the better the adaptation processes are organized, and the higher the vitality of the subject [4–6].

All researchers note that this conflict is an intrapersonal contradiction, perceived and emotionally experienced by a person as a significant psychological problem for him. This intrapersonal contradiction, the uncertainty self-awareness, affects a person's behavior and activity, affecting his social connections in a negative way [7–10].

In our study, we assumed that people with different levels of intrapersonal conflict differ in the distance which they establish in relation to their social environment. At the same time, the social environment is arranged, forming the space in which the individual is identified and self-determined. In this space the needs of an individual in recognition by others, in group protection, as well as in self-realization are realized.

The aim of our research is to study the specifics of psychological distance in relation to different social groups among young people with different levels of intrapersonal contradictions.

5.2 Methods

The study involved 253 people aged 16–24 (84 young men and 169 girls, average age is 18.6), residents of Komsomolsk-on-Amur.

To study the psychological distance in social contacts A. B. Kupreychenko's method was used [11]. For 18 social groups (from family and friends to the population of the country as a whole, including professional and non-professional spheres), the value of the "psychological distance" between the group and the respondent was evaluated on a five-point scale: the closest (5 points), close (4), neither close, nor distant (3), distant (2), the most distant (1 point). For a more detailed description of the results obtained, the groups assessed by the respondents were tentatively distributed according to the following grounds: (a) community scale: family and friends, classmates, citizens, compatriots; (b) age groups: children, peers, parents; (c) training and professional contacts: mentors, colleagues, superiors, careerists, successful people; (d) ethno-religious cultural contacts: my ethnic group and my religious group; (e) preferred behavioral strategies (people united by different behavioral strategies): people who live "like everyone else", people who have not lost faith in the future, self-made people.

Intrapersonal contradictions were estimated using the method of E. B. Fantalova, namely «Level of correlation of "value" and "accessibility" in different life spheres» (LCVA) [3], which allows to discover the gap between the significance of a particular personal sphere and its subjective accessibility in 12 life spheres. During the data processing the number of spheres in which there was an internal conflict (internal conflict is a contradiction between the value of an object and its insufficient subjective accessibility) and an internal vacuum (internal vacuum is a contradiction between the excessive presence of objects of low value in a person's life) was taken into account. In addition, dissociation of "Value–Accessibility" (the total amount of dissociation cases) was taken into account, indicating the depth of the state of person's involvement in one's own internal conflicts, that is not always conscious, the degree of internal dissatisfaction, and the blockade of basic life needs.

According to the results obtained through the method of E. B. Fantalova the contrast groups were formed for each of the indicators: (1) low and high level of internal conflict; (2) low and high level of internal vacuum; (3) low and high level of dissociation of "Value–Accessibility".

The differences between the samples were checked using student's *t*-test.

5.3 Results

5.3.1 *Psychological Distance in Social Contacts in Relation to Different Groups*

In our study we measured the psychological distance rate of youth in relation to representatives of various social groups (see Fig. 5.1).

Among the communities of different sizes, family and friends are rated by young people as psychologically close (the psychological distance for these groups is 4.5 and 4.0), classmates are rated as "neither close nor distant" (3.1). The distinguished

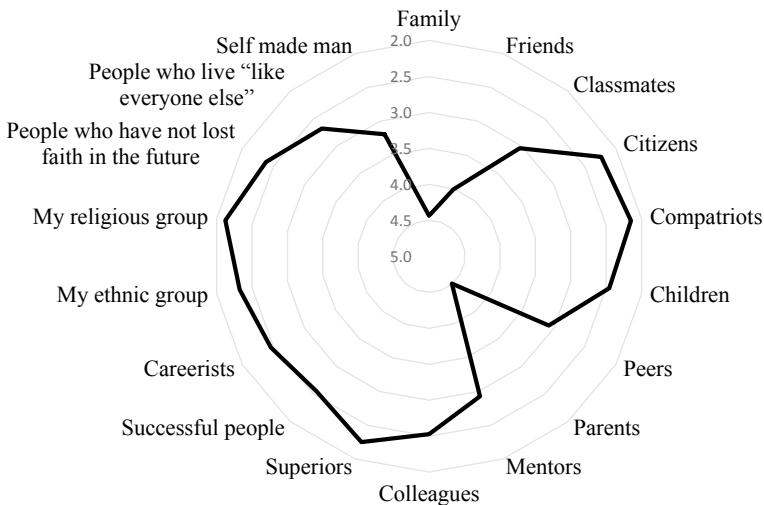


Fig. 5.1 Psychological distance in the social contacts among young people

groups form the field of social interaction of youth in which they are included in everyday life. Large communities (citizens (2.3) and compatriots (2.5)) are evaluated as distant. The psychological distance with ethnic (2.4) and religious (2.2) groups is rated by the respondents as distant too.

The closest of all age groups for young people in terms of psychological distance is the group of the older generation (parents—4.5), the average distance ("neither close nor distant") characterizes the relationship with the younger generation (children—3.8) and (peers—3.1). Such self-esteem of psychological closeness with parents and family as a whole points to family values orientation of the youth. At the same time, the young people who do not have their own children associate the concept of family primarily with parents, which may be the reason of great distance with the group of "children".

The analysis on the ground "educational and professional circle of contacts" showed that, on the whole, young people are psychologically distanced from this sphere of relations. A certain hierarchy of respondents' distance in the professional sphere is observed: superiors (2.6); careerists (2.6); successful people (2.6); colleagues (3.0); and mentors (3.0). Only the last two social groups are rated by young people as "neither near nor distant", the rest are perceived as distant. Perhaps, the data obtained is due to the fact that most of the respondents are currently students who do not carry out professional activities, so these contacts are not relevant for them yet.

The last ground for the analysis is psychological closeness with people who demonstrate different strategies of social behavior. All rates on this basis ground can also be interpreted as "neither close nor distant". A more preferable behavior model for young people is the behavior of "self-made people" (3.2) and "people who

have not lost faith in the future" (2.8) and a less preferred strategy of behavior in society is that of "people who live like everyone else" (2.5). This, in its turn, is an indicator of an active life position, determined by the desire of youth (age-related feature) to make their own destiny.

The obtained results can be considered as an evidence of an effective strategy (from the point of view of social adaptation) of establishing of psychological distance in the social contacts of young people in everyday life. Family (children, parents) and friends are in the zone of closest relationships, while peers, classmates, colleagues, and mentors remain in the field of business relations without penetrating into the zones of intimacy or alienation. On the other hand, excessive distancing from large ethno-religious-cultural groups may indicate a lack of a sense of unity with the Russian society (political nation) and with the state as a whole. Perhaps these groups for young people are largely formal-symbolic (not filled with personal meaning), and therefore the idea of them is formed not in everyday life, but under the influence of television and mass media.

5.3.2 Comparison of Psychological Distance in Relation to Social Groups Among Young People with Different Levels of Intrapersonal Contradictions

The study has revealed significant differences in social distance in groups with different levels of intrapersonal conflict (see Fig. 5.2).

The study has shown that 36.4% of respondents have marked intrapersonal conflicts in three or more life spheres, 25.4% have vacuum in at least one value-semantic sphere. 22.1% of youth have high dissociation values.

The data analysis of the study of psychological distance in communication with different social groups has shown that young people with marked contradictions in the value-semantic sphere manifest distance from small real social groups (family, parents, children, classmates, teachers/mentors, colleagues, superiors), as well as from large formal ones (compatriots, citizens, ethnic group). From the entire proposed list, these respondents equally estimated the distance (as "neither close nor distant") with a group of peers, with people who make their own destiny and people who live like everyone else.

For a more detailed analysis, the differences between the groups of young people with low and high levels of intrapersonal conflicts (internal conflict) and intrapersonal vacuum (internal vacuum) were analyzed. The results of the analysis are presented in Tables 5.1 and 5.2.

The increase in the number of spheres in which intrapersonal conflicts due to the contradiction between the value of the object and its inaccessibility are experienced turned out to be associated with the increase in the distance from parents, who are estimated by young people as less close ($t = 2.26$).

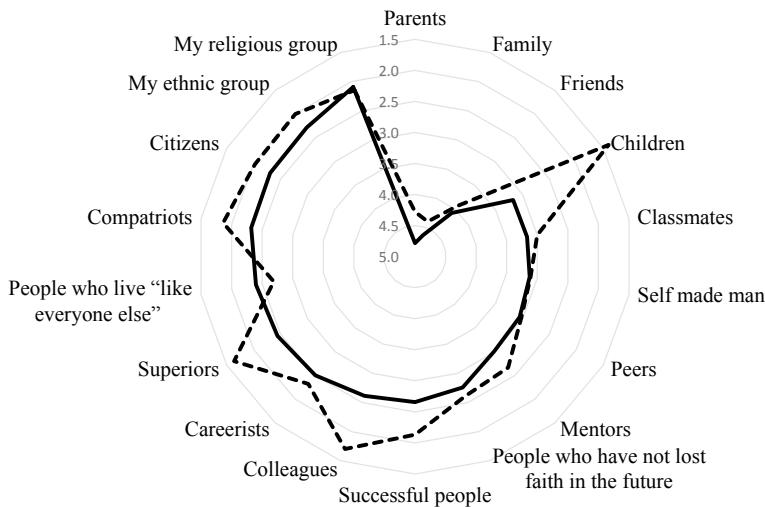


Fig. 5.2 Average values of psychological distance in the social contacts among young people with different levels of dissociation of “Value–Accessibility”. The solid line is low level; the dotted line is high level

With the increase in the number of life spheres in relation to which young people experience internal vacuum, the increase in the distance with social groups such as children ($t = 3.56$), classmates ($t = 2.22$), compatriots ($t = 2.72$), citizens ($t = 2.46$), colleagues ($t = 3.53$), careerists ($t = 2.37$), and people who have not lost faith in the future ($t = 2.26$) is registered. At the same time, young people, who have no life spheres perceived by them as redundant, are characterized, on average, by closer relations with all the evaluated groups ($t = 3.27$).

Thus, the experience of an intrapersonal conflict and an internal vacuum is accompanied by a distance of a person from social relations. At the same time, this trend is manifested in young people with marked intrapersonal conflicts toward their parents, while young people with marked intrapersonal vacuum distance themselves from a large number of groups. This applies to both small social groups in which the person is included, as well as large ones. The training and professional groups are also moving farther away.

5.4 Discussion

To explain the facts obtained, it is necessary to take into account the respondents' age. The period of early youth is generally defined as the period of “storm and stress” (S. Hall, E. Spranger), «marginality» (K. Levin), «individualization» (V. I. Slobodchikov), «adaptation» (D. Offer, J. Coleman, A. Bandura), «integration age» (I. S. Kon, A. V. Petrovskiy), etc. [12, 13]. Young people are in a situation of social

Table 5.1 Average values of psychological distance in the social contacts among young people with different levels of internal conflict

Social groups	Level of internal conflict		<i>t</i> -value
	Low	High	
Family	4.6	4.4	1.71
Parents	4.7	4.3	2.69**
Children	3.4	3.2	0.59
Peers	3.2	3.0	1.48
Classmates	3.3	3.1	1.49
Friends	4.0	3.9	0.33
Compatriots	2.5	2.4	0.69
Citizens	2.4	2.2	1.03
My ethnic group	2.3	2.4	-0.24
My religious group	2.0	2.3	-1.62
Mentors	3.0	2.8	1.15
Colleagues	2.9	2.7	0.75
Superiors	2.7	2.4	1.55
Successful people	2.6	2.5	0.38
Careerists	2.6	2.5	0.47
People who have not lost faith in the future	2.7	3.0	-1.84
People who live "like everyone else"	2.4	2.5	-0.46
Self-made man	3.0	3.2	-1.42
Average distance	3.0	2.9	0.90

** $p \leq 0.01$

changes, requiring the simultaneous manifestation of two opposite features: (1) social liability, which ensures the adaptation of a person to a changing social world; (2) social identity creating an internal "core" [14]. Moreover, personality development is carried out through two opposite mechanisms: isolation and identification [15–17]. The results of our study have shown that young people who have dissociation in the value-semantic sphere are more prone to isolation (distance). Young people with dissociation in the value-semantic sphere have chosen the isolation and narrowing of the communication space, distancing themselves from people, while their peers, on the contrary, expand their space through closer ties and relations with the social environment.

The dissociation between the significance for a person of value and the accessibility of its implementation is experienced as a problem, which must be reduced (F. E. Vasiluka, M. Argayl, L. V. Kulikov, A. A. Rean, and others). In this case, two strategies for correcting this condition can be distinguished. The first strategy is connected with the awareness of the causes to take action to overcome these problems. According to I. S. Kon, a need to master new roles emerges in youth, a break with the parental home

Table 5.2 Average values of psychological distance in the social contacts among young people with different levels of internal vacuum

Social groups	Level of internal vacuum		<i>t</i> -value
	Low	High	
Family	4.6	4.4	1.57
Parents	4.6	4.5	0.60
Children	3.5	2.2	3.56**
Peers	3.1	2.9	1.82
Classmates	3.2	2.9	2.22*
Friends	4.0	3.9	0.60
Compatriots	2.5	2.1	2.72**
Citizens	2.3	2.0	2.46*
My ethnic group	2.3	2.2	0.76
My religious group	2.2	1.8	1.89
Mentors	3.0	2.8	1.67
Colleagues	2.9	2.1	3.53**
Superiors	2.5	2.2	1.73
Successful people	2.6	2.5	0.96
Careerists	2.6	2.2	2.37*
People who have not lost faith in the future	2.9	2.5	2.26*
People who live “like everyone else”	2.4	2.4	-0.01
Self-made man	3.2	3.0	1.14
Average distance	3.0	2.8	3.24**

* $p \leq 0.05$ ** $p \leq 0.01$

is necessary to start one's own professional and personal self-determination [17]. The second strategy involves the use of compensatory mechanisms of psychological defense. Any protective mechanisms are destructive; they are used by the psyche as the “last hope”; and nevertheless, they are necessary, since they protect the psyche both from deep “breakdowns” (psychosis) and from relatively mild neurotic, functional disorders [18–20]. In scientific psychology, this phenomenon is often called as “alienation”, “escapism” “escape”; it is expressed in the tendency to “get away” from the world. According to K. Horney, the dynamic center for conflict resolution using protective mechanisms is associated with the attitudes of compliance (moving toward people), expansion/aggression (moving against people) and detachment/withdrawal (moving-away-from or resigning solution). When a person moves away from people, he does not want to belong to them, to communicate with them, or to fight; his only desire is to stay away. A person feels that he/she has little in common with the people around him/her, they do not understand him/her at all. One's world is made only of oneself [21].

It is necessary to pay attention to the fact that young people with intrapersonal conflicts revealed distancing only from parents. This fact can be explained by the degree of awareness of the intrapersonal conflict for a person. As indicated by E. B. Fantalova, the state of intrapersonal conflict is, first of all, a personal conscious state of “break” in the system between the need to achieve inherently significant values and the possibility of such an achievement in reality. Most likely, we observe this particular way of solving the problem among young people with marked intrapersonal conflicts. The awareness of the “gap” between the need and the ability to achieve meaningful values points at the self-reflection of young people. Distancing from parents helps them to solve the basic age task, i.e., the formation of personal identity by separating from parents.

Young people with an intrapersonal vacuum distance themselves from all social groups more. The state of the intrapersonal vacuum is a conflict hardly realized by an individual, emotionally experienced by him/her as uselessness. We assume that psychological defense mechanisms are used to eliminate this traumatic situation. Thus, the inability to satisfy one's needs in different spheres of life can lead to a saving for the psyche phenomenon—a decrease of needs, as well as “escape from people”. In this situation, a young person does not move away from a particular social group, but distances oneself from all social relations (without any desire to distance oneself from one's parents, as young people with intrapersonal conflicts do). The extreme variant of isolation is social alienation, which causes irreparable damage to the individual. Social alienation from others allows to accept and justify aggression, each step in this direction makes a person more hostile, more helpless, more indecisive, more alienated from himself and others, and the result is that the obstacles responsible for the conflict become even more insurmountable, and their real elimination becomes more unattainable.

5.5 Conclusion

1. Social distancing in youth (the age of 18–24) is characteristic of the people with a high level of dissociation in the value-semantic sphere. This phenomenon indicates an attempt to resolve intrapersonal conflicts by young people through social isolation. Their peers with a low level of dissociation are more likely to expand their social space through closer ties and relationships with others.
2. Young people with a marked intrapersonal conflict are aware of the contradictions in their value-semantic sphere. They are characterized by distance from their parents, which can be considered as an active attempt to solve the main task of their age: forming their personal identity by separating from parents.
3. Young people with a marked intrapersonal vacuum do not realize the contradictions in the value-semantic sphere and use alienation as a psychological defense mechanism associated with increasing distance in relation to different social groups.

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Chapter 6

Psychological Readiness for School: Current Requirements and Practices of the Russian Education



N. V. Nozikova

Abstract This paper gives the analysis of how the requirements of the Federal State Educational Standard of Preschool Education (FSES PE) for development of school readiness through various kinds of activities are implemented. The methodological approach, developed on the basis of scientific and practical achievements of the Russian psychological and pedagogical school, considers the concept of “school readiness” as complex or multi-component which determines the continuity of preschool and primary education. The requirements of the Federal State Educational Standard of Preschool Education define the mastery of different activities which work as a crosscutting mechanism that ensures development of a child, form the child’s cognitive interests and create prerequisites for successful educational activities in school. The paper represents the programs elaborated on the basis of the empirical research aimed at a preschooler’s development of communication activities, game, speech, project activities and modeling. The paper gives the examples of the complex psychological and pedagogical programs for formation of the school readiness using the techniques, which develop skills of a child in main activities and sociocultural practices. The experience of the social partnership development of social groups with the common purpose of development of a preschool child’s personality is revealed. The conclusion is made that it is necessary to create complex innovative programs and techniques to master activities in preschool age, taking into account current challenges.

6.1 Methodological Bases of the Formation of Readiness for School

The content of the concept “school readiness” was framed thanks to the works by L. I. Bozhovich, A. V. Zaporozhets, D. B. Elkonin and many other authors of the national psychological and pedagogical school, who laid the methodological foundations

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of the modern preschool education. Classical theories, that substantiate the school readiness complexity, are supplemented by scientific research and methodological techniques for formation of personality, motivation and abilities in the main educational areas in accordance with a current state of a child's development implemented in various activities.

Modern requirements to the social and normative characteristics of a child's possible achievements at the age of completion of preschool education are set out in the Federal State Educational Standard of Preschool Education (FSES PE). It defines targets as the basis of continuity of two stages of education: preschool and primary general, aimed at the formation of prerequisites for a child's future learning activity in school educational environment [1].

The purpose of this article is to study the implementation of the main requirements of the Federal State Educational Standard of Preschool Education in preschool education practices for formation of children psychological readiness to school through development of their cognitive interests and actions in various sociocultural activities. To achieve this purpose, let us consider: first, theoretical approaches to determination of children readiness for school; second, the results of empirical studies and methodological approaches for formation of school readiness through various activities; and third, techniques and experience of complex practical work on the formation of school readiness through the main activities.

6.2 Methodological Bases of the Formation of Readiness for School

The studies of children psychological readiness for school include a wide range of problems of psychophysiological, neuropsychological, psychological, social development of a preschooler, elaboration of methods and techniques to perform diagnostics and special developmental programs. The psychological and pedagogical concept "school readiness" is considered as complex or multi-component.

Thus, in works by L. I. Bozhovich (1968, 1972), the readiness for school was called "school maturity" which is determined by two parameters: intellectual and personal development of a child. Intellectual maturity is manifested in a certain level of its development in a child and the ability to voluntary regulation of his or her behavior in cognitive activity. Personal maturity is accompanied by the formation of the "internal position of a student" under the influence of new needs that a child of senior preschool age has: the cognitive need and the need for social communication with adults. As a result of the changes occurred in the need personality sphere, a leading activity of a child has changed and a game that was in demand in the preschool age no longer satisfies the child. It defines the new content of the child's motivational development at the age of admission to school and contributes to its successful inclusion in a new educational activity, distinguished by conscious objectives and a plan for their implementation.

A. V. Zaporozhets (1977) considered in connection with the formation of school readiness the level of development of a child's volitional regulation of actions, characteristics of cognitive, analytical and synthetic activity of thinking, its motivation, etc.

With the purpose of the formation of psychological readiness of a child for school, D. B. Elkonin (1981) suggested to develop a child's voluntary behavior in learning activity. Self-regulation in the voluntary behavior of a child starts to shape under the influence of external regulation from the side of the children's team in a joint group fair play. A collective play develops the voluntary regulation of behavior during preschool period, and when a child enters school, it is manifested in the following skills: (1) conscious compliance with rules; (2) orientation in the system of requirements; (3) perception of tasks in oral form; and (4) independent performance of tasks on visual perception of examples.

Multifaceted concept of school readiness includes a combination of morphophysiological and psychological characteristics that determine the successful transition of a senior preschooler to school education. The psychological characteristics of a child, which determine a child's success in mastering of learning activity, include: (1) general psychological readiness, manifested in intellectual and sensory motor activity; (2) special readiness, consisting of mastering of preschool programs; and (3) general personal readiness, expressed in integrative indicators of voluntariness to act, adequacy of communication with peers and adults, positive attitude to schooling.

Thus, the methodological approach, formed in the national pedagogical psychology, considers the concept of school readiness as a complex or multi-component that reflects morphofunctional, psychological and social characteristics of a senior preschooler necessary for successful adaptation to a systematic organized school education.

6.3 Contemporary Empirical Studies and Methodical Programs for Formation of School Readiness

The Russian state system of preschool education has accumulated the theoretical and practical experience of early development of a child [2].

Modern principles of preschool education are defined by the requirements of the Federal State Educational Standard of Preschool Education and based on the personal developmental and humanistic interaction of all participants of the educational process—adults and children. They are aimed at providing diversity, uniqueness and intrinsic value of childhood. Various aspects of school readiness are studied in scientific and methodical works, and in particular, the features of the current social situation of children's development are considered, including characteristics of the main educational areas: socio-communicative, cognitive, speech, artistic-aesthetic and physical development of a personality, specified in the requirements of the

Federal State Educational Standard of Preschool Education. The content of the above-mentioned educational areas is determined by the age and individual characteristics of a child and can be implemented in various kinds of activity, such as communication, play, substantive, communicative, cognitive and research and other kinds considered in FSES PE as “crosscutting mechanisms of development” throughout early childhood [1, p. 7]. A number of psychological and pedagogical research and studies of methodical techniques are devoted to the specifics of their mastering at an early age for “development of children in one or several educational areas, activities and/or cultural practices” [1, p. 8].

Thus, L. S. Rimashevskaya and A. N. Atarova consider various kinds of joint activity of children, due to which they get the experience of communication with peers and adults in the kindergarten group which represents an early form of the social organization. The empirical research of a preschooler’s independence, that carried out by the authors on the basis of the methodology for subjective and humanistic approaches, showed that value orientations, selectivity of communication in the interests of joint activities and, on the ground of attraction of the partner’s positive qualities, free choice in communication in reliance on the personal and business motives, acquired successful experience in joint activity, willingness to act independently in communication and activities, which are getting to form, have been the basis for the subjective manifestations of the child’s personality [3].

According to L. S. Vygotskii, the key characteristics of play are an imaginary situation and dual positioning in its implementation [4].

In the work by G. G. Kravtsov and E. E. Kravtsova, the use of game activity is considered for the purpose of developmental preschool education and formation of school readiness. According to the authors, preschool education shall, first, form children’s psychological readiness for game activity; second, teach them to play; and third, develop a skill to use a game in learning. The purpose of using game activity in a preschooler’s development is to create conditions for manifestation of volitional effort that forms voluntariness and self-regulation in the behavior [5]. In the empirical research, a distinct connection is revealed between quality indicators of children’s game, social acceptance of a child by peers and friendship depending on age [6].

The practice of preschool education includes innovative methodological techniques for developing a personality and cognitive interest of preschool children using various activities.

New social and cultural requirements in modern conditions are the project activity based on algorithmic skills. It determines the need for special psychological and pedagogical programs on its development for preschool children, L. V. Voronina and E. V. Korotaeva note in their article. The stages of development of the activity project include the following stages of the algorithm: (1) analysis of the situation with problem identification and clarification; (2) goal setting in definition of the concept of phenomenon; (3) activity planning; (4) mobilization of resources for its implementation; (5) selection of techniques; (6) actual implementation of the project; (7) monitoring of the project execution and analysis of its result; and (8) if necessary, additional actions are selected to achieve the project goals. The application of the project activity implementation technique shall take into consideration the age of

the children for formation and development of their skills to use the algorithm in the project activity. Educators also need to be prepared for their performance of the project work according to the activity algorithm together with children [7].

Savenkov A. I. and co-authors offer a methodological complex for the implementation of visual spatial models for development based on the activity of modeling of the creative thinking of children in the kindergarten preschool group [8].

Special attention should be paid to the process of formation of preschoolers' speech activity. The components of the functional system of the written speech arise by the beginning of schooling. On their basis, the writing and reading systems are formed, and the mechanisms for comprehension of a written text are mastered.

In the works by A. A. Almazova and co-authors, a technological map is proposed to assess the level of development of the functional base of writing and reading, including oral speech; language and metalanguage ability; and non-verbal prerequisites for learning to write and read. The application of the technological map allows us to identify the levels of readiness of children for learning to read and write and single out among them the risk groups for development of written speech [9].

Summarizing the analysis carried out in terms of major lines of empirical research and methodological techniques for development of school readiness, it should be noted that it is necessary to pay special attention to the creation and development of innovative psychological and pedagogical approaches that correspond to the current development situation to perform the objectives of the Federal State Educational Standard of Preschool Education (FSES PE) for unleashing the individual potential of capacities of a child "as a subject of relations with himself or herself, other children, adults and the world" [1, p. 7].

Let us consider the main approaches in the practice of forming and developing the school readiness of a preschooler.

An integrated and thematic principle of the preschool education practice determines the use of the close and interesting for a child topics for studies in the process of development, education and training of a child, which develop a child's research activity and emotionality, and form the intellectual and personal sphere [10].

Innovative programs, methods and techniques, which take into account modern social and cultural challenges in psychological and pedagogical practice, are actively implemented in preschool education.

The program of psychological readiness for school in the conditions of implementation of the Federal State Educational Standard of Preschool Education "Path to school" made by E. Yu. Konanykhina, that has become a nominee of the National Psychological Contest "Golden Psyche" in 2012, is intended for 5–7-year-old children. The program is aimed at developing the cognitive, emotional, personal and communicative qualities of a child through original approaches and technologies using various activities in classes with children: (1) game activity, including action-oriented and educational games; (2) art therapy techniques of free and thematic art work; (3) fairytale therapy techniques of composing and drawing based on fairy tales; (4) musical techniques to enhance the impact of other methods; (5) mind games; and (6) games for development of communication skills. Monitoring of the dynamics of psychological development of children during the implementation of the program

was carried out using the technique by L. A. Yasyukova "Readiness for school: forecasting and prevention of learning problems", as well as using feedbacks from parents [11].

In the author's program "I want to go to school" by A. V. Kireichev and K. E. Chavdar', a complex of forming, developing and remedial games for children of senior preschool age is implemented. The program is aimed at developing the higher mental functions, communication abilities, forming a favorable emotional and psychological climate in the children's team, creates prerequisites for development of mental outlook and psychosocial maturity of children, forms their interest and motivation for schooling and will further contribute to their successful adaptation in the school educational environment [12].

The program by L. V. Mamedova and O. D. Belogorskaya "Razvivai-ka" (Develop) for creating motivational readiness of children of senior preschool age for schooling solves the tasks of forming the student internal position, a positive emotional attitude to school, transition to a new level of self-awareness and expanding children's knowledge about school life using techniques of practical activities: games, educational exercises, performance of search assignment, trainings, game studies and thematic modeling [13].

The success of preschool education programs is based on the principles of organization of the social partnership in activities of all social groups with a common purpose to develop personality and form school readiness of a child. To involve the parent community in the activities of the open educational system, both traditional (conversations, consultations, parent meetings, illustrative propaganda tools) and innovative methods aimed at solving individual problems of a child and his or her family (thematic round table, surveys, interviews with parents, consultations of a specialist on an actual topic, etc.) are used. Such forms are offered as an oral magazine for parents with various topics on each page, family sports competition, consultations via trust mail or trust line, mind games for children and parents, interviews on current topics with parents and children, family talent shows, an auction of family secrets of education, family projects "Our family tree" and thematic exhibitions [14, 15].

6.4 Conclusion

In concluding the theoretical research of the principal approaches to the formation of the psychological readiness for school, it should be noted that the importance of early education is equally highly valued and the need to develop and improve this process is recognized in practice of the national pedagogical schools, but different strategies are implemented to ensure the continuity of preschool and primary education.

Differences are determined by the underlying purposes, content of regulatory documents, methods of work with children, families, educational and public organizations. Thus, for example, the Japanese pedagogical approach to a greater degree gives prominence to the procedure of interaction between educators. Finland has a

common methodological basis for preschool education, and innovations in its practical implementation are determined by preschool institutions. In Australia, the work at the preparatory stage to schooling and development of involvement of parents in interaction with children, educators and each other are emphasized [16].

In pedagogics and psychology in Russia, the methodological approach has been shaped that considers the concept “school readiness” as complex or multi-component, reflecting the morphofunctional, psychological and social characteristics of a senior preschool child, contributing to its successful adaptation to the next stage of their schooling.

The Russian Federal State Educational Standard identifies among modern fundamental principles of preschool education: (1) holistic development of a child at all stages of childhood; (2) individualization of the child's preschool education; (3) collaboration and cooperation of all parties of educational process—children and adults; (4) support of the children's proactivity; (5) cooperation with families; (6) learning sociocultural norms and traditions; (7) development of cognitive interests and actions of a child in various activities; (8) age-related adequacy of preschool education; and 9) taking into account the ethnocultural situation of the child's development.

The targets of the Federal State Educational Standard at the stage of the completion of preschool education, *inter alia*, define the need of mastering by a child the main cultural methods and kinds of activities, development his or her proactivity and independence in choosing a kind of activity and a participant for joint activities.

A complex principle of the implementation of preschool education determines the formation of a preschooler's abilities in the main ways of activities, as well as in the kinds of activities that meet modern sociocultural requirements, as a crosscutting mechanism for its development and readiness for school education. The innovative programs and methods of activities are offered, taking into account current social challenges. However, at the present time, the practice of preschool education is experiencing the lack of such complex target psychological and pedagogical research and development.

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Chapter 7

Development of a Structural–Functional Model for Comprehensive Support of Children with Autism Spectrum Disorders



I. A. Nigmatullina · V. V. Vasina · and Y. O. Mukhamedshina

Abstract The research describes the structural–functional model of integrated (medical, psychological, pedagogical) support for preschoolers with autism spectrum disorders (ASD). The longitudinal study provided poor results for 54 children with ASD who all attend educational institutions but learn according to different educational programs. The analysis of the research results led us to the conclusion that it is necessary to build a comprehensive medical–psychological–pedagogical model of supporting children with ASD. The scientific novelty of the research is associated with clarification of the concept of “comprehensive support” in relation to children of a preschool age with ASD from the point of view of an interdisciplinary approach. Our structural–functional model of comprehensive support of preschoolers with ASD, which reflects special conditions for ensuring their successful education when moving from one educational level to another in accordance with the requirements of Federal State Educational Standards, contributes to the idea of organizing an affordable and high-quality preschool education, as well as successful socialization of this category of children taking into account their medical condition.

7.1 Introduction

The features of teaching and socializing children with ASD have been studied both abroad and in Russia for a long time. The first mention in science was made by the English physician named Haslam in 1809 [1]. The term “autism” was introduced by the Swiss psychiatrist Bleiler in 1911 [2]. In 1925, the Soviet psychiatrist G. E. Sukharev described a clinical case, later called as an “Asperger’s syndrome” [3]. Since the mid-1960s, official science came to understanding that autism is a separate

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syndrome due to its stable lifelong character, demonstration of its differences from mental retardation, schizophrenia, and other developmental disorders [4]. At the same time, active parents began to get involved in behavioral therapy programs. 30 years ago, in the USA (Baron-Cohen et al. 1985) and in the USSR (Lebedinsky et al. 1990), scientists developed ideas about the need to create systems for comprehensive support of children by different specialists [5, 6]. We currently emphasize this idea for children with ASD and their families from the first days of their life. Recent studies prove the fact confirming the increase in the number of children with autism [7, 8]. If in 2000, only one individual out of 2000 children suffered from autism, then in 2017, there was approximately one case of autism for 50 newborns [9, 10]. A similar type of dysontogenesis is described in a large number of publications on this topic. It is designated as a group of developmental disorders or a set of conditions that are characterized by impaired social interaction, speech development, and stereotyped behavior patterns [11].

The relevance of this study is determined by the need to support children with ASD by various specialists within a comprehensive, systemic and holistic approach due to the complexity and heterogeneity of the disorder. Depending on the characteristics of affective and emotional development, autistic children develop a peculiar stereotype of communication with the outside world, which allows them to be divided into four main groups according to classification developed by O. S. Nikolskaya [12].

The unit of psychological support for children with ASD for their successful socialization is based on scientifically sound teaching practices in behavioral disorders, on effective methods of improving reading comprehension in children with ASD Cook B. G. (2013), Accardo A. L. (2015), which is reflected in the theory of thinking of individuals with autism (2017) [13–15]. The support of children with ASD separately by various specialists was previously investigated in detail by Quill K. A. (2010), Pawan Sinha (2014), Trent Gaugler, Lambertus Klei (2014), Gilroy S. P. (2017) [16–19] who described the features and problems of their communication [20–23]. However, the real practice requires joint efforts.

Russian scientists also made their contribution to general understanding of pedagogical problems of socialization of children with autism [24–26]. Parents are actively involved in social adaptation of their children and often accompany them throughout all of their lives. It has been proven that the styles of parental socialization influence the successfulness of socialization of a child [27]. To compose a complete picture of medical-psychological-pedagogical support of a child, we need to conduct a timely study of the parental attitude toward children with ASD. Modern systematic reviews describe the implementation of complex surveys [10, 28–30]. To understand the basics of building a model of comprehensive support, we used the experience of the formation of educational behavior in autistic preschoolers and the experience of teaching autistic children primary school skills [7, 8, 31]. The choice of diagnostic tools is determined by the possibility of studying a child as a holistic creature and by the need for interdisciplinary coverage of the problems of the autism spectrum from different points of view. Available studies of the biological foundations and medical aspects of autism are not always combined with dynamic psychological and pedagogical assessment. Modern domestic science has no scientifically based

models for comprehensive support of children with autism and families raising them as well as innovative platforms that broadcast such experience. This determines the purpose of this research—to develop a scientifically based structural–functional model of comprehensive support of children with ASD. The significance of the idea of developing a structural–functional model of integrated support for children with ASD is determined by the demand of society for functions related to ensuring equal conditions for education of children through creation of effective, scientifically based mechanism for organizing comprehensive support for children with ASD and their families since there is no single integrated system of comprehensive support of children with ASD in the consortium of educational institutions and universities of the Russian Federation.

7.2 Materials and Methods

The research involved comparative analysis of Russian and foreign studies on the issue. Using the method of concretizing the results of studying scientific theories and summarizing modern experience, the content of the term “comprehensive support” was revealed. For creating infographics of the structural–functional model of integrated support for children with ASD, we used design, modeling, and visualization methods.

7.3 Designing a Structural–Functional Model of Integrated Support of Children with Autism Spectrum Disorders

The Institute of Psychology and Education of Kazan (Volga Region) Federal University implements a new project aimed at testing a scientifically based variable model of comprehensive support of children with ASD and their families in the consortium of university scientists and specialists of educational institutions. The choice of the Institute of Psychology and Education as a scientific experimental site is not accidental. In 2020, it was decided to open a Kindergarten for children with ASD on the site of the Institute of Psychology and Education since it is currently the leading modern educational center in Russia, which conducts modern scientific research aimed at the developing psychological and pedagogical knowledge and organizing multidisciplinary international projects at various levels. Moreover, the institute’s activities are aimed at implementing educational programs of professional education in the field of psychology and education, as well as programs for improving qualifications and professional retraining of teachers.

The objective of the project is to translate new modern experience in the field of education of children with ASD through implementation of variable structural–functional model of their comprehensive support.

This project will help to improve the quality of preschool education of children with ASD through implementation of educational programs specially adapted for these children in a consortium of preschool educational organizations and the Kazan (Volga) Federal University (KFU). The project of comprehensive support of children with ASD is aimed at effective interaction of specialists, introduction, and dissemination of new experience in preparation of students who study on the departments “special (defectology) education” and “general medicine”.

To achieve the objectives of this project, we need to complete the following tasks:

1. Conducting fundamental scientific research aimed at studying the existing experience of support of children with ASD in the world.
2. Developing a model for integrated support of children with ASD.
3. Creating special educational conditions in kindergartens (environmental, personnel, organizational) for preparation of children with ASD for the transition to inclusive education in secondary schools.
4. Organizing interagency interaction of organizations working with people with ASD.

The infographics of the model structure is presented in Fig. 7.1.

The review of domestic and foreign experience in providing assistance for children with ASD showed that there are only a few studies on the issues of medical, psychological, and pedagogical support for people with ASD in educational institutions. There is some experience of the regions in implementation and testing of various

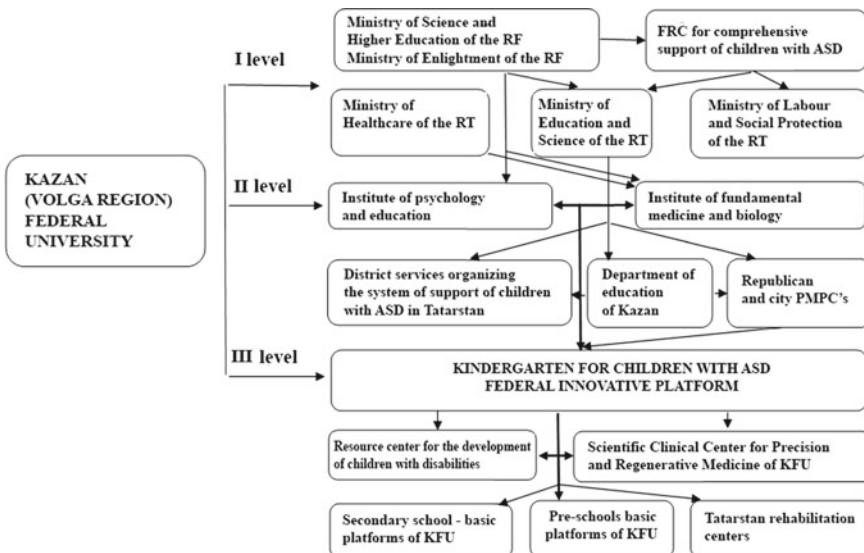


Fig. 7.1 Infographics of the structural-functional model of comprehensive support of children with ASD

forms of support of children with ASD and their families, but there is no comprehensive system of special assistance for children with ASD in preschool educational institutions. The tools and mechanisms for implementing an integrated approach toward education of children with ASD in preschool educational institutions are not developed, and the technologies for organizing continuity during transition to the next stage of training are not described [32–36]. Our model has been developed in accordance with the basic regulatory documents on preschool education: the Federal Law “On Education in the Russian Federation”; Federal State Educational Standard for Preschool Education; Federal Target Program “Concept for the Development of Education for 2016–2020”, the strategy for the development of education and upbringing in the Russian Federation until 2025 [37].

When developing a model based on the analysis of modern research and existing regulatory legal acts governing the organization of support to children with ASD, we clarified the content of the term “comprehensive support for children with ASD”. In the course of studying the research works, we have revealed the multi-variability of understanding of this term: as a process of organized interaction, as a method of implementing conditions, and as a system of joint professional actions [38, 39]. Most of the modern studies are devoted to psychological, pedagogical, medical, psychological–pedagogical, socio-psychological assistance of socialization of children, as well as other types of support. This fact underlines the narrow focus of research devoted to this process. When developing the model, we considered comprehensive support as:

- The process of organizing the system of interaction between state authorities, local self-government institutions, organizations of various departmental affiliations, social non-profit organizations, business structures and interaction of socially oriented entities whose activities are aimed at achieving goals through professional activities aimed at optimizing the socialization process and individualizing the development of a personality of a child with ASD.
- The method for practical implementation of the support process based on the diagnosis of the essence of the problem; information about the nature of the problem and ways of solving it; consultation at the stage of decision making and development of a plan for solving the problem; primary care during the implementation phase of the decision plan.

In the first approach, the design of the model structure considered the principles of institutionalization and level-based approaches to the process of organizing the system of interaction between hierarchically subordinate systems of support of children with ASD. The model has three levels. The first level is represented, firstly, by organization of interagency cooperation between the Institute of Psychology and Education and the Institute of Fundamental Medicine and Biology of the KFU for scientific support by a group of scientists of medical and educational process of children with ASD in preschool educational institutions of the Republic of Tatarstan. Secondly, it is represented by the Federal Resource Center for organization of comprehensive support of children with ASD, which provides consultative and

methodological support to the subjects of the Russian Federation on the development of regional integrated support systems for people with ASD. This activity is carried out on the basis of an agreement concluded between the Federal Resource Center for the Organization of Comprehensive Support for Children with ASD and the executive authority of the constituent entity of the Russian Federation in the field of education and in the field of social protection. Thirdly, the process of organizing interaction is carried out with the Ministry of Education and Science of the Republic of Tatarstan, the Ministry of Health of the Republic of Tatarstan, the Ministry of Labor, Employment and Social Security of the Republic of Tatarstan, and with the Education Department of the Kazan city on the basis of agreements on cooperation aimed at establishing long-term partnerships and implementation of joint events (conferences, consultations, seminars, meetings, including international ones, aimed at achieving the objectives of the federal innovation platform, developing regulatory framework, and implementing development strategies for supporting children with ASD) (see Fig. 7.2).

The second level is represented by organization of interagency cooperation with district services that organize a system for supporting children with ASD in the Republic of Tatarstan and with regional centers that provide psychological, pedagogical, and medical and social assistance to all participants of the process in solving the problems of the development of children with ASD (see Fig. 7.3).

The third level of the model is represented by organization of interdepartmental interaction of the Kindergarten at the Institute of Psychology and Education of KFU with the Resource Center for the Development of Children with Disabilities, established by KFU, the Scientific and Clinical Center for Precision and Regenerative Medicine of KFU with preschool educational organizations of the Republic of Tatarstan with their groups for children with ASD, rehabilitation centers of the Republic of Tatarstan, and medical organizations. The main task implemented at the third level is organization of an interaction system to address the issues of comprehensive diagnostics on the development of children with ASD, advising all participants

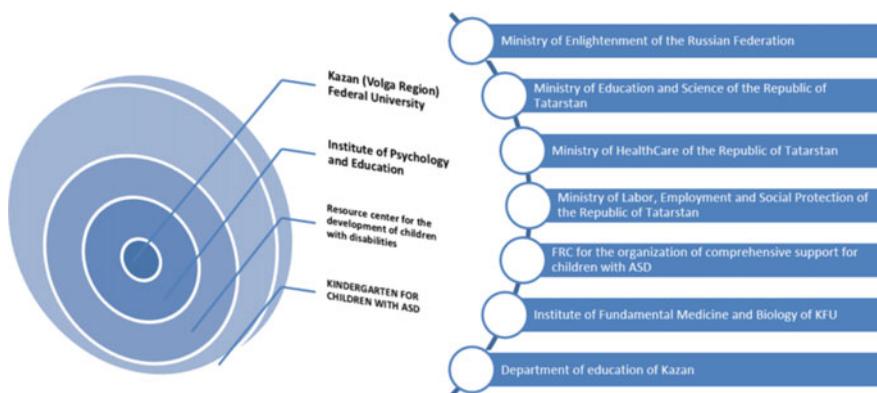


Fig. 7.2 First level of the model of comprehensive support of children with ASD

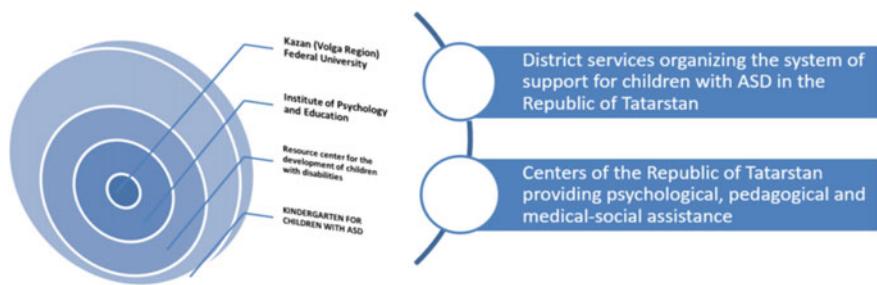


Fig. 7.3 Second level of the model of comprehensive support of children with ASD

of the educational process, group lessons, seminars, and trainings with specialists of the support process, parents, and children with ASD. In these organizations, the support is represented by a psychological, medical, and pedagogical consultation which involve psychologists, speech therapists, defectologists, social educators, and medical specialists. Inclusion in the model of the Scientific Clinical Center of Precision and Regenerative Medicine, created on the basis of the Institute of Fundamental Medicine and Biology of KFU, will make it possible to carry out scientific, clinical studies of autism, as well as to introduce new methods for comprehensive treatment, diagnosis, and prevention of developmental disorders in children with ASD. The activities of the Resource Center for the Development of Children with Disabilities in the implementation of the model are aimed at organizing socially significant events, interacting with charitable foundations, disseminating the best practices gained by the kindergarten on the use of modern technologies and methods for diagnosing and treatment within the framework of comprehensive support of children with ASD in the Republic of Tatarstan (see Fig. 7.4).

Comprehensive support, as a method of practical implementation of this process, is presented in the model by description of the structure of the Kindergarten of the Institute of Psychology and Education of KFU as a federal innovative platform that transfers the experience of testing scientifically based variable models and programs

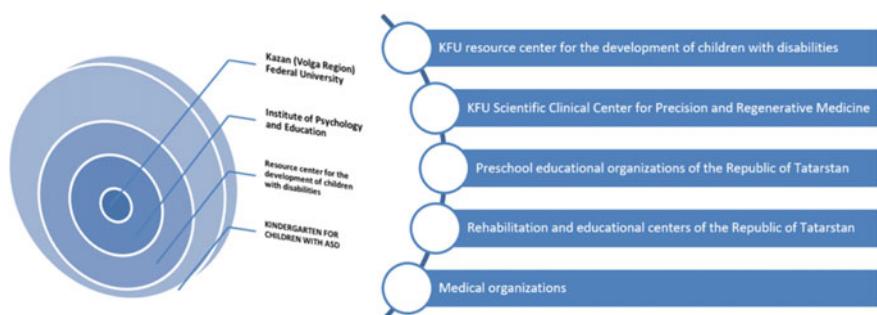


Fig. 7.4 Third level of the model of comprehensive support of children with ASD

for comprehensive support of children with autism and their families in a consortium of scientists and specialists of preschool educational organization. The implementation model of the comprehensive support system for preschoolers with ASD was built on the basis of the principles of continuity, multidisciplinarity, consistency, variability, and preventiveness, which made it possible to fill its functional component with content. The content of the model fully complies with the Federal State Educational Standard for Preschool Education, but the content component goes far beyond its scope and implies rich educational content that meets the cognitive interests of modern children. The Federal State Standard for Preschool Education (hereinafter referred to as the Federal State Educational Standard for Preschool Education) implies creation of favorable conditions for development of children in accordance with their age and individual characteristics, development of the skills and creative potential of each child as a subject of relations with oneself, others children, adults, and the world in the implementation of the basic general educational program of preschool education. The processes that contribute to the creation of a comprehensive developmental education focused on a free choice of an individual educational route for children with the use of a wide range of informational and educational resources that open up new opportunities for the development of personality of preschoolers. Children with ASD act as full participants of the educational process thanks to the provisions of the Federal State Educational Standard.

The purpose of the kindergarten is to create favorable conditions and additional opportunities for development and testing of variative models of education for preschoolers, to provide affordable and high-quality education when moving from one educational level to another in accordance with the requirements of Federal State Educational Standards (hereinafter—FSES), which is an important condition for their successful training and socialization (see Fig. 7.5).

The objectives of the kindergarten are as follows:

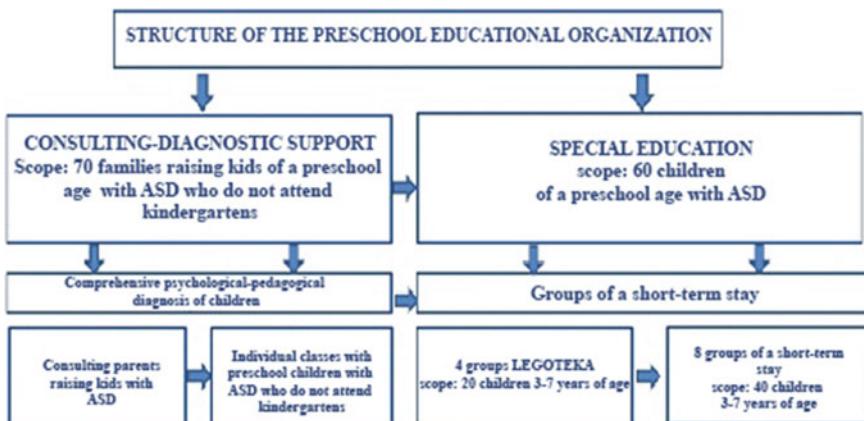


Fig. 7.5 Structure and activities of the preschool educational organization for children with ASD

1. Creation of special conditions (environmental, personnel, organizational) for social adaptation, preschool education, and correction of developmental disorders of children with ASD based on implementation of adapted educational programs as a part of the implementation of the main general educational program of preschool education.
2. Preparation of children with ASD for the transition to inclusive education in common education classes of schools among typically developing peers.
3. Generalization, implementation, and dissemination of modern technologies and experience in the upbringing and education of children with ASD, support of families with children of this category.
4. Conducting applied and fundamental scientific research in the field of studying and correcting disorders of the autistic spectrum, training, and socialization of children with ASD.
5. Methodological, expert and informational support of the activities of organizations working with people with ASD in the Republic of Tatarstan [40].

Implementation of the objectives is being carried out in five directions. The first direction is represented by consulting and diagnostic activities, which include comprehensive diagnostic work with preschoolers with ASD and advising parents (legal representatives) on creating developmental environment in the context of family education. The second—correctional and developmental direction—involves the development and implementation of individually oriented programs for support and social rehabilitation of children with ASD, correction and development of communicative and verbal skills, expansion of communication tools for children with ASD, development of sensory, cognitive, emotional, and volitional spheres; prevention of social maladaptation, development of psychological prerequisites for successful education of children with ASD among typically developing peers; and training parents (legal representatives) and experts in methods and technologies for accompanying children with ASD. The next area includes scientific testing of innovative technologies of supporting people with ASD and diagnostic assessment methods; implementation of research projects and grant programs on this issue, including the ones that involve KFU students; conducting scientific conferences, seminars (including international ones) on the issues of helping people with ASD; organization of meetings of research groups on current research issues; and analysis and generalization of the experience of organizing comprehensive support and education of children with ASD in the Russian Federation and abroad. The fourth area—educational-methodical—involves introduction and dissemination of effective practices for identifying people with ASD, diagnosing the features of their development; organization of lectures, practical classes for KFU students, conducting various types of student practice, including research work; development of software and methodological support for the activities of organizations and specialists involved in the education and support of people with ASD; organizing and conducting scientific and practical events of various levels for specialists and parents on the issues of training, education, rehabilitation, and social integration of people with ASD; and development and implementation of programs (modules) of professional education

for specialists working with people with ASD, including distance learning technologies. The informational-analytical area includes work on the collection, qualitative, and quantitative analysis of data, which will help to generalize the trends in the appealing of families living in the Republic of Tatarstan for special help; preparation and distribution of publications on issues of integrated psychological and pedagogical support for children with ASD and their parents; and development and implementation of projects aimed at formation of a tolerant attitude toward people with ASD in society, their normal development, and adaptation to life.

The work on these directions will allow to arrange interdepartmental cooperation in organizing a system of supporting people with ASD and to implement innovative technologies and effective methods developed by KFU scientists in order to provide qualified comprehensive support for children with ASD.

Thus, combining the resources of preschool and higher education makes it possible to timely identify children with ASD, organize comprehensive medical, psychological, and pedagogical support at the early stages of education, which are most important for compensating and correcting developmental disorders, preventing secondary developmental abnormalities.

As a result, the model of comprehensive support for children with ASD will be implemented on the basis of KFU Kindergarten, which will dissimulate the experience of scientists from the Institute of Psychology and Education and the Institute of Fundamental Medicine and Biology. The model defines the main directions of its implementation in the Republic of Tatarstan. It takes into account the specifics of the conditions for preschool education for children with autism, correction of developmental disorders and successful socialization, the need to work with families and training of specialists for similar work and also determines the range of necessary further research.

7.4 Conclusions

The research substantiates and develops a structural-functional model of comprehensive (medical, psychological, pedagogical) support of preschoolers with ASD. Children were earlier examined with the use of the methodology "Assessment System - VB-MAPP, Sundberg (2008)". The longitudinal study provided poor results for 54 children with ASD who all attend educational institutions but learn according to different educational programs. The analysis of the research results led us to the conclusion that it is necessary to build a comprehensive medical-psychological-pedagogical model of supporting children with ASD. The scientific novelty of the research is associated with clarification of the concept of "comprehensive support" in relation to children of a preschool age with ASD from the point of view of an interdisciplinary approach. Our structural-functional model of comprehensive support for preschoolers with ASD, which reflects special conditions for ensuring their successful education when moving from one educational level to another in accordance with the requirements of Federal State Educational Standards, contributes to

the idea of organizing an affordable and high-quality preschool education, as well as successful socialization of this category of children taking into account their medical condition.

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Chapter 8

Role of Professional Work of a Higher Education Teacher in the Development of Students' Creativity



M. I. Mykhnyuk and E. S. Suleymanov

Abstract This article presents the results of studying the role of the professional work of a higher education teacher in the development of students' creativity. The relevance of this problem is justified by the creative activities of a teacher, its main types, and the organization of the didactic process using organizational forms and methods of education facilitating the development of an integral creative individuality. The authors analyzed the types and the content of professional educational problems and studied the fulfillment conditions for students' creativity, as well as the characteristics, logic, and levels of pedagogic thinking and the criteria of pedagogic creativity. The theoretical methods of the research include the analysis of the literature dedicated to creative development and empirical methods aimed at the analysis and self-analysis of students' creativity development. The results of the research can be applied by young teachers in practice to improve the methods of teaching engineering subjects.

8.1 Introduction

Today, the problem of creative development of a student personality receives great attention in psychological and pedagogical studies. Higher education institutions should train specialists that can perform their future professional responsibilities taking into consideration the quick changes in job conditions. This stipulates the main goal of teaching staff: training creative personalities that can solve specific problems on their own. Therefore, teachers in higher education institutions must use various means of influencing student personalities efficiently. The increased attention to the development of creativity is aimed at organizing the didactic process in the context of the innovation paradigm. This guideline is manifested in the development of professional education technologies and methods that would facilitate the integrity of emotional and rational educational development factors, stimulate the

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creative activity of people, help develop personal and professional qualities of future specialists, and create conditions for the use of modern educational means. The goals set can be achieved via the following objectives: analyzing the theoretical studies of the problem; rationalizing the development of a teacher's creativity; identifying the types and content of teacher creative activities; and studying the requirements to the organization of the didactic process associated with the creative development of student personalities.

Even though various aspects of the creative development of personality have been studied in theoretical and practical pedagogics, this problem remains relevant. The purpose of this article is the rationalization of the role of the professional work of a higher education teacher in the development of student creativity.

8.2 Research Methods and Methodology

The research methodology includes the theory of creative development of a personality; the provisions of activity and person-centered approaches to the organization of the didactic process in higher education; and the conceptual bases of the formation of creative individuality of future specialists that can perform the professional functions associated with their degree.

In this research, the following theoretical methods were used: a comparative analysis of academic sources; as well as such empirical methods as evaluation and self-evaluation of student creativity development levels based on the results of solving professional and pedagogical problems. The materials of this research can be used in higher education for the professional training of various specialists.

Based on the study of theory, the authors developed methodological recommendations to be used by young teachers of engineering disciplines.

8.3 Review of Literature

Creativity is the subject matter for a variety of sciences. Philosophically, an act of creation, is a cognitive and practice act that produces new and original things. According to the philosophical encyclopedia, creativity is an “active interaction of the subject and the object, in which the subject purposefully changes the surrounding world and creates new, socially significant things in accordance with the requirements of objective patterns” [1, p. 8]. From the point of view of psychology, creativity is a type of human activity that creates or discovers new things that have previously been unknown for a specific subject and are connected with creative imagination, intuitive thinking, and creative inspiration [2, 3]. In scientific work, intuition helps to create hypotheses via the intuitive prediction of the best solutions for various problems [4, 5].

The problems of the formation of an integral creative personality have been studied by H. Eysenck, N. A. Berdyayev, V. S. Bibler, R. Kettel, A. Maslow, V. A. Molyako, S. A. Sysoyeva, G. Wallace, E. Fromm, etc. The problems of the creative activity of a teacher have been studied by L. S. Vygotsky, I. A. Zyazyun, M. S. Kagan, A. N. Leontyev, E. Torrance, G. I. Shchukina, B. P. Yusov, P. M. Yakobson, etc. The notion of psychological creativity and its parameters and qualities have been studied in the works by I. O. Ganchenko, V. A. Krutetskiy, M. M. Potashnik, etc. The mechanisms connecting creative development and professionalism have been investigated by V. I. Andreyev, V. I. Zagvyazinskiy, I. A. Zyazyun, I. P. Kuzmin, etc. The development of a scientific and pedagogical style of thinking of teachers is in the focus of works by I. P. Andriadi, Yu. K. Babanskiy, Z. T. Meretukova, V. S. Merlin, V. A. Slastenin, A. M. Stolyarenko, G. N. Shchukina, etc. The pedagogic technologies of student creative development were analyzed by A. K. Radchenko, G. K. Selevko, M. P. Sibirskaya, A. M. Alekseyuk, P. M. Volovik, E. N. Kulchinskaya, S. A. Sysoyeva, etc. The creative development of a personality is in the focus of the monographs by S. A. Gilmanov, S. V. Konovets, L. A. Milto, E. N. Otich, I. V. Sokolova, S. A. Sysoyeva, M. G. Chobitko, etc.

8.4 Research Findings

The professional pedagogic activity of a teacher in higher education is characterized by the integration of the engineering and pedagogic components. Its content comprises the management of student job training with a primary view of their creative development.

The authors approached the study of the theory of creativity from the position of rationalizing categories such as *artistic personality, creative activity, and creative process*. The problem of creative development was investigated by such ancient thinkers as Socrates, Plato, and Aristotle. Socrates claimed that the idea of the harmonious development of personality within a social whole was born and developed in a society. According to Plato, the image of an integral personality must be central to the educational theory. Aristotle believed that the main components of educations should include the theory of existence and its constituents, the theory of human activity, and the theory of creativity.

Philosophers such as I. Kant, G. Hegel, and F. Schelling perceived artistic people as god-like creatures and underlined the unlimited abilities of such people. G. S. Skovoroda believed that one of the key goals of a teacher is the development of natural inclinations and abilities of a person.

According to E. Fromm, the creative development of a person was necessary to “creatively understand something new with a help of spontaneous activity of one’s own mental and emotional forces” [6, p. 90].

Based on the humanist philosophy and the signature pedagogic concept of “good pedagogic”, I. A. Zyazyun in his works analyzes the phenomenon of the development of a harmonious artistic personality. He focuses on the necessity to facilitate

the overall development of a personality, the formation of its culture, individual experience, creative intuition, social responsibility, and self-consciousness [7].

It is scientifically proved that the humanization of job training at higher education institutions stipulates for rethinking of all of the pedagogic process components from the position of human and culture creation functions and facilitates the following:

- The transition for the pedagogic of requirements to the pedagogic of partnership and trust relationships;
- The teachers' tolerant attitude and trust toward the students, the development and improvement of their self-reverence via such qualities as responsibility, exigence, and respect;
- The acceptance of personal goal, requirements, and interests of students;
- The establishment of the best possible conditions for the development of student creative abilities to help them identify themselves professionally and in life in general;
- The facilitation of the development of individuality;
- The establishment of partnership and co-creation relationships between all of the participants of the pedagogic process;
- The understanding of teacher self-fulfillment as student creative self-realization [8].

The redirection of the education system is currently performed under the influence of the humanist paradigm that re-routes educational processes through the development of a personal creativity. On this point, I. A. Zazyun and G. M. Sagach wrote that "it was previously believed that the increase of productivity was rooted in employees' physical abilities, while today their personal culture is the key factor. Technological development sets up new requirements for specialists that are completely different from the conventional ideas that addressed the goals of the extensive planning economy. Contemporary industries need broad-minded specialists with a multi-option patterns of needs, well-developed imagination, constant urge to develop both professionally and culturally" [7, p. 24].

Thus, the key source of pedagogic creativity is the artistic personality with the respective focus and abilities that creates new things through using innovative technologies, values, and methods. According to V. A. Slastenin, the creative personality of a teacher acts as an external parameter of their professional skill and at the same time as a personal category that facilitates the development of creative initiative, intellectual faculties, breadth and depth of their knowledge, and the inclination toward creative hesitation and professionalism [9, p. 70]. The artistic personality, according to S. A. Gilmanov, has an integral core and a rich inner world, which is manifested through its autonomy, activity, and the originality of all its creative endeavors [10]. S. A. Sysoyeva, in her turn, interprets the artistic personality as the one that acquired the necessary additional creative qualities that help achieve important results in various areas of activity via the influence of some external factors. She stresses that the artistic personality is a subject of creative social relations and willful creative activity [11].

Thus, the creativity of a single personality can be seen by the researches in two aspects: as a combination of its qualities that influence the attitude of the subject to

the world and itself and as a creative activity that implies a high activity of the person in general.

The main qualities of a creative person may include the following:

- Understanding of their activities as a higher mission, the ability to see the meaning behind specific actions;
- Urge to fulfill oneself, which can only be satisfied by the person themselves and whose presence is an important criterion of creative individuality;
- Scope of the teacher's interests to which they want to introduce their students;
- Flexibility of mind, originality, the empathic understanding of students' intellectual states;
- Urge to create, which is the main driver of a person's professional activity;
- Ability to see communications with students as a personal value;
- Interest in the innovative experience, activities of the colleagues, the ability to notice unique features of their activities [12].

The formation of personality, according to scientists, is connected with the study of creative activities. They see creative activity, in its turn, as a condition for the implementation of a person's creative abilities. V. I. Andreyev analyzed creative activity through several parameters characterizing it as an integral process:

- The presence of controversies in a problem situation or a creative task;
- Social and personal significance, progressiveness that contributes to the development of the society and the personality;
- The presence of objective (social, material) preconditions for creativity;
- The presence of the subjective (personal qualities, knowledge, and skills);
- The novelty and originality of a process or its result [13, p. 240].

The creative nature of the pedagogic activity was also studied by P. F. Kapterev. He wrote that "a teacher's activity is complex because its basis is in the academic knowledge" [14, p. 600]. The scientist believed that the broader and the more solid someone's knowledge is, the more productive their activity will be [14]. According to V. A. Slastenin, the creative nature of the pedagogic activity is confirmed by the fact that a correct pedagogic decision concerning self-management complies with the rules of heuristics that the teacher is using [9].

V. A. Kan-Kalik points out that the pedagogic creativity of a teacher includes the creative pedagogic activity of the teacher and the creative learning activity of students and their interactions, as well as the results of their creative activities influencing their development and self-development. That is, a teacher's individuality is manifested to the utmost degree in their creative activities [15]. There is a conceptual provision to determine the level of the creative activity of a teacher in higher education, and it is reasonable to look into various aspects of this activity. That being said, it is necessary to take into consideration the fact that every teacher uses different types of creative activity.

Researchers identify various types of teachers' creative activities: methodical creativity, which is associated with the ability to simulate training using various

pedagogic situations along with the selection of content and methods of interaction; communicative creativity implemented via dialogs to promote pedagogic self-adjustment; creative self-improvement as a mechanism of self-perception and the identification of personal and professional qualities necessary for improvement or self-improvement; and innovative creativity that stipulates for the creation of new theoretical knowledge and scientific provisions, as well as technologies and methods [16].

Thus, under the variability of education, pedagogic creativity can manifest itself as the improvement of the existing technologies and methods; the creation of new methods of pedagogic activity to solve professional and pedagogic problems; the improvement of the existing real experience to raise the quality of professional training; and the transformation of the existing provisions into specific pedagogic actions.

When looking at pedagogic creativity as a creative process that manifests itself in integral didactic process design and management, as well as in forecasting its results, it is necessary to pay attention to the mechanisms of pedagogic interactions. To this end, one can use various means and methods of information and sign communication, build subject-to-subject dialog relations, develop skills for the efficient use of speech forms that facilitate a more efficient acquisition of information, and implement reflexive self-cognition processes.

According to the aforesaid, didactic process organization and management in the context of higher education requires the use of active and interactive organizational forms and methods of education aimed at solving various problem situations and tasks.

Based on the theoretical analysis of academic publications and the authors' own practical experience, a conclusion is drawn that the main types of professional pedagogic tasks implemented by a teacher in higher education may include the following:

- Analytical and reflexive (analyzing specific pedagogic situations and various types of professional pedagogic activities, reflecting on the difficulties and failures occurring in the didactic process, as well as on one's own results and colleagues' experience, etc.);
- Constructive and forecasting (planning teaching and educational activities with a view to the psychological profile of students, planning research work and forecasting its results, and simulating specific job-oriented situations);
- Organizational and managerial (planning and organizing the didactic process using various organizational forms and methods of education aimed at encouraging student' cognitive activity, including during the individual work);
- Corrective (adjusting the content of professional pedagogic activities according to the changes in the approaches to their solution, regulating pedagogic interactions in the subject-to-subject environment, operative use of various information for the creative development of students, personalized regulation of this process).

The creative process itself influences its result, which, in its turn, is expressed both in the objective form and in the changes of the actors themselves.

According to S. A. Sysoyeva, “the creative abilities of a person are not only implemented in specialized activities aimed at creating universal cultural values but also in the person’s life and its self-fulfillment as a means of self-assertion through self-expression and self-development” [17, p. 207].

The creative activity of a teacher influences the productiveness of their professional pedagogic activity. Researchers see the creative activity of a teacher as a general instrument for the fulfillment of creativity of students’ personalities. In order to fulfill the creative capacity of students’, teachers must create specific conditions, including the following:

- Provide students with didactic resources for the development of creative interest and inquisitiveness;
- Create conditions for constructive education irrespective of the level of creative development of the students;
- Provide students with opportunities to put forward hypotheses and original ideas;
- Use the teacher’s personal example to solve problems in a creative manner;
- Facilitate a creative atmosphere for the solution of study problems;
- Involve students in the creation and use of various data in the educational process actively;
- Create conditions for the practical use of the knowledge received [17].

Thus, based on the research conducted, we can conclude that the practical professional pedagogic activity facilitates the development of creative capacities of students’ personalities due to the use of efficient methods, technologies, and didactic means that can be used to simulate and solve various problems and tasks.

Many scientists link the phenomenon of creativity with the features of the teacher’s and students’ creative thinking. K. K. Platonov defines creativity as thinking in its highest form that goes beyond what is necessary to solve problems using conventional methods [18].

In psychology, creative thinking is viewed as something necessary for the development of a person’s intellectual and unconventional thinking that is aimed at reasoning, analyzing, and synthesizing various phenomena and factors in order to make a certain decision. The development of student creative thinking cannot be studied separately from the creative development of the person responsible for this process. In other words, the development level of the teacher’s pedagogical thinking influences the development of student personalities.

N. A. Moreva sees pedagogic thinking as a “specific cognitive and practical activity of a teacher that facilitates the efficiency of their use of ethical standards, academic knowledge, pedagogic technologies, and personal qualities in teaching” [19, p. 71]. The key characteristics of pedagogical thinking include reflexivity, critical nature, comprehensiveness, particularity, independence, constructiveness, professional competence, and individuality. This researcher believes that the logic of pedagogical thinking has some specific features of its own. First of all, it is directed toward the connection between cognition and activity, the practical transformation of reality, because the real pedagogic situation requires teachers to find solutions to

general problems of education and apply the methods found to specific personalities [19, pp. 72–73]. She focuses on the levels of categorical pedagogic thinking: the level of leading ideas representing the general direction of a teacher's activities; ideas create problems to be solved; the level of constructive methodical schemes. In this case, the suggested test procedures for training methods are implemented. These procedures are integrated into the constructive schemes by the teacher; the level of the specific implementation of schemes developed in the real conditions of the pedagogic process [19, p. 73].

According to I. A. Zyazyun, a teacher must be flexible, open, independent, critical, creative, empathetic, etc., in order to develop creative pedagogic thinking. Researchers suggested a number of creative thinking types that can be relevant nowadays, but a lot more attention was paid toward critical thinking, which stands for a thoroughly rationalized and weighed decision made about a specific view. J. Dewey holds a position that a person with creative thinking tends to be ready to plan their own cognitive activity, correct their own mistakes, comprehend the cognitive process, and search for compromises [20, 21].

The main criteria of pedagogical creativity, according to scientists, include the presence of deep and comprehensive knowledge and its critical processing and understanding; the ability to implement theoretical and methodical provisions, as well as pedagogic actions; the ability for self-improvement and self-education; the development of new methods, forms, techniques, and means, as well as their unique combination; dialectical and variable nature of the activity system; the efficient application of the existing experience under new conditions; the ability to perform a reflective assessment of one's own activity and its results; the formation of an individual style in professional pedagogic work based on the combination and the development of standard and individual personal qualities of a teacher; the ability to improvise based on knowledge and intuition [8, pp. 177–178]; the development of brand-new approaches to education, training, and development; the comprehensive and versatile application of all theoretical knowledge and practical skills to professional activities; the practical implementation of cooperation pedagogic principles; the performance of a systematic self-analysis for professional activities; the research work to creatively generalize one's own experience and that of one's colleagues; the demonstration of flexibility in the selection of the best managerial decision in unconventional situations; and genuine construction of the education and training process [17, p. 100].

8.5 Conclusions

Based on the aforementioned, the authors can conclude that the results of the development of student creative capacities depend on the respective conditions and methods of professional pedagogic work used by teachers in higher education, as well as the psychological and pedagogical mechanisms used to influence students when they are solving various problems and tasks.

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Chapter 9

Problems of Migration and Migrants Through the Eyes of Youth: Materials of a Sociological Survey in the Republic of Bashkortostan



I. Gabdrafikov, L. Khusnudinova, and O. Kogan

Abstract The results of a study of public opinion of urban and rural population on migration in the Republic of Bashkortostan are presented. The study was conducted in stages in the spring–autumn of 2018. During the first stage, 300 respondents were interviewed (150 schoolchildren and 150 students of higher educational institutions in Ufa), during the second stage, the opinion of the urban population (260 respondents from Ufa) and the rural (40 respondents from Chekmagush village). The survey showed that the topic of migration is quite relevant and important for residents of the Republic of Bashkortostan. The vast majority of respondents unanimously believe that migrant labor is needed, and especially in those areas in which the local population is reluctant—construction, housing and communal services, and agriculture. The authors conclude that among the local population a relatively calm attitude toward attracting labor of foreign workers prevails. Bashkortostan and its capital Ufa have significant integration potential, where the majority of citizens are positive about migrant workers and the weakness of migrant-phobic sentiments.

9.1 Introduction

In modern conditions of deideologization, the state's withdrawal from paternalistic aspirations, the growth of anarchist, rebellious, as well as religious and nationalist sentiments, the problem of youth participation in political life takes on new relevance. The increasing politicization of ethnicity is accompanied by new trends and manifestations in ethnopolitical, ethnosocial, ethnocultural, and other processes, forcing us to seek new theoretical and methodological means of its research. External migration also leaves a global mark in the ethnopolitical space of the host country, creating a

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need to study the practices of socialization, integration and acculturation of foreign ethnic groups, as well as the forms of their identification activity in the ethnopolitical and ethnosocial space, including at the regional level. The structural changes that have taken place in the ethnopolitical space of the Russian region in recent decades make it possible to single out the ethnic identity of the diaspora as a special phenomenon that contains not only the resources of the integration model of interaction, but also the conflict potential. For modern Russia, an important element of “soft security” is interethnic and inter-regional relations on the ground, and above all, the problems of relations between migrants and the local population.

The process of adaptation and integration of migrants into the local multi-ethnic community is often hampered by the migrant-phobia existing in society [1]. Sometimes public opinion is infected with “household xenophobia” [2], which manifests itself in everyday life situations, but it can seriously harm the rapprochement of migrants with the local population. Some politicians and government officials often use such public opinion to justify certain managerial actions [3]. A conservative stance on migration is especially evident during the election period, using anti-migrant sentiments of the population. A negative attitude toward migrants also contributes to the development of corruption among representatives of various organizations that allow themselves illegal actions [4].

According to the census of 2002, 2010, the total number of the Tajiks, the Uzbeks, the Kirghiz, permanently residing in the Russian Federation, almost doubled [5]. Over time, foreign ethnic groups form ethnocultural organizations and public organizations (associations) with the fixed political and legal status of national-cultural autonomies (NCA), as evidenced by their identification activity at all levels of the ethnopolitical space [6].

The aim of our study is to study the public opinion of the urban and rural population of the Republic of Bashkortostan (on the example of Ufa and Chekmagush village) on migration issues, to reveal how different strata of the population perceive migrants, and assess the degree of tolerance to migrants.

In order to achieve this goal, in the spring and autumn of 2018, sociological surveys of citizens, villagers, including schoolchildren and students on a standardized questionnaire, were conducted in the Republic of Bashkortostan. A special survey of schoolchildren and students is determined to identify the position of the most active part of society, which largely determines its future development.

The study of the public opinion of the population on migration issues has significantly supplemented and expanded understanding in modern science of the latest trends in the migration movement of the population, the role and influence of public and national-cultural organizations on the adaptation and integration of migrants in the new multi-ethnic community. The results obtained in our study can also be claimed as a theoretical and practical basis for new studies of migration processes in modern Russia and for optimizing the socio-cultural adaptation and integration of migrants in the local community through the development of special state programs, concepts, and recommendations.

9.2 Materials and Methods

The methodological basis of the study was the fundamental works of Russian scientists on the study of patterns, trends, types, forms, directions of migration, as well as theoretical principles for the study of adaptation processes, public opinion of the host population, etc. Among these, authors are L. Rybakovsky, V. Moiseenko, V. Mukomel, V. Perevedentsev, G. Vitkovskaya, N. Lebedeva, J. Zayonchkovskaya, V. V. Tishkov, A. Khokhlov, T. Yudina, N. Yukhneva, S. Ryazantsev, I. Badyshtova, R. Galin, I. Gabdrafikov, V. Anuchin, E. Alaev, and others.

The empirical base of the study was the results of a phased sociological study of the local population of the Republic of Bashkortostan on the study of public opinion on migration issues, conducted by the authors from April to December 2018 in this region. The basis of the tools was a standardized mass survey questionnaire. In conducting this study, a territorial sample was used. The obtained results were subjected to an analytical description, correlation analysis, along with methods of descriptive statistics, etc.

9.3 Results

During the first stage of the study, conducted from April to May 2018, 300 young respondents were interviewed: 150 students of secondary educational institutions (of which 20 were students of school No. 85 in Ufa, 30 students in mathematical gymnasium No. 93 in Ufa, 30 students of the gymnasium of Chekmagush village, 49 students of Bashkir College of Architecture and Civil Engineering, 18 students of Ufa Mechanics and Technology College), as well as 150 students of higher educational institutions (including 39 students of Bashkir State Agrarian University, 30 students of Ufa State Petroleum Technical University, 34 students of Ufa State Petroleum Technical University—Institute of Service and Economics, 25 students of Bashkir Cooperative Institute, 20 students of Ufa State Aviation Technical University, 1 student of Bashkir State University, and 1 student of Bashkir Academy of Public Administration and Management).

Among the schoolchildren and students surveyed, different profiles of education were presented: technical, general education, humanitarian, mathematical, chemical, and biological.

The demographic composition of the students surveyed 75—girls, 75—guys, students: 76 girls, 74 guys, 270 urban residents, 30 rural residents.

By age, respondents were divided into the following groups: 14–17 years old—27%, 18–19 years old—38%, 20–24 years old—29%, 25 years old, and over—5%.

44% of Russians, 16% of Bashkirs, 39% of Tatars, 11%—representatives of other ethnic groups. Nationality was indicated by 70% of respondents, two nationalities and more indicated by 21%, did not answer—9%.

96% of respondents have lived in Bashkiria for more than 10 years, including 94% who have lived since birth. 5% came from another region of Russia, 1% from another state, including republics of the former USSR.

During the second stage of the study, which was conducted from October to November 2018, another 300 people were interviewed, of which 260 were residents of the city of Ufa, 40 were residents of the village of Chekmagush.

According to a sample of the study, the survey was conducted in Ufa (a large city) and in the district center of the Chekmagushevsky district of the Republic of Bashkortostan, the village of Chekmagush (the population of the village is more than 12 thousand inhabitants, the district is a suburban, suburb of a large city, located 70 km to the north-west from Ufa).

Among the respondents were respondents with different levels of education, of which: with primary education and incomplete or without education—0%, incomplete secondary—0%, secondary (general education certificate)—17%, secondary special (diploma of a school or technical school)—23%, unfinished higher education (certificate, or currently studying)—21%, higher education (diploma, including four-year degree, graduate school, academic degrees)—38%.

The socio-demographic composition of the respondents: men—40%, women—60%.

By age, respondents were divided into the following groups: 18–29 years old—45%, 30–59 years old—44%, 60 and older—11%. By the time of the survey, 53% of respondents were working, 20% were studying, 8% were pensioners, 2.9% were unemployed, 3% were engaged in household work, and 13% indicated otherwise.

36% of Russians, 20% of Bashkirs, 29% of Tatars, 15%—representatives of other ethnic groups. Nationality was indicated by 70% of respondents, two nationalities and more indicated—20%, did not answer—9%.

97% of respondents have been living in Bashkiria for more than 10 years, 84% have been living since birth, and 9% came from another region of Russia, 6% from another state, including republics of the former USSR.

The survey data showed that the alignment of the responses of respondents of all categories of citizens (both the population and students) to almost all questions is similar, there is no tangible difference in their attitude to certain aspects related to the theme of migration and migration policy.

We do not observe any noticeable differences in the distribution of the answers of the entire population and students to the question about in which professions the labor of foreign migrants should be used in the region. The main answers of the respondents were distributed in those areas where a heavy physical is required, are less prestigious for the local population, in which the bulk of labor migrants are already employed: cleaning and other housing and communal services—16% of the total population, 15%—students, in construction and road works—16% of the total population, 14%—students, agriculture—13% of the total population and 10% of students, in factories—9% of the total population and 8% of students, employment with citizens (in household plots, nannies in families, etc.)—7% of the total population, 7% of students, as well as trade—8% of the total population and 8% of students (in this case, the respondents most likely meant market trade, where representatives

of the countries of Central Asia and the Caucasus are traditionally employed). At the same time, the percentage of those who answered the question that migrants are not needed in any professions—4% of the total population and 3% of students, 3% of respondents from the entire population and 6% of students found it difficult to answer, and 4% of those and others suggested their own answer.

At the same time, the vast majority of respondents unanimously answered that migrant labor is needed in these professions, which turned out to be 80% of the population and 76% of students. Only 11% of the population and 8% of students answered that migrant labor is not needed at all, and 10% of the population and 16% of students found it difficult to answer.

Despite the fact that the overwhelming majority of respondents answered about the need for migrant labor, still few of them communicate with migrants, only 25% of the population and 27% of students turned out to be such, of whom 9% of the population and 14% of students communicate almost daily, 8% population and 7% of students—every week, 8% of the population, 5%—every month. At the same time, 73% of the total population and 72% of students do not communicate or practically do not communicate with migrants: very rarely—46% of the population and 49% of students, never—25% of the population and 21% of students, gave another answer—2%, and those and others. The answers to the question indicate that the position of the vast majority of respondents is formed not on the basis of direct contacts with labor migrants, but indirectly through publications in the media, virtual communication on social networks, rumors, social stereotypes, etc.

When asked whether visitors from other countries take away work from local residents, the answers of the respondents diverged. Approximately, half of the respondents from the general population said that local residents themselves do not want to take some jobs. At the same time, a slightly smaller proportion of students have the same opinion—42%. According to 11% of the population and the same proportion of students, visitors nevertheless take away work from local residents, and about 1/3 of the respondents from the total population and 37% of students answered “both”, i.e., newcomers take away work from local residents, but local residents themselves do not want to take some jobs. A small proportion of respondents gave a different answer (3% each of the groups surveyed), found it difficult to answer (5% of the population and 8% of students).

The data from our survey do not confirm the assumption that the stereotype prevailing in the public mind is that foreign labor migrants more often commit crimes than local residents. According to only 17% of respondents from the population and 19% of students, migrants more often commit crimes than local residents. 64% of respondents and 66% of students answered that there are no special differences between migrants and local crime rates. 3% of the population and 5% of students gave a different answer. At the same time, a rather significant proportion (16% of the population and 11% of students) found it difficult to answer, which, in our opinion, is also reasonable—ordinary citizens may not necessarily know such statistics, their ideas, as a rule, are based on rumors in most cases and existing in public opinion stereotypes.

The survey confirmed the data of our previous polls on the tolerant attitude of the population toward migrants and the weakness of migrant-phobic sentiments among them. So, 70%, i.e., more than 2/3 of the total population surveyed, and 62% of students are determined not to support pickets or other actions against foreign labor migrants if they occur. At the same time, about 8% and 11% of students would support such an action, while 6% of the population and 5% of students gave a different answer, and 16% of the population and 22% of students found it difficult to answer. It should be noted that the alignment of answers to this and previous questions is quite comparable with the data of surveys conducted by us on the topic of migrant integration in previous years as part of the RRC research project.

In general, the survey showed a positive attitude of the respondents to the question of who, in their opinion, should be considered compatriots. According to 49% of the population and 41% of the students surveyed, compatriots should be all former citizens of the USSR (apparently, because of their young age, students know the Soviet past of the country less well, and they are less connected with the common history of the peoples of the former Soviet Union), and 16% of the population and 22% students named those who know Russian. According to only 8% of the population and 7% of students, these should be separate nationalities, and 5% of the population and 1.5% of students gave a different answer. But nevertheless, it should be noted that a rather significant proportion of respondents who found it difficult to answer—there were a little more than 1/5 (23%) of the population and even more students—28%. Apparently, this question was unexpected for this part of the respondents, and she apparently had not thought deeply about this before.

The layout of answers to the question about the respondents' attitude to the joint education of their children with migrants looks very indicative. Interviewees are sympathetic to coeducation: 22% of the population and 25% of students said they were positive, and more than 60% of the total population and students were neutral. Only 7% of the population and 9% of students are negative about coeducation, 2% gave a different answer, and 5% of the population and 3% of students found it difficult to answer.

Similar answers were given by respondents to the question about the need to teach migrants the Russian language, i.e., the vast majority (more than 90%) of both groups of respondents are also inclined to the linguistic integration of migrants. 47% of respondents from the general group of respondents and 53% of students said that they support the idea of teaching Russian to migrants. 1/5 of the respondents from the general group of respondents and 11% of the students answered in the affirmative, but provided that “only train those who want to stay in Russia,” and more than 1/4 (27% and 28%) of both groups answered “yes” in case migrants themselves pay for the Russian language. And only 5% of respondents are against migrants learning the Russian language, and 2% of each of the groups found it difficult to answer.

Answers to the question about methods of informing migrants with local traditions and culture indicate a positive mood of respondents to integrate into new settlers in their environment. More than a quarter (28%) of the population surveyed and 40% of students believe that migrants should be involved in public life, and 10% of the population and 8% of students believe that information leaflets should be given to

them. A significant proportion of respondents believed that there should be more than one way of informing. Thus, according to 37% of the population and 36% of students, that one and the other should be used, i.e., both ways—and leaflets, and to engage in public life. Together, the proportion of those who believe that migrants need to be informed about local cultural norms is more than 78% of the population and 86% of students, and the proportion of those who answered the question negatively, i.e., answered that it is not necessary to inform migrants, it is insignificant—no more than 9% and 8%, another answer was given by 5% and 3%, and 12% of the population and 6% of students found it difficult to answer.

Together, about 70% of the population and 78% of students believe that we should strive to integrate migrants, only 1/5 of the respondents answered negatively, and 1/10 found it difficult to answer. This suggests that Bashkiria and its capital Ufa have significant integration potential, where the majority of citizens are positively disposed toward labor migrants.

The vast majority of labor migrants arriving in Bashkiria are immigrants from Central Asia, and the lion's share among them are immigrants from two republics—Uzbekistan and Tajikistan, less from Kirgizstan. There is also a significant flow of labor migrants from the Transcaucasian countries—Armenia and Azerbaijan, although they are inferior in volume to Uzbekistan and Tajikistan. From the point of view of tourism (historical, ethnographic, and geographical), all of these listed countries, its affordability and virtually no language barrier, cultural proximity, are attractive to Russian citizens. Apparently, based on this, about half of the respondents (44% each) have a positive attitude to the development of tourism in those countries from which labor migrants come to the region. Almost the same number of respondents are neutral toward it (47% and 45%) and a very small percentage of respondents (4% and 7%) negatively or found it difficult to answer (5% and 3.5%).

The reality of modern Russian cities is such that they have many restaurants and cafes with national cuisine—Uzbek, Armenian, Azerbaijani, Georgian, etc. This is the reality that the Russians have long been accustomed to, which is not something out of the ordinary. Restaurants of oriental cuisine have become a favorite vacation spot for many. Therefore, it is not surprising that the vast majority of respondents to the question of how they relate to the appearance in the city of cafes and restaurants of national cuisine from the countries from which migrants come answered positively (61% of the population and 67% of students), about 1/3 (31% and 26%) is neutral, and only 5% for both of them is negative.

The next question, aimed at revealing the attitude of respondents to teaching art crafts, dancing, music, cooking national dishes from the countries from which migrants come, is, in fact, a logical continuation of the previous question. Therefore, the alignment of the answers received is very similar to the alignment of answers to the previous question. 61% of the total array of respondents and 67% of students have a positive attitude toward teaching art, dancing, music, cooking national dishes from countries from which migrants come, approximately 1/3 (32% and 28%) are neutral and only 5% and 4%—negatively.

In our opinion, the rather high degree of tolerance and readiness for integration of the local population with migrants is evidenced by the answers to the question

about the respondents' attitude to a possible organization for everyone who wants to learn the languages of neighboring countries from which migrants come, how you will react to this. More than half (51% of the population and 58% of students) of the respondents reacted positively to the organization of studying the languages of migrants and also 1/3 (34% and 33%)—neutral. 11% and 5% reacted negatively to this idea; 3% found it difficult to answer. Students are more tolerant of learning the languages of migrants than other population groups.

Thus, the answers to the questions about local attitudes towards the integration of migrants generally indicate a favourable attitude of the local population towards labour migrants and a weak xenophobic attitude. More than half of the respondents in all population groups are positively inclined toward the integration of migrants. At the same time, 1/3 are neutral (not against, but not for), and only 6% answered that they are negatively inclined to integrate migrants into the local environment.

9.4 Discussion

However, this does not mean that in the republic, in the relations of the local population with migrants, the circumstances of the case are cloudless, as, at first glance, the data of our survey may indicate. The region has territories, individual cities with an unfavorable socioeconomic situation and a high share of unemployment, in which migrant-phobic sentiments are quite high, especially among young people.

Let us give an example of incidents that testified to migrant-phobic attitudes among young people, which almost coincided in time with the period of our survey. These facts of intolerance toward migrant groups deserve the attention of both researchers and practitioners. So, on the night of September 30, 2018, a conflict occurred in Temyasovo village in the Baimak district (located in the Trans-Ural territory of the republic). Workers from a decorative stone quarry located near the village who came from Chechnya went to the store for shawarma. As an 18-year-old saleswoman later said, they talked rudely to her, doused with beer and threatened with a knife. The girl called her brother, but by his arrival, the intruders had already disappeared. A little later, local guys decided to “ask offenders”. A fight ensued between the parties, and as a result of which, several people were seriously injured. One of the locals was injured in the stomach [7]. After that, an angry crowd of Temyasovo residents smashed and set fire to temporary booths where migrant workers lived, as well as their cars. The police detained the participants in the scuffle, but about 300 more people arrived at the department, demanding the release of those who represented the locals in the conflict.

After the conflict in Temyasovo, on the initiative of the Bashkir public men, a decision was made from among the residents of the Trans-Ural regions of the republic to organize “people’s squads for self-defense”. Literally a week later, on October 7, a yiyyn—a meeting of the Bashkir public, was held in the Baymak district. According to various sources, residents of different parts of the republic and representatives of the neighboring Chelyabinsk region arrived at it. Despite the rather cool weather,

from 500 to 1000, people gathered on a field near Temyasovo. The meeting was initiated by social activists from the Bashkort organization, who threw a cry on social networks urging them to get together.

In our opinion, the incident in Temyasovo village on the night of September 29–30, 2018, indicates an unfavorable socioeconomic situation in rural areas, including in the Trans-Ural zone of Bashkiria, where this village is located. This is a domestic conflict, but colored in interethnic form. Such sudden outbreaks of violence at the local level, their exact place and time of manifestation are very difficult to predict, but the causes of the conflicts can be studied and therefore can be prevented. The underlying causes of this conflict are social, and it is unemployment and the low standard of living of the residents of the region. The villagers, especially the youth, are dissatisfied with their situation, as mentioned above, a significant part of them cannot find work, and many of them travel to neighboring regions and further to the north. In Temyasovo, we observe omissions of local authorities and law enforcement agencies. The incident testifies to the extreme importance of the municipal link in the management of interethnic and interfaith relations. In a crisis and an unfavorable socioeconomic situation, any reckless movement, provocation can develop into a serious conflict.

It should be noted that in Bashkiria such skirmishes between representatives of the local population and migrants occurred earlier, but very rarely. However, at the end of the year, there were three such resonant cases only in the Trans-Ural zone of the republic. In addition to the incident in Temyasovo village, a brawl took place in Sibay on November 11, when Bashkir guys in a Kurdish cafe had a fight with young representatives of Yezidi Kurds. In December, another conflict with an interethnic connotation became known—in the city of Beloretsk. This time, a skirmish occurred between students—a Russian citizen born in Tajikistan and a young man of Bashkir nationality [8].

In our opinion, more frequent such cases indicate an unfavorable trend, namely the growth of migrant-phobic sentiments in society, which requires a detailed study and adoption of managerial decisions. In a crisis and an unfavorable socioeconomic situation, any careless action or provocation can develop into a serious conflict in certain territories. Certainly, special trainings with municipal employees, police and local population, preventive work, and identification of problem areas from the point of view of conflict could mitigate the situation.

9.4.1 Migration Attitudes of Respondents

The vast majority of respondents do not plan to leave for another region of Russia or another country for a long term or for permanent residence (60%). At the same time, 10% of respondents and 9% plan to leave for another country in another region of Russia, while 18% found it difficult to give a definite answer.

The survey data of this population are comparable with the results of a survey among university students in Ufa. A survey of students indicates that a significant

part of students at local universities can potentially join the ranks of those leaving the republic. So, to the question “Do you plan to leave for another region of Russia or another country for a long term or for permanent residence?”, more than a third of respondents answered in the affirmative, of which 13%—to another region of Russia, 22%—to another country. At the same time, 37% of students replied that they did not plan to leave the region, while 27% found it difficult to answer.

Moreover, as noted above, the vast majority of students positively assessed interethnic relations in the region. The survey covered approximately the same number of students of Bashkir, Russian, and Tatar nationalities, representing the largest ethnic groups in the republic.

9.5 Conclusions and Recommendations

One of the most obvious indicators of crisis phenomena is the negative processes in the demographic development of the republic. They say that in recent years there has been a negative population growth due to migration outflows. The most significant share of those leaving the republic is young people (school graduates) who leave the republic for the purpose of entering the capital’s universities, as well as Kazan, Yekaterinburg. Most of them do not return home after graduation. Also, a significant part of people of active working age, due to difficult employment problems, is forced to leave to work in other regions, especially in the Tyumen region, Khanty-Mansiisk autonomous district and Yamalo-Nenets Autonomous Okrug, Moscow and Moscow Region [9].

The data from our survey record an increase in the number of young people who do not connect their future with the republic. A rather noticeable share of the population, especially a significant part of the students surveyed, is determined to travel outside the republic to another region or even to another country. The main motive for the desire to leave the region is socioeconomic, i.e., unfavorable situation on the local labor market, and for students, there is still a desire to continue their studies at universities outside Bashkiria, especially in the capital’s universities. At the same time, the vast majority of respondents positively evaluate interethnic relations in the region. These data once again indicate that the republican authorities need targeted measures of a precisely socioeconomic orientation to change the migration situation in the region.

According to the results of the survey, we can conclude about the tolerant attitude of all population groups toward migrants, including labor.

The survey confirmed the conclusions of our previous ethnosociological studies as a whole about the positive mood of the local population toward labor migrants and the need for their labor. The vast majority of respondents unanimously believe that migrant labor is needed, and especially in those areas in which the local population is reluctant—construction, housing and communal services, and agriculture.

There is also a positive attitude toward the development of tourism with those countries from which migrants come, the joint education of children in schools, and

the study of the Russian language. At the same time, migrant-phobic moods are rather weak in the region. Few respondents would support anti-migrant actions in the form of pickets and other public speeches.

At the same time, the survey data revealed a weak involvement of public organizations in the process of migration relations and state migration policy. Answers to questions in which respondents' opinions on particular aspects of migration and migration policy are revealed indicate that public organizations practically do not participate or take little part in the process of migrants' interaction with the local population, their adaptation and integration.

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Chapter 10

Modern Labor Market in the Conditions of Digital Economy Development



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Abstract The labor market is a fundamental element of the economy of any country, and the functioning of the national economy depends on its dynamics and condition. The article analyzes the problems and trends in the field of the labor market in the context of the formation and development of the digital economy. Based on the data obtained, a number of key recommendations have been compiled to eliminate existing problems and improve the situation of labor market in the world. The basic professional competencies that an employee should possess in the modern world are considered. A decision-making method based on stochastic factor analysis when choosing the measures necessary for implementation in the labor market is proposed.

10.1 Introduction

The development of modern technology has an impact on the structure of life and social relations. Of course, changes are occurring in the labor market and employment. Most experts in digital technology and economics indicate that significant changes will occur in the labor market and employment in the coming decades, with up to 50% of work processes being automated in the world by 2036 [1]. This, undoubtedly, will lead to a significant dismissal of staff, a reduction in the number of jobs requiring low and medium qualifications, and an increase in the difference in wage levels, growing official and real unemployment rates. Therefore, in this regard, there is an active discussion taking place on necessary measures in developed countries. In such conditions, digital personnel is a strategic asset, and their lack inevitably leads to a slowdown in the growth of both the digital economy and the economy of the country as a whole, which is one of the most complex problems of our time.

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Thus, the study is relevant, as it contributes to the study of the global digital labor market and employment.

Technological changes affect the supply and demand in the labor market, organizational and substantive foundations of work. As a result of which, a new model of labor and employment “Work 4.0” is gaining ground [2]. Of course, the presented model provides both a number of new opportunities for the economy and labor resources, as well as threats. So instead of the standardization and unification that are characteristic of labor relations in an industrial economy, labor standardization, precarious hiring, a subsidized labor contract, and the development of flexible forms of employment will be increasingly developed. The main source of competitiveness and labor productivity is human resources, which are the main wealth of any society. The nature of the labor market is changing itself, because of which the classical organization of labor and the usual forms of employment are destroying and the new economic forms are emerging, such as gig-economy and platform economy, as well as new business models of labor market: platform labor (crowd work, micro-work, cloud work, job on demand) and Job 4.0. A digital labor and employment market are being formed, where the interaction of entities occurs exclusively with the use of information and communication technologies.

10.2 Methods

The article used the methods of multiple analysis, study, generalization, comparison, sociological survey (in particular, questionnaire survey), factor analysis and grouping.

The sources on which the provisions and conclusions of this publication are based on scientific works of foreign and domestic experts, and the data is published on the official websites of organizations, as well as an author's research among students of the Faculty of Economics at RUDN University.

10.3 Discussion

10.3.1 *The State of the World Labor Market*

Stability in society is determined by the state of the labor market, and it is undergoing significant changes at the present time. Guy Ryder, Director General of the International Labor Organization (ILO), believes that “changes in the world of work have never been so dynamic and deep, they are due to demographic and technological changes, growing inequality, poverty and the slow pace of economic recovery [3].” As a rule, changes entail the appearance of some difficulties; rise of socio-economic problems, one of which is the unemployment.

The world (international) labor market is a system of economic mechanisms, standards, tools that fulfill the balance of demand for labor and its supply at the interstate level. In conditions of deepening globalization processes in the world economy, which are manifested in the growing interdependence of countries and their regional groupings, national labor markets, as well as markets for goods, services and capitals, are strongly losing their restraint and isolation, which leads to the formation of the so-called common labor market. The formation of the world labor market takes place in two ways: the first way is the migration of labor and capital; the second way is the gradual merger of national labor markets, as a result of which judicial, ethnical, cultural and other obstacles between them are eliminated.

The formation and development of the world labor market is evidence that currently the integration processes not only cover the economical and technological spheres, but also affect the field of social and labor relations, which are becoming more and more global.

In present, studying the labor market is worth noting one important feature: a potential employee is forced to accept unfavorable conditions from employers due to fear of losing his job. In 2016, there is a downward trend in staff demand, and the number of vacancies continues to decline, at the same time, the number of resumes increase. Today, more and more people are talking not about the labor market, but about the “candidates’ market.” This especially belongs to professions in the humanitarian sphere (management, jurisprudence), top managers, bank employees, the tourism and entertainment industry, workers in the household services segment, and maintenance personnel. It is worth noting that currently more than 200 million people in the world are unemployed, which is almost 3 million more than it was in 2015 (197.1 million unemployed) [4]. In 2016, the unemployment rate decreased in countries such as Spain, France, Australia, Indonesia, India, China and Japan (Fig. 10.1.). It is worth noting that the real unemployment rate is much higher than the official, as evidenced by the difference between this indicator and the calculation of unemployment according to the ILO methodology, as well as the level of employment of labor force.

It is also worth noting the fact that currently the demand for some professions in the world is much higher than others, while in each country, the prestige and demand for certain professions are different (Table 10.1).

Thus, among the main problems of labor market in the world can be distinguished as follows:

- Imbalance in the labor market. There are a huge number of vacancies that are posted by various organizations, as well as a significant number of unemployed cannot take advantage of the proposed vacancies because of demanded skills, professional training and work experience.
- An increase in the number of urban populations. Thus, according to UN forecasts, by 2030, about 4.9 billion people will live in cities.
- The growing negative attitude toward labor migrants by the local population.

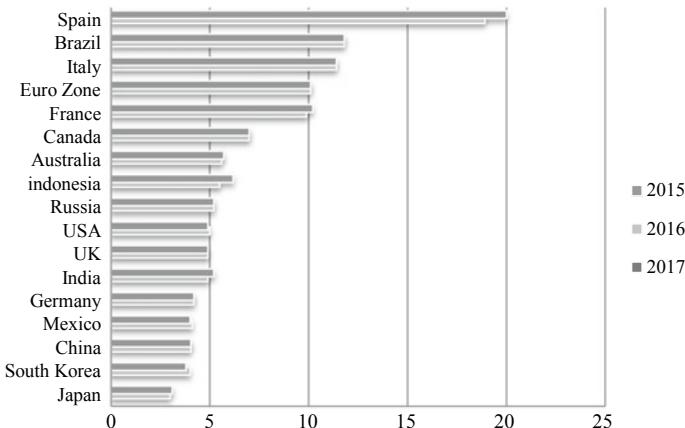


Fig. 10.1 Official unemployment rate in the world by countries (%). *Source* Compiled by the authors based on materials: Unemployment rate - list of countries. <https://ru.tradingeconomics.com/country-list/unemployment-rate> [5]

Table 10.1 Rating of the most prestigious and highly paid professions in the world in 2019

The most prestigious professions		Highest paid professions
IT specialist	1	Surgeon
Engineer	2	Anesthetist
Doctor	3	Top manager
Tourism specialist	4	Pilot
Logistics specialist	5	Dentist
Ecologist	6	Financial market analyst
Chemist, power engineer	7	Lawyer
Nanotechnology specialist	8	IT specialist
Journalist, image maker	9	Advertising specialist
Service specialist	10	Genetic engineer, plant breeder

Source compiled by the authors according to the materials: What are the most popular and highest paid professions in Russia, Ukraine, Belarus, the world in 2019? <https://alenakraeva.com/new-digital-world/samye-vysokooplachivaemye-i-vostrebovannyye-professii-rejtingi-i-video-2016/> [6]

- The presence of restrictions, including legal ones, that reduce the real possibilities of mobility of the working-age population (the existing institution of registration and registration significantly binds a person to a specific location).
- The lack of possibility providing affordable housing, which, reduces the mobility of good professionals in other regions.

10.3.2 Methods for Improving the Labor Market Management System

In order to improve the management system of the labor market and labor mobility in both developing and developed countries, it is necessary to recognize the relevance of this problem and develop a set of specific measures to address them. First of all, it is necessary to conduct a regular analysis of state policy in the field of employment, identify key problems that impede the development of the labor market, develop and formulate the main directions for improving the youth labor market at the national and international levels.

Based on the problems listed above, the following activities are of particular relevance:

- The introduction of professional programs, thanks to which highly qualified personnel can stay in the country for a longer period (for example, such programs are actively used in the USA, Canada, France and Sweden);
- Intensification of interaction between educational institutions and the state, companies (control of budget places in universities of the country, for example, to allocate more places to more popular professions for the state, and less demanded, respectively, less; companies can also sign agreements with universities on the basis of which the institution will prepare specialists for the organization in the required specialties);
- State measures to regulate legal and social guarantees for migrants;
- The opportunity to work as a freelancer outside your own country, etc.

Modern society is facing problem of widening the gap between the demand and supply of skilled labor. As Russia and Belarus also faced this problem. The Head of the Department of Social Policy and Information Support of the Standing Committee of the Union State emphasized that on average about 20% of knowledge is lost after graduation, while the rate of obsolescence of knowledge is about four times faster than the rate of updating it within one generation, and this leads to that in the labor market more and more specialists of unclaimed specialties appear, which ultimately leads to an imbalance between the demand and supply of labor [7]. In addition, more often employers have begun to face a problem—an increase in the number of people who received education and training accompanied by a process of growing professional incompetence. In this regard, there is a need to predict the key of competencies that employees should possess when entering the labor market.

It is predicted that more clearly, there would be more and more struggle for talent in the labor market. Unique workers will have the greatest quality—those people who will become the bearers of unique competencies and who will not be so many on the domestic labor market.

A special role is played by professional competencies, which should be owned by every working person who lives in a rapidly developing information society. Among the professional competencies, the following should be highlighted: managerial

competencies; organization skills; communication skills; ability to conduct a presentation; skills necessary for project management; skill to work in team; reliability; responsibility; ability to promote business and influence people [8].

But, it is also important to note that in the modern world, talented employees must possess such competencies as:

1. Systemic thinking and cognitive flexibility. It is very important that the employee can not only perform his professional duties in a quality manner, but also can see how changes occurring in a particular department can affect the activities of the company as a whole. In addition, in an open, large, very multivariate world, the ability of an employee to switch from one thought to another, as well as thinking about several things at the same time, plays a significant role.
2. Intersectoral communications. Recently, more and more often, company's employees have to work in several areas at once, which means that a person must be competent in various fields of knowledge, subsequently, the use these skills to create unexpected, unique, breakthrough solutions in their field (for example, for an HR specialist in addition to the skills of working with personnel, knowledge in the field of IT-technologies, mathematics, etc., are also necessary). Moreover, there is a tendency that in future the need for multidisciplinary approaches and solutions will only increase.
3. Work with IT systems. Employing in any large company, a person who has the skill to work with various information systems (SAP, CRM, etc.) will have a significant advantage among others. This is also due to the fact that in future, many systems of labor will use IT systems, therefore, mastering this skill will become mandatory.
4. High adaptability. Currently, it is increasingly necessary to work in constantly changing conditions; therefore, it is important that the employee can quickly adapt to the current situation, as well as solve the problems as quickly as possible. It is worth noting that the representatives of generation Y have this skill already formed, that is, the uncertainty is comfortable for them, and they can easily cope with it.
5. Cross-culture and openness. People from different countries and cultures often work in international companies, and it is important that a person can find a common language with these people, accept them and use their potential to solve the problem.
6. Professional self-development. Managers welcome the process of self-development of employees, which includes the independent improvement of knowledge, skills, personal and functional qualities, competencies in general, which subsequently contribute to ensuring the effectiveness of a person's professional activities in the company.

The authors also find it interesting to highlight the basic qualities of the employee in future that have been highlighted by modern students. So, based on a series of surveys of more than 200 students of the Faculty of Economics of RUDN University in 2018–2019. When studying the topic “Modern Labor Market” as part of the study of the “Labor Market” discipline, it was revealed that the defining qualities



Fig. 10.2 Main qualities of the employee of the future (%). Source compiled by the authors based on a survey of students of the Faculty of Economics at RUDN University in 2018–2019

of a future employee are: leadership (83.3%), learning ability (88.9%), creative abilities (creativity) (80.6%), high intelligence (75%), responsibility (83.3%), stress resistance (80.6%), etc. (Fig. 10.2).

It is worth noting that the list of competencies and basic qualities of talented employees are far from exhaustive, but I must say that today the most attractive for employers are flexible and adaptive specialists and managers who are aimed at training and acquiring new skills and abilities that can overcome difficulties and maintain working capacity even in difficult conditions, possess analytical skills, information technology and capable of effective teamwork.

10.3.3 A Decision-Making Method Based on Stochastic Factor Analysis When Choosing Measures Necessary for Implementation on the Labor Market

As noted earlier, there are problems in the global labor market. Their solution enhances the country's competitiveness in the international level. Of course, measures to develop the labor market include the definition of both operational and strategic goals. In order to make a decision on the implementation of certain measures in the face of uncertainty, a decision-making method based on stochastic factor analysis is used.

Figure 10.3 shows the simplest relationship between the resulting economic indicator Y and the impact measure X .

To make a decision, it is necessary:

1. To determine the impact of measure X on the resulting indicator U .

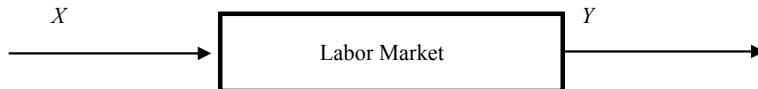


Fig. 10.3 Simplest relationship between the resulting economic indicator Y and the impact measure X . *Source* compiled by the authors based on: Tebekin A. V. Methods of making management decisions. Textbook/Moscow, 2019. Ser. 58 Bachelor. Academic Course (1st ed.) [9]; Anisimov V. G., Anisimov E. G., Arslanov R. F., Arslanova A. P., Bogoeva E. M., Goloskokov V. I., Lipatova N. G., Popov V. V., Saurenko T. N., Tebekin A. V. Economic and customs risk management. State treasury educational institution of higher education “Russian Customs Academy”. Moscow, 2015 [10]

2. To assess the degree and nature of the influence on Y , which determines the type of their relationship (linear or nonlinear, increasing or decreasing dependence).
3. To determine the level of confidence in the obtained model dependencies of Y from X .
4. Predict the change in the result of Y with a possible change in measures.
5. For this, it is necessary to conduct a correlation and regression analysis.

The simplest dependence of the indicator Y on the event X expresses a linear one-factor model of the form:

$$y_{ip} = a_0 + a_1 * x_i,$$

where y_{ip} is the calculated value of the determinate basis of the indicator for a given value of the event x_i ,

a_0 and a_1 —statistical coefficients obtained by processing the actual data on the values of a particular population y_i and x_i .

The difference between the actual value of y_i as fixed value of x_i and calculated value of y_{ip} in the determinate basis, referred to as a random component (remainder), is determined by the ratio: $e_i = y_i - y_{ip}$.

The task of obtaining the regression equation is to find, based on pairs of observations (x_i, y_i) , such values of the coefficients a_0 and a_1 for which the regression line will pass as close as possible to the points of actual observations.

The best way to find the coefficients of the regression equation is the least squares method developed by Gauss and Legendre, and the essence of which is to find the coefficients a_0 and a_1 for which the sum of the squared differences between the actual values of the indicator y_i and the calculated y_{ip} ones lying on the regression line is minimal $\sum e_i^2 \rightarrow \min$.

The indicator characterizing the quality of the model can be determined by the coefficient of determination:

$$R^2 = 1 - \sigma_{ocm.cp.}^2 / \sigma_y^2 = 1 - \sum (y_i - y_{ip})^2 / \sum (y_i - \bar{y}_{cp})^2.$$

It characterizes that share of the total (general) variance \sum_y^2 , which is explained using the regression model. When $R^2 = 1$, all values of the sample lie on the regression line. When $R^2 = 0$, the regression equation does not explain anything.

In the end result, on the basis of the analysis, it is possible to identify a number of measures that need to be carried out in the labor market for its further effective functioning.

As noted earlier, evaluating the effectiveness of measures taken on the labor market will allow the results and their reflection on key indicators. Among which we can note: the level of economic activity of the population, the unemployment rate, the percentage of unemployed youth, the number of job vacancies in the labor market, the percentage of budget expenditures on labor market policies, etc. Undoubtedly, the proposed measures should be related to specific goals of the labor market development in the condition of development of digital economy. Moreover, the results obtained are determined by the achievement of particular goals, which comprise the process of achieving both strategic and operational objectives. Their determination in the formation of decisions on the economic efficiency of the development of the labor market is based on probability-theoretical forecasting.

10.4 Conclusions

The digital economy represents a new stage, which is characterized by the replacement of mechanical, repetitive labor by technical means. It should be noted that the labor market is also undergoing a change [11]. It becomes more virtual and involves the interaction of workers and employers via the Internet. Of course, the concept of human employment is changing. A person's employment depends on how quickly he can adapt to constantly changing working conditions. Each person should independently monitor their demand, while constantly improving their professional skills.

The following problems can be distinguished on the world labor market: unbalanced labor market; increase in urban population; the growing negative attitude toward migrant workers on the part of the local population; the presence of restrictions, including legal ones that reduce the real possibilities of mobility of the working population; lack of availability of affordable housing.

To solve these problems, it is necessary to highlight the measures that will contribute to improve the situation on the labor market: the introduction of professional programs; intensification of interaction between educational institutions, the state and companies; government measures to regulate legal and social guarantees for migrants; realization of the opportunity to work as a freelancer outside your own country, etc.

Currently, companies are striving to attract and retain talented employees (high-potential employees who are able to quickly solve the problem and increase the company's profit as a whole). It was revealed that a talented employee should possess

such competencies as: systemic thinking, intersectoral communications, work with IT systems, high adaptability, cross-culture and openness and professional self-development. Of course, a talented employee with the competencies presented is able to influence economic growth by increasing labor productivity, while creating more opportunities for employees, it is possible to introduce new technologies and innovations. Lack of skills and the imbalance between supply and demand for required competencies reduces growth potential and consumes extra resources.

In the process of eliminating problems on the labor market, a complex of measures arises to solve them. In this regard, a decision-making method based on stochastic factor analysis is used. Based on the analysis, it is possible to identify a number of activities that need to be carried out on the labor market for its further effective development. It is possible to evaluate the effectiveness of measures taken on the labor market by achieving the greatest effect at the lowest possible cost. It is important to say that measures to solve problems in the labor market are part of labor market development programs in the context of the development of the digital economy.

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Chapter 11

Implementation of the Stage-Gate Model in Project Activities in the Innovative Thinking Formation of Future Teachers



G. V. Akhmetzhanova and T. V. Emelyanova

Abstract The article describes the Stage-Gate model implementation experience in the educational process of higher education institutions—an effective tool for successful management of complex processes of innovative products development. The authors presented the process of implementing the Stage-Gate model in the training of future teachers at the university in order to form innovative thinking of students. The Stage-Gate model implementation process is integrated into Project activity discipline. The project stages are listed and filled with content: start, review, creation of a business case, development, testing, and launch. The experiment resulted in the creation of educational products that cover the areas of theoretical and practical pedagogy, pedagogical design and business, and increase of students' innovative thinking level. The conducted experimental work has shown the efficiency of the Stage-Gate model in project activities. The research is aimed at education process modernization, especially in the development of media products.

11.1 Introduction

The Stage-Gate model (a phase-gate model), developed by Cooper [1–3] for managing the product development process and innovation in general, is a structured transition of the project from idea to launch and includes several decision points (the so-called “gates”) regarding further actions in the project progress.

The model is considered as a general project management methodology with a wide range of variations, including in the education system. Thus, it is successfully used in the field of technical [4], environmental [5], and medical [6] education. The Stage-Gate process has a number of advantages, including less errors in the development of a particular product, identifying resources that are not always obvious, and active communication between the project team and external organizations-partners

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and stakeholders. Examples of using this model in the process of professional training of teachers include the implementation of research projects in the course of practice [7, 8].

Based on the essence of the Stage-Gate model as a method for planning the product development process, it is defined what exactly is a product from a methodological and didactic point of view. Thus, digital educational resources is a product created to solve certain pedagogical tasks. These resources are defined by completeness, interactivity and multimedia. Such product helps to solve the task set by teacher without attracting additional resources, it can be amended by the teacher or other users, contains text, audio, video, etc. [9]. As a rule, developers of digital products are not teachers, they are far from the educational process, and do not clearly understand didactic goals and principles. As a result, many digital products that are positioned as didactic solve only secondary tasks, that sometimes are not directly related to learning goals. At the same time, the transition to the digital educational process changes the teacher's roles and functions, who becomes a methodologist and an architect of digital learning tools, a developer of the educational digital environment [10, 11].

11.2 Relevance

The ability to develop their own program, methodological and didactic materials is a touchstone for expert assessment of the teacher's competence in the area of developing a professional activity program and making pedagogical decisions [12–15]. In General, we are talking about didactical readiness of teachers to develop digital educational environment in the context of implementation of the priority national project “Digital school”, part of program “The digital economy of the Russian Federation” (approved by the decree of the Government of the Russian Federation from July 28, 2017 No. 1632-p).

It should be noted that in modern conditions, it is relevant to build the educational process at the university, which will form the personality of the “teacher of the future”, who has an innovative type of thinking, is able to independently master and implement new technologies, and develop modern didactic materials.

11.3 Terms of Reference

Our research is aimed at forming innovative thinking of future teachers in the process of project activity through the implementation of the Stage-Gate model.

11.4 Theoretical Part

It should be clarified that innovative thinking includes such components as:

- research that encourages the search of relevant information;
- logical, that indicate the ability to analyze and structure information;
- creative, allowing to find non-standard ways to solve professional issues;
- communicative, allowing to build constructive relationships in the social and professional areas [16].

In addition, we have introduced a transcultural component to the component of innovative thinking [17, 21]. In particular, the project involved a group of students from different fields of training, and there were humanitarians and technicians, that in fact, present a different view of both the planned product and the process of its development. In such a situation, the transcultural type of thinking reflects the ability to go “beyond” their own professional culture (without losing their own professional identity) for better understanding when interacting with representatives of other professions.

11.5 Experimental Part

The process of implementing the Stage-Gate model includes a number of stages that guide the development of the project from the idea to the creation of a real innovative product. Let's consider these stages, filling their content with research, design and other activities that are directly related to pedagogy.

Preparation stage (opening)

In the classic version of the Stage-Gate model, at this stage teams usually discover new opportunities. This can be achieved through brainstorming, market research, and etc.

In our case, the project was implemented by a multi-functional and multidisciplinary project team of Togliatti State University. Team composition by training areas: “Psychological and pedagogical education”—72%, “Sociology”—4%, “Applied math and computer science”—10%, “Law”—7%, “Linguistics”—7% (total of 29 students).

The project team conducted a study to identify the needs of Togliatti schools in methodological and didactic support (its types and characteristics), as well as to clarify the difficulties faced by primary school teachers when selecting tools to improve the quality of the educational process in the formation of innovative thinking of students. A survey of teachers' staff (58 primary school teachers) was conducted, during which they answered the question: “What, in your opinion, will be the priority means of education in 10 years?”

The survey results showed: according to 49% of teachers—increased mobility of the educational process (replacement of textbooks with tablets, laptops); 31% of teachers suggested that the training will take place using tools such as a desktop computer and projector; 11% of respondents believe that there will be no obvious changes, and the blackboard and the teacher's word will remain the primary means of their professional activity; 9% of teachers who participated in the survey were undecided.

The second question of the questionnaire concerned the technological and methodological difficulties faced by teachers. It was the open question, and it was assumed that the respondents would independently name 2–3 difficulties. The survey showed that the greatest concern of teachers is their own lack of readiness to use modern computer technology in the educational process (8%), or the insufficient amount of these technologies for an adequate solution of didactic tasks (19%). At the same time, many teachers (61%), tell about their desire to use modern technologies to improve the efficiency of the educational process, but also note that there are no methodological recommendations for implementation of available e-learning tools. Another problem pointed out by 63% of teachers is that there is a lack of electronic textbooks, simulators, and didactic computer games, while teachers themselves do not have the skills to create high-quality training products.

Further, during brainstorming, students suggested that it is necessary to develop some sort of algorithm that speeds up and facilitates the process of creating a computer didactic product by a teacher, which is necessary to improve the efficiency of the educational process.

Let's clarify that at this stage, students form the research component of innovative thinking.

Stage 1 (overview)

To form a logical component, according to the Stage-Gate model, it was assumed that at this stage the team evaluates the idea of the product and its volume tries to determine whether the idea is viable and can be of interest to potential consumers. The work was carried out through SWOT analysis [18], on the basis of which the team can evaluate the idea, taking into account the strengths and weaknesses, opportunities and risks.

At this stage, the work of the student project group was aimed at specifying the contingent of consumers of the innovative product: the age group, the level of computer literacy, etc. Further action plan of the project group: development of an electronic training manual for teachers on creating computer didactic games for the formation of innovative thinking of test subjects.

Stage 2 (business case creation)

Once the idea is formulated and there is a clear idea of the product being created, the team begins work on defining and analyzing the product, project plan, and feasibility study.

The design of the electronic training manual was based on the analysis of the target audience. At this stage, the methods of motivating and stimulating students'

learning activities were specified (for example, animated characters accompany users during the entire training period). The product goal and objectives were formulated, its content was selected and structured, and information slides were created. Training methods were specified: visual methods (demonstration, illustration, video fragments) and verbal methods (text, hypertext, sound, etc.). In addition, it was clarified that the electronic training manual for teachers will be distributed via flash media.

In order to promote the product and attract potential consumers, a business case was developed, which indicates the problems the product is aimed at (solution of the problem concerning the lack of electronic textbooks, simulators, didactic computer games, helping teachers to master the skills of creating high-quality training products). This is a kind of advertising that reveals to potential consumers that developers have the necessary knowledge and experience, as well as the means to solve these problems, and leaves the recipients in no doubt that their difficulties will be solved.

At this stage, the logical (logical structuring of the content of the electronic manual and business case) and communicative (communication with potential consumers, presentation of the business case to them) components of innovative thinking of future teachers.

Stage 3 (development)

Next, the team works on the plan drawn up at the above stages and puts it into action by creating the product prototype. The goals set in the planning process were specific and measurable, and met the time, budget, and quality limits (SMART) [19].

One of the main goals of the project helped to specify the activities: the formation of teachers' competence in the development of electronic didactic games and tasks necessary to achieve this goal.

Measurability is achieved through creating a list of results and setting requirements for them. The foreseeable results serve as guidelines for project management and task completion. Project results are based on specific consumer needs, so it was important to answer the questions: how the product will be produced? What methods and forms of training are in priority?

Achieving the project goal assumed that it should be adequate for students, but too simple and clear projects do not have a chance. Also, the present project assumed interdepartmental cooperation (with the administration and teaching staff of educational institutions) throughout the entire implementation period, thus the goal and objectives reflected both the requests of teachers and the capabilities of the project team.

The feasibility of the project was to determine the risk factors. For example, the project work was carried out by a new team, and there was a risk that students did not fully understand the procedures related to creation of the e-learning tool and to diagnostic activities. Therefore, it was decided to extend communication by including Sociology and IT-technologies students to the project.

Project deadlines are based on the time frame of educational process—two semesters.

At the same stage, a prototype of the electronic training manual was developed—a working model that was used for testing before the final version. The prototype helped students to learn about the process of creating a product (in particular, about its design), about the specifics of its application in educational institutions, determine what problems the intended user may face, and what their experience is.

As a result, there were formed the creative (idea generation) and transcultural (communication between technicians and humanitarians) components of innovative thinking.

Stage 4 (testing)

At the testing stage, the communicative component of students ‘innovative thinking’ is formed. The prototype was tested in educational institutions, using feedback to identify existing shortcomings, and generate ideas for improving the product. A series of master classes allowed teachers to work with the created prototype to see if it really solves the problem.

Stage 5 (launch)

As soon as the product (an electronic training manual on creation of computer didactic games) has passed all production stages, from the idea to implementation, it reached the launch stage and was introduced to the market.

11.6 Results of Research Studies

The study on the level of formation of innovative thinking of students in the project team was conducted twice: before the project (the observing stage of the study) and before the launch of the project (the control study). Comparative diagnostic results are shown in Fig. 11.1.

The table analysis shows that the greatest increase in indicators was detected during the diagnostics of the research (diagnostics of research potential/V. E. Milman) and communicative (adapted test of communication skills/L. Michelson) components. Indicators referring to the logical component (game test for logical thinking/M. Voinarovskii) increased slightly. At the beginning of the project, one-third of subjects showed an average and high level of the creative component of innovative thinking formation (modified tests of divergent productivity/J. Guilford), but towards the end, half of the project team showed an increase of this indicator. However, in our opinion, this can't be regarded as a real achievement, and it is necessary to focus further work on the development of students' creativity. Diagnostics of the transcultural component formation level (R. Inglehart scale modified by M. S. Ianitskii) [20] showed that the majority of students has orientation to the past, following traditions (family, career, social recognition), and only a small part of students—orientation to the future, to achievement of rapid significant results (self-realization, freedom, tolerance) (Fig. 11.1). Please note that the transcultural component of innovative thinking

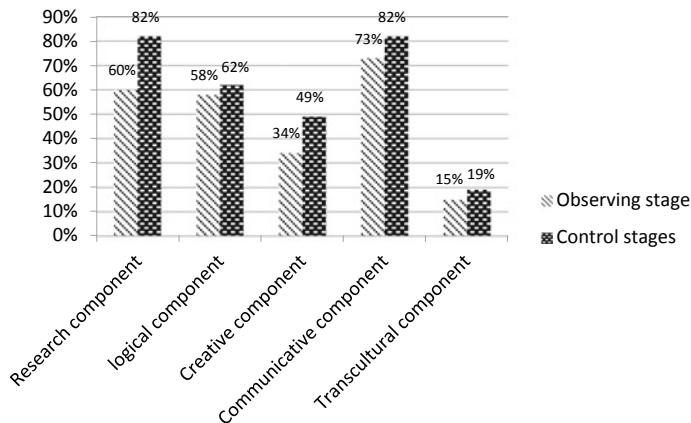


Fig. 11.1 Diagnostics results of the project team students' level of innovative thinking at the observing and controlling research stages

involves a special approach to its formation, the development of appropriate didactic, methodological and psychological tools.

When describing the efficiency of the process of innovative thinking components formation, we took into account the total number of respondents with an average and high level of formation of each of these components.

11.7 Conclusion

Thus, each of the above stages can be considered complete only if all the activities have been worked out, and the results planned have been received. If the results do not meet the specified criteria, the project may be terminated or suspended. Therefore, it is important to clearly define what results should be achieved at each stage of the project.

An important condition for the success of a project is its independent assessment. In our case, the project was assessed by a group of expert teachers, whose goal was not to criticize, but to provide professional support and adequate recommendations in order to improve the overall efficiency of the project.

Overall, it can be argued that implementation of the Stage-Gate model to project activities on the formation of innovative thinking of future teachers—is a specific response to the need to improve professional pedagogy, because there is still the issue of the gap between the knowledge and skills acquired in the process of higher education, and the true willingness of a graduate to carry out independent pedagogical activities.

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Chapter 12

Revealing the Human Direction of Managers' Vocational Training at Bryansk State Technical University



J. A. Vorontsova

Abstract The problem of training managerial personnel at a technical university during the integration of the humanitarian, economic and technological components of education is considered. The proposed approach allows training economists-managers of the industrial production possessing a high level of professional competence, economic culture, humanistic views, who are able to carry out highly effective activities in the field of creating and functioning the competitive organizations. The results of the sociological studies carried out among the students of the economic direction, the profile "Economics and running the Enterprise" at Bryansk State Technical University aimed at finding the humanitarian interests, the ways to improve the process of teaching humanitarian disciplines are presented. The findings of the sociological study are a good basis for seeking ways to improve the humanitarian training of the production managers, for forming the humanistic orientation of the student's personality, for using the most powerful tools to maintain the students' motivation.

12.1 Introduction

In the context of fundamental changes in the economic, social, technological and information spheres of the society, there arises a strong necessity to review traditional approaches to training qualified managerial personnel. While integrating humanitarian and technological components of education, the synthesis of cultures takes place and interpenetrating technological and humanitarian knowledge intensifies.

The new stage in the activities of technical universities today is preparing managerial personnel with deep economic knowledge to work in industrial enterprises of different ownership forms. Therefore, a necessary principle of implementing the system of higher economic and managerial education is to ensure high-quality activities of technical universities as a special social-cultural institution, aimed at helping to meet students' interests and needs, developing their various abilities, especially in a moral, humanitarian and professional sense. To realize humanistic goals in a

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higher technical school, it is important to carry out targeted pedagogical, cultural-educational, organizational, material and technical measures, to more actively predict the humanistic system of training managerial staff corresponding to new needs as an important factor in the rapid rise and successful development of the industrial production.

12.2 The Relevance of the Research

The dynamism of modern society raises the problem of resolving the contradictions between objective needs in forming contemporary managerial personnel and the real quality of their training. Currently, the dependence of social progress on the abilities and knowledge of future managers studying in the educational system of a higher technical school is growing. They should have an all-round education, a high level of professional competence, economic culture, humanistic views, capable of implementing highly-effective activities in the field of creating and functioning competitive organizations.

Studies show that the most important area in forming the humanitarian environment of a higher economic and managerial education at a technical university is creating a flexibly changing comfortable social-psychological climate. National scientists (Vygotsky [1], Kokhanovich [2], Saraskina [3]) understand the humanitarian environment as the interconnection of the humanitarian orientation in the administration activities, the educational disciplines of the humanitarian cycle and intensive teaching methods based on the humanistic approach.

The urgent need to intensify the process of the humanitarian training is due to the insufficiently high cultural level of a significant part of students having an economic and managerial profile. They possess a low culture of speech, experience some hardships while working with scientific literature, lack the need for self-education and self-development.

Implementing an integrated approach to the humanitarization of higher economic and managerial education within the framework of a technical university makes it possible to purposefully resolve the issue of shaping a student's worldview. In the scientific works of many leading scholars and social scientists (M. M. Bakhtin, V. S. Bibler, E. V. Bondarevskaya, B. S. Gershunsky, M. S. Kagan, S. Kraver, S. V. Kulnevich, E. Power, N. P. Pakhomov, H. Ozmok, V. S. Styopin, G. P. Shchedrovitsky) the idea of the necessity to combine different mindset paradigms and, above all, orientations towards culture, society, and the individual is being increasingly approved nowadays. Culture creates an objective basis for uniting the society and the individual, the integrity of man's purposeful activity and the spiritual and moral positions of the society.

12.3 The Vocational Orientation of the Humanitarian Cycle Disciplines in the Process of Training Economists-Managers at BSTU

The heads of technical higher education institutions specializing in preparing economists-managers should be clearly aware, that it is urgently needed to develop and implement the Russian version of the qualified training of managerial personnel to work in the industry.

The student needs to deeply understand the meaning of modern social changes. To see the real picture of technical college activities and identify the positive and negative consequences of some innovations, it is important to have the feedback from the students, to know and analyze their opinions on many educational problems. In this regard, the methods of sociological research, the possibilities of which are broad and multifaceted, are of particular significance. They help to reflect the real state of affairs at the technical college and determine the factors affecting their change; to identify the leading trends in developing innovative education and find the best ways to improve them; to summarize the best teaching methods and to develop recommendations for overcoming shortcomings.

In the framework of the sociological research of the educational process at Bryansk State Technical University a survey of first, second and year students studying in the direction 38.03.02. "Management", profile "Economics and running the enterprise" was conducted. This study was aimed at determining the students' multifaceted humanitarian interests, at identifying their attitude to the forms of the humanitarian training on the basis of the opinions and suggestions received.

The findings of the sociological survey were a good basis to improve the humanitarian training of production managers at BSTU. Each student could indicate several problems, as a result of which practically all the proposed questions were equally in demand. The results of the study show that the humanitarian interests of the students—future production managers are diverse and the problems of man, people's communication are of particular importance. A modern student believes that knowing how to get along with people is necessary for future organizers to solve life problems, to establish interaction in the team, to manage effectively, which necessarily leads to economic and social benefits of the company and the society as a whole (Table 12.1).

Sociological questionnaires were also aimed at identifying the factors to stimulate the students' interest in taking the humanities. The results should be carefully studied by the teaching staff of this cycle of disciplines to encourage future managers of industrial production to a more serious deepening of humanitarian knowledge.

In the first place in the list of factors, students put "the opportunity to learn new things in class, to broaden their horizons." This opinion reflects the demand of the contemporary time, as any humanitarian discipline must constantly update its content, ensuring a student's effective inclusion in the system of social ties, modern ideas, goals and values, providing an adequate understanding of the depth and complexity of social processes.

Table 12.1 Humanitarian interests of economic profile students at BSTU

Issue	Total responded (100 people)		%	
	Young men	Young women	Young men	Young women
Political problems	45	18	90	36
Human problems	40	45	80	90
Problems of economic creativity	34	35	68	70
Communication problems of people	30	30	60	60
Business issues	26	16	52	32
Problems of our state history	20	8	40	16
Others	15	10	30	20

Among other factors, students identified “a personal inclination for the humanities”, which is not entirely characteristic of the economic and managerial profile of students of technical universities. Lecturers should consider that abstract theorizing is not suitable for the future economists-managers and the students themselves note this, highlighting such a factor as “the link of the taught humanitarian discipline with the current situation in the country and in the world, as well as with the profile of the chosen direction”.

The sociological study shows that it is necessary to diversify the methodology of conducting tutorials, to introduce some creative atmosphere, develop copyright courses that suggest the variability of delivering humanitarian disciplines in one direction within the same educational institution. It is precisely this atmosphere, according to students’ responses, that contributes to realizing such a factor of increasing the students’ interest in the humanities as “the opportunity to speak in classes on an urgent problem, to debate.”

Among other factors, students noted the “importance of the lecturer’s personality”. Today, students of economic profile would like to see such a tutor in the lecture-room who improves the didactic conditions of the educational process, enriching it with advanced courses, foreign methodological developments; draws particular attention to the relationship between humanitarian and vocational training (Table 12.2).

Since the program of the humanitarian cycle includes mastering a foreign language, a sociological study was also conducted on the problems of taking this discipline by the students of the direction “Management and running the enterprise”. To reveal the opinion of future production managers on the problem of improving the language training, they were asked to indicate the most significant ways to update the didactic conditions of the process of teaching a foreign language at a given university (Table 12.3).

The analysis of the sociological study results allows us to emphasize the necessity to draw special attention to the teaching techniques for training future managers of industrial production. The lecturers should study thoroughly and modify the forms,

Table 12.2 Factors determining the economic profile students' interest in studying the humanities at BSTU

Factor	Total responded (100 people)		%	
	Young men	Young women	Young men	Young women
The opportunity to learn new things, broaden the horizons, improve the cultural level in the classroom	50	50	100	100
The existence of a personal inclination for the humanities	40	45	80	90
The link of the taught humanitarian discipline with the current situation in the country and in the world	36	30	72	60
The link of the content of the humanities with the profile of the chosen direction	30	34	60	68
The opportunity to speak in classes on an urgent problem, to debate	28	26	56	52
The existence of various forms of conducting classes; the presence of a creative atmosphere, good working environment, etc	29	20	58	40
The lecturer's personality	17	20	34	40

methods, approaches, ways and means of improving the process of conducting humanitarian disciplines; create integrated courses on history, cultural studies, philosophy, law on the most significant and disputable subjects for students; demand from the students philosophical understanding of the revealed economic problems when writing term papers and graduation projects.

Teaching the disciplines of the humanitarian cycle can be successful only if students have a high motivation for learning. To achieve the students' active involvement in the educational process means to increase the training effectiveness. This position is expressed by Granovskaya in [4] that "work done contrary to desire ... is always boring and hard In such a situation, even rest is ineffective, because mobilization continues Such people have low labor productivity, even if they try." It is important to develop motivation at the beginning of the learning process. According to Makhmutov [5], the most effective ways of forming a motive for learning are

Table 12.3 Ways to improve the process of teaching a foreign language to the economic profile students' at BSTU

Way	Total responded (100 people)		%	
	Young men	Young women	Young men	Young women
Paying equal attention to teaching the conversational aspect of a foreign language and special terminology: business correspondence, business communication, business letter, working with economic literature	35	28	70	56
Introducing in-depth study of one language and optional study of another	34	37	68	74
Paying more attention to communication in a foreign language, especially with native speakers of the studied language	46	41	92	82
Conducting classes in the form of role-playing and business games, case studies, conferences	38	42	76	84
Delivering lectures and tutorials in a foreign language to senior students if they possess the necessary vocabulary	35	28	56	70
Applying multi-media teaching tools: computer programs, language courses, skype and zoom-conferences, modern economic literature in a foreign language	34	37	74	78

(continued)

Table 12.3 (continued)

Way	Total responded (100 people)		%	
	Young men	Young women	Young men	Young women
The presence of an improved qualified work program in a foreign language in the direction "management and running the enterprise"	46	41	50	58

to impact on emotions and to reveal the vital, practical significance of the studied subject.

Bespalko [6] and Tatura [6] confirm that creating motivational problematical situations, often taken from life practice, convicting the students in the vital role of the subject proficiency for high-quality activities are the simplest methods for forming motivational activity in the lecture-room.

Nothing contributes more to stimulating emotions and developing a motive for study, than a significant goal that must be achieved. As early as Komensky in "The Great Didactics" [7] pointed out that the main didactic aspect of education is establishing the basis for pedagogical targeting, the presence of an precisely-set goal.

Fluent communication in a foreign language is prestigious in the society and new skills acquired in the process of studying the disciplines of the humanitarian cycle can give definite advantages to the students after their graduation, namely foreign contacts, the exchange of experience, well-paid work in the field of domestic production, applying received knowledge into practice. Motivating to study humanities is first and foremost for the lecturer, only after defining it is recommended to proceed to the training itself. The lecturer's personality largely determines the students' motivation, is an indicator of the success in achieving educational goals.

To provide future economists-managers with comprehensive humanitarian, administrative and technical knowledge, the state educational standard of Bryansk State Technical University, drawn up for a multi-level education system (bachelor's degree and master's degree), provides for studying the following cycles of disciplines (38.03.02. "Management", profile "Economics and running the enterprise") [8]:

SE.00 General humanitarian and socio-economic disciplines

GN.00 Mathematical and general natural sciences

DS.00 General professional disciplines

SD.00 Special Disciplines.

The listed cycles of the disciplines are an integral component of all types of educational standards of technical universities, their interrelation is one of the main requirements of the vocational education didactics. Curricula developed on the basis of the latest state standards, focusing on the humanization of higher economic and managerial education within the framework of a technical university, are the plans of

Table 12.4 The ratio of the discipline cycles at Bryansk state technical University

Cycle	Number of class hours	Percentage (%)
SE.00	1207	27
GN.00	680	15.2
DS.00	1615	36
SD.00	989	22.1

a new generation. The temporal correlation of the given discipline cycles confirms a high percentage of blocks, modules, subjects of the humanitarian cycle (Table 12.4).

According to the table, the share of humanitarian cycle blocks in the context of the entire training course of the industrial production managers is 27%, i.e. it is a little more than a forth part. It should be stated that the university curriculum on the profile “Economics and running the enterprise” provides for a greater amount of hours for studying the humanities disciplines in comparison with the economics and management specialties of other technical universities of a similar profile in Russia: 37%–63% respectively [9, 10]. However, the proportion of humanitarian disciplines is not the maximum. In higher education institutions of a similar profile abroad, the percentage ratio of humanitarian and special disciplines is 50–50%, which makes it possible to form a holistic worldview of students, expand their horizons, and develop creative skills and abilities.

The humanitarian block at BSTU includes ten disciplines which definitely provides broad and profound humanitarian training of the students—future production managers, to form a layer of people who are able to maintain and increase the cultural level of the society and each individual, to acquaint with national and world spiritual traditions. This is evidenced by the teaching staff of the humanities chairs, which corresponds to the teaching staff of general professional and social departments, if we take into account the academic status (Table 12.5).

Since the staff is approximately equivalent, teachers of the humanitarian disciplines cycle should improve the conditions of the educational process, identify the positive and negative aspects of the humanitarian training of future production managers, get acquainted with foreign experience, study periodical literature on these subjects.

12.4 Conclusion

The teaching staff of the humanities departments at Bryansk State Technical University makes great efforts to give an all-round humanitarian education to the students of the economic profile.

The effectiveness of the process of humanitarian education of future economists - industrial production managers at BSTU is achieved if the organization of this process includes:

Table 12.5 The humanitarian disciplines at BSTU

Cipher	The discipline	Total number of the TS	Including			Number of class hours	Percentage ratio
			Professors, Doctors of Science	Associate Professors, candidates of Science	Senior teachers, assistants		
SE.00	Philosophy	5	1	4	—	85	1,9
SE.01	Foreign language	16	1	11	4	272	6
SE.03	Culture studies	3	1	3	—	68	1,5
SE.04	History	3	1	2	—	68	1,5
SE.05	Physical training	10	—	3	5	408	9,1
SE.06	Legal science	3	1	2	—	17	0,4
SE.07	Sociology	3	1	2	—	17	0,4
SE.08	Political studies	3	1	2	—	17	0,4
SE.09	Psychology and pedagogy	2	—	2	—	68	1,5
SE.10	Elective courses					170	3,8

- determining the purpose, means and methods of the humanitarian education;
- mastering the students' humanitarian knowledge and skills, taking into account their value orientation and the ability solve specific academic issues;
- forming the humanistic orientation of the student's personality, emphasizing humanitarian values and readiness for humanitarian activities;
- creating problematic situations in the teaching process, using the necessary material from available sources of scientific information.

The success of providing humanitarian education of future industrial production managers at BSTU is ensured by creating such social-pedagogical conditions as: giving intellectual activity, problem-searching, ensuring the prestige of social and humanitarian aspects.

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Chapter 13

Successful Entrepreneur's Personality Resources in Representations of University Students and Businessmen



E. N. Katkova, E. V. Opevalova, and A. V. Shchegoleva

Abstract Personality resource of the individual as the subject of economic activity is an integral part of the human capital. The content study of the collective subjects' representations in the process of educational and training activities gives an opportunity to estimate the personality efficiency in the future entrepreneurship, build an individual strategy of the personality adaptation to the market economy, and form the ability for the Humanities University graduate to start up a small business. The article gives a comparative analysis of representations about successful entrepreneur's personality resource in the Humanities University graduates' consciousness and representations of Far Eastern entrepreneurs having small businesses and foreign big business owners. The study of the personal qualities correlation structure in the respondents' minds by means of stratification of correlation matrix method revealed differences between the three groups of responders. In the Humanities University students' consciousness, such personal qualities of a successful entrepreneur as *greed—slyness—education level* and *industriousness—initiative* are connected at a medium level. In the small business entrepreneurs' consciousness some other personal qualities are connected at the same (medium) level: *entrepreneurial spirit—honesty* and *responsibility—communicability*, while at a lower than medium level—*responsibility—industriousness—benevolence*. Big business representatives have the following variables connected at a higher than medium level: *commitment to the cause—team spirit—self-confidence—ability to anticipate, patience—generosity—ability to anticipate*, and at a medium level such qualities as '*determination—adventurism*'. Recommendations for building individual strategies of the future entrepreneur's personality development in crisis economic conditions are offered.

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13.1 Introduction

The problem of studying the structure of human capital in conditions of socio-economic instability does not cease to be urgent. According to the leading economists' evaluation, the average amount of the population entrepreneurial activity is 15% of the Gross Domestic Product (GDP) of any country. That is why, to make proper projections, it is necessary to analyze the personality resource influencing both the economic efficiency of the entrepreneurial activity and economic development of the country. The research shows the way we studied the entrepreneur's personality resource in representations of future and present subjects of entrepreneurial activity.

The relationship of psychological resources and different types of human economic behavior is generally studied within the framework of economic psychology. If these characteristics are considered as constituents of the human capital, they should be taken into consideration in certain economic models. Numerous studies of the human capital economic efficiency showed the influence of education level (length of schooling) and professional experience (measured by the length of service) on the person's income. The theoretical foundation of these studies was laid in the works of Becker, Mincer, and some other economists [1]. The amount of human capital in their studies is defined as a set of person's abilities, skills, capabilities, knowledge, etc., resulting in productivity growth, and income accordingly. Meanwhile, such human capital includes both inherited characteristics (for example, ability in mathematics, memory, etc.) and those got in the process of education (first of all in educational institutions and in the workplace).

Human capital direct measuring is practically impossible, that is why there is an assumption that the investment volume (measured by the length of schooling, the record of work, etc.) correlates with its level and can be used as the earning level determinant (or payment rate). Meanwhile, an effect of differences in the abilities of people with the same education level and professional experience remains unexplained. It prompted the researchers to include some variables into the models, which can measure abilities and skills (for example, cognitive power, the intellect level, and so on) [2]. It should be mentioned that *abilities* and especially *skills*, as it is reflected in Western studies, have a rather high correlation with the received education, so each factor must be taken into consideration.

Human activity has the following main characteristics: its motive, goal (object), and means (actions and operations). The motive for doing something is the reason for doing it. The motive of action, as a rule, is some concrete need that is satisfied in the process and with the help of certain activities. The type of activity is usually determined in accordance with the dominant motive as any human activity is caused by different motives [3, 4]. People involved in economic activity have a need for achievement, but due to lack of possibility to realize it, fear of failure may appear. In case it exceeds the need for achievement, a person will hardly ever take up any business [5].

Economic activity involves the ability to make decisions; it influences not only the subject of the activity but also the one who is concerned about the consequences

of the final decision. Therefore, the subject must take into account not only the internal factors affecting decision-making, but also external ones. Responsible decisions depend on these factors and motives. When the situation in a society is too unstable or the intensity of competition is very high, and therefore in both cases the risk of failure is very big, then people can refuse this type of activity even with a high motivation to achieve and a moderate fear of failure [6]. An important factor influencing the involvement in the economic activity is the guarantee of stability in a society, and the policy of the state in relation to the economy in particular. Psychological processes and conditions included in the activity regulation can be internal factors, affecting economic activity [7]. Any human activity is revealed and continued in creations; it has not only consumer character, but also a productive one, and has both external and internal components [8]. Internal features include anatomical and physiological features involved in the management of activity on the part of central nervous system, as well as psychological processes and conditions included in the regulation of activities. Different types of movements, connected with practical performance of the activity can be referred to the external component [9].

Most research in economic psychology studies behavior of adults able to make economic decisions [10]. However, E. Sonuga-Barke and P. Webley consider that it is also important to study the influence of psychological characteristics on the finance behavior of children, teenagers, and the youth. Alongside with economic and social capital of the family, Hutmacher et al. [11] consider the importance of the psychological component (abilities, intellect, cognitive abilities) for educational achievements (success at school), accessibility of education, possible transition to the next level of education.

A number of studies [2, 12] show that although the psychological component does affect the income, it is not big enough to consider the results of the model evaluation without including special variables of *abilities* to be significantly shifted. Bowles [13] gives an overview of studies modeling factors that influence the income considering *skills and abilities* and other psychological characteristics. For example, the results of the following tests were used: IQ, AFQT, a number of tests measuring cognitive abilities, vocabulary, aggressiveness, extraversion, emotional stability, autonomy, etc. One more way to measure the human capital economic effectiveness is to include the respondent's parents, the level of education, and job position into the model of characteristics.

Besides widely spread evaluation of the economic efficiency of the human capital, relationship of psychological characteristics and different types of economic behavior have been studied. Thus, some empirical studies of Filblat and Gregory considered the impact of psychological characteristics (stress, in particular) on professional choice [14], status disparities and social inequalities [12], the length of being unemployed and the labor market position in the long run [15]. It can be assumed that certain psychological personality types are also differently prone to marriage and childbirth, migration, alcohol addiction and smoking, deviant and delinquent behavior.

There are some differences in the relationship between internal and environmental factors in people's explanation of their successes and failures depending on the motives for achieving success or avoiding failure. While those who strive for success

attribute it to their abilities, people trying to escape from failure start analyzing their abilities in case of a failure (quite the opposite case). A person who is afraid of failure tends to attribute his/her success to a combination of circumstances, while the one who seeks success explains the failure in this way [4].

Depending on the dominating motive, connected with activity aimed at achieving success, people with different motives tend to explain the results of the activity in a different way. Those who seek to achieve success, attribute their achievements to intrapersonal factors (abilities, diligence, etc.). However, people with strongly expressed motives of escape from failure tend to underestimate their abilities, get upset quickly in case of a failure; their self-esteem is lowered. Meanwhile, those who are aimed at success have an opposite pattern of behavior: they estimate their abilities in the right way, they are mobilized in case of a failure, and they do not get upset [16]. It is impossible to give a certain answer to a question what personal attributes a person should have to become a successful entrepreneur, but still the analysis of successful entrepreneurship allows generalizing some facts [17].

According to the Italian scientist A. Meneghetti, an economic leader is an operational center of many relationships and functions, he/she creates new job opportunities, makes profits, and contributes to the development of the service industry. In the field of economics, he has outlined the subjective criteria for the entrepreneur that points to the successful outcome of economic rationality. In the sphere of sociology, he tells about the necessity to make a research of the human nature intentionality and historic contradictions with the environment rather than the primitive man or statistical behavior. According to A. Meneghetti, the leader has three groups of qualities, among which one can distinguish intellectual abilities, personality qualities, and skills (see Table 13.1).

The US Small Business Administration considers [11, 18] that the entrepreneur should possess the five most important characteristic features that guarantee a success in any risky business. They are: (a) energy and the ability to make everybody work; (b) the ability to think; (c) the ability to build relationships with people; (d) communicability; (e) knowledge of technical equipment and technology.

The studies were done by the American firm *Mac Ber and Company* under the support of the United States Agency for International Development and National

Table 13.1 Leader's personality traits according to Meneghetti [19]

Intellectual abilities	Traits of character	Acquired skills
Developed logical thinking, shrewdness, originality, curiosity, the ability to acquire new knowledge and skills, intuition, education level	Initiative, flexibility, creativity, courage, self-confidence, emotional balance, inner directedness, ambitiousness, adequate self-evaluation, responsibility, energy, reliability, authoritativeness, working capacity, independence	The ability to enlist support, cooperate, the ability to gain popularity and prestige, the ability to express ideas, tact, diplomacy; the ability to take risks and responsibility, organize other people; the ability to persuade, see a joke; knowledge of human nature

Science Foundation have some practical value. They allowed identifying personal qualities constantly shown by successful entrepreneurs [1, 13]:

- opportunity search and initiative (sees and uses new or unusual business opportunities; acts before events force him to do so);
- tenacity and perseverance (one is ready for repeated efforts to meet the challenge or overcome the obstacle; changes strategies to achieve the goal);
- risk-taking (one prefers challenging situations or moderate risk, weighs the risks, takes actions to reduce the risk or control the results);
- efficiency and quality oriented (finds the opportunity to make things better, quicker and cheaper, tries to achieve perfection, to improve performance standards);
- involvement in working relationship (takes responsibility, ready to sacrifice for work, goes to work together with employees or instead of them);
- commitment (clearly expresses goals, has a long-term vision, always poses challenges and adjusts short-term objectives);
- desire to be informed (generalizes information about clients, contractors, and competitors in person using business as well as personal contacts for that);
- systematic planning and observation (makes plans subdividing major tasks into subtasks, keeps an eye on financial results, and uses tracking procedures to see the completion of work);
- persuasiveness and the ability to establish links (uses cautious strategies to fulfil tasks and persuade people, uses business contacts as a means to achieve goals);
- independence and self-confidence (strives for independence from rules and other people's control, relies only on himself in the face of or in case of opposition or absence of success, believes in his own ability to fulfil difficult tasks).

Russian philosophers of the early twentieth century [20] identified the following qualities and motives of behavior specific to entrepreneurs: (1) they have a vision or dream they pursue daily; (2) they have unlimited belief in their products or types of services; (3) they constantly strive to do something; (4) they are inventors; (5) they are pertinacious and single-minded; (6) they are profit-oriented; (7) they are aimed at success and plan for over several years; (8) they know their strength and weaknesses better than anyone; (9) they are not afraid to start all over again; (10) money is not the only or the main incentive for them; (11) they do everything by themselves; (12) they understand the importance of subtle changes, their impact on business success; (13) they want to grow; (14) they understand the dominant role of the customer; (15) they do not think they are taking great risks; (16) they are practical; (17) they ask for something they really want; (18) they are very market sensitive; (19) they are difficult to be intimidated; (20) they are accustomed to loneliness; (21) they are ready to share.

Modern twenty-first-century Russian scientists [7, 10] distinguish the following qualities: having a goal, self-confidence, internal locus of control, responsibility, the ability to anticipate, expansion of interests, health care, the ability to relax, positive attitude to failure, the power to rebirth. Thus, Romanova [21] identifies the following qualities, based on the job description that gives an opportunity to be a successful entrepreneur: entrepreneurial skills, leadership and managerial skills, high level of

conceptual thinking, good analytical abilities, verbal and declamatory skills (the ability to express ideas clearly and precisely), communicability (the ability to get on with people easily), interpersonal skills (the ability to work within groups and work as a team), the ability to make decisions under difficult time and information constraints, the self-regulation ability.

In Russian and foreign scientific studies there are different approaches to the evaluation of the economic performance. At any stage of economic development many authors are counting on personal resource that is referred to as the illiquid part of the human capital; it needs time for entrepreneurial activity development to get an economic effect. That is why, in spite of different approaches to the evaluation of this human resource, personal qualities lists are similar.

Thus, the analysis of the given research (and the ones done earlier [22]) prove that correlation between the internal factors and environmental factors in the economic activity is not constant. Sometimes environmental factors require the person to mobilize some internal resources, but sometimes the person reconstructs the environment of his/her economic activity.

13.2 Research Methodology

Our study is based on the idea that successful people taken together make the quality of the human capital in any country. In this regard, it is necessary to study young people's personal resources in the educational environment. We assumed that a personal resource and its representation in the reflections of the subjects are defining factors of the human resource qualitative development in the human capital structure. The socialization system in Russia (the educational environment and the parenting system) does not allow a person to reveal and develop entrepreneurial personal qualities. It happens because the system of education is aimed at making graduates employees. Thus, those who start up their own businesses are prevented from getting high rates of economic efficiency.

The purpose of our research was to study the content of personality qualities that determine a person's success in business in terms of economic efficiency. Small business entrepreneurs of the Far East (38 people) and 5th-year undergraduates of the Faculty of Information Technologies, Mathematics, and Physics at Amur State University of Humanities and Pedagogy (36 students) took part in the survey. They were offered to name 10 personality qualities they consider to be characteristic of successful entrepreneurs. The personality qualities of large business representatives were studied through the analysis of interviews with nine famous representatives of large business in the media, who shared the secrets of their success. Autobiographical references were taken from the website of the free encyclopedia Wikipedia ru.wikipedia.org.:

- Michael Rubens Bloomberg is an American entrepreneur and the 108th mayor of New York (2002–2013). He is the founder and owner of the information agency *Bloomberg*.
- Robert Toru Kiyosaki is an American entrepreneur, investor, writer, and motivator; the author of a number of investment books, including the bestseller *Rich Dad, Poor Dad*; a financial columnist for *Yahoo Finance*, the founder of *Rich Dad Company*, the creator of the game *Cashflow* and online games for teaching adults and children financial and business concepts.
- William Henry Gates, better known as Bill Gates, is an American entrepreneur and public figure, philanthropist, one of the creators of *Microsoft*.
- Donald John Trump is an American political leader, and current president of the United States of America since January 20, 2017. In the past—an entrepreneur (mainly in the field of real estate), showman, and TV presenter.
- Karl-Heinz Kipp is a German billionaire and founder of the *Massa* department store chain. In 2017, *Forbes* estimated its net worth at \$4.9 billion.
- Richard Charles Nicholas Branson is a British entrepreneur, the founder of the *Virgin Group Corporation*, which includes about 400 companies of various types.
- Carlos Slim Elu is a Mexican businessman of Lebanese descent, the son of Maronite emigrants from Lebanon. He is a billionaire, one of the richest people on the planet. According to Forbes, from 2010 to 2013 he was the richest man in the world.
- Henry Ford (died in 1940) was an American industrialist, owner of automobile factories around the world, inventor, author of a US 161 patent. The Ford Motor Company still exists today.
- John Davison Rockefeller (died in 1937) was an American entrepreneur, philanthropist, and the first official dollar billionaire in human history.

The texts were first subjected to content analysis and then correlation analysis by stratifying the intercorrelation matrix [23] in the following sequence: (1) counting the frequency of occurrence of each word in the descriptions of the phenomenon, (2) compiling the matrix of *connectivity fields* of the accounted words, (3) counting the connections between words in the matrix using the factor of rank correlation of Ch. Spearman, (4) using the criteria of intercorrelation matrix stratification according to the strength of relationship: $0.607 \leq \rho \leq 1$ —the strength of relationship is higher than average; $0.478 < \rho < 0.607$ —average strength of relationship; $0.349 < \rho < 0.478$ —the strength of relationship is lower than average; $0.220 < \rho < 0.349$ —a weak statistically significant relationship among variables. Very weak statistical relationships ($0.091 < \rho < 0.220$) were not taken into account in the analysis of empirical data [24].

13.3 Results of the Research

Let us consider the results of the research. Variables (personal qualities), which are presented in Table 13.2, are distinguished with the help of content analysis applied in

Table 13.2 Most frequently occurred personality qualities distinguished by content analysis in the reflection of respondents

Small business entrepreneurs in the far east ($n = 38$, total amount of words—380)	Students ($n = 36$, total amount of words—463)	Big business representatives ($n = 9$, total amount of words—176)
<i>Responsibility*</i>	<i>Responsibility</i>	Optimism
<i>Industriousness</i>	<i>Industriousness</i>	Team spirit
<i>Communicability</i>	<i>Communicability</i>	Self-confidence
<i>Education level</i>	<i>Education level</i>	<i>Education level</i>
<i>Determination</i>	<i>Determination</i>	<i>Determination</i>
<i>Literacy</i>	Rationality	<i>Literacy</i>
Politeness	Slyness	Patience
Punctuality	Initiative	Ability to anticipate
Honesty	Impudence	Generosity
Benevolence	Creativity	Commitment to the cause
Self-confidence	Greed	versatility
Sociability	Punctuality	Adventurism
Entrepreneurial spirit	Activity Judgment	

*Common personality qualities in different groups are italicized

three groups of respondents, whose reflections have undergone correlation analysis in order to build intercorrelation matrix.

Table 13.2 shows that in the respondents' consciousness of these groups a successful entrepreneur possesses such qualities as *determination* and *education level*. Far Eastern students and entrepreneurs distinguish such common qualities as *responsibility*, *industriousness* and *communicability*. Variables, given in Table 13.2, were subjected to correlation analysis, further stratification of intercorrelation matrix and construction of correlation pleiades.

Correlation pleiades, got by means of stratification of correlation matrix on the sample group of the Far Eastern entrepreneurs with medium strength of relationship ($0.478 < \rho < 0.607$) and lower than medium strength of relationship ($0.349 < \rho < 0.478$) are presented in Fig. 13.1. Weakly expressed relations among variables are not given in the correlation pleiade because of its multiplicity.

It is seen from Fig. 13.1 that such significant personal qualities as *entrepreneurial spirit*—*honesty* and *responsibility*—*communicability* have medium strength of relationship in the entrepreneurs' consciousness. ***Responsibility*—*industriousness*—*benevolence*** are interrelated at a lower than medium level. Meanwhile, such quality as *self-confidence* pushes apart from *industriousness* and *benevolence*. It proves inefficiency of this quality in the entrepreneur's activity. Such personal quality as *determination*, being a common one for those respondents, has weak positive relationship with *punctuality* ($\rho = 0.20$) and *sociability* ($\rho = 0.12$), and negative one with *responsibility* ($\rho = -0.16$), *benevolence* ($\rho = -0.24$) and *honesty* ($\rho = -0.11$). The quality *politeness* pushes apart from *determination* with medium strength of relationship ($\rho = -0.43$). The personal quality *education level*, common for those respondents, has weak positive relationship with *sociability* ($\rho = 0.27$), *honesty* ($\rho = 0.12$), *politeness*

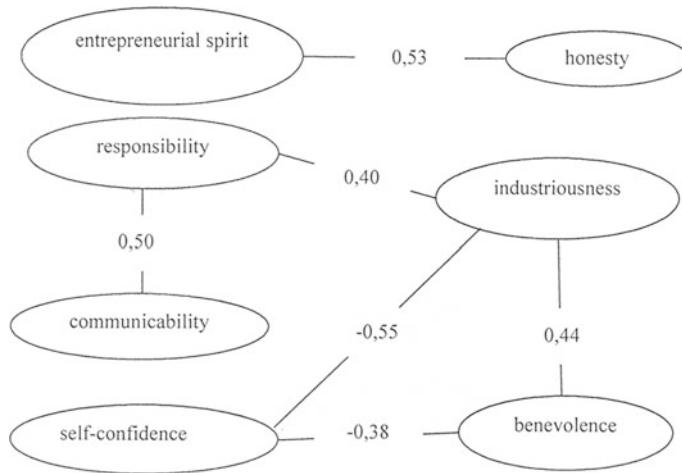


Fig. 13.1 Correlation pleiades, got by means of stratification of correlation matrix on the sample group of the Far Eastern entrepreneurs with medium strength of relationship ($0.478 < \rho < 0.607$) and lower than medium strength of relationship ($0.349 < \rho < 0.478$)

($\rho = 0.27$) and negative one with *benevolence* ($\rho = -0.11$) and *industriousness* ($\rho = -0.31$).

In the students' consciousness (Fig. 13.2), such entrepreneurs' personal qualities as *greed—slyness—education level* and *industriousness—initiative* have more significant relationship (medium level). *Greed—education level—punctuality* are positively related at lower than medium level ($\rho = 0.42$); *activity—education level* ($\rho = -0.39$), *education level—communicability* ($\rho = -0.42$), and *creativity—communicability* ($\rho = -0.43$) are negatively related. A personality quality, common for the three samplings of respondents (*determination*) has a weak positive relationship with *communicability* ($\rho = 0.14$), *education level* ($\rho = 0.12$), *slyness* ($\rho = 0.22$), and a negative relationship with *rationality* ($\rho = -0.14$), *creativity* ($\rho = -0.28$), *judgment* ($\rho = -0.14$).

The fact, that in the students' consciousness *education level* is negatively related (lower than medium level) with the quality *impudence* ($\rho = -0.39$), but at the same time, it is positively related with *greed* and *slyness*, draws our attention. According to the public morality, *greed* and *slyness* are condemned, but not in the consciousness of the students' collective subject.

Let us consider correlation pleiades, got by means of stratification of correlation matrix on the sample group of big business representatives (Fig. 13.3). It is seen from the figure that such variables as *commitment to the cause—team spirit—self-confidence—ability to anticipate*, and *patience—generosity—ability to anticipate* are more closely related (higher than medium level). Such qualities as *determination—adventurism* are less closely related (medium level).

It should be noted that *determination* (a common quality for the three samplings of respondents) is positively related with *adventurism* and negatively related with

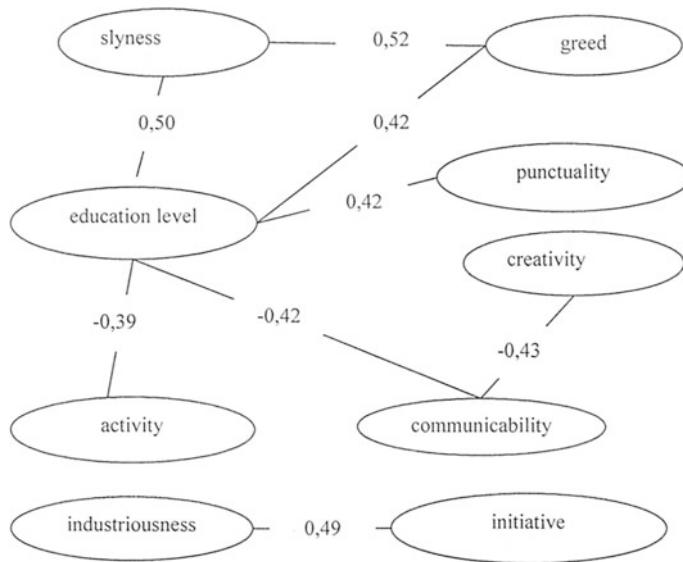


Fig. 13.2 Correlation pleiades, got by means of stratification of correlation matrix on the sample group of the undergraduates with medium strength of relationship ($0.478 < \rho < 0.607$) and lower than medium strength of relationship ($0.349 < \rho < 0.478$)

optimism and *generosity*. *Education level* is positively related with *optimism* (at lower than medium level), it has weak positive relationship with *self-confidence* and *literacy*, but weak negative relationship with *team spirit*, *ability to anticipate* and *commitment to the cause*.

The results of the research allow adjusting the content of the course *Effective Technologies of Employment* taught to senior students. It is possible to use Holland Code Career Test to find out the personality types of students and provide individual consultations with the enterprising personality types. Such courses of lectures as *Entrepreneurship as an Alternative Variant of Employment* [9, 11], *Career Psychology* [10, 25] and a workshop *My Career* [7, 26–28] have been worked out. The significance of them is reflected in the earlier published studies [12, 13] and is proven by some graduates who have realized the entrepreneurial abilities and started up small businesses.

13.4 Conclusion

The study showed that in the ideas of entrepreneurs (small and big businesses) as well as the Humanities University graduates' representations there are common

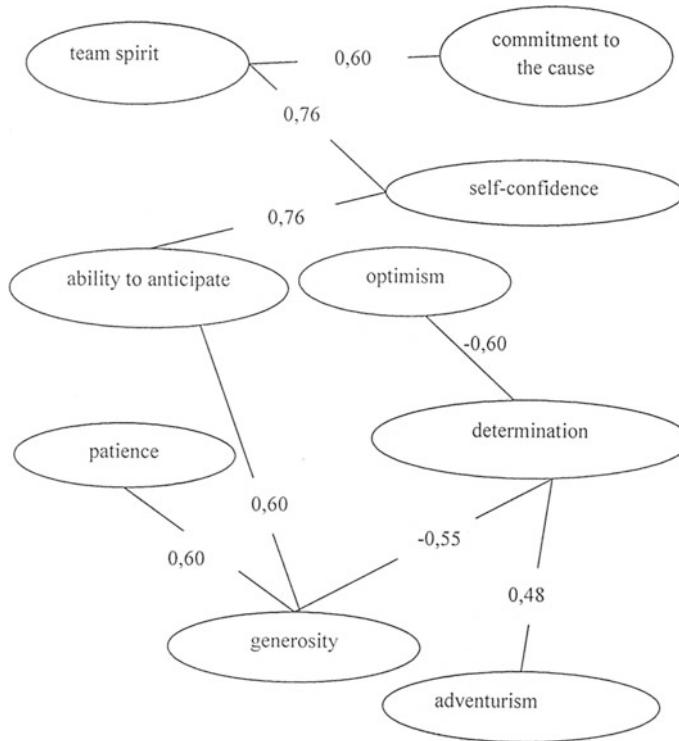


Fig. 13.3 Correlation pleiades, got by means of stratification of correlation matrix on the sample group of businessmen with higher than medium strength of relationship ($0.607 \leq \rho \leq 1$) and medium strength of relationship ($0.478 < \rho < 0.607$)

personality qualities considered as significant for doing business, namely: *determination* and *education level*, meanwhile, the cognitive structure of significant qualities is different. In the consciousness of big business representatives such qualities as *commitment to the cause*—*team spirit*—*self-confidence*—*ability to anticipate*, and *patience*—*generosity*—*ability to anticipate* are the most highly related. Small business representatives have the following most highly related qualities: *entrepreneurial spirit*—*honesty, responsibility*—*communicability*, and *responsibility*—*industriousness*—*benevolence*. In the students' minds *education level* as the personality quality is positively related with *greed* and negatively related with *impudence*, which points to the value diffusion, because from the public morality point of view, qualities of opposite modality are positively related.

Big business entrepreneurs rely on the team spirit and long-term prospects, while representatives of small business—personal responsibility and the ability to negotiate without setting long-term goals and relying exclusively on themselves.

The Humanities University students do not have enough knowledge neither about their personal resource (potential abilities), nor about the qualities that global rate

successful businesspersons have. It proves the necessity to perfect the content of education by means of broadening the areas covered in the course *Effective Technologies of Employment*. It is recommended to include the theme *Personality Qualities of the Big Business Representative*.

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Chapter 14

Human Capital of the Russian Elite as a Factor of Digital Technologies Development in Administration



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Abstract Nowadays the world leaders in social and economic development are the countries, which have learned better than most how to form and implement the human capital, skills, knowledge, and competencies of people, their abilities for continuation training and the application of digital technologies in the innovative economy. Economies of the developed countries more and more rely on human capital as a factor of growth and an immense resource for digitization of social and economic systems management and the social and economic development of the country in general. This can be easily seen through the example of such countries as Japan, South Korea, and Germany, which significantly outrun the Russian Federation in this sphere. Thus, South Korea with a population of 53 mln and the territory half the size of our Kamchatka peninsula, in 2018 was surpassing the vast Russia with its innumerable natural resources in nominal GDP. And such a country as Singapore surpasses the Russian Federation by several times in GDP per capita. That is why the extensive use of digital technologies in managing social and economic systems in the Russian Federation becomes a top-priority goal in the state economic and social policy, and one of the most important vectors aimed at achieving the strategic goals and objectives, determined in the May (2018) decree of the President of the Russian Federation and his address to the Federal Assembly. The paper analyzes the human capital of the Russian elite and its influence on social and economic development of our country.

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14.1 Introduction

In the developed countries of the world digital transformation of business processes is now afoot; digital technologies are widely used in managing social and economic systems of management processes. Digital economy of the leading states, first of all, of the USA, Japan, Germany, determines the development vector for social and economic systems of micro-, meso- and macro-level for the long run. Much attention in advanced countries is paid to improving digital technologies in managing social and economic processes and systems.

In the Russian Federation, digital technologies in social and economic systems management have been paid little attention by the political elite up to the second decade of the twenty-first century. Only due to the known initiatives of President V. Putin, the presidium of the Council of President of the Russian Federation for strategic development and national projects approved the national program “Digital Economy of the Russian Federation” on December 24, 2018 [1]. As practice shows, the government of the Russian Federation headed by D. Medvedev has done little for implementing this national project by 2020. So, no wonder that the President of Russia V. Putin in his message of 2020 delivered a number of critical remarks to the government and the Russian elite in general. The result of these criticisms was resignation of the government of D. Medvedev, which hadn't been able to solve a number of urgent problems, including those concerning the implementation of digital technologies in management, as well as the formation and implementation of the human capital of the country for the purpose of rapid social and economic development.

The problems of formation and development of human capital in some particular historical conditions were considered in a great number of works by foreign and domestic researchers. The formation of the modern theory of human capital and its segregation as a separate school of the world economic science took place in the late 1950s–early 1960s. The term “human capital” was first used by an American economist Jacob Mincer in 1958, and then by Theodore Schulz in 1961 [2].

The role of human capital in forming the long-term and sustainable economic growth was shown in the works of Nobel Prize winners R. E. Lucas, K. Pissarides, R. Solow and other prominent researchers. Thus, the Nobel Prize winner K. Pissarides, emphasizing the importance of education in human potential development, noted that the role and activity of the state policy should increase when dealing with investments into education. This is the sphere of investment efforts application, which provides the long-term positive effect of sustainable economic growth [3].

The influence of human capital on innovational processes was studied by outstanding economists, such as J. Schumpeter, La Pierre, P. Whitfield, R. Drucker, K. Knight, B. Twiss, etc. They are the authors of an important conclusion that the human capital becomes now a determining factor of development.

The concept of the digital economy and the mechanism of transition to it are considered in works of such Russian authors as G. N. Andreeva, T. G. Bogatyreva,

A. V. Babkin, S. Yu. Glazyev, V. A. Efimushkin, R. V. Mescheryakov, V. F. Minakov, A. V. V. V. Trofimov, V. A. Tsvetkov, E. V. Shkarupeta etc.

The study of the human capital of the Russian elite is dealt with in the works by I. A. Androsenko, A. P. Kochetkova, O. V. Kryshtanovskaya, and others [4]. Olga Kryshtanovskaya, head of the Elites Research Department in the Institute of Sociology of the Russian Academy of Sciences (RAS), writes in the introduction to her monograph “Anatomy of the Russian Elite” that the book is “about changes, that has taken place in the Russian society in the recent 20 years, about the elite, which initiated those changes and how it changed itself” [5]. The author arrives at the conclusion that “only the professionally trained political elite can become a source of creation and dynamic development of the state public management” [6].

14.1.1 Purpose and Objectives of Research

The purpose of research is analyzing the human capital of the Russian elite and its influence on the quality of state administration, and on the social-economic development of Russia in general.

To achieve this purpose the following objectives were set and solved:

- to analyze the level of digital government development in Russia;
- to study the results of implementing the human capital of the ruling elite in the Russian conditions.

14.1.2 Results of the Research

Political elite is a ruling group of the society, which is the upper strata of the political class. The term “political elite” means belonging to the higher privileged layer, which performs the functions of administration and influences the life of the society. Taking responsible, sometimes pivotal decisions, and showing the right way into the better tomorrow of the country, the political elite leads the other social layers and groups of the population. That is why on the quality of the human capital of those who take the most important managerial decisions, which deal with lives of millions of Russians, the vector and results of social and economic development of our enormous country depends on a great extent.

Comparing the actions of the political elite in Russia and its state administration, with those of China, South Korea, Japan, and other developed countries, and their actual results in economy and social sphere, including digitization of administrative technologies, we obtain the results, which are not in favor of Russia. Thus, the reforms of Deng Xiaoping, started in 1978, were successfully continued by his successors—Jiang Zemin (1989–2002), Hu Jintao (2002–2012), and Xi Jinping (from 2012 up to the present day). Using digital technologies, including those in state administration, China has performed an unprecedented spurt in economic development, having

gained a secure status is one of the strongest countries in the world economy. Nowadays China is one of the world's major economies, its gross domestic product (GDP) has increased in 40 years by over 50 times. The investment of China into the world economy has increased from 1.8 to 18.2% [7].

Today the statement about the substantial influence of technological changes on the economic development of the country goes without saying. According to the World Bank, the digital dividends (or results of digital transformations) are presented by the rapid growth of economy, business activity, new investments, etc. [8]. At the same time the implementation of digital technologies is accompanied by certain challenges, which the state and the society have to overcome for the successful implementation of digital economy:

- short-term decrease of labor productivity during the introduction of new technologies;
- decrease of the number of employed people due to technological unemployment (reduction in requirement for low-skilled workers and increase of requirement for the professionals, having the sufficient level of human capital: computer and information literacy, creative and innovative potential) [9];
- the temporary increase of income inequality during the period of improving the quality of human capital to the necessary qualification level;
- substantial changes in the regional structure of productive forces distribution, education-and-qualification and professional composition of labor force, the structure of basic production assets and fixed productive assets of organizations;
- substantial transformation of legislation in the sphere of intellectual property protection, improving the anti-monopoly legislation, etc.

For successful formation of digital economy the three efficiently functioning components are required [8]:

- (1) regulatory and legal framework, which would support competitiveness of enterprises and their entrance to the market, and would allow them using digital technologies for competition and innovations to the full extent;
- (2) skills, which are necessary for employees, businessmen, and government workers for using the opportunities of digital technologies;
- (3) efficient and answerable institutions, which would use the Internet for extending rights and possibilities of citizens.

An important factor of digital economy and society development is the sector of information and communication technology (ICT). According to the researchers, information technologies can provide from one quarter to one-third of the total volume of economic growth [10, p. 69]. At the same time, according to the data of the World Bank, the share of ICT in gross domestic product in OECD countries is about 6% and is significantly lower in developing countries. In the USA, where there are 8 of 14 of the leading in level of income high-tech companies, the contribution of ICT sector amounts to 7% of gross domestic product growth. This index amounts to 12% in Ireland—the country, where there is no their own Silicon Valley, but which is

Table 14.1 E-government development index of countries across the world in 2018 [11, p. 21]

Countries	E-government development index	Including subindices		
		online state services development	ICT telecommunications infrastructure	Human capital development
Denmark	0.9150	1.0000	0.7978	0.9472
Austria	0.9053	0.9722	0.7436	1.0000
South Korea	0.9010	0.9792	0.8496	0.8743
Great Britain	0.8999	0.9792	0.8004	0.9200
Sweden	0.8882	0.9444	0.7835	0.9366
Finland	0.8815	0.9653	0.7284	0.9509
Singapore	0.8812	0.9861	0.8019	0.8557
New Zealand	0.8806	0.9514	0.7455	0.9450
France	0.8790	0.9792	0.7979	0.8598
Japan	0.8783	0.8514	0.8406	0.8428
Malta	0.8011	0.8403	0.7657	0.7973
Israel	0.7998	0.8264	0.7095	0.8635
Russia	0.7969	0.9167	0.6219	0.8522

attractive for many foreign companies due to its competitive business environment and advantageous tax rates [10, p. 70].

One of the key trends of economy digitalization is the development of electronic government. According to the data of Economic and Social Development Department of the UN in 2018, Russia took the 13th position in countries ranking in E-Government Development Index (Table 14.1). This index is calculated on the basis of three parameters: subindex of online state services development; subindex of ICT telecommunications infrastructure; subindex of human capital development.

As follows from Table 14.1, our country is among the outsiders of this important process, which negatively affects the quality and results of public administration.

In 2018 Russia was taking the 32th position in the countries ranking in subindex of online state services development. In our country, this index made up 0.9167. The leading positions were taken by Denmark (1.0000), Australia (0.9722), South Korea (0.9792), Great Britain (0.9792), and Sweden (0.9444). In 2017 only 6% of state and local government bodies were using in their work Broad Band WL with access speed 100 mbps and higher, 23.9%—cloud services, 53.8%—web sites, 88.2%—Broad Band WL, 94.8%—Internet [12, pp. 58–59]. The main areas of using Internet by government authorities in 2017 were:

- (1) communications: contacting by e-mail—92.9%, video conferences—41.8%, telephone conversations via Internet—22.5% of government bodies;
- (2) personnel: professional training of personnel—44.5%, internal and external hire of personnel—23.2% of government bodies;

- (3) information resources: access to databases—33.6%, subscriptions for electronic databases and electronic libraries on a fee basis—23.1% of government bodies [12, p. 57].

In conditions of digital economy the human capital, both of the ruling elite, and the total human capital, and informational technologies play a pivotal role in ensuring the sustainable development of economy. In this regard, training the highly-qualified managers and specialists with account of market demands and up-to-date tendencies of digital technologies development, the efficient implementation of which brings about the acceleration of economic growth, increases the number of jobs and improves the quality of services, takes on particular significance. To use the potential of digital technologies to its full extent, the new specialists are needed, which would possess the up-to-date digital knowledge and skills, which would be capable of self-education and solving complicated tasks in a constantly changing environment.

But the data of domestic statistics indicate that the government authorities underestimate the role of digitization factor in providing economic growth. Thus, in 2013–2018 financial investments into research and development in the priority area “Information and communication systems” (as a percentage of total costs for research and development) remained the same—at the level of 8%; the relative share of households, having access to the Internet, grew in 6 years only by 9.4%—from 67.2 to 76.6%; at the same time the gross added value of information-communications technologies sector reduced from 2.7 to 2.6%. This can be seen in the Table 14.2 [11, p. 13].

As follows from the table, the insufficient attention of government authorities to the processes of informatization and digitization adversely affects the development of information and communications technologies. In the structure of Global Innovation Index, the figures of Russia are more than modest. According to the Cornell University Consortium, Business School INSEAD, and World Intellectual Property Organization (WIPO), in 2018 Russia took only the 46th position among 126 countries in Global Innovation Index, 22th—in human capital and science subindex,

Table 14.2 Main indices of digital economy development in the Russian Federation

Index	Year		
	2013	2015	2018
Internal costs for research and development in the priority area “Information and communications systems” as a percentage of total internal costs for research and development	8.0	8.2	8.0
Publications of Russian authors in the sphere of ICT in periodicals, indexed in Scopus database			
Total, units	3678	6798	11,727
% of global number of publications in the sphere of ICT	1.08	1.87	2.72
Gross added value of ICT sector in % to GDP	2.7	2.7	2.6
Relative share of households, having access to the Internet, of the total number of households (%)	67.2	72.1	76.6

63th—in the infrastructure subindex, 33th—in business development subindex and 47th—in the subindex of technologies development and knowledge-based economy [11]. This is shown in the Table 14.3 [12, p. 31].

Table 14.3 Indices of ICT of Russia and its position in the structure of global innovation index in 2018

Index	Russia		Leading country: Switzerland	
	Ranking position in the corresponding index	Value	ranking position in the corresponding index	Value
Global innovation index	46	37.9	1	68.14
Subindex 2. Human capital and science	22	48.4	5	64.0
Block 2.2. Higher education	19	49.1	16	54.8
2.2.2. Graduates of science and engineering courses	15	29.0	32	24.4
Subindex 3. Infrastructure	63	45.2	8	65.3
Block 3.1. Information and communications technologies	37	70.3	30	73.8
3.1.1. Access to ICT	45	72.3	7	88.5
3.1.2. Usage of ICT	46	61.3	2	88.8
3.1.3. State online services index	37	73.2	64	60.1
3.1.4. Index of population's electronic participation in taking policy decisions	32	74.6	70	57.6
Subindex 5. Business development	33	39.9	4	62.6
Block 5.3. Mastering of knowledge	35	38.1	9	53.3
5.3.3. Import of ICT services	28	1.8	5	3.7
Subindex 6. Development of technologies and knowledge-based economy	47	28.9	1	74.9
Block 6.2. Influence of knowledge	80	32.5	4	57.9
6.2.3. Software costs	48	0.3	3	0.8

As follows from the table, the position of the Russian Federation in the world ranking in a number of key indices is among low-performing countries (from 15 to 80th positions).

In the beginning of digitization era, the Russian ruling elites were wary of teaching digital technologies to the masses, believing that after mastering such technologies the Russian citizens would be able to expose their erroneous policy both in economy, and in the social sphere. By the way, the practice has confirmed those suspicions. By means of Internet and digital technologies of obtaining information millions of average Russian citizens began to better understand the policy, carried out by the elite, be less credulous to the propaganda in mass media, including the television. It should be mentioned that the distribution of new technological paradigm cardinally changes the whole system of managing global social-economic processes. Nowadays an average Russian citizen can get to know through the Internet, which part of the Russian elite is engaged in corruption, how many dollar billionaires there are in the country and by which means they gained their riches. And the usage of the so-called “smart voting” with using social networks made it possible in 2019 to put competitive pressure on the governing party in representative government bodies in some regions of Russia, for example, in Moscow.

Nowadays in Russia, which holds leading positions in the world in extraction and export of oil, gas, and other natural resources, about 20 mln of people are below the poverty line, according to official data [13]. And in fact, the number of poor and deprived Russians is several-fold higher, as such people should be calculated not by their meager incomes, but by whether they have real possibilities of getting education, maintaining their health, going on vacation, buying necessary clothes for themselves and their children, having balanced nutrition, etc. On these essential conditions, which determine the standard of living, the formation, development, and usage of human capital of a country depend to a great extent.

Only in several recent years, the political elite of the country has increased various direct and indirect taxes, duties, and fees, which aggravated the already difficult economical position of Russians. Thus, in 2018 the President signed the federal law about increasing the value-added tax (VAT) from 18 to 20%, which brings to the budget over 600 bln rubles or almost 10 bln dollars. The increase of VAT resulted in the new price rise in the country and in decrease of the actual earnings of the population. And after the property tax began to be calculated by the cadastral value, it became beyond the means of many average Russians. In recent years the administration of Putin has considerably (sometimes several-fold) increased tax rates not only of property taxes, but of land and transport taxes as well. While in 2015 these three taxes were bringing to the state treasury 178 bln rubles, in 2018 they were bringing 279 bln rubles already. In 2018 the government increased by 1.5–3 times the so-called “scrapage fee” on cars [8, 14–27].

The policy in the sphere of labor remuneration, carried out in Russia by the ruling elite, doesn't support the recovery, development, and accumulation of human capital. According to official data, several millions of employed citizens receive salaries, which are not above the subsistence rate—11.2 thousand rubles. Thus, in the published bulletin of the analytical center of the government “Working poor

in Russia and abroad" it is stated that one-sixth of all employees in Russia cannot provide themselves and their families. And according to Rosstat, the salary below 12 thousand rubles (\$187) in 2018 was received by 13 mln of Russians. The major share of poor in Russia are working people with children, which salaries don't exceed 2 subsistence rates, if they have two children, or 1.5 subsistence rate, if they have one child, said by Lilia Ovcharova, the director of the Social Policy Institute of NRU HSE. About 60% of all poor citizens are people of working age, 90% of them are employed [8].

Studying the quality of the human capital of the Russian political elite, one cannot pass over the high level of corruption, afflicting all the levels of government authorities, both in the federal center, and in the regions. Using their official positions for personal profit, officials in government, ministers, governors, staffers of the presidential administration, State Duma deputies through corrupt practices perform grand embezzlements from the state budget and other financial resources. This already refers to not only millions or even billions, but trillions of rubles. Thus, by the estimations of experts, in the recent 5 years (2014–2018) the federal budget has suffered a loss of over 7 trillion rubles [15].

14.1.3 Results and Discussion

Nowadays, digital economy is an efficient basis for developing public administration system, economy, business, social sphere, and the society in general. Formation of the digital economy is also the issue of national security and independence of Russia, competitiveness of the Russian companies, position of the country at the world scene for the long run.

For the successful development of digital economy in Russia the effective state policy aimed at overcoming the "digital divide" and stimulating the development of digital economy is needed. The key strategy in "digitization" of Russia should be the activity in developing the human capital of the ruling elite in accordance with the present-day developments and challenges, creating the electronic, and then the digital government, and the key initiative should be the formation of motivations and needs for "digital technologies" in representatives of state authority bodies, business structures and population. It is reasonable to enact at the country's level the project "Digital government of Russia—2025", in which the active role of the state in implementing and realizing the strategy of digital economy development, digitization of all spheres of activities, the active implementation of Industry 4.0, formation of necessary skills of both the ruling elite and all the stakeholders should be stipulated.

The country cannot be successful in digital economy development in conditions of deformation of the values-and-motivations component of the human capital of the ruling elite, lack of necessary statutory and regulatory base, and without the strategy of developing the economy, based on digital technologies. But no less important

is the formation of professional skills and the basic information and communications literacy, preparation for the professional carrier and facilitation of the lifelong learning and self-education.

14.2 Conclusions

The carried-out research allows the authors to make the following conclusions.

1. The elite, which is the core of the Russian political circles, is obviously recruited not by the meritocratic principle. The prioritized and the most influential of its segments is the administrative bureaucracy of the highest level, which represents the interests of the Russian corporate business. Their symbiosis acts, first of all, for their personal gains, and not for the public benefit. Today it becomes obvious that without the serious renewal of the Russian elite, the modernization and the further development of the Russian society is not possible. The positive effect from the renewal of the ruling elite is vividly proved by the 40-years experience of China, as a result of which it transformed from a backward country to a developed state with muscular economy.
2. Numerous facts indicate that the present-day Russian elite is bogged down in corruption. The characteristic features of its human capital have become the avarice and striving for profits by any means, ignoring the active laws and moral and ethic principles. Corruption has penetrated now into all state power bodies of public and municipal administration. This is indicated by numerous arrests and court sentences of staffers of the Presidential administration, ministers, members of the Federation Council and the State Duma, governments of regions, and mayors of cities.
3. The unreasonable economic strategy focusing on raw materials export, the erroneous economic policy, carried out by the present-day elite, the offshore economy, the adverse investment climate, high dependency on import, —these and other reasons confirm the unprofessionalism and incompetence of the most representatives of the Russian elite in the sphere of public administration, indicates their ignoring of economical laws. All this adversely affects the social and economic development of Russia, especially in recent five years, when the economic growth rates of the country are characterized with a neologism “aboutzero”.

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Chapter 15

Development of Supporting Women's Health for Indigenous Minorities of the Far East in the Second Half of 1950—The Second Half of the 1980s



A. V. Akhmetova and E. V. Klimova

Abstract The article is based on the unpublished and first introduced the problems of supporting women's health of ethnic minorities of the Far East in the second half of 1950—the second half of the 1980s into scientific circulation documents (The State Archive of Khabarovsk Krai (GAKHK), State Archive of Magadan Oblast (GAMO), State Archive of Primorsky Krai Primorsky Krai (GAPK)). The authors characterize this issue as a key problem in Soviet national policy regarding aboriginal public health during the second half of the 1950s and the second half of the 1980s. On the basis of the analysis of archival data first introduced in the scientific circulation, questions of the organization of birthing facilities, the organization of children's educational institutions, and medical aid to women and children were investigated. The reported study was funded by RFBR, project number 20-09-00023.

15.1 Introduction

The Soviet state was aware of the role of woman in all spheres of an aboriginal society's life, at the same time, it recognized her disempowered position and set the task of equalizing women with men, significantly changing the nature of family ties by supplanting the patriarchal way of life and private family life, and destroyed the principle of the inviolability of family ties, determined the place of a woman in public consciousness and her sociocultural appearance, involved her in a social production and development of her societal activity. A separate area of Soviet policy was the solution of protecting issues of women's health, motherhood, and infancy, social protection of women and children.

The health system of women of indigenous minorities of the Soviet period, in particular, the protection of motherhood and childhood, originated from the clash of various interests, both on the part of the state and society. From the point of view of the Soviet government, the protection of motherhood and infancy was a complex of

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state measures carried out with the aim of supporting motherhood, allowing a woman to exercise the right to protection if she fulfilled her duty to the state and society [1].

Motherhood is the most important function of a woman, that must be supported by a number of social guarantees. They include the organization and functioning of maternity and child welfare clinics, maternity hospitals, child welfare institutions, guarantee of paid maternity leave, etc.

15.2 Actuality

Supporting the health and medical problems of aboriginal people is directly dependent on the specifics of the traditional way of life and transformations associated with the introduction of the customs of other peoples into everyday lives and the industrialization of national regions. Nowadays, the orientation and mechanisms of human evolution as a biological object remain the same as in past millennia, but as a result of social and scientific-technological progress, the methods, rules, and timing of evolution are changed. Whereas previously a person adapted to the natural environment, now it is the socio-economic environment that is created by him.

The modernization of the system of supporting women's health of aborigines in the conditions of Soviet industrialization of the Far East is an integral part of the process of radical transformation of the traditional way of life of traditional ethnic groups around the world. In the XX century, the cultures of indigenous minorities were influenced by technological civilization, that exacerbated the problem of their further development's path. It actualizes the study of women's health of ethnic minorities of the Far East in the second half of 1950–the second half of the 1980s.

15.3 Materials and Methods

The current direction in modern humanities is the social history of medicine. Its representatives study medicine as part of the historical development of society. The most important category of this theory is medicalization. The founders of that concept supposed that government interference in the life of citizens would be much more effective if they shared the idea that that invasion was beneficial for the sake of supporting public health [2]. Such processes were characteristic of the period when the healthcare system was formed in the national regions of the Far East. Members of medical teams and medical expeditions performed not only their healing functions, but also they carried out educational, enlightenment events on the new way of life with the aborigines of remote areas, and they often directly agitated for the Soviet regime. Medicalization could be considered the most important mechanism for the development of minorities in the era of Soviet modernization, which had a disciplining effect on the local population and without using coercive methods involved it in the sphere of influence of the Soviet state.

The archival documents of the SACC, GAMO, and GAPK were used in the research, as well as materials of scientific research in the field of development of minorities of the Far East of the USSR [3].

15.4 Formulation of the Problem

The purpose of the research is to analyze the activities of the Soviet government in the field of supporting women's health of the aborigines of the Far East from the perspective of modern methodology in the second half of 1950 and the second half of the 1980s.

15.5 Theoretical Part

Women's health and illness are different from men's due to unique biological, behavioral, and social conditions. Biological differences vary from phenotype to cellular and they show specific risks for the development of poor health [4]. The World Health Organization (WHO) defines the term "health" as: "a state of complete physical, mental and social welfare, and not just the absence of diseases or ailments" [5]. Women's health is an example of the health of a population in a particular country or region.

During the process of medicalization of female reproductive health, an obstetrical science encompassed a woman's entire life period from maturation to pregnancy, childbirth, postnatal recovery and female diseases. The concept of "medicalization" is associated with an analysis of the role of medicine as an institution or discourse of a social control. The researchers focus on social problems, the power of the medical profession, and control [6, 7]. They describe medicalization as a social mechanism by which individual non-medical problems (social or "natural" phenomena) are defined as medical, in terms of illness or disorder [8, 9].

As part of the analysis of the medicalization process in Russia, it becomes obvious that domestic doctors do not have the degree of expert power and autonomy that allows them to impose their vision and control their implementation in other countries. The reason for this is the total control of the state over medicine. The obstetricians cannot influence the institutional organization of the obstetric care system and the conditions of their work. The work of Soviet obstetricians was characterized by a bureaucratization of responsibility. In that mode, doctors focused on performing administrative tasks and obeyed medical officials at various levels, it significantly complicated the performance of professional duties. The responsibility to the patient was not as significant for them as reporting to the administration. In those conditions, the practitioners constantly felt the pressure of the bureaucratic machine of the Soviet health care system. The patient had to obey the rules established by the medical institution (including bureaucratic ones) and the instructions of doctors. There were

no influential medical professional organizations, such as the pirogov society in the pre-revolutionary period [10].

In the post-war years, the Soviet government took measures to strengthen the family. While maintaining the strategic party line, tactics changed for the implementation. As a result, the situation of women and children had changed in the direction of increasing legal and economic guarantees, a public attention had been drawn to the problems of motherhood and childhood, the good conditions had been created for combining family responsibilities with production and public employment, the economic measures had been taken to improve the material living standards.

A national family was the most important institution for the development of indigenous societies in the context of the implementation of the Soviet policy modernization. The aboriginal women and children became the instrument of support for the Soviet system. It led to the active participation of women in a political life. In the post-war period, the Soviet state paid a special attention to the problems of health care and the education of the indigenous minorities of the Far East.

15.6 Practical Part

In the post-war period, the improving of medical and sanitary services of minorities in the region was an important task for the Soviet government. The malnutrition, difficult working conditions, widespread alcoholism, and the lack of qualified medical care had become the factors in the growth of morbidity and mortality of aborigines. As early as 1944, the Chukchi statistical office noted that the indigenous population was dying from tuberculosis, it affected that almost half of the aborigines were ill [11]. In the Chukotka Autonomous Okrug, the mortality rate was higher than the birth rate, it reached—minus 1.2%. The Chukchi had a very high infant mortality, it was 68%, the Evens—43%. Due to constant contacts, with the infected relatives and neighbors, the surviving children were often subjected to various skin and infectious diseases, different forms of tuberculosis. A similar situation was typical for all areas of the region. The head of the AGO had cited figures confirming the annual reduction in the number of aborigines in his reports to the regional authorities on the population living in Kolyma [12].

According to the results of medical expeditions to Chukotka in the late 1940s and early 1950s, “before it a woman gave birth in a yaranga, during childbirth she had the right to have the oldest woman of camp. The woman had a very strange position during childbirth: she sat on her left leg bent at the knee and with the heel of that leg propped up her red-footed falcon, while the right leg was in a straightened state and was pulled forward and to the side. The woman giving birth placed her hands on the upper abdomen, and it was the position when the birth took place. After childbirth, they washed a child in urine (!) and took a child out for some time at any time of the year. And now we have to meet a pregnant woman who came to us with a request to determine the gestational age and say whether her pregnancy is proceeding correctly. And to our question where she will give birth, we get the answer: “I’ll go

to Lavrentiy, to the hospital, I'm afraid to give birth at home, they will help there, but there is nobody here" [13].

In 1956, the Magadan Oblast Executive Committee issued a decision "On the status and measures to improve maternal and child health in national areas of the region". Home birth was considered an unacceptable phenomenon, because of it the perpetrators were brought to justice [14]. A pregnant woman went to specially equipped places where they received the skills of care for infants. It was recommended that mother and child in the first year of life of the child remained under the supervision of specialists. Such measures had provoked the widespread protests according to the prolonged separation of the mother from her family, while at the same time that had reduced a child mortality.

Medical care for pregnant and gynecological patients was provided by obstetricians working in women's clinics, obstetrical-gynecological offices, and midwives of feldsher-obstetric centers. Pregnant women were registered, while the early appearance at the medical staff remained quite low and it reached 57%.

There were no cases of childbirth at home among the indigenous population during 1962–1963. On 1 April 1960, the period of women's staying in the hospital was extended to 1 month [15]. But in practice, that period was rarely maintained and averaged 16 days. In some cases, newborns were observed in the maternity ward up to a month, it was characterized by bad living conditions or poor health of the child. The short staying of women in the hospital was due to the fact that most of them were mothers with many children, and husbands were often absent at home, they were engaged in hunting and fishing. When women were discharged from the maternity ward of feldsher-obstetric centers they received a free "dowry" (clothing, set of linen) for a newborn. During that period, the number of medical and obstetric offices for pregnant women increased, for example, in the Koryak national district—from 62 to 72.

At the same time, despite the improvement of medical services, mortality among children up to one year from national areas was high, and there was no tendency to decrease it. On the contrary, the growth of mortality was characteristic until 1962, while the infant mortality reduced annually in the region. For example, in 1960, the mortality rate of children under one year in national regions per 1000 births was 58.0, the same rate throughout the Khabarovsk Krai it was 37, and in 1963—43.4 and 30.8, respectively. The causes of high child mortality were revealed, there were mainly non-compliance with basic sanitary and hygienic requirements, poor nutrition of children under 1-year old, and insufficient pediatric monitoring.

But at the same time, the birth rate was at a relatively high level. For example, in the Chukotka Autonomous Okrug in 1960, 39 children were born per 1,000 inhabitants, it was more than the national average [16].

By an Order of the Council of Ministers of the RSFSR 1964, the degree of success was achieved were in the medical care of minorities (the growth of the Health Institutions Network, the improvement of the work of mobile medical centers, the improvement of ambulance, etc.), but the Ministry of Health of the RSFSR and local authorities received a task "Take the necessary measures to eliminate serious disadvantage in medical services and protect the health of the population of the Extreme North

regions and remote localities, strengthen the material base of medical institutions, equip them with necessary machinery and vehicles, staff medical and children's institutions with doctors and other health workers" [17].

The task was set to ensure the full coverage of children with small and calming forms of tuberculosis and children with tuberculosis intoxication by sanatorium-and-health institutions, conduct the preventive work with people who had constant contact with patients in the areas of tension of tuberculosis infection, mandatory tuberculosis vaccinations of the uninfected population. The analyzed resolution obliged the local authorities to take measures to supply medical institutions with fresh meat for reindeer herding farms and collective farms throughout the year, to increase the rate of milk delivery per child in boarding schools to 500 g [17]. There was a large stratum of the indigenous population, the tuberculosis vaccination of newborn children ranged from 95 to 100% in most areas of the North.

The tuberculosis patients, from the national areas, were sent for treatment in sanatoriums and children's institutions of a sanatorium type.

Only for 1963 and 10 months of 1964, 256 adults, 6 adolescents, 111 children went to the sanatorium; patients with osteoarticular and other forms of diseases: 28 adults, 4 adolescents, and 30 children. In addition, 30 children went to a sanatorium boarding school in 1964 [18].

The number of women's and children's consultations in national areas had tripled during that period, it played an important role in improving the preventive work. By 1966, the number of women's and children's consultations had increased to 97. Over 60% of women in the national areas of the Far East gave birth in treatment facilities [19].

The protection of motherhood and childhood is legally reformed in the Constitution of the USSR in 1977. As a result, the public policy in the field of strengthening the family had acquired a systemic character. Article 42 of the Constitution guaranteed the right of citizens to health protection, including emphasizing special care for the health of the younger generation. Article 53 was firstly introduced in the Basic Law of the country, it guaranteed that "the state takes care of the family by creating and developing a wide network of childcare facilities, organizing and improving the service of public services and catering, paying allowance for the birth of a child, providing allowance and benefits for large families, and other types of allowance and assistance to the family" [20].

It was guaranteed that social measures were taken to protect labor, legal, moral, and material support for motherhood and childhood in the USSR. A list of excluded professions for women for protecting their health had been established. The working conditions for women in industry were allowed only according to the physiological characteristics of the female body. The legal protection of motherhood and childhood with the improvement of relations in that area corresponded to the international legal standards.

15.7 Conclusion

Therefore, in the period 1950–1980s, the living conditions of indigenous women were improved, many problems in the field of supporting the women's health of the peoples of the North were solved or were in the process of implementation, for example, the construction and repair of the first-aid posts in remote areas, equipping them with medical machinery and apparatus, quantitative and qualitative growth of staff, usage of national personnel, attracting national cadres, health education, etc. [21].

It should be noted that the general positive trend in Soviet politics was aimed at strengthening the family ties. It was manifested in a change in the position of women and children in the direction of increasing legal and economic guarantees, raising public awareness to the problems of motherhood and childhood, creating good conditions for women to combine family responsibilities with production and public employment. The economic measures were taken to increase the material standard of living of the population, the construction of a large number of nurseries, kindergartens, schools, civil construction increased, it was difficult, but the real estate problem was solved, especially in the regions of the North, the large construction projects. Legislative measures had been developed to guarantee the woman's labor, political and economic rights, providing her with various kinds of benefits and advantages that protect the work of a pregnant woman, mother, and woman.

It should be mentioned that no matter what negative consequences the absolutization of the role of the state in the life and work of a man had, the state nature of the system for protecting mothers and children had become a determinant in preserving the life and health of the children of the Soviet Republic.

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Chapter 16

Banking System of Russia in Context of Spread of Coronavirus Pandemic



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Abstract This article evaluates the situation in the Russian banking system under the current world economic crisis due to the coronavirus pandemic. It presents a comparison of the causes of the current and the previous economic crises, investigates state support measures, and the consequences of the crises of 2008–2009 and 2014–2015 for the Russian economy. It claims that this time the banking system was better prepared than previously. The authors identify the key problems for the banking sector in the current situation. The possible consequences of implementing various scenarios for banks are assessed. Further, the authors analyze the state support measures for the banking sector implemented by the Bank of Russia. The article stresses the importance of the banking system for the country to overcome the economic recession caused by the crisis. The article also underlines that state support had a positive effect on the country's companies. The authors analyze the long-term development prospects of the Russian banks and their current activities. Key development areas for the banking system are identified, including the transformation of the range of services rendered and the new forms of interacting with the customers. The research was carried out on the statistics from official sources in Russia and abroad, as well as the academic writings of Russian experts. With a view to the abovesaid, the authors conclude that state support has a decisive effect on the process of overcoming economic crises and increasing the competitive edge on the global market.

16.1 Introduction: Relevance and Purpose of the Study

Crises in the global economy have been registered by various experts throughout several recent years. Structural problems connected to the disbalance between the development of the financial sector and the real economy, “bubbles” in the stock and real estate markets, the increase of debts, both state and household, trade wars—all of these phenomena made the new economic crisis not just possible but rather pending. Nonetheless, it broke out unexpectedly for the governments of all countries. The

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reason for that lies in a unique combination of different factors if viewed historically. Simultaneous and steep decrease of oil prices and the overall reduction of demand both in the international trade and in domestic markets caused by the border closure and the lockdown induced by almost all countries slowed down the global economy dramatically. The depth of its drop will depend, first of all, on the duration of the lockdown and countries' self-isolation.

In the context of the current global economic crisis, it is yet difficult to employ any clear statistics. The situation changes by the day, and the analytical forecasts published by different experts lose their relevance within a few weeks and need constant adjustments. Valid statistics are almost nonexistent, and this also refers to the academic articles explaining the current situation. Due to this, the purpose of this article is to determine the state of the Russian banking system at the current moment, including the actions taken by the state to support its sustainability and operation in comparison with the crises of 2008–2009 and 2014–2015.

16.2 Background of the Study and Research Methodology

The preceding crises analyzed were different. While the crisis of 2008 was a global one and it was caused by the estate debt repudiation in the USA, the crisis of 2014 was Russian only, and it was caused by the political sanctions against the Russian Federation due to the events in Crimea and Ukraine, which led to a liquidity outflow from the Russian banking system. In both cases, the situation was aggravated by the decrease in oil prices and the depreciation of the national currency. In 2008, the ruble showed an average depreciation of 72%, and in 2014, 20% (e.g., at the date of writing this article, in April 2020, the ruble lost 20% of its value) [1]. The inflation equaled 13.28% in 2008 and 11.36% in 2014 [2]. According to the IMF, the reduction of the GDP in 2009 as compared to 2008 equaled 26.6%, and in 2016 as compared to 2013, 44.1% [3].

The research presented in this article is based on the use of general scientific methods, including the analysis, synthesis, and analogy. At the theoretical level, the historical method is used along with abstraction and generalizing. At the empirical level, the work relies on the comparison method.

16.3 Review of Scientific Publications and Research Study

The authors used the publications of Russian researches specializing in banking system operation and its interactions with the government as the theoretical basis for this research. Among the research, characterizing the economic crises of 2008–2009 and 2014–2015 and describing the ways of overcoming previous crises, the authors can specify several publications [4–11]. The discussion of state support actions, their relevance, and impact assessment for the banking sector were presented in [12–20].

The works listed analyze the state of the banking system, its resilience against the credit portfolio crisis, the deterioration of bank asset quality, and liquidity crises. They also specify the impact of the crisis duration. The authors can specifically mention a research paper considering the problems and opportunities of organizing remote banking services [21]. The few newly published research works dedicated to today's financial crisis are of special interest since they also address its epidemiological nature [22, 23].

The empirical basis of this research is the analytical and regulatory documents from various organizations that contain relevant statistics and strategic data. The paper mostly makes use of the official data from the Bank of Russia (<https://cbu.ru>), the International Monetary Fund (<https://www.imf.org>), and Russian rating agencies.

16.4 Research Findings

The main difference between the current crisis and the previous ones is that it was not caused by the problems in the financial sector but is a consequence of a global crisis in the real sector of the world economy. The Russian economy suffers significant losses due to the steep decrease in export income, logistics problems, and the overall reduction of demand. This leads to inevitable losses for the Russian banking system associated with the realization of loan risks due to the problems faced by the lenders, especially those from the most affected sectors, such as transport, trade, hotel, and restaurant businesses. The increase in the overdue debts and the reserve volumes for loan security is inevitable. The quality of bank assets shall deteriorate as well.

By the beginning of the current crisis, the state of the Russian banking system can be classified as being significantly better than during the preceding shocks. The number of banks reduced greatly, and small, unsustainable, or criminal organizations left the market. The concentration of bank assets increased in a relatively small number of banks, mostly with state participation. The profits of the banking sector in 2019 amounted to 2 trillion rubles, which is a record value. The liquidity of the banking sector also remained high due to a significant volume of deposits. All of this makes us expect that the financial stability of Russian banks will help them survive the crisis.

This optimistic scenario can be valid if its severe stage lasts no longer than the first six months of 2020. If that is the case, experts forecast that bank profits will drop by 10% and start to grow in 2021 already. If a long-term struggle scenario develops with the severe crisis lasting over the whole year of 2020, the losses will amount to 900 billion rubles with possible profits in 2021 only. The preservation of capital sufficiency, however, even in the most pessimistic scenario, will remain well higher than the standard. Experts do not see the increase of bank capitalization as a necessary measure of state support [24].

In 2008, the state funded the country's banking system through the VEB and some of the largest banks. That being said, Sberbank received loans to the tune of 500 billion rubles, following Federal Law No 173-FZ Concerning Additional

Measures to Support the Financial System of the Russian Federation. In 2014, the amount of state support paid to banks was 1.7 trillion rubles. Currently, the state has not started increasing the capitalization of the banking system, and its main focus is on the implementation of regulatory measures. The head of the Bank of Russia, E. Nabiullina, at an online conference of 20.03.2020 claimed that “Today, we have taken several measures, regulatory derogations <...> It is not necessary to increase capitalization. By the way, we perform stress testing and we keep performing them in order to see how the entire banking system and individual banks are going to act under the riskiest scenarios. The stress test results show that the system is stable, and the existing problems, if any, are isolated—only some specific banks have them. We don’t think it is necessary to increase capitalization, and no one asked us to do that” [25].

Thus, at the moment, the majority of measures aimed to support the banking system are represented by regulatory derogations, which allowed banks [26]:

- (1) Not to re-evaluate securities in their possession, thus avoiding the losses due to their depreciation on the stock markets;
- (2) To use irrevocable credit lines from the Bank of Russia on more favorable conditions. The interest rate has been decreased and the standards limiting the credit line size have been relaxed. This will help the banks increase their liquidity in case of a prolonged economic downturn;
- (3) To freeze the exchange rate for operations in six main currencies in the statutory ratio of 01.03.2020, which will allow them not to break the ratio. The recent and significant reduction of the foreign exchange holdings of the banks will help them protect against the volatility of the currency markets in the current situation;
- (4) To keep the service quality evaluation for the loans provided to small and medium enterprises on the current level in case of the borrower’s financial situation aggravates. Besides, the Bank of Russia granted 500 billion rubles to refinance the obligations of small and medium businesses in order to maintain the crediting volume;
- (5) Not to make reserves and not to uplift the payment for the restructured loans taken out by natural entities if their financial situation gets worse because of coronavirus;
- (6) To reduce the risk multiplier uplifts for mortgages, which will give the banks a possibility to continue loaning without prejudice to their situation;
- (7) To postpone the introduction of standards for fund reservation and acquisition or takeover transaction security;
- (8) To change the commencement dates for various capital sufficiency standards and reports.

These measures will help the banking system to go through the crisis more smoothly. They are also aimed at maintaining the full volume of crediting and have a positive effect on the financial situation of creditors. The support actions taken as of today are temporary. It is possible that in case of a prolonged economic downturn, the state will have to prolong and expand the support measures for the banking sector.

The aforementioned regulatory derogations for banks facilitate, including, but not limited to, the transfer of a portion of their personnel to the remote working mode. The majority of banks have already transferred all of their employees, whose presence in the office is not vital, to remote work from home. In the companies like Sberbank, Gazprombank, and Rosbank, the number of employees working in such a way currently exceeds a half of the entire staff. It became possible due to the preliminary preparation of software and network equipment in accordance with the information security requirements for banking activities. Besides, the Bank of Russia has developed recommendations for financial organizations concerning cybersecurity in the context of the coronavirus lockdown to reduce the transaction risks [27].

The reduction of bank profits associated with the crediting volume, as well as fee revenues, calls for a transformation of banking business, finding new growth areas, and a change in the development of banking services. The establishment of partnerships between banks and other organizations (e.g., retailers and providers of non-banking services like entertainment, travel, sports, etc.) is becoming a trend and promises good prospects for all of the participants. With programs like these, banks will be able to promote their products more efficiently and attract more clients. The programs aiming to help banks promote a larger range of financial services in partnership with insurance companies and stock market players also seem promising. Besides, one can observe a trend for the reduction in the number of banking offices and transition to remote and mobile customer servicing. Banks develop and update programs for remote customer servicing that improve the quality of services rendered, make them more available, and cover larger groups of the population. It also helps the banks to reduce the office and personnel costs. At the same time, such actions require investment in IT, which not all the banks can afford. Specialists underline a significant difference in digitalization between smaller and larger banks. The advantages of digitalization make the share of large banks in the financial sector even bigger. Thus, in 2019, the online sales of the top one hundred Russian banks were 22%, and the rest had only 9% [28]. The customer demand in the quality of services rendered is increasing simultaneously. Previously, the main bank selection criterion for customers was the transaction commission. Nowadays, other things become more important, such as the convenience, the speed of transactions, and extra services that customers can get from a specific bank.

16.5 Conclusions and Recommendations

The measures taken by the Bank of Russia after the crises of 2008–2009 and 2014–2015 helped reduce the bank currency crediting, significantly reduced the volume of currency liabilities toward non-residents, as well as the aggregate debt of the banking sector. Banks whose financial position was not stable enough left the market. This fact and banks' own experience received during previous crises make us assume that they will be able to overcome the current problems. At the moment, it is impossible to assess the depth of the global crisis and the subsequent reduction of Russia's GDP

in the future. This crisis affects the economy of all countries, and the efficiency of state policies can only be assessed afterward through the additional competitive edge on the global market received by some countries and the withdrawal of the others.

It is hard to forecast how fast the post-crisis economic recovery will be and which form it will take. Only one thing is certain: the reasonable policies of the Bank of Russia, as well as the timeliness and flexibility of the support provided to the banking system of the country, become crucial these days. State support for the country's economy implemented via banking institutions shall help us overcome the crisis with minimized losses and facilitate the quickest mitigation of its consequences possible.

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Chapter 17

Digital Economy and Its Role in the Development of Online Higher Education



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Abstract The term “digital economy” has been widely used not only in theory, but also in practice. However, the scientists have not yet reached agreement of opinion about the interpretation of the concept. In the present paper, the authors give definitions to the following concepts: digital economy and digitization of education. Besides, the authors have analysed the main advantages and disadvantages of online education and investigated the influence of digital economy on the development of online higher education at universities. The present investigation used such general scientific methods as: observation, descriptive research and modelling. The significance of the paper is determined by the fact that nowadays there is not enough investigation devoted to the theme of the influence of digital economy on the development of online education. The authors state that digitalization of economy directly impacts the development of online education. For example, there appear a lot of new knowledge, abilities and skills that an employee must possess, and there develops active interaction between business sphere and educational institutions due to the need in regular training of employees on the job. Besides, qualified employees and

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the complex of all the correctly organized interconnected processes determine the successful transition to digital society.

17.1 Introduction

Digital economy is rapidly developing which is determined by overall application of information and communications technology. Digitalization is literally penetrating all the spheres of people's life: social networks, online orders, electronic commerce, Internet marketing, online education and so on. Online environment is becoming an essential part of life of any person irrespective of his/her age, educational background, profession or status. Therefore, the process of digitalization is becoming one of the innovative trends of the development of contemporary economy. We witness the transition from implementation of separate digital technology elements to the complex building of digital system in the framework of national and world economies. Due to that there appears the need for the efficient and rational interaction of all the participants of digitalization process—government authorities, business sphere, industrial and agricultural sectors, financial structures and, certainly, educational institutions.

17.2 Research Rationale

The rationale of the present research is determined by the inevitable transition to digital economy, giving the main role to highly qualified specialists. That is the reason why the essential part of work of any educational institution is the proper establishment of educational environment at the age of high-technology systems. It is worth mentioning that the authors consider that educational process comprises not only the hours of direct interaction with students but the whole system of intramural interaction at the university.

17.3 Scholarly Importance of the Issue

An American information scientist Nicholas Negroponte was first to use the term “digital economy” in 1995. However, he did not give the exact definition to the term, he merely used it as a figural expression [1].

Then followed the digital economy investigations conducted by such scholars as: Bahl [2], Brynjolfsson and Hahnen [3], de Reuver et al. [4] and others [5–14].

We should point out the investigations of such Russian scholars as: Kulkov [15], Urmantsev [16], Norets and Stankevich [17], Sudarushkin and Stefanov [18], Alekseev [19], Vasilenko [20].

It can be concluded that the above-mentioned authors agree that digital economy is a specific part of economic relationships based on information technology.

Among the investigations in the sphere of digital education, we can emphasize the scientific contribution of Zavyalova [21], Lukashenko [22], Andaev et al. [23].

17.4 Setting the Objective

The main objective of the present research is to investigate the influence of digital economy on the development of online education under contemporary conditions. For that purpose, the authors have analysed the main development trends of online education market, studied its strong and weak points and gave definition to the concept of “digitalization of education”.

17.5 Theoretical Part

The scientists have not reached agreement of opinion concerning the interpretation of the concept of “digital economy”. Besides, Russian scholars in their papers often substitute the following synonyms for this term: “API economy”, “the new technological structure of the world”, “electronic economy”, “applications economy”, “creative economy”.

We consider that digital economy is a complex of technological, informational and communications technologies, which can be effectively updated and adjusted due to constantly changing factors under the conditions of economy globalization and the development of online environment.

Digitalization of all the social spheres of life takes a great deal of effort. For example, digitalization is a hot button issue at many economic forums, and large-scale governmental programmes are devoted to this theme.

As it has been stated above, the digitalization relates to absolutely all the fields of activity, which is shown in Fig. 17.1.

Nowadays, under the conditions of global digitalization, the role of universities in educational sphere is rapidly changing. Higher educational institutions of the whole world are actively competing for the best teachers, students, research grants and minor educational programmes.

The world digitalization makes it important to transfer to the new system of education, which includes active application of information and communications resources.

We consider that the first prerequisites of digitalization of the Russian education were the implementation of several thousands of the first Soviet personal electronic computing machines into educational sphere in 1985 and implementation of the general course on informatics and computer hardware basics in secondary schools.

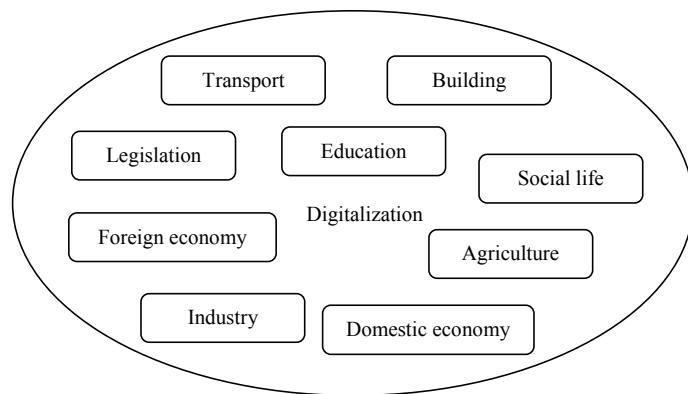


Fig. 17.1 Influence of digitalization on all the fields of activity

The digitalization of economy makes it necessary for employers and employees to adapt to the new conditions, namely to constantly improve their skills, knowledge and abilities. Thus, every employee strives for self-improvement and training in order to get more advantages at an extremely competitive job market. Consequently, successful functioning and development of digital economy demands that the system of education and retraining must provide the economy with specialists who meet the requirements of the digital age.

The authors have come to the conclusion that the countries, which will be able to adjust their educational infrastructures for the new requirements, will be able to significantly strengthen their economic position at the world market during the transit to the digital economy. Therefore, Russia stands a good chance to maintain its competitiveness by upgrading educational system and the system of retraining of workers [21].

We can point out the main areas of digitalization in educational sphere, they are:

1. Reforming in the sphere of education (fixing the norms and opportunities of applying online teaching);
2. Creating and development of research centres for conducting fundamental investigations;
3. Retraining academic staff and their additional training with the purpose of successful development and implementation of online teaching;
4. Fulfilling priority tasks of digital development of education;
5. Development of digital infrastructure.

It is worth mentioning that thanks to the activities being conducted, and the digitalization of online education is getting more and more popular every year. That can be proved by the data, as shown in Figs. 17.2 and 17.3.

However, in spite of the world tendency towards the development of online education, the authors state that this system has both its advantages and disadvantages (Table 17.1).

Fig. 17.2 Number of courses available at open educational platforms

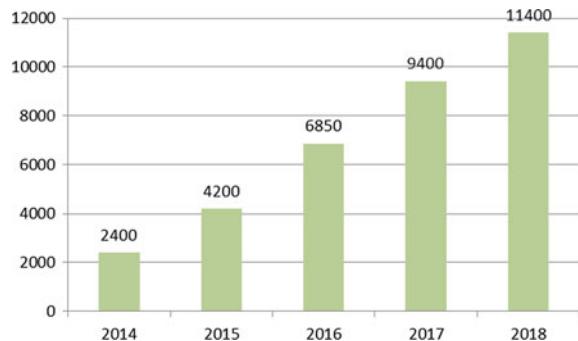
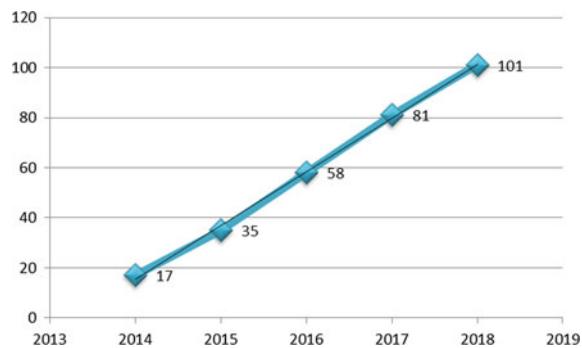


Fig. 17.3 Number of users of open educational platforms, mln people



Therefore, an educational institution must comprehensively assess and investigate the possibilities of implementation of online teaching, and try to develop high-grade digital courses, striving for their quality, not quantity.

On the basis of the conducted analysis, presented above, the authors give the following definition to the concept of “digitalization of education”: it is the process of transition to the digital platform of teaching by means of applying online courses and leading technology, and on the basis of educational standards and competency building patterns, with correct and timely interaction among all the subdivisions of an educational institution.

In conditions of digital economy, the job market is dramatically changing, we often witness the process of robotic application (replacement of human resource by a robot, computer technology and so on). Thus, people are beginning to attach significance to the concept of lifetime education, which is based on online education and which is continuous (studying at any moment of time, possibility to take additional courses on the job). But for the lifetime education to become a norm of social life, we must skilfully build up the structure of online education and foster digital literacy in the society.

Also, one of the tasks of the effective employment of human capital in conditions of digitalization of economy is involvement of the bigger circle of people in productive activity, considering the levels of their education, qualification, mobility and other

Table 17.1 Strong and weak points of online education

No.	Strong points of online education	Weak points of online education
1	Flexible schedule for students	Not all the subjects can be turned into online course
2	Remote education for disabled people and people on the job	No possibility to get the instant explanation of the necessary information from the teacher
3	Studying at any higher institution of the world	No personal development in social environment
4	Opportunity to get several professions simultaneously	Difficulties in control over the students' self-study
5	Using video and audio content of online courses allows students to perceive more information	Need for regular updating of online courses
6	Increase in number of students	Rise of unemployment due to reduction of academic staff, because guiding online courses requires less number of employees
7	Additional money inflow in higher educational institutions due to increase in number of students	Online communication with students requires more time resource
8	Convenient work schedule for teachers	Students are getting limited thinking due to standard ways of assessment of their progress in a subject
9	An opportunity to take retraining courses and advanced training courses on the job at any educational institution of the world	Need for special training of staff and purchase of the equipment and software
10	The access to online lessons is not limited in time (possibility to study the material several times)	Decrease in quality of teaching subjects and, consequently, loss of the competitive edge by graduates

factors. That will provide for the flexible forms of employment (part time job, flexible hours, side work). We can refer the following people to the human capital: students, pensioners, women on a child rearing leave, disabled people.

That is why digital economy demands not only “digitalization” of some materials, courses and books from online education, but also the changes in complex approach which must set new goals, modernize the structure and content of educational process.

17.6 Practical Relevance

In conditions of contemporary life, in order to understand the economic and social effect from digital technology for business and society, it is necessary to develop adaptability and study skills of workers. The capacity for constant study and readiness to get new knowledge by means of modern technology are becoming the main

competence. That is the key factor for a successful and professional growth in a contemporary digital world. A good worker today is a confident user of various gadgets, a user who has necessary competence for efficient activity in conditions of digital economy (including the spheres of education, culture, research, defence and security), and a user who refers to the digital environment and digital tools in his/her activity as a student and as a professional.

The influence of digital economy on the sphere of education provides everyone with individualization, personalization, availability and effectiveness of education, including the following:

- Educational results achievable by any citizen, including people with reduced capabilities;
- Motivation for every student;
- Providing with educational elements offering an opportunity to unlock individual abilities and talents to the maximum.

17.7 Conclusions

Digital economy is not only the spread of digital technology, the changes connected with it are much more profound. For example, there develop new online services (insurance, enhanced features of Internet banking, opportunity to do online shopping from any place of the world), there appears an opportunity for people on the job to get education at any university of the world.

Nowadays, the sphere of digital education is rapidly developing. A lot of higher educational institutions are turning to digital resources, developing their sets of lectures and courses and switching to the mode of “electronic education”. As any project, online education has its strong and weak points. It is worth mentioning that one of the biggest advantages of such education is process continuity, even in force majeure circumstances (today’s bright example of that is imposing lockdown in many countries due to the large-scale spread of coronavirus disease). Besides, the level of applying information and communications resources by today’s students shows that educational process must move with the time, meaning that the transition to online education is inevitable.

The authors hold an opinion that the process of digitalization of education is definitely connected with digitalization of economy in general, but it has its particular features. The correct development of online education cannot accept a trial-and-error method, because teachers work with the main capital—human resource. For economy, the main losses are expressed in money, whereas for educational process, the main loss is the loss of knowledge.

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Chapter 18

Using Audiovisual Aids to Develop Communicative Competence in Aviation English



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Abstract The article deals with the development of communicative competence in the process of teaching Aviation English. Special attention is given to audiovisual means as an effective tool that has a positive impact on the organization of the learning process, making it clearer and more focused. The main objectives of the paper are to study the theoretical bases of the communicative competence formation of the future military pilots with the help of audiovisual aids and the way it can be performed in the multilevel classroom. The results show that communicative language teaching (CLT) is the core method used today to gain experience and knowledge necessary for successful activity in the professional sphere. The most important skill is considered to be the skill to perform radio negotiations between the flight crew and the air traffic control services to interact with the colleagues during different peacekeeping operations, joint exercises and maneuvers. The findings concerning multilevel class teaching have direct practical relevance.

18.1 Introduction

Language proficiency requirements for air traffic controllers and pilots were introduced by the International Civil Aviation Organization (ICAO) to reduce communication errors and provide safety of flights. English language proficiency at Level 4 and above is required for all pilots flying international routes and air traffic controllers serving international airports [1]. The ICAO language proficiency scale ranges from Level 1 to Level 6 in pronunciation, fluency, structure, vocabulary, comprehension and interaction. That is why in the course of Aviation English, all the training activities and the content of materials should promote communicative skills.

The Aviation English course objectives for future military pilots are determined by the necessity to use English in both every day and professional communication.

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Though there is no goal to prepare cadets to pass the English language proficiency exam at the end of the course, they should be able to read, understand and discuss aviation-related professional issues. The content of Aviation English course for military pilots reflects the necessity to use plain English to clarify, paraphrase, provide additional information and understand standardized phraseology of radiotelephony.

The paper deals with teaching 3rd year cadets of Krasnodar Air Force Institute for Pilots. It is oriented at the training activities based on interaction, group problem and resolution activities to develop fluency skills. The program of the course includes six topics, but we have taken *Airports and Airdromes* as an example. The content and the variety of exercises give an opportunity to enlarge the vocabulary and practice grammar structures through oral use rather than writing exercises and prepare cadets for the course of radiotelephony. We pay special attention to the usage of audiovisual means for developing communicative competence. Interactive listening comprehension exercises elicit oral responses from learners and teach them to summarize the information and give details about the content of the video they watch.

18.2 Communicative Competence in Aviation

The problem of foreign language proficiency has been essential since the second half of the XX century due to expanse of international co-operation and building up a concept “Europe without borders.” One of the key aspects of this concept is foreign languages spreading and learning around the world. Since 1970s, Council for Cultural Co-operation in Europe has intensified its work on foreign language communicative competence model and developing foreign language threshold levels on its basis. There was adopted a document under the title “Modern languages: learning, teaching, evaluation. European foreign language communicative competence” (Strasburg, 1996). Communicative language teaching (CLT) is the core method nowadays in the sphere of methodology since it emphasizes interaction as both the means and the ultimate goal of learning a language. Despite a number of criticisms [2], it continues to be popular, particularly, in most Asian countries and Europe [3].

Communicative language teaching is the approach, which focuses its attention on building up language acquisition and comprehension of foreign speech by the students as well as understanding linguistic material for making up utterances. Communicative language teaching in the field of foreign language training is intended to teach students to freely navigate in a foreign language environment and to react properly in different communicative situations [4]. For this, the primary task of a teacher is to develop communicative competence in the sphere of a foreign language environment. According to Zimnyaya, competence is “actual, personal quality built as a quality based on knowledge, an intellectual and personally-related socially-professional characteristic of a person, his personal quality” [5]. The term competence means that a person has experience and knowledge necessary for successful activity in his professional sphere.

Communicative competence can include the following aspects:

- Knowledge of how to use a language for different purposes and roles;
- Knowledge of how the language changes depending on this or that communicative situation and on the participants in this situation (for example, knowledge of the differences between formal and informal speech, oral or written speech);
- Ability to create, read and understand texts of different types and sorts (for example, stories, interviews, dialogues, reports);
- Skills to communicate even with a limited vocabulary and grammar base.

To form communicative competence, methodologists have made up various methods and exercises. Having analyzed them, we conclude that the most relevant are the following ones:

- The method of information imbalance. The information in a foreign language is given unevenly to partners and it stimulates interaction;
- The method of different opinions. The main motivation for interaction is the difference that lies in speakers' experience;
- The method of re-decoding information. The information is given in non-verbal forms such as pictures, charts, diagrams and schemes;
- The method of information grading. It consists of grading the information from the most to least favorable and important to the participants;
- The method of mutual solution of the task;
- The method of a role play which creates the most favorable real conditions for communication;
- The method of text reconstruction;
- The method of dramatization;
- The method of a questionnaire which is a very effective means of producing students oral speech because it is full of individual potential, contextuality and originality;
- The method of game modeling where educational situations are very realistic and the students are able to use their professional roles allowing them to create realistic relations between the participants;
- The method of language games and quizzes. It allows using phonetic, grammar and vocabulary games to form linguistic competence [6]. However communicative language teaching focuses its attention not on correct language structures, though this aspect is important, but on such items as:
 - Interaction during the process of communication;
 - Comprehension and achieving a common communicative purpose;
 - Attempts to explain and express situations in different ways;
 - Broadening the competence of one participant of communication by means of communicating with the others [7].

Modern society implies training of highly qualified and professional pilots for the Air Force. Professional communicative competence is one of the most essential and important qualities of a modern military pilot that defines his readiness for future professional activity. This quality includes a complex of various skills to fulfill managing, conduct scientific research work, provide technical maintenance

and training activities. However, the most important skill is considered to be the skill to perform radio negotiations between the flight crew and the Air Traffic Control Services and to interact with the colleagues during different peacekeeping operations, joint exercises and maneuvers.

The Federal state educational standard contains definite demands to specialists' competence regarding the modern labor market [8]. The performance of a future pilot depends on his professional competence. In future, he must be able to work with different information sources, use the data for more productive and effective work, be able to interpret and transmit this data in situations of radio traffic in English, which is hardly possible without a high level of foreign language communicative competence.

The most attention is given to a group education. The main task of a teacher and a student is to learn to work teamwise. The student learns to listen to the dialogue partner, discusses problematic issues in a group and works over various projects. During the course of "Aviation English," teachers use the following methods: re-decoding information, role playing, questionnaire and game modeling. They allow involving all level students in the educational process and stimulating interaction and motivation that help to form communicative competence of future pilots. Special attention should be paid to the development and improvement of the students' oral speech skills because of their limited professional vocabulary at the beginning of the course.

Foreign language teaching in a military institution is aimed at solving one of the main fundamental tasks of language training, i.e., developing communicative competence of future military pilots.

Efficiency and proficiency of developing professional communicative competence of future military pilots depend mostly on how much modern proficiency requirements of aviation community are taken into consideration and realized. These requirements are described in the document of the International Civil Aviation Organization (ICAO) Doc 983/AN 453 "Manual on the Implementation of ICAO Language Proficiency Requirements" [9]. It contains international standards of Aviation English for the flight crew, the criteria of language testing and descriptors of language competence during examination. It is much easier to realize these requirements in the teaching process with the help of audiovisual aids.

18.3 Audiovisual Aids

In the age of information technologies and rapid changes, teaching a foreign language is almost impossible without technical means. New active and interactive technologies including audiovisual aids are replacing traditional technologies.

Audiovisual learning tools allow the development and application of fundamentally new means of information interaction between learners themselves and learners and means of informatization and communication as well.

The generalization of experience and the use of theoretical sources have revealed that the rational use of technical means allows:

- To fully implement an important didactic principle of visibility;
- To provide training taking into consideration the individual typological characteristics of each student;
- To create better conditions for planning and control;
- To ensure the accelerated formation and development of self-monitoring skills;
- To make the most of the analytical and simulation abilities of students and fully mobilize their internal resources;
- To do a lot of active exercises with all students simultaneously and control them [10].
- Audiovisual learning tools are special technical means that serve to present visual and auditory information. They include:
- Auditory aids: all kinds of audio exercises, audio texts, audio lessons and audio lectures;
- Visual aids: pictures, tables, diagrams, thematic slides;
- Audiovisual aids: video clips, video tutorials, videos, video lectures;
- Computer tutorials: electronic textbooks, self-teachers, manuals, handbooks, dictionaries, tests and training games;
- The Internet: network databases, video conferences, video broadcasts, virtual seminars, teleconferences on special thematic forums and telecommunication projects [11].

Visual and auditory images that simulate communicative situations and surrounding reality are both bright, expressive and informative; therefore, audiovisual tools are an effective source of improvement in the quality of teaching. They help to form certain impressions affecting visual and auditory senses, thereby attracting students' attention. At the same time, the lessons successfully implement the didactic principle of visibility, individualize learning, and at the same time, unite students (for example, while watching videos, working in a computer laboratory).

The advantages of audiovisual tools help save energy and time. For example, slides demonstrated with the help of a projector help significantly reduce the teacher's efforts, as there is no need to duplicate the same text with chalk on the board for each class. Visual and audiovisual aids are used to orient students in phonetic, lexical, grammatical aspects of language, to develop speech automatisms, to create a semantic support and to stimulate speaking [12].

It should be noted that the use of audiovisual learning tools has a positive impact on the organization of the entire learning process, making it clearer and more focused.

Learning a foreign language at a higher educational institution will be more efficient and will create favorable conditions for forming communicative competence due to the integrated use of video materials in combination with didactic materials, compiled in accordance with the proposed methodology. Video fragments and didactic materials made on their basis create necessary conditions for the effective classroom and extracurricular work of students [13].

Video materials as audiovisual aids of teaching a foreign language have the following advantages:

1. Videos successfully create an artificial foreign language environment, which fully implements the principle of visibility.
2. Dialogues, monologues and polylogues presented in educational films are pronounced at a fairly rapid speed, thus achieving one of the main tasks of teaching oral speech—improving listening skills. We teach students to understand a foreign language from a single presentation, creating a natural environment for the learning process.
3. Videos present different ranges of voices (male, female, children) and sounds of the spoken language. They also reflect the behavior of native speakers of different ages and different social background in a given situation.
4. In a video fragment, the speech is often superimposed on natural noises (traffic, rain, phone call, knocking on the door, birdsong, water) and creates the maximum approximation of the training video to real life [14].

To make an effective use of video in class, you need to make sure that:

1. The content of the videos used corresponds to the language proficiency of the students.
2. The length of the video clip used does not exceed the limits of the lesson phase.
3. The situations shown in the video fragment provide opportunities for the development of language, speech and sociocultural competence of students.
4. The context has a degree of novelty or surprise.
5. The text of the video is accompanied by a clear instruction aimed at solving a specific learning task, understandable to students and justified by the logic of the lesson.

Different kinds of videos can be used at the lesson such as educational video, feature films, documentaries, cartoons, videos of television news and other TV shows, music videos, advertisements, video tours of various cities and museums around the world, various computer programs with video series, etc. [15].

The efficiency of video use depends on the effective organization of the lessons.

Learning tasks that can be solved with the help of video are as follows:

1. Vocabulary revision.

The teacher usually uses a video fragment (30 s–1 min), which presents objects, actions or characteristics on a lexical topic. It is better when the video is accompanied by music or a text in English. It is also possible to use a video clip with subtitles in the native language but to remove the sound in this case.

While revising the material, the group can be divided into subgroups or pairs. Each of them receives its own assignment. Tasks can be different or duplicated for multiple groups or pairs. Students watch videos and discuss what they saw in groups (pairs).

2. Introducing new lexical units or a new lexical theme.

Videos in this case make a much brighter impression and contribute to better memorization than working with textbooks. While watching a video fragment, students not only understand which context the new words are better used in but also learn how to pronounce them correctly. The teacher can also use the ‘pause’ function so that students can see all the details on the screen and comment on the video.

3. Listening comprehension.

It can be said that the use of the video for listening comprehension has both its positive and negative side.

On the one hand, the video recording, compared to the audio recording, is richer and more emotional—students not only hear, but also see the speakers, their facial expressions and body movements which give clues to the meaning. Background information about the context of what is happening (the place of the action, the age of the participants, etc.) can be filled in visually.

On the other hand, all these factors distract the student from the actual speech, and he/she may be carried away from what is happening on the screen, instead of focusing on listening.

Therefore, especially at the initial stage, before watching a video students should be given a clear task, on which they will have to focus [3].

After selecting the material, the next work stage is to think over the activities that will be carried out by students under the teacher’s guidance. While creating your own exercises or adapting existing ones, it is important to take into account that a video lesson is a three-step process: pre-viewing activities, while-viewing activities or demonstration and post-viewing activities. Each of these steps includes several specific types of exercises. When planning, the teacher has the opportunity to choose exercises, which are the most appropriate for the goals and objectives of the lesson.

Exercises at the preview stage may be of the following types: brainstorming; listening to a musical passage, conversations, discussions; reading the text; filling the table; descriptions/illustrations/photos; positioning the illustrations in the right order; making assumptions about the content of the video fragment; a question-and-answer type interaction; associations; introduction of the new vocabulary and practicing it.

The second stage or demonstration is considered to be the active stage and can include such exercises as: filling the table; silent viewing; watching with a pause; search viewing; directed viewing; making free or pattern notes (mind maps); ordering sentences/pictures/paragraphs; putting episodes of the passage being viewed in the correct order; classification of information; matching words and phrases.

Exercises, which are used at the post-view stage, help to develop writing and speaking skills. All language difficulties have already been removed and the teacher directs the discussion providing students with speech patterns and creating the conditions for joint and individual activity. It can be carried out in such a way: a discussion, a quiz, assessment of the fragment that has been viewed, exchange of viewpoints, creating a project/poster, writing an announcement/report, a role play, description,

creating the end of the given story, providing ideas for solving the problem and writing a review.

Using video materials in the learning process enhances its effectiveness as videos can be recorded from a variety of sources and adds creativity to teaching activities. Therefore, all audiovisual tools make the material more user friendly. They help teacher's presentation and objectives by placing emphasis on whatever is being taught [16].

Taking into consideration all the advantages, provided by audiovisual aids, the teachers of the foreign language department widely use them in the course of studies for future pilots. Various kinds of audiovisual tools are used at every lesson. The most important lexical and grammar material is presented with the help of visual aids: posters and tables, which help to memorize the structure of the Air Force, parts of the aircraft and many other things. All kinds of audio exercises are used throughout the lesson providing models of authentic pronunciation, stress and intonation. Working with video fragments stimulates speech activity. Besides, cadets have an opportunity to practice tests and use electronic textbooks that are available in the computer laboratory. They can do it on their own or with the help of the teacher when they have individual studies.

18.4 Multilevel Class Teaching

Every class we are teaching at the Air Force Institute is multilevel because the cadets are subdivided into groups not according to the level of English, but according to the type of military aircraft, they are trained to fly: fighters, bombers, attack, transport or long-range aviation aircraft, etc. More than that, some of them studied German or French at school, so their level of English in the majority of cases is very low after a course of English they have had. As a result, we may have highly motivated above-level cadets who plan to fly international airlines in future and those below-level ones.

It is always very challenging to teach multilevel classes. Besides, we are often overwhelmed by the amount of the material that need to be covered within a short period and the teachers find themselves rushing through things that need recycling and reinforcement. It is particularly important in large classes where some students are racing ahead while others need a review. The teachers should realize that they are not just covering material and they are teaching a language. The problem is to provide the activities that allow the low-level learners to review the material and keep the high-level student interested [17]. Willingness to support, coordinate, facilitate and enhance communication between students rather than only "teach" (i.e., transmit knowledge) is very important [18].

There are different strategies to arrange work effectively. Students can be grouped in pairs, small groups, teams or there can be whole class work when all the students participate in an activity. There are some difficulties in planning the group work

with higher-level and lower-level students. The class can be organized as “like-ability” where the students have the same level of English or “cross-ability” where the students of different levels work together. In case of cross-ability grouping, the higher-level students can help the lower-level students. As for teamwork, it is always “cross-ability,” otherwise, it would be impossible for low-level team to win [19].

Methodologists offer to start a lesson with the whole class activity because it provides the foundation for the leveled task that will be done later. Since most classes begin with the vocabulary of the unit, it is recommended to practice new words with the whole class. Then, the tasks can be leveled according to proficiency and language skills to suit the interests of the learners. It is necessary as the below-level students need more time to fulfill the task, and above-level students can get bored waiting for the others to “catch up.” At the end of the lesson, it is advisable to review the material with the whole class activity [19].

Here, it is an example of practicing dialogues with the multilevel class. We introduce the sample dialogue to the whole class: all the students listen and repeat in pauses. Then, they practice in like-ability pairs. The below-level pairs practice reading the conversation. The at-level learners first read the dialogue in pairs, and then reproduce it to the class. The above-level pairs make up their own dialogues based on the sample one.

Since aeronautical radiotelephony that is taught to fourth year cadets requires listening and speaking skills, we use different audiovisual means to develop them with third year students. As it is written in Doc 9835, a usual conversation is supported by gestures, postures, gazes, while the absence of a visual/kinetic channel puts increased reliance on clear and accurate speech. Besides, the separation of speakers in space means that much more information needs to be exchanged in order to establish common ground [9].

It is easier to understand a foreign language speaker in case we are watching a video, not just listen to someone speaking; that is why videos are often used while teaching Aviation English to third year students. Since all the students are of different language level, the exercises stimulating their communicative competence are also different. Hence, teachers should provide various types of exercises and activities leading to the most effective process of learning. As we are talking about audiovisual means, let us focus our attention on the video fragment *departures and arrivals*. It is taken to illustrate the way a multilevel class can practice both listening and communicative skills [20, 21].

The video script is given below:

Departures and Arrivals

In most airports, certainly, the larger and more modern ones, *arrivals* are on the ground floor and *departures* are on the floor above. The main reason why these design works is gravity. Planes land on the ground full of suitcases. That is a lot less effort to move the luggage downward from the plane to the ground than it would be to move it up to a higher floor.

Another reason is that we spend more time with departures than arrivals. So, they need more space. The space for departures can extend upwards when the airport

wants to build more places for you to spend money. When people arrive at an airport, they just want to get their luggage and leave, and the design of an airport reflects this. No “bright light”, flashy shops or seating areas. Just a short and straight journey as possible: from the plane to the carousel, to the customs, to the exit.

Before watching a video, it is favorable to divide the whole class into three groups according to the language proficiency level of the students. Each group is offered its individual task to cover. We offer below-level students to complete the sentence gaps with the correct variant of the given ones:

1. In big airports, arrival and departure zones are ...
 - (a) on the same floor, (b) *on different floors*, (c) in separate buildings
2. The design of the airport depends on ...
 - (a) *gravity*, (b) amount of suitcases, (c) number of passengers
3. Arrivals require time than departures.
 - (a) more, (b) little, (c)*less*

The second group of students can be offered to re-decode information from the video. The information is given in the picture or a diagram depicting the departure and arrival zones. They are to build up consequences of events after they are at the airport.

The above-level cadets can present mini-dialogues or a role play imitating the procedures of departures or arrivals. Thus, it will be possible to involve all level students to take an active part in speaking and interacting.

There are some other variants how to arrange the group work in a multilevel class using the same video. We can offer to answer the questions of the pre-watching task first:

1. Where are the *arrivals* and the *departures* lounges in most airports?
2. What is the main reason for that?

Answers can vary from one word phrase for below-level cadets to a monologue with the expression of the speaker’s opinion for above-level ones. In case there are some difficulties in explaining the reason, it is better not to waste time waiting for an answer, but return to the question later. Students are asked to watch a video, paying attention to where the departure and arrival zones are located, how long passengers stay in both zones and what can be found there. They are supposed to do while watching task marking T (true)/F (false)/NI (no information). This is a whole class task, but a word bank with the vocabulary is given to the below-level cadets.

1. The *arrivals* are on the upper floor and the *departures* are on the ground floor. (F)
2. It is easier to move the luggage downward from the plane to the ground than move it upward to the floor above. (T)
3. Passengers spend less time with arrivals. (T)
4. When people are at the airport, they want to buy souvenirs for their relatives and friends. (NI)

5. When passengers arrive at the airport, they don't want to stay there for a long time. (T)
6. There are flashy shops, bright lights and seating areas in the departure lounges. (F)

Then, at-level cadets are asked to answer the questions of the follow-up task:

1. Why do the *Departures* need more space?
2. What does the design of the *arrivals* lounge reflect?

After that, one more exercise is offered as the whole class activity:

You have heard about the order of actions when people arrive at the airport (*they go from the plane to the carousel, to the Customs, to the exit*). Put the given actions in the correct order so that you could say what passengers do before the flight: *be checked by security, board aircraft through gates, check in the luggage, wait for the flight in the departure zone and go through passport control.*

Power point presentation is a good visual tool that allows doing the exercise quickly. Then, at-level students give information what passengers can do in the arrival or departure zones, while the above-level learners compare these zones using the information in the video and illustrating it with their own experience or background knowledge.

18.5 Conclusion

In conclusion, we should point out that developing communicative competence is one of the most important aspects of professional specialists training because it leads to mastering such ability as solving communicative tasks in a professional sphere. The system of exercises should be aimed not only at developing listening comprehension skills, but also at the creative usage of information in different communicative professional situations. Audiovisual aids help in developing communicative competence and, consequently, lead to language proficiency, especially among aviation specialists.

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Chapter 19

Regional Human Capital: Assessment of Needs and Problems of Forecasting



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Abstract The article considers the issues related to the concept and assessment of regional human capital. It presents different approaches to the assessment of regional human capital. Based on the authors' survey of representatives of the scientific and business community, the main parameters that determine the assessment of human capital in a region are revealed. They include education, health care, career opportunities, wages/salaries, and gender. A matrix of the strengths and weaknesses of this assessment and forecasting capabilities is presented. The authors provide recommendations that contribute to the development of human capital in a region. The most important is to establish the conditions under which human capital would be in demand and be motivated for developing in the region.

19.1 Introduction

Currently, there is a growing interest to the assessment of the impact of human capital quality on the development of regions and countries as a whole. Economic welfare is determined by the projects implemented by people. However, the segmented assessment of human capital is only being established, and it requires significant improvements.

The human capital includes a system of indicators that influence economic development, the quality of the workforce, development of innovations, level of education of the people, quality of life, and other related things.

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The very notion of human capital is not new. It was first mentioned in the papers by Adam Smith dated 1776. The formalized definition, however, was given significantly later, in 1962, by Becker. Since then, the study of human capital began to develop. Initially, the assessment was carried out based on the evaluation of schooling efficiency. The most prominent research in this area belongs to Nelson and Phelps (1966), Mincer (1984), Lucas (1988), Barro (1991), and Mankiw et al. [1].

This system of assessing human capital is insufficient. Even though the scope of schooling in the world is quite large, the UNESCO data published in 2017 show that six out of ten school children from all over the world lack basic knowledge of mathematics and reading (UNESCO 2017) [2]. This means that the standardized test that has been performed for a long time showed its inefficiency. According to the World Bank, the assessment of schooling without evaluating the knowledge received is irrelevant and provides for a large number of errors in the research.

A separate assessment of the economic efficiency indicators, such as GRP, GDP, employment level, as well as social and cultural indicators, does not obtain the desired effect and cannot result in a comprehensive assessment of the human capital level in regions. Creating a list of indicators necessary for the comprehensive assessment of regional human capital is a key problem nowadays.

With a comprehensive assessment of human capital quality, it is possible to identify potentially effective industries that can transform the economics and facilitate the solution of social and economic problems. The first problems to be solved shall include efficient budget funding in regions, as well as finding deficiencies and proposing a way to eliminate those. The identification of promising industries and their influence on the development of human capital is becoming more important than ever. The gaps in the quality of human capital in the regions of Russia remain significant.

19.2 Review of Publications

As has been mentioned above, human capital was first mentioned in the papers of A. Smith.

In 1961, Schultz defined human capital as a combination of “valuable qualities acquired by a person that can be improved through respective investments” [3]. The approach of Dolan and Lindsay was different in a way that they talked about the mental abilities of a person that could be trained through formal education or practice [1].

Later on, G. Becker presented the methods for the assessment of human capital that took into consideration such indicators as the overall salary, the part of the salary paid for labor; the age at which professional activity stops, and the interest rate. He viewed human capital as a combination of knowledge, acquired skills, and experience of a person. Becker defined human capital as being “formed as a result of investing in the human, including education, industrial training, healthcare, migration, as well as price and income information search expenses” [4].

Note that Schultz and Becker paid more attention to the role of human capital in the development of GDP, which is deemed insufficient for comprehensive analysis today.

The concept of human capital was also mentioned in the papers by D. Ricardo, A. Marshall, K. Marx, F. Engels, J. Mill, L. Valras, and other researchers [5]. Even though numerous researchers have been studied the problems of human capital quality assessment, there is no uniform approach to this issue. This can be due to the fact that human capital as a term is a complex configuration of indicators that can change according to the external conditions.

Analyzing the interpretations of the human capital notion, the authors notice that earlier interpretations have the main focus on the required portfolio of knowledge and skills that entitles a person to a certain income. Later on, the definition was complemented with such indicators as competencies that facilitate personal development, as well as social and economic well-being.

When assessing human capital, V. Alaverdyan introduced a notion of “human capital goodwill.” It is a “multiplier that reflects the real market value of an employee with specific competencies that are interesting for a potential employee” [6].

Kurganskiy suggested to identify the structural elements that characterize human capital and present them as the human capital capacity that creates a specific pool of skills that can be used in work [7]. Markova and Smirnov described human capital using the indicators of potential human capital [8]. Mustafin and Ignateva pointed out in their work that human capital can be viewed as a combination of specific elements [9].

Akhmetshin et al. [10] in their research presented a general human capital index formed on the basis of the analysis of educational capacity index, potential health index, employment index, social and cultural capacity index, intellectual capacity index, innovative activity index, and business capacity index. This research presents an attempt to develop a national methodology for the assessment of human capital.

However, the construction of an efficient system of human capital management requires a significant reconstruction of the assessment indicator system that will support the cartographic analysis of human capital in the regions of the Russian Federation and the selection of the most effective way of developing each of the regions.

19.3 Methodology

The first assessment of education results was developed in the early 1960s in the USA. They were grade-based tests (SAT and NAEP). SAT (SAT Reasoning Test, Scholastic Aptitude Test, Scholastic Assessment Test) is currently a standardized test for university or college entry in the USA. It contains some compulsory sections such as working with texts and the English language, mathematics [11]. These, in their turn, can be subdivided into the following parts: text analysis; grammar and language, no calculator maths, and calculator maths. NAEP (National Assessment of

Educational Progress) is an assessment of students' knowledge in various areas. It is conducted on several levels: national, state, and municipal. Currently, the assessment is performed using digital platforms, and the test is divided into four types: interactive computer tasks, mathematical tasks, engineering skills, writing skills. As it turned out later, these tests are insufficient to make up a comprehensive picture of the human capital level. Since the 1990s, the OECD started conducting international assessment (PISA and TIMSS).

As of the current moment, several international assessments were included in the analysis of human capital and its development [12]. It is crucial that this analysis only covers the OECD and a number of developing countries. This distribution influences the results of the research and the possibility of monitoring the correlations between the economic development of a given territory and the quality of its human capital.

The majority of experts agree that the best way to assess the impact of human capital on economic development is the regression analysis that can help obtain constants between different tests. An example of applying the regression analysis methods in the assessment of human capital is presented in the research of Bogoviz et al. [13].

The most outstanding papers in this area were written by Khanushek and Kimko (2000). They present a longitudinal study of the impact of human capital on economic development based on the data from the USA. The USA is a good example because they've been carrying out a comprehensive national assessment of human capital for many years. In their latest paper, Altinok et al. [10] use the same approach for different counties and times.

Chizhova in her research [8] mentions three methods of measuring the level of human capital: (1) cost—based on the aggregate investments in human capital,(2) discounted—the calculation of human capital cost for the given standard rate of return for the national wealth; (3) integral—based on the calculation of the composite index via measuring its components with statistical indicators.

The authors should note that the calculation of the composite index is the most popular comparison method for the development level of human capital in various territories.

The statistical method is the simplest and the most explicit one. Besides, it mostly considers the existing trends and does not consider forecasted values. One can agree with the conclusions made by some researchers [8] that claim that the natural limiter for all assessment methods is the database created by the Federal Office for National Statistics in Russia, which also selects the indicators. These indicators complicate the assessment of human capital value for the region and its forecasting.

To calculate the forecast values, it is necessary to use the methods of mathematical simulation or expert evaluation methods.

The human capital of the region stands for the combination of specific elements determining human competences with a view to the needs of a specific territory.

To assess human capital and calculate forecast values, the following approaches can be used [12].

1. The qualitative assessment methods that include the evaluation of company employee qualities (education level, experience relevant to the position, creativity, teamwork skills, etc.) and their impact on the company profits.
2. The cost method, or the assessment of company personnel costs (labor compensation, taxes, training and re-training expenses, etc.). A big drawback of this method is that it can only consider the costs that the company incurred due to personnel upkeep and it does not consider the competencies that someone has before they join the company, as well as the possibilities of their development.
3. The method of calculating the initial and recovery personnel costs. This method analyzes the costs associated with personnel hiring and replacement (costs incurred when looking for and hiring employees, initial training (“original costs”), “recovery costs” (discharge payments and indirect costs associated with the reduction of labor productivity of an employee that is about to be fired or the situation in the team).
4. The method of calculating the individual cost for every employee [14] which is aimed at the value assessment of specific employees taking into consideration their lengths of employment in the company, i.e., the expected income from the activity of these employees at the company.
5. Expert evaluation method. This method is based on polling the expert community and identifying general trends. This method was already used in real research.

To determine the need in human capital in the region, several expert polls were conducted in five expert groups (128 people) representing the science and educational communities, as well as a real sector of the economy.

The questions asked from the experts were divided into two blocks. The first block dealt with the issues of human capital quality satisfaction in a specific territory. The second block of questions was dedicated to value forecasting (which competencies are necessary for people to develop in specific territories).

19.4 Findings

The results of polling according to the methods described above were as follows:

- 58% of the representatives from the real sector of the economy were generally happy with the quality of human capital in the territory where their company was located;
- 39% of the representatives from the academic and educational community pointed to the insufficiency of human capital to develop their territories;
- 64% of the respondents said it was necessary to create new educational programs for improving the quality of human capital in their territories;
- 76% of the respondents notice that it was necessary to do some career planning to develop the quality of human capital in the region;
- 87% of the respondents said that proper rest impacts the quality of human capital;

- 42% of the respondents found it difficult to say which competencies are necessary to develop their region in the next five years.

Based on the research conducted, the authors analyzed the main human capital development parameters for different regions as shown in Table 19.1.

Table 19.1 Analysis of the key development parameters of human capital in the regions

Assessment parameters	Strengths	Weaknesses
Level of education	<ul style="list-style-type: none"> • Accessibility of secondary vocational and higher education • Multiple further education courses • Opportunities for on-the-job training • Developed network of educational institutions and corporate universities 	<ul style="list-style-type: none"> • The high cost of basic higher education programs • The selection of programs does not reflect the dictates of the time very often • Education programs are long (4–6 years) • The majority of graduates do not work in their degree field
Healthcare	<ul style="list-style-type: none"> • Accessibility of medical services through compulsory medical insurance • Availability of different (in terms of prices) sports centers • Promotion of healthy lifestyle 	<ul style="list-style-type: none"> • The system of voluntary medical insurance for employees is poorly developed • Not all companies have a system of professional medical tests • Irregular working hours
Career planning	<ul style="list-style-type: none"> • High motivation • Transparency of career progress 	<ul style="list-style-type: none"> • Not many regional companies have a system of career planning • High competition • Lack of career lifts in many companies • “Employee drain”
Labor compensation	<ul style="list-style-type: none"> • Opportunities for a pay rise • Paid vacation • Bonus system • Correlations between salaries and working efficiency assessments (KPI) 	<ul style="list-style-type: none"> • Poor correlation between the increase of human capital quality and salary increase • Lack of correlation between the working efficiency assessment and the salary • The low average salary in the region • Off-the-book wages
Gender characteristics	<ul style="list-style-type: none"> • Career opportunities for women 	<ul style="list-style-type: none"> • Gender discrimination at the hiring stage (especially for managers) • The increase in the number of single women

19.5 Discussion

The efficient use of human capital in the regional economy requires the conditions under which this capital will be relevant and motivated for the development. The results of the research show that the majority of the regions need qualified employees but there is no understanding of the kind of specialists and a set of competencies required.

Small business managers do not see investments in the development of personnel as necessary. Medium and large businesses have personnel training systems, including corporate universities, but they still have some problems making use of such employees in the future. As a result, people lose motivation for self-development because their career progress does not directly depend on their new competences.

The recruiting system for regional companies, especially in smaller towns, often relies on personal recommendations from friends, which also leads to a reluctant attitude to self-development among potential employees.

People with career ambitions and developed competencies are trying to find their place in larger territorial entities with diversified economies, which leads to the depletion of the human capital in their region.

The main indicators of human capital development are the education and health of people in a specific territory or a country in general. These indicators can be improved via targeted investments in the respective spheres.

19.6 Conclusion

Human capital develops in working activities and outside them. It is also affected by external factors. For example, the massive promotion of a healthy lifestyle and organization of marathons made people care more about their health. Running marathons became a kind of networking platform. However, human capital tends to degrade if it is unused, and if the general level of culture is low. This must be accounted for when implementing a regional policy aimed at the development of human capital.

Thus, the development of human capital in a region requires a comprehensive approach from regional and federal authorities, employers, and citizens themselves.

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Chapter 20

Demographic Problems of the Consumer Society



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Abstract The article deals with the problems associated with the formation of a consumer society in Russia. From the point of view of synergetics, the economic convergence of previously ideologically antagonistic social systems of Russia, China and the Alliance into a global consumer society has become inevitable and uncontested. One of the consequences of this kind of society transformation was the depopulation, most noticeable in Russia in the regions with the lowest level of wages, thus making such regions even less attractive for investment and exacerbating their social and structural degradation. The effectiveness of economic stimulation of fertility should be based on the classical concepts of labor reproduction cost. For this, along with supporting families through public consumption funds, wages should be sharply increased. This is only possible as a result of a change in the structure of the economy in favor of a knowledge economy capable of generating a greater amount of added value. Since it is not realistic to expect a quick return from measures to stimulate birth rates, it is advisable to develop and implement a program for adapting to life in Russia for citizens of the CIS countries, starting with their education at home in Russian schools. For regions with stable and irreversible depopulation, specific management methods that most fully take into account both changes in the structure of a society and a decrease in economic activity of a business due to a decrease in solvent demand should be developed.

20.1 Introduction

The global crisis, aggravated by the coronavirus pandemic, transferred many problems that were previously managed to somehow be circumvented or, in any case,

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stopped, the most negative of the phenomena accompanying them, paramount. Among these phenomena is global demography, which is characterized by two diametrically opposite trends. One of the challenges for modern civilization is the uncontrolled population growth in the poorest and most backward countries, causing increasing tension in providing people with resources and basic consumer goods. On the other hand, there is a tendency toward a steady decrease in the birth rate and an aging population in the most developed countries.

Russia is one of the latter, with all the ensuing consequences. For some time, it was possible to alleviate the problem of depopulation by attracting migrants from the CIS countries, but due to the economic difficulties of recent years, the country's attractiveness for them has significantly decreased.

The situation is compounded by the fact that the degree of differentiation of the social economic situation between the country regions has sharply increased. In particular, a large group of donor regions has formed, providing labor migrants to Moscow, St. Petersburg and other relatively prosperous regions. Moreover, in the territories of mass population, exodus-specific problems that are not characteristic of more prosperous federation subjects are generated. The identification, systematization of these problems and the formation of an adequate reaction to their growth are an urgent task for the sciences of the social economic block.

20.2 Problem Relevance

It should be noted that within the framework of a reactive state management system, it is impossible to solve its problems in an optimal manner in principle. The fact is that the problems that have to be responded are mostly generated by informal intellectual centers of global governance, which, in comparison with national governments, have incomparably greater opportunities for both forecasting and for the actual formation of the necessary parameters of reality, which leave no chance for opponents. A convincing illustration for this is the post-Soviet space transformation algorithms announced in the famous works of Brzezinski [1, 2]. Their implementation is carried out throughout the post-Soviet period purposefully and continuously.

A significant role in shaping modern reality was played by G. Kissinger, who, in particular, was one of the architects of the “Chinese Economic Miracle.” In his latest publications, he complained that not everything came out of what had been planned, and therefore, it was necessary to adjust the relationship between the subjects of world politics without changing the essence of its long-term goals and guidelines [3].

But if the globalists of the world did not succeed in everything, then in Russia over the past two decades, not a single program of social economic development has been fully implemented. On the one hand, as in the process of any confrontation, the achievement of the stated goals is hampered by the opposition of geopolitical opponents, on the other hand, it is possible that the goals and algorithms for their achievement were formulated without due regard to the real possibilities and deep

understanding of the processes in all their diversity [4]. In particular, this concerns the consequences of building a typical consumer society in Russia, through the prism of which the problems and prospects of state and regional policies should be considered in case of long-term forecasting.

As paradoxical as it seems, communism and capitalism, as modes of production, use the same motivation for their development. So, it is generally accepted that capitalism (the conditionally market economy) has become the dominant global system, primarily due to a focused orientation on creating a consumer society [5]. At the same time, the desire for unlimited consumption over the past decades has become so much dominant in the system of human values and life aspirations that it has supplanted many traditional moral and ethical guidelines (which once seemed unshakable), on the basis of which, in fact, our civilization was formed [6–10].

The discussion of the consumer society problems in the scientific literature comes down to several aspects. Firstly, the authors strive to show negative aspects for society as a whole as well as for an individual [6, 10]. At the same time, attempts are being made to focus on the peculiarities of Russia, which (supposedly) deprives the consumer society of the full development chances in our country [7]. On the other hand, referring to limited resources, the authors, as an alternative to the “consumer society,” offer a more promising “service society” from their point of view [9]. At the same time, it is overlooked that a service is the same product as a material thing; therefore, the desire for excessive consumption of services deforms a person as well as an excess of material goods. A positive result of a critical understanding of the problem of the attitude to the consumer society in its modern form is the opposition to it as an alternative to a development society [8].

20.3 Problem Statement

First of all, it is advisable to identify the main patterns of development of negative processes in modern Russian society. On the basis of this, it is necessary to generate real ways of transferring processes into a positive channel or to form effective methods for managing them in case of their irreversibility. The optimization criterion should be considered the minimum degree of destabilization of the social economic environment of the problem region.

20.4 Theoretical Part

If we consider the ideology of communism from the point of view of motivating the activities and aspirations of an ordinary person, then we find the same goal of social development as under capitalism: “From each according to his ability—to each according to his needs.” By and large, this is nothing more than the main distinguishing feature of the “Consumer Society.” This is evidenced, in particular, by the

point of view on the problem of F. Engels at the end of his life, reflected in the famous letter to Joseph Bloch in 1890: “According to the materialistic understanding of history in the historical process, the decisive moment in the long run is the production and reproduction of real life. Neither I nor Marx ever claimed more.” [11]. That is, the material basis of society should provide the possibility of reproduction of life, which, however, is a necessary but not sufficient condition for this. For the reproduction of their own kind, specific people must have an irresistible desire for this at the level of instinct, which, within the framework of modern civilization, a significant part of the population has “successfully” overcome, replacing it with surrogates of endless pleasure.

Unfortunately, a utopian version of a consumer society has been realized in Russia for many decades. Its main provisions were formulated as early as the period preceding the Enlightenment [12]. The problem is that, on the whole, an unsuccessful attempt was made to replace market regulation of social wealth distribution between people, the state one, which implied the unconditional acceptance by society and each individual person of self-restrictions, due, in particular, to limited resources [7]. The utopia was realized through the desire, together with building the material basis of a consumer society, to form a new person able to voluntarily limit himself in consumption. It turned out that this utopian extreme contradicts the essence of man, the nature inherent in him and is an obstacle to the development of civilization.

The essence of social progress boils down to the fact that extremes, as a rule, are discarded, and in practice, in the end, a compromise version of development is realized. With good reason, this can also be attributed to the format for the implementation of the consumer society phenomenon. In modern conditions, in most successful countries, market methods for distributing social wealth are combined with varying degrees of rigidity by state regulation of this process. That is, repeatedly balancing on the brink of the collapse of civilization in the global conflict over the past hundred years both “antagonistic” social systems have gone in different ways, essentially, to the same goal. This paradox was obvious to many thinkers of the twentieth century, to whom the ideological differences of the two systems seemed as far-fetched and insignificant as the subjects of discussion of medieval scholastics.

In synergetics, such a phenomenon is usually called an “attractor” which is usually visually associated with a certain “funnel” on the inner surface of which processes are directed along different trajectories, directed inward and downward, and in future, inevitably converging into a single endpoint [13–15]. It was this synergistic understanding of the processes of social development that allowed formulate the idea of the convergence of two social systems in the 1950–1960s, whose representatives abroad were: R. Aron (France), J. Galbraith, P. Sorokin, W. Rostow (USA), D. Streich (Great Britain), J. Tinbergen (Netherlands), O. Fluteheimon (Germany) and other scholars [16–18]. In the USSR, the idea of convergence was once ardently supported by an academician Sakharov [19].

The practical implementation of the idea of economic convergence in the 1970s was started in China, which as a result became the main producing unit of the global consumer society, but did not abandon its authoritarian management system and many communist ideas that seem anachronistic in the market environment. On the other

hand, the social structure of European countries to a large extent has transformed toward the construction of a “Social State.”

20.5 Results and Discussion

As noted above, the trajectory of the process as part of its movement in the direction of the attractor can be implemented in various ways. In this regard, any entity, including a consumer society, without any checks and balances, can at some stage of development transform into a monstrously hypertrophied phenomenon, which is essentially the opposite of the original, completely humanistic concept. As far back as the 1930s, Aldous Huxley warned about this in the form of a fantastic dystopia [20]. To the full extent of the North Atlantic civilization, his fantasies have not yet been realized, but the words “mom” and “dad” (and most importantly—the essence of these concepts), which (as predicted by O. Huxley in 1930) became incorrect and condemned in Europe, we have to defend in Russia at the level of constitutional amendments.

In the long term, the modern consumer ideology of a consumer society, in fact, becomes an algorithm of self-destruction for both individual ethnic groups and the whole modern civilization. This is due to the fact that at some stage, the demographic catastrophe assumes an irreversible character, as evidenced by the examples of the EU countries that survive so far only through the exploitation of human resources in Eastern Europe [21].

One of the main problems of modern Russia, which sharply intensified the process of building a consumer society thirty years ago, is also demography. At the same time, the rate of depopulation characteristic of all the most developed countries is aggravated in Russia as the region becomes more depressed and financially backward [22, 23]. As a result, due to the predominance of the population of older age groups, the age pyramid of the regional society loses its traditional stability through reliance on children, youth and people of working age.

The consequence of this phenomenon is a deep transformation of the region's economy structure and its management systems. In particular, rural municipalities are rapidly losing their tax base as well as the possibility of budgeting. As a result, there is a redistribution of functions between regions. So, in the Vygonychi district of the Bryansk region, the tax office, the regional post office and other organizations were closed. Their functions were transferred to the neighboring region (Zhiryatinsky). In fact, the trend is aimed at enlarging the districts and even at dividing the territory of the region into several districts subordinate to urban entities.

Similarly, six draft regional laws on the unification of settlements included in the districts and giving them the status of urban districts were approved in 2018 at the 25th meeting of the Belgorod Regional Duma. The initiators of the bills were municipal councils. The advantages of such an integration are the centralization of the budget and the expansion of the financial capabilities of local governments, reducing the cost of maintaining the administrative and administrative apparatus, developing the

social infrastructure of rural settlements and increasing the investment attractiveness of the territories.

Demographic problems negatively affected the transport system of the region and the regional center. Thus, a decreasing passenger flow makes commuter trains and bus routes more and more unprofitable. Their financial support requires ever-increasing amounts of cash.

Due to the difficult demographic situation and the severe crisis the number of departments at the Faculty of Mechanization of Bryansk State Agrarian University decreased by half during the post-Soviet period. At the same time, the reduction of support staff, laboratory assistants in particular, continues, which increases the workload of tutors with routine work, leaving them no time for scientific creativity.

Significant reductions have occurred in the system of regional branches of metropolitan universities. Optimization was carried out under the plausible pretext of improving the quality of education, but in fact, the limiting factor was the failure to meet the planned figures for admission of applicants.

An important consequence of the negative demographic situation is the inevitable increase in the cost of medical care for the population of a demographically disadvantaged region. Obviously, older people get sick more often than citizens of working age. In addition, it is inevitable to change the structure of regional medicine by reducing the departments of pediatrics and the corresponding expansion of the departments for the treatment of age-related diseases. Medical training programs must be transformed accordingly.

Changes in the social sphere of the region inevitably affect its economy. So, in the Bryansk region, the average amount of pension payments in 2020 amounted to 14,045 rubles, while the salary was equal to 27,730 rubles. That is, retirement of each new resident of the region reduces the money supply in the region by 13,685 rubles per month or by 164,220 rubles per year. Consequently, as the share of people of retirement age in the structure of the region's population grows the solvent demand for goods and services decreases significantly, which negatively affects many business sectors. Similarly, the continuous decline in the number of university professors is also affecting the economic situation, as their salary should be twice the average for the region. At the same time, one should bear in mind the general decrease in effective demand in connection with a decrease in the population, which further reduces the investment rating of the region and contributes to a decrease in business activity.

20.6 Conclusions

Since the tendency toward a decrease in the population in most regions of Russia is steady and irresistible, it seems advisable to carry out the following measures that contribute to leveling the negative consequences of crisis phenomena in demography.

1. It is advisable to stimulate the birth rate not only through public consumption funds, but also through the growth of wages, since children require expenses

even after seven years of age. Moreover, as they grow older, spending on us increases. We should not forget the classical concepts of the cost of reproduction of labor, formulated by the classics 200 years ago. It is possible to hope at least for a simple reproduction of the population only if the man's wages allow him to keep his unemployed wife and two children for a long time without falling into extreme poverty.

2. It would be useful to envisage the formation of a personal bonus in the gold equivalent for each born child, which a young person will be able to receive upon reaching adulthood. The source of funding for the event should be a part of the income from the country's natural rent.
3. Implementation of plans for real financial support for the birth rate is possible if the formation of a knowledge economy is made a priority of the state's structural policy due to a substantial increase in budget financing for R&D, which will make it possible to generate a higher level of added value, as well as creating a large number of highly paid jobs. At the same time, a significant part of the production of consumer goods of an ordinary technological level can be located in the CIS countries or the Middle East. In part, this has already begun to be realized through the formation of Russian industrial zones in Egypt.
4. The largest infrastructure projects and programs adopted for implementation should be monitored for a real assessment of the prospects for their positive impact on social economic processes. In the case of a negative expertise result, the released financial resources should be directed to R&D and support of regional universities.
5. Without any hope for a sharp increase in the short-term birth rate, it is advisable to stimulate the influx of young people with an adequate level of education and an acceptable mentality from the CIS countries. To do this, it is necessary to finance and open a network of Russian schools in the respective countries, in which local children will receive education under Russian programs and join the Russian culture. We must purposefully prepare our new fellow citizens for the process of their integration into Russian society.
6. It would be extremely useful to develop a theoretical framework for the management of regions with pronounced depopulation processes. Since the whole country's negative balance between fertility and mortality cannot be overcome for a long time, the inevitability of forming a large group of such regions is an objective reality that should not be ignored, trying to hide behind traditional and, as a rule, not fully implemented measures for fertility stimulation.

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Chapter 21

Strategic Design as an Effective Tool for Managing Digital Development of a Company



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Abstract This article is devoted to a new strategic management tool—strategic design. Modern conditions with rapidly changing technologies and consumer preferences, changing supply chains, emerging new markets, products, and new product safety requirements require the enterprise management strategy development to have adequate modern tools as well. The authors prove that such a tool can be a strategic design, which is based on design thinking and in-depth comprehensive analytics. It is analytics, as well as tracking the current and future customer needs, that allows the company to increase its competitiveness in both existing and new markets, including digital ones. This paper discusses strategic design stages preceding the development of a digital development strategy for a company.

21.1 Introduction

The development and implementation of industrial policy, especially in the technology field, is accompanied by high uncertainty. Products that are scheduled to enter the market in several years may not be in demand due to the emergence of more advanced technologies. Often, initiatives in this direction fail due to incorrect focus or resource misuse.

Since the end of the twentieth century, the focus of competitiveness has shifted from the extraction of raw materials to the production of goods and provision of services, in particular, to the organization of a full cycle customer service with the simultaneous challenge of shaping future customer preferences [1]. From that moment on, companies began to look for new tools and methods of transformation when forming their strategy, focusing on customer needs [2–4].

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Strategic management of a company gains first priority in connection with the need to implement an adaptive industrial policy, as well as with the need to respond to rapidly changing external conditions.

Strategic management currently transforms, as the existing toolkit shall be changed and made more flexible, responsive to a rapidly changing external environment, thereby providing opportunities for business development in highly uncertain and turbulent conditions. One of the newest strategic management tools is strategic design.

21.2 Literature Review

The concept of “strategic design” is quite new and virtually not used in the foreign and domestic scientific literature. Certain studies discuss the possibility of using design in business model creation. Design is seen as a means for stimulating innovations [5], and also as a consequence of the project development process [6]. Some studies define design as a factor that stimulates innovations in business modeling [7].

Since the publication of “Designing for People” by Dreyfuss [8], there is an opinion that design is aimed mainly to satisfy user needs regardless of the designed object properties. Only in recent years, different studies began to consider design as a part of the innovation process [9], as well as the role of design in the development of the company’s business strategy [10].

At the same time, some researchers in the innovation field note that design is historically perceived as a technical rather than a strategic property [11].

Research on innovation process design tools has been extended to multinational corporations [12], non-profit organizations [13], as well as small- and medium-sized companies [14]. These studies point out that the concept of “design” is generally perceived as conventional design (graphic design, product design), and not as strategic design, i.e., the design of business processes and company development strategies.

21.3 Theoretical Framework

In the last decade, the study of the business model creation process has considered a design approach, which, according to certain scientists, consists of the application of experimental methods and prototype creation [15]. Such studies of business models in foreign research are generally called “business modeling innovations” [16, 17].

At the same time, this approach is somewhat limited due to that it does not consider many new elements, in particular, changes in working conditions for employees due to the COVID-19 pandemic. In the coming years, most companies are expected to attract workers on the terms of part-time and non-traditional employment (remote work, project work, etc.). The pandemic is changing the development strategies of

companies. The consumer needs are changing with their requirements for the quality and safety of products and services, as well as the channels for their delivery and payment. Also, the main production and supporting processes are actively digitalized. If earlier it was assumed that digitalization of the main processes would occur in 2030–2035, now analysts provide other terms—2023–2025.

Strategic management undergoes significant changes in such conditions as well. Strategic milestones that companies set for themselves in 2019 are changing dramatically in 2020. Accordingly, the toolkit providing the development and implementation means for the company development strategy shall be changed as well.

In this regard, the strategic design should be understood as a tool for creating and implementing the company development strategy, which implies project activities based on creativity and scientifically grounded use of technologies in the organization and provision of services.

Strategic design is at the heart of the development of the company's roadmaps, which take into account technology changes. For example, additive technologies are driving significant changes in the aerospace industry, enabling faster prototyping and manufacturing of complex products. Accordingly, when developing a company strategy, future technology changes, as well as changes in product manufacturing times shall be taken into account. Additionally, high-speed wireless data transmission, artificial intelligence, and machine learning will lead to significant changes in logistics and road transport fields in the short term.

As for the concepts of roadmap development, they come from the middle of the twentieth century and do not consider the uncertainty and rapidity of modern development, as well as the dynamics of markets and technologies [18]. They focus mainly on identifying the key aspects and functionalities of products and solutions without considering the key benefits for consumers.

Based on research [19], the following weaknesses of the conventional roadmaps can be identified.

1. Communication problems

Generally, communication problems occur during roadmap development and when the existing opportunities and barriers are considered during the implementation of the planned stages.

Although the main goal of the development and implementation of a new product or production process solution may be clear for all departments [20], the mechanisms for achieving this goal can be understood differently. This is a common problem that is more specific to the management system within the company, rather than the roadmap creation and implementation process.

In this context, it is important to take into account the general understanding of the customer experience and capabilities of the company and its divisions when creating a roadmap, which can ensure a higher-quality strategy and relevant business processes of the company.

2. Lack of customer focus

The development of high-tech products or the introduction of new production solutions aimed at the total satisfaction of customers' needs involves a significant number of participants in the project. Furthermore, such projects are generally multi-stage, while their execution is performed by multiple departments, which rely more on their own experience, and not on the customer needs. Company managers may also lack an understanding of customer needs, as well as the requirements of new markets. Thus, customer needs and market requirements are not considered partly or completely, which leads to the production of non-demanded products, and financial difficulties for the company and even bankruptcy with time.

3. Inconsistency with modern conditions and challenges

Conventional roadmaps are currently unable to fully address modern challenges such as uncertainty and poor predictability of global and market processes, which are determined by a significant number of predictable and unpredictable factors, as well as the rate of emergence of new technologies and solutions.

In the traditional understanding, roadmaps have low adaptability after approval and implementation, which often leads to the fact that a company that is forced to adapt to changing market conditions deviates from strict adherence to the roadmap and the adopted strategy.

The roadmaps that are the base of the company's development strategy shall be created using the design approach allowing a deeper analysis of the customer needs, as well as the company's ability to adapt to changing external conditions. Thus, strategic design is based on addressing both current and future customer needs creating new business opportunities.

21.4 Results

Current trends and the external environment uncertainties require additional research to determine, predict, and take into account consumer needs. Such studies are the base for the strategic design, which is used to develop a strategy addressing various alternative decisions and consequences, as well as the possibility of using alternative technologies [21].

In the course of the study, the authors identified the following stages of strategic design. It should be noted that strategic design stage contents are based on analytics, which can be obtained by applying classical strategic management tools. Furthermore, the strategic design should be also based on the possibilities of design thinking.

1. General analysis of the situation. At this stage, a classic SWOT analysis is performed, which gives a general idea of the business strengths and weaknesses, as well as its opportunities and threats. Furthermore, information is collected during this stage about the target audience of the company's activities. Both the current state and changes in customer behavior are traced, as well as changes to

their preferences, for example, the pandemic has exacerbated customer safety requirements for the products and services, as well as the way they are delivered and paid.

2. Collection and processing of additional information. At this stage, additional information is processed, addressing issues related to changing customer needs. Their needs are clarified, wishes are accounted, and future trends and markets, etc., are analyzed. This stage helps to “fine-tune” narrow the problem, as well as the development of directions for its solution.
3. Market and consumer mapping. At this stage, markets and consumers are zoned taking into account the previous analysis. Zoning can be done both locally and globally, depending on the ambitions and business scale.
4. Subject field generation (generation of ideas). At this stage, the foresight method is used to crystallize the main directions of solving previously identified problems to maximize customer satisfaction.
5. Determining the most viable ideas. At this stage, ideas are “screened out,” which do not meet the time requirements. Only one or two of the most viable ideas may be left, which have a creative solution to drive a company’s breakthrough.
6. Prototyping and testing. The selected solutions are implemented as a sample or prototype. Computer simulation of the situation is possible as well if the company has technical means to perform it. At this stage, the prototype is tested by potential consumers. Moreover, testing shall be carried out among different groups of consumers, as well as in different markets.
This process allows assessing all the positive and negative aspects of a possible solution. If the most positive effect is obtained, the solution is scaled.
7. Scaling. The selected and tested solution becomes the base for the strategy roadmap.

The final roadmap is created at the last stage. Moreover, it can have two versions—for internal and external use. The first is necessary for planning the required resources and carrying out product development. The second is provided to external partners to know their opinion.

Thus, the roadmap that addresses the specifics of a highly dynamic market allows employees to understand the direction of the company’s activities and development and take into account the needs of consumers (customers) when forming the company’s strategy and business processes.

This approach is characterized by deep analytical research, as well as the mapping of potential customers and markets, allowing to improve logistics and address the specifics of consumers (e.g., cultural behavior, customs, requirements of national legislation for foreign customers, etc.).

21.5 Conclusion

Technologies are going to change at an ever-increasing pace, and companies will have to become more flexible and efficient in researching, selecting, developing, and implementing new technologies and solutions. Without addressing the target customer experience and overall market needs, there is a risk of erroneous choice of technologies and loss of market position and competitiveness.

When creating a company development strategy, customer needs and market requirements shall be considered, both existing and prospective. This will accelerate the digital development of the company, its entry into virtual markets, and improve sales of its products on the Internet. Creating a digital development strategy for a company is only possible with effective tools available, and strategic design being the most modern and effective.

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Chapter 22

Human Capital Russian Elite and Efficiency Public Administration



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Abstract The article considers the influence of the quality of human capital of the Russian elite on the effectiveness of public administration in modern Russia. Focusing on the qualitative characteristics of the Russian elite, the authors pay special attention to the analysis of the main components and consequences of its socioeconomic policy. As the present study shows the lack of professionalism and incompetence of the majority of the Russian elite in matters of public administration, their disregard of economic laws negatively affects the socioeconomic development of Russia and does not allow creating an innovative economy, ensuring a high quality of life for the majority of Russian citizens. The huge property differentiation of Russian society and the low standard of living of the main part of Russians not only contributes to the growth of social tension in society, but also hinders the development of Russia as a whole. According to the authors, the human capital of the Russian elite has not yet reached quality indicators comparable to the developed countries of the world and is not always a decisive factor in the innovative development of regions and the national economy. Therefore, the modernization of the human capital of the Russian elite should become a priority direction of the state policy of modern Russia.

22.1 Introduction

The elite, by definition, is the most active and capable part of society, occupying a leading position in the development of norms and values that all its members are guided by. This is a small social group that is the upper stratum, the core of the political

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class, in the hands of which there is real power. The elite makes the most important strategic political decisions and leads the rest of the social strata of the population. Unfortunately, the Russian elite is not always recruited on the meritocratic principle, not on the basis of a value approach, the foundations of which were laid by such famous philosophers of the past as Confucius, Plato, and Aristotle. According to this approach, the elite should consist of the best representatives of society and be the best human capital.

To measure the quality of the elite, the human capital index is used, which is a practical tool, since the main attention is paid not to smart speeches written by speech-writers, but to the knowledge, talents, and professional competencies of the politician, statesman, and his creative approach in making and implementing managerial decisions.

The importance of human capital in the formation of long-term sustainable economic growth is shown in the works of Nobel laureates R. Lucas, K. Pissarides, R. Solow, and other authoritative researchers [1, 2, 3, 4, 5]. Thus, the Nobel laureate K. Pissarides, emphasizing the importance of education in human development, pointed out that the role and activity of public policy should increase when it comes to investment in education. It is this area of investment efforts that gives a long-term positive effect of sustainable economic growth.

The influence of human capital on innovation processes has been studied by prominent economists, among whom we can mention Y. Schumpeter, La Piere, P. Whitfield, P. Drucker, K. Knight, Brian Twiss, and others [6]. They have an important conclusion that human capital is becoming a determining factor in the development of the country.

The human capital research of the Russian elite is devoted to the works of I. A. Androsenko, A. G. Ashin, O. V. Gaman-Golutvina, D. K. Grigoryan, A. V. Duk, A. P. Kochetkov, O. V. Kryshtanovskaya, A. V. Ponedelkov, N. Yu. Lapin, A. E. Chirikova, and other Russian researchers [7, 8–10, 11, 12, 13–15, 16].

In the works of these Russian authors, an important conclusion is made that the human capital of the ruling elite plays an important role in the socioeconomic development of the country, for example, after the death of the “great helmsman,” the beginning of radical transformations in the people’s Republic of China, which lagged far behind the Soviet Union in economic and social development. They were started by Deng Xiaoping, who was a visionary politician and brought to power an elite characterized by determination, consistency, and a desire to serve the people and make the country richer and more powerful. Thanks to the reforms initiated by Deng Xiaoping, China has made a leap in economic development and raised Chinese society to the level of “middle income,” gaining the status of one of the strongest countries in the world economy. Today, China is a leading economic power, with its gross domestic product (GDP) increasing from \$255.7 billion in 1979 to \$13.2 trillion in 2018, more than 50 times. China’s contribution to the world economy increased from 1.8 to 18.2% [17, pp. 536–537].

22.2 Scientific Significance of the Issue

The purpose of this study is to analyze the human capital of the Russian elite and its impact on the effectiveness of public administration in the country. Based on this analysis, the authors tried to find answers to the following key questions.

1. To establish whether the human capital of the Russian elite is able to develop and implement the state socioeconomic strategy and what results it has led its people
2. To identify the main problems that have not yet been solved in the management of our country.
3. To identify what qualities are lacking in the human capital of the Russian elite for the successful implementation of the decree of President Vladimir Putin on national goals and strategic objectives that must be implemented by 2024.

The following methods are used in this study.

1. The comparative method which allows comparing the government of Russia, its level, and quality with the developed European and Asian countries.
2. The systemic and structural-functional approaches allow us forming a holistic view of the state management, led by President Vladimir Putin, to show achievements and shortcomings, mistakes, and miscalculations made in 2000–2019.
3. The institutional approach makes it possible to analyze the influence of various state institutions on the formation of economic and social policy in Russia and determining the effectiveness of state institutions in our country.
4. Content analysis allows you to make a meaningful quantitative analysis of arrays of official statistical data, with the purpose of subsequent meaningful interpretation of the revealed numerical patterns.

22.3 Theoretical Part, Practical Significance, and Research Results

Today, we can note the high level of corruption that has affected all levels of government, both in the Federal center and in the regions. Using their official position for personal enrichment, members of the government, ministers, governors, employees of the presidential administration, and State Duma deputies engage in large-scale embezzlement from the state budget and other financial sources through corruption schemes. Thus, according to the General Prosecutor's office of the Russian Federation in 2018, the amount of material damage from corruption crimes amounted to 65.7 billion rubles, which is 66% more than in 2017 [18].

After becoming a legally elected president, Vladimir Putin began a reform of public administration, which resulted in the creation of a new vertical of power based on the enormous powers of the head of state. The main principle of selecting personnel for top management positions in the state was not so much professionalism

as personal loyalty to the president. For this reason, a serious mistake was made in the development of the state's economic strategy: instead of developing an economy based on knowledge, innovation, and IT technologies, the economy relied on the production and export of raw materials, primarily oil and gas, abroad. D. Medvedev, A. Miller, I. Sechin, and other Putin's closest associates, not daring to contradict the head of state, supported his ideas regarding the construction of new export pipelines to Europe and then to China (Nord stream, Nord stream-2, South stream, The Power of Siberia, and others). The development of innovative production based on modern high technologies and rational use of human capital was given secondary attention.

It should be noted that the favorable price environment for hydrocarbon raw materials (in 2008, they reached 149 dollars per barrel) negatively affected the work of the ruling elite surrounding President Vladimir Putin: the country received hundreds of billions of petrodollars. This money was used to buy industrial goods and technologies, food, shoes, and clothing for the population.

However, during the global financial and economic crisis of 2008–2009, the situation in the economy changed dramatically: the world price of oil, gas, coal, non-ferrous and ferrous metals, round wood, and other natural resources fell, the stock exchange collapsed, the ruble devalued, and the population became impoverished. Dmitry Medvedev, who was the head of state in those years, in the famous article “Russia, forward!” recognized the mistakes made by the elite: the crisis clearly showed that he and other people who were part of the Russian elite at that time did not do everything necessary in the years leading up to the crisis and did not do everything correctly.

The crisis has clearly demonstrated that the Russian manufacturing industry and its leading industries, aircraft, shipbuilding, machine tools, and others, have not developed and have almost degraded. In comparison with the Soviet Union, capitalist Russia reduced the volume of industrial production several times.

The state, according to most Russians, does not cope with its distribution function. It does not distribute oil revenues fairly, as is the case in Norway, for example, where contributions to the national pension fund already exceed \$1 trillion. Such a state policy leads not only to a dangerous increase in social tension, but also contradicts the concept of a social state enshrined in the current Russian Constitution.

The repeated devaluation of the national currency (2008–2009, 2014–2015, 2020) is a striking example of government decision making in favor of large exporters of raw materials. After the devaluation of the national currency, artificially changing the exchange rate of the ruble to the dollar, oil companies were able to recoup some of the losses associated with the falling prices for “black gold,” but also significantly enriched. Selling oil, gasoline, diesel fuel, and fuel oil for currency, oil magnates began to exchange it for rubles at a very favorable rate for them, and pay salaries, taxes, and debts to related companies in cheaper rubles. With the devaluation of the ruble in the tens of percent, at the same time, there are large losses for the majority of Russians, who keep their earned money, usually in the national currency and have almost no savings in hard currency, dollars and euros. Devaluation almost always worsens the situation of a large part of the population, as it leads to higher prices for imported goods and a fall in real wages.

Today, Russia, which occupies a leading position in the world in the production and export of oil and gas and other natural resources, counts on the one hand, more than 110 dollar billionaires and 246 thousand dollar millionaires, on the other 19 million people, even according to official data, live below the poverty line. In the hands of 10% of our most affluent citizens, 83% of all personal wealth in the country is concentrated. This is higher than in the United States (76%), which has one of the highest levels of wealth concentration among developed countries [18]. In fact, the number of poor Russians is many times higher because we should not count such people based on their poor income, but on the real opportunities of people to get an education, maintain their health, go on vacation, buy necessary clothes for themselves and their children, eat a balanced diet, etc. The formation, development, and use of the human capital of a given state largely depend on these essential conditions that determine the standard of living. However, the facts show that the leadership of the Russian Federation and the ruling elite are not very concerned about the state of human capital in the country. This is evidenced by many arguments and facts, including such an important economic indicator as the share of human capital in production. If in developed countries (Germany, Japan, South Korea, Singapore, etc.) this figure reaches 80%, in Russia, it is less than 15% [19].

Over the past few years, the social and economic situation of ordinary citizens has deteriorated significantly due to the increase in direct and indirect taxes. So, in 2018, a new tax on the “self-employed” was adopted, the Federal law on increasing the value-added tax (VAT) from 18 to 20%, which additionally brings more than 600 billion rubles or 10 billion dollars to the budget [20]. With the increase in VAT in the country, there was a new increase in prices and a decrease in real incomes of the population. Tax rates on land, property, and transport have also been significantly increased during this period. If in 2015, these three taxes brought to the state treasury a total of 178 billion rubles, then in 2018, it was already 279 billion (including taxes. 2019). Multibillion dollar revenues come from a constant increase in excise taxes on gasoline, tobacco, and alcohol.

Against the background of a significant increase in the tax burden on ordinary citizens, the ruling elite of Russia stubbornly refuses to affect the interests of the super-rich Russians, to introduce a progressive tax scale under the pretext that this will contribute to the withdrawal of capital from the country (as if this has not actually happened for many years).

Having a surplus budget (Federal budget revenues exceeded planned expenditures by 2.746 trillion only in 2018 rubles.) the Russian government, instead of providing real social assistance to low-income Russian citizens, establishing decent pensions and benefits for disabled people and labor veterans, large families and other categories of needy Russians, prefers to accumulate money in the National Welfare Fund [21].

This policy is the result of one-sided thinking of the Russian elite, which is afraid that excessive monetary investments in the development of the socioeconomic sphere of Russian society will lead to inflation. Unwilling to abandon the long-outdated monetarist concept, the Russian government focuses only on one of the aspects that contribute to inflation. The fact is that low purchasing demand of the population,

underdevelopment of the economy as a whole, and a number of other factors lead to inflation—all these circumstances are simply ignored by them.

As a result of the erroneous policy of the Russian elite in relation to wages and taxation, the population is forced to take loans from banks for urgent needs (buying clothes, shoes, to get a child to school, etc.). Rosstat founds that almost 80% of Russian families have difficulties in order to purchase the necessary minimum of goods and meet the amount of family income. 14.6% of families are faced with “great difficulties.” The minimum income required for a large family (three children or more) is set at 82 thousand rubles per month. Young families need at least 68–69 thousand rubles; single-parent families need 62.5 thousand rubles. Families consisting only of pensioners need 38.3 thousand rubles to avoid hunger. Russians are forced to borrow the missing amounts from banks and other credit organizations. By the beginning of 2020, the total amount of loans to Russians exceeded the astronomical amount more than 15.5 trillion rubles. Moreover, according to the ministry of economic development, in 2019, half of Russian borrowers spent more than 50% of their monthly income on loan payments. 16% of these loans, or 10.2 trillion rubles, are problematic that they are either already restructured or served with a delay exceeding 90 days [22].

Saving on the salaries of state employees, the Russian elite is already facing a serious shortage of highly qualified personnel. According to Deputy Prime Minister of the Russian government O. Golodets, more than 1.5 million well-educated and competitive Russians and highly qualified specialists went abroad in search of a better share of permanent residence [23]. The well-known Bill Gates company, for example, now successfully employs more than 22% of employees who come from Russia. Another 53% of young people between the ages of 18 and 24, according to the Levada Center, would like to leave Russia forever [24].

It should be noted here that in addition to the mass outflow of high-quality human capital abroad, there is a mass influx of emigrants from the post-Soviet republics of Central Asia and Transcaucasia—poorly educated, insufficiently qualified, and poorly versed in the Russian language. Therefore, it is unlikely that migrants from the near abroad can be classified as highly qualified personnel. They worsen rather than improving Russian human capital.

The attitude of the Russian elite to small- and medium-sized businesses is also alarming. By verbally promising them full support and assistance, the country’s leaders, through law enforcement agencies and dependent courts, are clearly taking the opposite line. Russian entrepreneurs have learned the hard way that there are no guarantees to protect their profitable businesses in Russia, and businessmen are increasingly losing faith in the president and the political elite, Federal and regional authorities. This is indicated by the fact that over the past 25 years, they have withdrawn about \$750 billion abroad or almost three annual budgets of the country. [25]. It is not possible to return this huge amount of money to our country: businessmen prefer to keep their savings in Western banks. If these assets were invested in the domestic economy, they could increase production and budget revenues from taxes that could be spent on infrastructure development and social programs. But instead,

most of them went to buy foreign assets, including luxury yachts that are used by the Russian elite as entertainment and recreation.

With the adoption of a large-scale creative program in May 2012, the Russian ruling elite had a real chance to accelerate the country's economic and social development. The implementation of this program could be successfully completed under one very important condition: to form a government of competent, highly educated people, professionals in their field. Unfortunately, this did not happen.

The presidential decree appointed so-called "universal managers" to ministerial positions who did not have basic education or experience in the industry that needed to be managed. Thus, V. Putin appointed the minister of industry and trade the sociologist D. Manturov; the head of the space industry (Roscosmos)—international journalist D. Rogozin; E. Nabiulina, who never worked in the banking system, was appointed head of the Central Bank of Russia; T. Golikova, an accountant by training, managed all Russian health care, the negative results of which are well known; V. Mutko, a mechanical engineer on ship machines, for a long time headed the ministry of sports and the olympic committee of Russia, glorifying Russian sports achievements in doping, etc.

In order to successfully manage the industry, you need to have good training, basic education, experience in management work, and be a professional. A significant part of the human capital of today's government did not possess such qualities. But he is good at writing reports and references, writing reports, and announcing long-term plans for the future. The ministry of industry and trade had to determine on a national scale which industrial goods were produced by domestic enterprises and which were purchased for import abroad, observing the principles of economic security. However, the minister sociologist with a non-core education failed to solve this problem. According to the same department, Russia's dependence on imports has not decreased, as the head of state demanded, but on the contrary, has increased significantly, for example, the share of imports in heavy engineering is 60–80%, in light industry—70–90%, in radio-electronic industry—80–90%, and in pharmaceuticals and medical industry—70–80% [26, pp. 7–8].

As a result, the real implementation of the eight-year socioeconomic development program of the country did not work out, and time was lost. Even today, the successful implementation of national projects is hindered by the unwillingness of many representatives of the Russian elite to take responsibility for solving a number of issues in the course of their specific implementation, and sometimes by the lack of competence and professionalism.

Unprofessional actions of the Russian elite in the international arena resulted in anti-Russian sanctions and multibillion dollar losses for the economy (according to some estimates, from 150 to 200 billion dollars for 2014–2019). An example of this is the permanent "gas war" with Ukraine, which negatively affected the international prestige and image of our country, as well as resulted in significant financial losses. At the end of February 2018, the Stockholm arbitration court ruled on the issue of Russian gas transit through Ukraine, obliging Gazprom to pay Ukraine \$4.673 billion in a lawsuit for not delivering the agreed volumes of gas for transit.

Among the qualities of the human capital of the Russian elite, it is possible to note that they are not required to implement their promises, which were publicly and even in writing stated earlier, for example, the ruling United Russia party and the Government of the Russian Federation, led by the leader of this party, Dmitry Medvedev, on the eve of 2020, when the well-known “Strategy 2020” came due, did not say a word about why they did not implement what they so promoted 12 years ago.

Among the negative qualities of the Russian elite, it is worth noting not only greed and self-interest, expressed in its mass corruption, but also obvious pharisaism. Calling on Russians to be patriotic, work for the good of the motherland, and be ready to defend the country from external enemies, especially from NATO countries led by the USA, many representatives of the Russian political elite acquire elite real estate in these countries, get a second citizenship and a residence permit, and invest their money in offshore companies and foreign banks, for example, some current members of the Russian government have a residence permit (residence permit) in Italy, Germany, France, Great Britain, and Bulgaria (NATO member countries). Among them are Deputy Prime Minister O. Golodets (in Italy), minister of labor and social protection M. Topilin (in Bulgaria), deputy minister of industry and trade G. Kalamanov (in the UK), deputy minister of economic development A. Talybov (in France), and others.

22.4 Conclusion

The study allows the authors to draw the following conclusions.

1. The elite, the core of the Russian political class, is clearly not recruited on a meritocratic basis. Its priority and most influential segments are the top-level management bureaucracy that represents the interests of Russian corporate business. Today, it has become obvious that without limiting the influence of the highest administrative bureaucracy on the government, and a serious renewal of the Russian elite, it is impossible to modernize and further successfully develop Russian society.
2. According to the laws of dialectics, the Russian elite must be updated periodically, and rotational processes must also take place within it. The positive effect of the renewal of the ruling elite was clearly confirmed by the 40 year experience of China, as a result of which it turned from a backward country into a developed state with a powerful economy. The activities of the Russian elite in the post-Soviet period led to stagnation and stagnation in the economy, reducing the level and quality of life of millions of citizens. Keeping the former elite unchanged did not benefit our country and did not ensure an effective social and economic policy in the interests of the vast majority of Russian citizens. The Russian elite cannot (or will not) provide them with a quality of life that meets modern requirements. Due to insufficient funding for social policy,

- many of the most important social problems have not been properly resolved today, among them are demographic (depopulation processes are not stopped in Russia), housing (more than 60% of the population needs better housing), pension provision, etc.
3. Numerous facts show that the current Russian elite is mired in corruption. Greed and the desire to get rich at any cost, regardless of current laws and moral and ethical principles, became characteristic properties of its human capital. Corruption has infiltrated today in all the organs of state power, state administration, and municipal management. This is evidenced by numerous arrests and court sentences against employees of the presidential administration, ministers, members of the Federation Council and the State Duma, governors of republics and regions, and mayors of cities.
- The end of bureaucratic arbitrariness in Russia will be put if the corresponding state position held by an official is not automatically identified with a certain set of social privileges, first of all, with the ability to “solve” certain issues for the purpose of personal enrichment. In addition, it is necessary to constantly monitor the activities of officials from the top political leadership of the state, as well as institutions and associations of civil society from the bottom. Given that Russia does not have any of the above conditions, we do not have to wait for the emergence of a civilized bureaucracy in the near future, consisting of highly qualified specialists of spiritual work, with a developed professional honor that guarantees the integrity of their activities, without which the risk of corruption and permissiveness of officials remains.
4. By an ill-conceived economic strategy with an emphasis on the export of raw materials, an incorrect economic policy pursued by the current elite, an offshore economy, an unfavorable investment climate, and a high dependence on imports, these and other reasons indicate the unprofessionalism and incompetence of the majority of the Russian elite in matters of public administration and indicate that they ignore economic laws. All this has a negative impact on the socioeconomic development of Russia, especially in the last five years, when the country's economic growth rate is characterized by the neologism “near zero.”

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Chapter 23

The Structure of A. Lincoln's Argumentative Discourse



L. I. Shadaeva

Abstract The argumentation is directly related to the ontologization of new knowledge. According to this statement, A. N. Baranov and V. M. Sergeev distinguish logical or rational argumentation, dialectical, generative, and emotional argumentation. By using the biblical expressions and metaphors such as “the last best hope of earth” and “all men are created equal,” A. Lincoln not only changes the value hierarchy in the picture of the addressee’s world, but also creates in the minds of the American people a new value category—its exclusive role in the world history. Thus, A. Lincoln determines the ethical significance of the American people for all mankind. The use of dialectical and generative argumentation, as noted by A. N. Baranov and V. M. Sergeev, involves an appeal to logical argumentation. Logical (or rational) argument is the main, “basic” type in A. Lincoln’s argumentative discourse. Also, we consider a thesis in the A. Lincoln’s argumentation structure. We determined that the argument of A. Lincoln is characterized by the introduction of the thesis by indirect speech acts of affirmation, assumption, etc., oriented to the picture of the world and the knowledge of the addressee.

23.1 Introduction

With all the various texts formed in the process of argumentation, a commonality of their logical structures is observed. One can distinguish the thesis (this) and the basis (arguments) in any of them. Obviously, the argument is more complex than, for example, syllogism or any other deductive inference. Any argumentation begins with analysis of existing facts called data (premise, thesis), with the help of which a specific conclusion (conclusion, result) is substantiated. In addition, a certain basis is needed to allow this transition. The transition from the initial judgment to the final is not an unmotivated process. A judgment establishes a causal relationship. This judgment represents the universe of faith regarding the way in which facts are interdependent in experience and knowledge of the world.

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Graphically, the connection between the elements of argumentation can be represented by the scheme [1, 2]:

The connection between the elements of argumentation
 Data → ↓ → Conclusion
 Ground (arguments)

In the framework of the cognitive approach, the argument is a text/discourse that changes the model of the recipient's world to influence the decision-making process. "An argumentative discourse is a form of social practice in a sociocultural context, since it is directed at another person or other people" [3].

23.2 Materials and Methods

Baranov and Sergeev [4] recognize the value categories as one of the mechanisms of changing the human world model. So, the ontologization of knowledge occurs in an argumentative way of organizing discourse. The nature of the use and functioning of these categories in the process of natural language argumentation is the basis of the typology of argumentation. In this case, the basic rule of argumentation is as follows: the thesis under discussion is transformed to become completely obvious. The latter allows the listener to evaluate the speaker's thesis. On the other hand, the value transformation of the statement enables the speaker to put forward his own thesis in the process of argumentation.

A. N. Baranov and V. M. Sergeev distinguish logical or rational argumentation, dialectical, generative, and emotional argumentation. All distinguished types of argumentation are directly related to the ontologization of new knowledge. Logical argumentation is aimed at reinterpreting the thesis within a given value. Dialectical argumentation involves the use of actualized value concepts and their hierarchies. In this case, the ontologization of new knowledge precedes the actualization of existing knowledge. The generating type of argument provides the creation of new value categories and their hierarchies in the addressee's mind. Emotional argumentation is limited to the involvement of immanent value structures, as a rule, not realized by the addressee. The emotional type of argumentation requires specific actions, a specific choice in the decision-making process without a rational analysis of the reasons. We do not consider this type of argumentation, since it requires special detailed research.

In order to show the role of metaphor in A. Lincoln's argumentative discourse, we present a fragment of his annual report on the work done in Congress (December 1, 1862):

We say we are for the Union. The world will not forget that we say this. We know how to save the Union. The world knows we do know how to save it. We — even here — hold the power, and bear the responsibility. In giving freedom to the slave, we assure freedom to the free - honorable alike in what we give, and what we preserve. We shall nobly save, or meanly lose, the last best hope of earth. Other means may succeed; this could not fail. The way is

plain, peaceful, generous, just - a way which, if followed, the world will forever applaud, and God must forever bless [5].

23.3 Results and Discussions

The expression “the last best hope of earth” is a biblical metaphor. The context of the Bible explains our understanding of this metaphor: “For we are saved by hope: but hope that is seen is not hope: for what a man seeth, why doth he yet hope for?” [6]. This metaphor in the context of the Bible embodies such a value as faith in the Lord God on the path to the mankind’s salvation. In the context of A. Lincoln’s statement, the metaphor “the last best hope” defines the American nation as a hope for the salvation of all mankind. The adjectives ‘last’ and ‘best’ appeal to such concepts in A. Lincoln’s linguistic personality worldview as the selectivity and exclusivity of American people.

The era of development of American society in the nineteenth century is characterized by commitment: The moral principles of Protestantism. The faith in the Lord God was a fundamental value in the world picture of an ordinary member of American society. In the cited passage, A. Lincoln uses this metaphorical statement in defining the American nation as a conclusion to the thesis “We know how to save the Union.” He thereby not only changes the value hierarchy in the picture of the addressee’s world, but also creates in the minds of the American people a new value category—its exclusive role in the world history. Thus, A. Lincoln determines the ethical significance of the American people for all mankind. We can observe in A. Lincoln’s discourse the presence of dialectic and generating types of argumentation. The use of dialectical and generative argumentation, as noted by A. N. Baranov and V. M. Sergeev, involves an appeal to logical argumentation. On one hand, dialectical and generative argumentations provide the necessary coordination of the participants’ value structures in the argumentative discourse and thereby pave the way for logical argumentation. On the other hand, it is logical argumentation that directly affects the decision-making process [4].

So, if we turn to the logical scheme of argumentation, then we get the following structure.

The data: We say we are for the Union. The world will not forget that we say this. We know how to save the Union. The world knows we do know how to save it.

Base (argument): We—even here—hold the power and bear the responsibility. In giving freedom to the slave, we assure freedom to the free—honorable alike in what we give, and what we preserve.

Conclusion: "We shall nobly save, or meanly lose, the last best hope of earth. Other means may succeed; this could not fail. The way is plain, peaceful, generous, just—a way which, if followed, the world forever applaud, and God must forever bless."

As we have already noted, logical reasoning is aimed at reinterpreting the thesis: “We know how to save Union” within the framework of a given value. This type of argumentation involves modeling some mental procedures of a pragmatic nature:

1. establishing correspondence between the structures of participants’ values;
2. comparison of the thesis under discussion with the updated value concept;
3. assessment of the conformity degree of the thesis to the idea of value;
4. explication of the significance of the defended thesis.

Mental procedures of a pragmatic nature allow us to determine, firstly, how the integration of new knowledge into the model of the addressee’s world is achieved, and secondly, how the “ontologized knowledge” is reconciled with the existing ideas of the addressee about reality [4].

A. Lincoln, using the biblical metaphor “the last best hope of earth” in the argumentation conclusion, thereby establishes the correspondence between the structure of values of his world and the structure of values in the American people’s world. Since one of the fundamental categories of A. Lincoln’s era is faith in the God-choseness of the American nation, the comparison procedure and assessment of the conformity degree with the updated value concept ends with an explication of the American people’s significance for all mankind, as well as their eternal blessing of the Lord God. Thus, A. Lincoln reinterpreted the thesis “We know how to save the Union within the framework of the value of faith in the God-choseness of the American people,” which corresponds to the procedures of logical argumentation. Logical (or rational) argument is the main, “basic” type in A. Lincoln’s argumentative discourse.

As we have already noted, any argumentation is incentive, arising from the purpose of argumentation—to influence the choice of the addressee in the decision-making process and thereby influence its structure of activity. Meanwhile, if we consider argumentation as a simple combination of those speech acts that expressed the thesis and argument, then the imperative nature of argumentation does not receive adequate reflection.

The thesis is “a set of statements that are a verbal formulation of the main proved idea, conveying the essence of the concept that is put forward for discussion, assuming a certain interpretation of the facts whose merits we are trying to establish, and adding something new to our knowledge” [7]. There are several ways to express a thesis, for example, American linguists Rick [Rieke] and Sillars [8] distinguish three main types of thesis: the judgment of facts, assessments, and actions.

A. N. Baranov considers the thesis from the point of view of the theory of speech acts. The author writes that there are “two main groups of speech acts, the most adapted … to the introduction of the thesis in explicit reasoning. The first group—“imperatives” in the broadest sense—includes speech acts directly affecting the decision-making process: order/command, advice, wish, desire, etc.; the second group—“epistemic”—is limited by speech acts of affirmation, assumption, expression of opinion, etc., oriented to the model of the world and knowledge of the addressee” [9].

The mechanism of indirect representation of the argument thesis is associated with the functioning of indirect speech acts in communication and with the identification of some part of a connected text with one or another semantic episode (e.g., “attack,” “threat,” “episodes,” “bargaining,” etc.) [4].

An indirect introduction of the argument of argumentation implies that the addressee restores some part of the meaning of the argumentative discourse omitted by the speaker. This implied part is connected with the conditions of success and other types of implicit semantic information by which the speaker represents the argument [4].

To analyze the indirect introduction of the thesis, we take an excerpt from a speech by A. Lincoln on July 10, 1858 in Chicago, Illinois:

1. It is said in one of the admonitions of the Lord, “As your Father in Heaven is perfect, be ye also perfect.” 2. The Savior, I suppose, did not expect that any human creature could be perfect as the Father in Heaven; but He said, “As your Father in Heaven is perfect, be ye also perfect.” 3. He set that up as a standard, attained the highest degree of moral perfection.
4. So I say in relation to the principle that all men are created equal. 5. let it be as nearly reached as we can. 6. If we cannot give freedom to every creature, let us do nothing that will impose slavery upon other creature. 7. Let us then turn this government back into the channel in which the framers of the Constitution originally placed it. 8. Let us stand firmly by each other. 9. Let us discard all these things, and unite as one people throughout this land, until we shall once more stand up declaring that all men are created equal. 10. I leave you, hoping that the lamp of liberty will bum in your bosoms until there shall no longer be a doubt that all men are created free and equal [5].

We will only comment on the thesis advanced by A. Lincoln. In this passage, the thesis consists of several Assertives (1, 2, 3) representing the status quo. Direct quotation of the Bible is an appeal, on the one hand, to the highest authority, on the other hand, is a confirmation of the truth of the thesis put forward by him. The use of the “degree of moral perfection,” a metaphor, is a thematic transfer of the “Testament of the Lord God → to the principle of a democratic society.” The addressee is invited to restore part of the meaning of the thesis. The context of the Bible is: “Be perfected as your heavenly Father is perfect” [6].

If the biblical covenant the “perfection” of a believer was associated with the desire for God’s grace and impartiality, A. Lincoln’s thesis “the degree of moral perfection” is determined by the degree of American society’s desire to get rid of “the evil of slavery.” The focus word “perfection” in the context of A. Lincoln’s statement takes on a new meaning and does not coincide with the context of the biblical metaphor. The new context is expanding the meaning of the focal word [10]. As we have already noted, “moral perfection” is the fundamental value category of American society in the nineteenth century, which allowed A. Lincoln to be confident in the positive addressee’s acceptance of the thesis put forward. A. Lincoln with the help of the biblical metaphor makes addressee experience the phenomenon of the real world (the principle of a democratic society) in terms of the world of eternity (according to the Bible).

In support of his thesis, A. Lincoln put forward the following argument (4)—Assertive speech act, relying on the expression “all men are created equal.” It is clear that this expression is not a metaphor itself, but reflects the ethical view and conviction

of both A. Lincoln himself and the authors of the fundamental document—the US Constitution. This expression, in turn, is based on the biblical dictum that we are all “children of God,” and therefore, all people are equal: “The Spirit himself gives witness with our spirit that we are children of God” [6].

The concept has blurred boundaries; most often it is not materialized in the objects of reality. Thus, the moral judgment “all men are created equal” (“all people are equal to each other”) is included in the concept of “equality,” since we are all children of the Lord God, and reflects the fundamental value category in the addressee and the speaker’s world.

It is interesting that the thesis put forward by A. Lincoln is at the same time an argument, which confirms the opinion of van Eemeren and Grootendorst [11] about the double communicative power of the speech act. The propositional content of this thesis will be: “I urge you to strive for moral perfection, since this is the covenant of the Lord God, we need to free ourselves from the evil of slavery, because God made us equal.”

23.4 Conclusion

So, we determined that the argument of A. Lincoln is characterized by the thesis expressed by indirect speech acts of affirmation, assumption, etc., oriented to the picture of the world and the knowledge of the addressee.

Also, A. Lincoln, explicating the biblical metaphor and expressions, establishes the correspondence between the structure of values of his world and the structure of values in the American people’s world. Reinterpretation of the biblical expressions corresponds to the procedures of logical argumentation. Logical (or rational) argument is the main, “basic” type in A. Lincoln’s argumentative discourse.

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Chapter 24

Structural and Functional Characteristics of Forecasting Capability in Preschoolers with Hearing Disorders



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Abstract Preschoolers with hearing disorders have difficulties in interacting with other people who may assist them in improving their skills of anticipating the development of future events. Prognostic competence of a child with a hearing disorder consists of the one's ability to predict situations in significant areas of relationships (relationships with peers, parents, adults), that is why we set a goal—to study structural and functional components of forecasting in children with hearing disorders in situations of alleged interaction with other people. The experiment involved 50 children aged 5–7 years who attend preschool educational organizations: 25 children with no hearing disorders and 25 children with hearing disorders. The results of this study show that children with hearing disorder are characterized by using ineffective methods of forecasting. Children with hearing disorder have difficulties in interacting with strangers. In particular, they are not well familiar with the rules of safe behavior. In their forecasting, children with hearing disorders are more often characterized by taking a passive position. In most situations, these children indicated other participants—often adults—as active subjects of future events. The results of the research give reason to identify children with hearing disorders as a group prone to the risk of maladaptation. The formation of prognostic skills in this category of children can contribute their successful learning of social norms.

24.1 Introduction

The ability to anticipate the development of events and results of one's own interaction with adults and peers plays important part in social adaptation of children [1, 2]. Children with hearing disorders have difficulties with socialization which begin to manifest themselves already in a preschool age. The problems arise due to violation of children's interaction with people and objects around them and inability to predict future situations which leads to adoption of wrong strategies of reasoning

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and behavior [3]. We suggest that one of the main causes of difficulties with socialization is associated with the specificity of the ability to anticipate future situations by children with hearing disorders. Therefore, we consider it important to study in detail its features, which can subsequently play a significant role in the development of comprehensive correctional program on the development of forecasting skills by various specialists of educational organizations (defectologist, psychologist, speech therapist, and others).

Studies of recent decades have shown that forecasting represents an important aspect of human mental development. According to Sergienko, “the course of mental processes at both micro and macro levels always includes foresight and anticipation” [4]. Studies of such scientists as Zaporozhets, Neverovich, Mukhina, and Wenger prove that the ability to predict manifests itself already in a preschool age [5]. This ability begins with sensorimotor anticipatory reactions in infancy. In a preschool age, sensory anticipation improves and we can see the formation of anticipation processes at other cognitive levels: perceptive (in particular, in interaction with objects), representative (at the level of images), and speech thinking [6].

With regard to dysontogenesis, the features of prognostic processes in preschoolers have only recently become the subject of researcher's attention [1, 7, 8]. The most extensively studied category of children is the one with speech disorders. In her studies of forecasting capability of preschoolers with hearing disorders, Sirotkina describes the phenomenon of emotional anticipation. She discovered that emotional predictions of children are presented in a constant form which does not allow children to establish a causal relationship of positive or negative emotions.

Foreign studies show a tendency toward comparative analysis of forecasting in people of different ages, different cultures, and socioeconomic groups. Foreign scientists managed to establish the following age-related peculiarity of the anticipatory activity of preschoolers: the younger the children, the more they show a strong inclination toward desired future situations and optimistic outcomes of future situations [4, 6, 8–28].

24.2 Organization of the Research

24.2.1 Sample

To study the ability to anticipate future situations by children with hearing disorders, we have conducted an experimental research which took place from October to December 2019 on the basis of several educational organizations in the Republic of Tatarstan which included kindergartens and groups for children with special needs. The participants of the experiment were 25 preschoolers with hearing disorders (deaf, hard of hearing children, and children with a cochlear implant) 5–7 years of age with a diagnosis “bilateral sensorineural hearing loss of the I–IV degree” with different

levels of proficiency in verbal or sign language, as well as 25 children with normal development (with no developmental disorders in their medical records).

24.2.2 Research Methods

Method of studying the prognostic capability called “Try-to-Guess” (L. I. Peresleni, V. L. Podobed). This method enables to identify the qualitative and quantitative characteristics of forecasting activity and determine informative indicators for assessing its features in children with and without developmental disorders.

The survey implies organizing a situation in which subjects must independently determine the alternation order of two events, taking into account the correctness or fallacy of their own predictions. Symbols “A” and “B” or numbers 1 and 2 or geometric figures can be used as a material for alternation. We selected a circle and a square in black as a material for provision to preschoolers with hearing disorders and children with normotypic development.

During the research, we have been calculating and analyzing the number of errors in the predictions of sets #2 and #3 and children’s ability to reproduce the order of all three sets after presentation of the cards. The indicators obtained during the research allow us to quantitatively characterize the features of long-term and short-term memory, thinking, and such properties of attention as stability, switchability, and distributability, as well as to identify forecasting strategies.

The “prognostic stories” methodology was developed by staff of the Department of Psychology and Pedagogy of Special Education, Institute of Psychology and Education of Kazan Federal University.

The research procedure is presented as follows: initially, the child is asked to take a look at the image of a bear and then listen to the stories that happened with the hero. Albums with stories are presented in two versions—for girls and for boys. Each story is illustrated with two plot pictures. After explaining the pictures, the child is given a clean sheet of paper and is asked the question: “What do you think will happen next? Tell me what will happen next.” If the child finds it difficult to answer on his own, he is asked some leading questions about what the heroes of the story will do, say, and how they will feel. If the child cannot give a verbal answer, he is shown two pictures depicting options for the development of story and is given instructions: “Look at these 2 pictures, think again, what will happen next? Show and tell us which one is more likely to happen.” The methodology presents six situations covering areas of relationships that seem significant for the socialization of preschoolers in child-adult, child-parent, child-child situations of interaction and in different types of activities (free and organized). For their answers, children are given from 0 to 4 points in assessment of the structural components of forecasts: 4 points—*independent answer*, 3 points—*answer with a hint (leading questions)*, 2 points—*an answer with visual support*, 1 point—*non-verbal choice*, and 0 point—*no response*. Thus, for their forecasts of emotions, children can score a maximum of 24 points and a minimum of 0 points.

The methodology allows to study the structural components of a child's forecast—prediction of actions, statements, and emotions (feelings)—as well as to interpret functional (regulatory, cognitive, and speech-communicative) characteristics of forecasts. Functional components are represented by nine indicators that allow to reveal attitudes toward prosocial/asocial behavior, optimistic/pessimistic, and active/passive attitudes in the respondents' forecasts. The methodology also allows to evaluate the variability, detailedness, and likeliness of forecasts and analyze the verbalization of forecast and the use of verbal means.

24.3 Results

See Figs. 24.1, 24.2 and Tables 24.1, 24.2, 24.3, and 24.4.

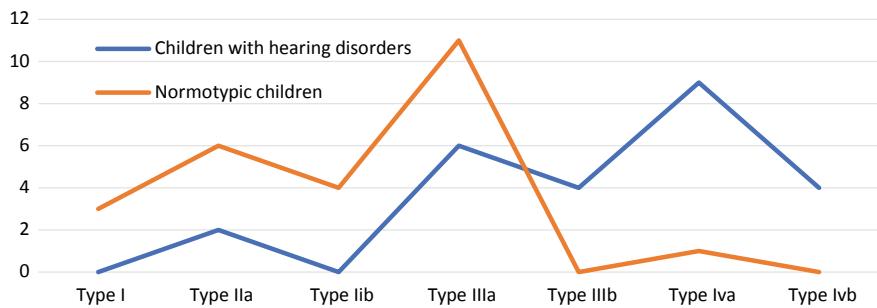


Fig. 24.1 Types of prognostic activity in children with hearing disorders and normotypic children

Fig. 24.2 Comparison of structural components of forecast in children with hearing disorders and normotypic children

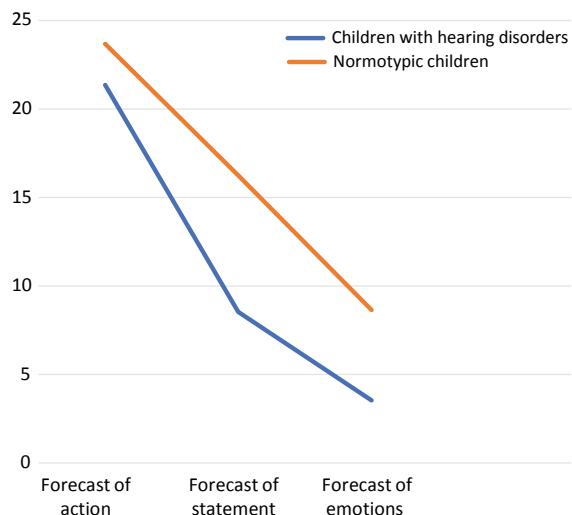


Table 24.1 Quantitative indicators of the features of prognostic activity of children with hearing disorders and children with normotypic development

Indicators	Children with hearing disorders (n = 25)		Normotypic children (n = 25)	
	Median (M)	Dispersion (SD)	Median (M)	Dispersion (SD)
Forecast formation rate	1.68	0.80	2.74	0.52
Maturity of regulation	2.80	0.40	2.44	0.50
Reproduction	1.20	0.50	2.04	0.93
Strategies	3.00	0.86	3.92	0.27

Table 24.2 Comparison of structural components of forecast in children with hearing disorders and normotypic children

Indicators	Children with hearing disorders (n = 25)		Normotypic children (n = 25)		T
	Median (M)	Dispersion (SD)	Median (M)	Dispersion (SD)	
Forecast of action	21.36	3.82	23.68	0.90	2.19
Forecast of statement	8.54	6.99	16.24	5.01	2.90
Forecast of emotion	3.54	6.21	8.64	5.64	1.39

Table 24.3 Prosocial/asocial behavior in forecasts of hearing-impaired children (n = 25)

Indicators	Minimum	Maximum	Median	Dispersion
Total sum	1	6	4.36	1.07
In organized activities	0	3	2.32	0.80
In free activity	0	3	2.04	0.73
In a parent-child area	0	2	1.72	0.54
In a child-adult area	0	2	0.96	0.53
In a child-child area	0	2	1.68	0.55

Table 24.4 Comparative characteristics of functional components of forecasts of children with hearing disorders and normotypic children

Indicators	Children with hearing disorders (n = 25)		Normotypic children (n = 25)		T	P
	Median (M)	Dispersion (SD)	Median (M)	Dispersion (SD)		
Free activity	8.54	2.73	14.45	4.41	3.77	$\leq .001$
Child-adult area of relationships	5.45	2.06	9.09	3.47	2.98	$\leq .001$
Child-child area of relationships	6.00	2.11	9.18	3.15	2.76	$\leq .001$
Cognitive function	6.36	2.35	8.72	2.57	2.25	$\leq .001$
Detailedness	0.81	0.98	2.18	1.66	2.34	$\leq .001$

24.4 Discussion

Analysis of the results of the study of prognostic activity using the ‘Try-to-Guess’ technique showed no statistically significant differences between preschoolers with hearing disorders and their normotypic peers in methodology indicators. However, we can notice the difference in the mean values of indicators (Table 24.1).

The results on the “forecast formation rate” indicator ($M_{hd} = 1.68$ and $M_n = 2.80$) clearly show that children with hearing disorders are characterized by an average and low rate of forecast formation, in contrast to their normotypic peers who are more likely to have high forecast formation rate.

The results on the “maturity of regulation” indicator ($M_{hd} = 2.80$ and $M_n = 2.36$) may indicate that children of both groups do not have neurodynamic disturbances leading to pathological instability of attention.

The results for the “reproduction” indicator reflect children’s ability to keep their forecasts in memory. The difference in mean values ($M_{hd} = 1.20$ and $M_n = 2.16$) may demonstrate that children with hearing disorders have a worse long-term memory—they can hardly remember information without special instructions.

The results for the “strategy” indicator also showed a significant difference in mean values ($M_{hd} = 2.33$ and $M_n = 3.64$). Hearing-impaired children are more likely to change their strategies, in contrast to their normal peers who use rational forecasting strategies.

Comparative analysis of the results of this method showed that preschoolers with hearing disorders may need to develop the ability to anticipate future situations. The lagging behind the normal values of the indicators “forecast formation rate,” “maturity of regulation,” and “strategy” does not give reason to assume the presence of pathological regulatory or cognitive impairments in terms of prognostic activity of children with hearing disorders. However, it is worth noting that the biggest lag behind the normal values in the “reproduction” indicator confirms the need for the development of a long-term memory formation of the analysis of previous experience in the structure of prognostic activity.

In addition to studying the four main indicators, the authors of the methodology propose determination of respondent’s type of prognostic activity. Based on his experimental research, L. I. Peresleni could identify seven types of prognostic activities and formulate criteria for effective forecasting: small number of erroneous predictions (up to 13.5); lack of “distraction” mistakes; correct reproduction of the order of alternating elements of any set after the end of the examination; rational strategies. These characteristics correspond to I, IIa, IIb, and IIIa types of forecasting. However, types IIb and IIIa demonstrate lower productivity of indicators of maturity of regulation and reproduction of orders of sets. The structure of prognostic activity of children with IIIb and IV types of forecasting is characterized by a deficiency of such intellectual functions as memory and thinking. Figure 24.1 illustrates the quantitative ratio of various types of forecasts in children with hearing disorders and children with normal development, for example, children with hearing disorders are more prone to having ineffective types of prognostic activity. In particular, they

are characterized by difficulties in reading information from long-term memory and difficulties in forming generalizations that impede the use of rational forecasting strategies.

In order to study the structural and functional characteristics of the forecasting activity in preschoolers with hearing disorders, the researchers used the “forecasting stories” methodology developed by Kazan Federal University pedagogical staff.

The study of the structural components of forecast covered several levels of children’s answers: an independent answer for which children received the maximum number of points—4, an answer with a hint (leading questions)—3 points, an answer with visual support (choosing one of the proposed pictures)—2 points, a non-verbal choice (the choice of a picture alone, without a verbal answer)—1, the lack of response—0 points. As a result, for the forecast of a separate structural component of forecast—forecast of action, forecast of statements, forecast of emotions—children can score a maximum of 24 points and a minimum of 0 points.

14 out of 25 respondents with hearing disorders (56% of the sample) with a developed understanding of speech showed a lack or minimal level of verbal communication—they were able to participate in the study giving answers with the use of a non-verbal choice. In this regard, it is impossible to evaluate the structural components of forecasts of a certain part of the sample. Therefore, when studying the structural components of the forecasts of children with hearing disorders, we turned to the results of 11 children who gave independent answers and answers with hints. In general, 44% of respondents expressed their forecasts of action. Forecast of statements was demonstrated by 36% of respondents. Forecast of emotions was expressed by 16% of respondents.

Using Student’s *T*-criterion, we could reveal that there were significant differences in the forecasts of statements between normotypic children and children with hearing disorders ($T = 2.90$). It is possible that low values of indicators of forecasts of statements are associated with a specific speech ontogenesis which determines low speech activity of children with hearing disorders in a preschool age and also affects the forecasts of their own and other people’s statements. The values of indicators of forecast of action and forecast of emotions in both groups are approximately at the same level. Forecast of action is found in all respondents; the average value of forecast of action is slightly inferior to the maximum score. Forecast of emotions is much less common in both groups of children. It is worth noting that the absence of forecast of emotions was observed in a larger number of children even after leading questions, which gives reason to suppose the presence of difficulties in predicting emotions for preschoolers regardless of the presence of developmental disorders (Fig. 24.2).

Analysis of functional components of children’s forecasts. Only one criterion related to the regulatory function was analyzed in the respondents who gave a non-verbal answer—prosocial/asocial behavior. This criterion assesses the willingness and attitude of children toward socially approved behavior. By analyzing the indicators of the criterion, we can observe adaptive strategies of behavior or attitudes toward asocial forms of behavior.

Only one child from the entire sample was characterized by the prevalence of anti-social responses. Across the entire sample, the number of prosocial responses significantly prevails over asocial ones. We can state that children with hearing disorders generally have favorable social behavior, but there are obvious difficulties in understanding and predicting certain situations—in particular, they are unfamiliar with certain norms of behavior, for example, only 32% of children learned the rule that one should not take gifts from strangers on the street. The described situation belongs to the child–adult sphere of interaction. Based on Table 24.3, we can further inquire that this area causes the greatest difficulties for children with hearing disorders since the indicator of the child–adult sphere has the lowest average value which significantly differs from other areas. We can also note that the most socially favorable forecasts were given by children in relation to situations of organized activity and child–parent spheres of interaction. We assume that it reflects the role of external regulation, which is provided by teachers and parents within organized activities. External regulation significantly helps children with hearing disorders to interact with other people more successfully.

The functional characteristics of forecasting in the “predictive stories” methodology are represented by nine criteria included in three functions—regulatory, cognitive, and speech-communicative. However, we consider it impossible to assess the speech-communicative criteria due to the specifics of the development of speech in children with hearing disorders. Therefore, in this group of children, we considered it legitimate to analyze only seven criteria related to regulatory and cognitive functions. Table 24.4 presents the criteria in which statistically significant differences were found between the two samples.

In addition to a direct analysis of the functional criteria of forecasts, the methodology allowed us to assess the degree of success of forecasting in different types of activities and areas of relations. Statistical analysis of the data showed that children with hearing disorders are more likely to have difficulties with forecasting in situations of free activity ($t = 3.77$). Besides, children with hearing disorders are more likely to take a passive position—in most situations, children indicated other participants of situation, most often adults, as subjects of future events. Most often, children’s forecasts reflect the actions and words of their mothers or teachers. Perhaps the difficulties of forecasting in situations of free activity are associated with the peculiarities of self-regulation, insufficiently developed independence, and dependence on a significant adult in situations of social interaction.

It is no coincidence that statistically significant differences were found precisely in child–adult ($t = 2.98$) and child–child ($t = 2.76$) areas of relations. Qualitative analysis of children’s responses showed that in the child–adult sphere the greatest difficulties for children were caused by the situation with a stranger on the street—children did not know the rule of not taking any gifts from strangers.

Cognitive function of forecasting is the least developed one in children with hearing disorders which is also manifested by statistically significant differences in this indicator ($t = 2.25$).

Among all the cognitive criteria, the criterion realistic/fantasy images ($M_{\text{hd}} = 4.73$) has the highest average value. Despite the fact that during the study, children

were involved in composing the continuation of stories about the fictional characters named Manyune or Mishunya, and they almost completely projected their stories on real life, giving realistic descriptions of future situations. The remaining three indicators have extremely low values.

Only a small number of respondents detailed their forecasts or went beyond the time frame of a given situation having expressed a long-term perspective. Variation of forecasts was not presented neither among children with hearing impairment, nor among normotypic children.

Thus, we could identify that the least developed function in children with hearing disorders is a regulatory one. But it is worth emphasizing that in most of the answers, the role that decided the outcome of a future situation was given to teachers and parents. This observation once again confirms the importance of external regulation in socialization of children with hearing disorder.

24.5 Conclusion

The research revealed the features of forecasting activity in children of a preschool age with hearing disorders. Hearing-impaired children are characterized by using ineffective types of forecasting activity. In particular, they are characterized by difficulties in reading information from long-term memory difficulties in forming generalizations that impede the use of rational forecasting strategies.

We have revealed statistically significant differences in structural and functional components of forecasting in children with hearing disorders and children with normotypic development according to the following indicators: forecast of statement, free activity, child-adult sphere of relations, child-child sphere of relations, cognitive function, and detailedness.

Difficulties in forecasting future situations and the use of inefficient forms of forecasting make it difficult for children to communicate freely with adults and peers and affect child's activities in free interaction.

Regardless of the presence of developmental disorders, all preschoolers face certain difficulties in anticipating emotions and presenting variable outcomes in forecasts.

The research allows us to talk about the need to create special correctional and developmental classes aimed at developing successful social behavior in children with hearing disorders and developing their ability to anticipate future situations.

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Chapter 25

Forecasting as a Resource of Socialization of Children with Speech Disorders



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Abstract The ability of children to predict the development of events is considered by many Russian and foreign scientists as one of the key resources for their social adaptation. The success of mastering social anticipatory models by children affects their success in communication, their communicative flexibility, and the variability of communication tools that they use depending on the context and qualities of the subjects of communication. The purpose of this research was to identify the relationship between forecasting capability and indicators of successful socialization in preschoolers with speech disorders. The study involved 54 children aged 5–7 years with a general speech underdevelopment of I–IV levels who attend preschool educational institutions of Russia. The following methods were used: “Prognostic stories” (Akhmetzyanova, Artemyeva), “Try-to-Guess” (Peresleni), “Emotional faces” (Semago), “Methodology for studying the compliance of a preschooler with the rules of a normative situation” (Bayanova, 2015), and “Pictures” (Smirnova, 2005). We have identified such features of forecasting activity of preschoolers with speech pathology as a violation of the mechanisms of memorization and “reading” information from memory with intact mobility of thought processes; difficulties in predicting emotions in future situations; insufficient development of cognitive function of forecasting activity. The empirical study confirmed close correlation between indicators of forecasting and socialization: forecasting actions, emotions, level of verbalization, and the use of speech and language means in forecasts are associated with communicative competence of preschoolers. Forecasts of actions depend on the maturity of children’s self-control, and forecasts of emotions are influenced by the maturity of children’s self-control and self-service skills. The study allows us to suggest the need for creating special classes for children with speech disorders aimed at developing their ability to anticipate future events and successful social behavior.

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25.1 Introduction

Difficulties in understanding and mastering the norms and rules of social interaction make it difficult for a child with developmental disorders to socialize and adapt to new social conditions. Successful socialization of modern preschoolers with speech disorders is hampered by the lack of free communication between children and little experience in their interaction with peers and adults. Scientists consider the development of the ability to anticipate events as one of the key areas of the socialization process. The ability to anticipate itself indicates a good level of orientation in reality, as well as a high level of the development of its cognitive and emotional-personal components [1].

Intensive development of forecasting capability in older preschool age makes it an important resource for positive socialization of children. The success of mastering social anticipatory models by children affects their success in communication, their communicative flexibility, and the variability of communication tools that they use depending on the context and qualities of the subjects of communication [2]. According to Feigenberg [3], probabilistic forecasting plays essential role in almost all situations of human activity. Kalyuzhin [4] suggests that the mechanism of emotional anticipation of the result appears on the fourth year of a child's life and represents itself in the development of the ability to emotionally anticipate the results of one's own actions and actions of other people and to activate past experience, where the experience of the future and the past—as something relevant to a corresponding emotional state—acts as a specific phenomenon of emotional regulation. Martin-Ordas [5] who studied the ability of preschoolers to anticipate current and future needs concluded that at the age of 3–5 years, children develop the ability to plan their own and others' future needs; however, they have great difficulty forecasting future needs that conflict with the current ones. Kinsbourne and Scott [6] note that anticipation is an integral constructive characteristic of the brain; their study showed that by 30 months of age, the ability to anticipate transcends the boundaries of immediate objects of reality and becomes a part of the field of language objects (i.e. words). Skuse et al. [7] suggest that the socio-communicative deficit of forecasting is important for adapting the behavior of children in school.

Speech is the basis for the formation of child's social connections with the world, and if it is disturbed, these connections will not be formed well enough. Unlike their peers with no speech pathologies, preschoolers with speech disorders are more closed off and have less balanced nervous processes, they feel more stressed working in a team and are less adapted to the conditions of existence in it [8]. The ability to predict and anticipate events and situations and determine their cause which is considered one of the most important characteristics of cognitive speech and social development of children. Preschoolers with a general speech underdevelopment are characterized by a disturbance of cognitive prerequisites of speech. They are also characterized by cognitive weakness and desegmentation of speech production and absence of its semantic integrity and structure; disadvantages of transmitting logical links of the plot; semantic inconsistency, and incompleteness of the plot [9]. Studies conducted

by A. I. Akhmetzyanova, T. V. Artemyeva, E. S. Viktorova, O. L. Lekhanova, and O. A. Denisova show that in comparison with children whose speaking skills correspond to the age norm, children with general speech underdevelopment face difficulties with formation of correct forecasts [9–11].

Difficulties in understanding and mastering the norms and rules of social interaction, lack of free communication between children, little experience in interaction with peers and adults, and low level of development of socio-prognostic skills make it difficult for a child with speech pathology to adapt to new social conditions and to successfully socialize. Children with speech disorders have social development problems such as low social mobility; poverty and stereotypical nature of social interaction with peers and adults; limited knowledge of human, and national culture. Researchers of this issue revealed the features of forecasting activity of primary schoolchildren with normal development and with impaired vision, hearing, speech, and musculoskeletal system. They found that the mechanisms for anticipating the development of events play a major role in the process of socio-psychological adaptation of children with disabilities [1]. However, there is a clear lack of research devoted to the study of forecasting features of preschoolers with developmental disorders and correlation between forecasting and socialization in children with speech disorders.

25.1.1 Materials and Methods

Participants. The study involved 54 preschoolers aged 5–7 years with general speech underdevelopment of I–IV levels who attend kindergartens of the Russian Federation. There were 26 boys and 28 girls. Parents gave permission to examine their children. The work with children took place in the morning primarily on an individual basis. As a rule, researchers required several meetings with each child for successful examination.

Materials. The study of the ability of preschoolers to predict further development of events was carried out using the “Prognostic stories” methodology developed by members of the Department of Psychology and Pedagogy of Special Education of Kazan Federal University.

- The study of the specifics of communication and interaction with peers and adults, social, and emotional intelligence was carried out using N. Y. Semago’s “Emotional faces” technique (assessment of the adequacy, accuracy, and quality of recognition of the emotional state) [12].
- Preschoolers’ understanding of social norms and values was determined with the use of technique developed by L. F. Bayanova, T. R. Mustafina “Methodology for studying the compliance of a preschooler with the rules of a normative situation” (“Obedience, meeting expectations of adults”; “Safety”; “Self-care, hygiene”; “Self-control”) [13].
- The study of the features of forecasting activity was carried out using the “Try-to-Guess” technique developed by Peresleni and Podobodom [14].

- To identify children's communicative competence in communication with peers, we used the "Pictures" technique developed by Smirnova and Burlakova [15].

Research hypothesis. We assumed that preschoolers with speech disorders may have difficulties with forecasting future situations, which may be associated with difficulties in their social adaptation and insufficient level of development of social competence.

Research objective. To identify the relationship between forecasting capability and indicators of successful socialization of preschoolers with speech disorders.

25.2 The Results of the Study

In order to process the results of the research, the researchers used statistical program SPSS 21. In order to study the relationship between forecasting indicators and socialization indicators, the researchers used Pearson's correlation coefficient. The significance level of 0.01 was used.

Analysis of indicators of socialization and forecasting skills of preschoolers with developmental disabilities (Table 25.1).

The empirical research using the "Try-to-Guess" technique showed that preschoolers with speech disorders are characterized by low forecasting efficiency ($M = 2.30$), which reflects children's inability to keep their forecasts in memory, to compare them with the order of presented elements, as well as the low span of their voluntary attention. The "Maturity of regulation" indicator characterizes the level of the development of regulatory processes, stability of voluntary attention which may be assessed by calculating the number of "distraction" errors. High values for this indicator ($M = 2.69$) were found both in children who quickly identified the alternation order and made no mistakes before the presentation of the set, and in those who could not identify the alternation order and did not make "distraction" errors, since almost all of their predictions were erroneous. The results on the "Reproduction of orders" indicator ($M = 1.89$) show that preschoolers with a general speech underdevelopment are characterized by having difficulties in reproducing the orders of alternation of the elements in three sets after the end of their presentation. 78% of

Table 25.1 Quantitative indicators of the features of forecasting activity of preschoolers with speech pathology (using the "Try-to-Guess" technique)

Technique indicators	Minimum	Maximum	Median	Standard deviation
Forecast efficiency	1.00	3.00	2.30	.924
Maturity of regulation	2.00	3.00	2.69	.469
Reproduction of orders	1.00	3.00	1.89	.572
Forecasting strategies	1.00	4.00	3.37	.977

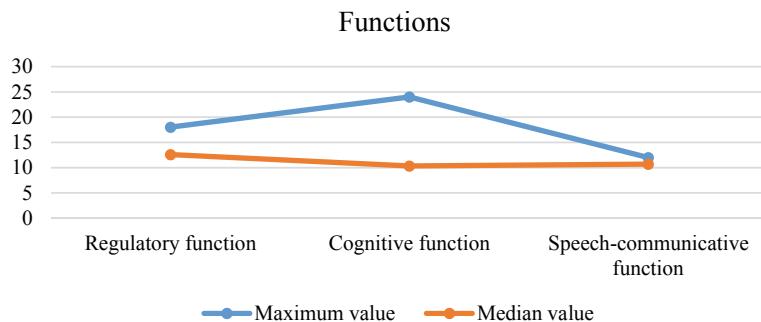


Fig. 25.1 Average values for the functions of forecasting activity of children with speech disorders (according to the “Prognostic stories” method)

children from the sample demonstrated the ability to carry out predictive activities using rational strategies that increase the likelihood of a successful solution to the forecasting task with a small number of erroneous predictions. 22% of children used irrational strategies as they could not identify the alternation order of elements of the sets II and III.

The results of the study of qualitative and quantitative characteristics of forecasting activity showed that forecasting skills of preschoolers with speech disorders are characterized by low efficiency, insufficient development of regulatory processes and selective attention, and impaired mechanisms of “reading” information from memory with possibility of choosing rational forecasting strategies (Fig. 25.1).

Evaluation of the regulatory ($M = 12.60$), cognitive ($M = 10.34$), and speech-communicative ($M = 10.70$) functions of forecasting activity showed that children with speech disorders can forecast future events quite effectively. The analysis of the data suggests that preschoolers with speech pathology are able to regulate their own activities and the activities of other participants in the anticipated situation. Forecasting future events, children plan possible strategies of behavior taking into account the norms and rules that are common in society. Preschoolers transmit the predicted image of the future using certain verbal models. Using verbalization, they make assumptions regarding the behavior of other people in future events as well as their speech and emotional states. Older preschoolers present information in a detailed form. In their answers, they use mainly lexically and grammatically correctly formed answers. Children with speech disorders often use simple common sentences in their answers, less often—single-word sentences. Forecasting possible future events, preschoolers often use future tense verbs and sometimes past tense verbs.

The lowest rates were found in the cognitive function. When predicting the future events, preschoolers with speech disorders often can offer only one option for the development of events, without going beyond the limits of a current situation. Their answers often have no logical reasons or explanations.

In order to determine the degree of preschoolers' compliance with speech pathology with the rules of a normative situation, we used the "Methodology for studying the compliance of a preschooler with the rules of a normative situation" developed by Bayanova and Mustafina [13]. Cultural congruence of preschoolers was assessed in accordance with four substantive factors: "Obedience, meeting expectations of adults," "Safety," "Self-care, hygiene," and "Self-control." The results of the empirical study of indicators of socialization showed that preschoolers with speech disorders are characterized by a low level of compliance with the rules of a normative situation.

The results of the study of recognition of emotional states allow us to conclude that preschoolers with speech disorders more often correctly recognize such emotional states as affability, surprise, anger, and shame. The least familiar words for children were the ones denoting the emotions of joy, fear, and resentment. Children with general speech underdevelopment are characterized by a uniform and primitive description of emotions which shows difficulties in verbalization of emotional states and insufficient identification of emotions.

The study of the communicative development and interpersonal relationships of preschoolers showed that preschoolers with speech disorders are characterized by an insufficiently high level of communicative competence. A significant part of children demonstrate either communicative helplessness and the lack of independence, or a tendency to aggressive behavior which manifests itself in the difficulties in finding a common language with peers, unwillingness to take into account the interests of the opponent in case of a conflict and inability to independently solve problem situations.

The relationship between forecasting capability and socialization indicators in preschoolers with developmental disorders (Table 25.2).

The results of the research show the ability to predict actions in a future situation by preschoolers with speech pathology is associated with self-control ($r = .586^{**}$) and with indicators of communicative competence in communication ($r = .607^{**}$). Cultural congruency indicators such as "self-care" ($r = .787^{**}$) and "self-control" ($r = .645^{**}$) influence the way preschoolers with speech disorders predict emotions and feelings. The speech-communicative forecasting function in preschoolers with general underdevelopment of speech is associated with communicative competence ($r = .678^{**}$) and with self-control ($r = .537^*$). The regulatory function of forecasting in children with speech pathology is associated with the ability to distinguish emotions ($r = .487^*$). The success of order reproduction in children with speech disorders depends on the degree of obedience ($r = .444^*$).

25.3 Discussion and Conclusions

The experimental research revealed the features of forecasting capability of preschoolers with speech disorders. The analysis of the data collected allows us to conclude that the most disturbed mechanisms in children are memorization and "reading," and the most preserved one is the mobility of thought processes which

Table 25.2 Relationship of forecasting indicators and indicators of socialization in preschoolers with speech pathology

Methodology indicators	Cultural congruence				Communicative competence	Emotional faces
	Obedience	Safety	Self-service	Self-control		
	Reproduction of orders					
Action forecast	.444*					
Total points					.586**	.607**
Organized activities		-.476*			.487*	
Free activities					.611**	.733**
Child-parent		-.455*				
Child-adult					.488*	.682**
Child-child		.521*			.590**	.512*
Independent answer					.548*	.601**
With a leading question						-.749**
With a hint that has options					-.540*	
Statement forecast						
Total points						
Organized activities					-.542*	
Child-adult						.486*
With a leading question						-.473*
With a hint that has options					-.543*	-.611**
Emotion forecast						
Total points					.787**	.645**
Organized activities					.565**	.455*
Free activities					.767**	.637**
Child-parent					.657**	.564**

(continued)

Table 25.2 (continued)

Methodology indicators	Cultural congruence				Communicative competence	Emotional faces
	Obedience	Safety	Self-service	Self-control		
Functional characteristics	Child-adult		.552*	.449*		
	Child-child		.641**	.503*		
	With a leading question		.781**	.697**		
	Optimistic/pessimistic attitude		.468*	.455*	.503*	
	Detailing/generalization		.529*	.615**		
	Max/min verbalization		.534*	.730**		
	Regulatory function				.487*	
	Speech-communicative function		.537*	.678**		

is confirmed by the ability of preschoolers to choose rational forecasting strategies. The analysis of structural components of forecasting showed that preschoolers with speech disorders are more successful in forecasting actions than in forecasting statements, and the biggest difficulties are associated with forecasting emotions. The analysis of functional characteristics of forecasting revealed that the most developed functions in children are the regulatory and speech-communicative ones, while the lowest indicators were found in a cognitive function.

The results of the study of the qualitative and quantitative characteristics of forecasting activity showed that forecasting capabilities of preschoolers with speech disorders are characterized by low forecasting efficiency, insufficient development of regulatory processes and selective attention, and impaired mechanisms of “reading” from memory with possibility of choosing rational forecasting strategies. Thus, the research confirmed the results of studies by Martin-Ordas, Suddendorf, and Atance devoted to difficulties with forecasting future events in children [5, 16–18]. Akhmetzyanova’s studies confirm the lack of forecasting function in children with developmental disorders [10].

The results of the empirical study of indicators of socialization showed that preschoolers with speech disorders are characterized by a low level of compliance with the rules of a normative situation. Preschoolers with general underdevelopment of speech are unable to adequately control their actions and subject them to certain rules of social interaction, which is most often manifested in resistance to restrictions set by adult and in difficulties in controlling their own emotional reactions. The results of the research are confirmed by the studies conducted by O. A. Denisova which state that children with disabilities—due to certain characteristics of their development—face difficulties in mastering the above groups of sociocultural experience. It is emphasized that children with speech disorders have difficulties in free communication with people, especially with those who do not belong to family members or caregivers [11].

The results of the correlation analysis show a close relationship between the regulatory, speech-communicative forecasting functions and indicators of socialization. Considering children with speech disorders, the regulatory function of forecasting is associated with the ability to distinguish emotions. The speech-communicative forecasting function in preschoolers is associated with a general underdevelopment of speech with communicative competence and with self-control.

The study allows us to argue that the developed prognostic ability of children allows you to interact with peers and adults, to find a productive solution to the conflict situation, since in this case they can successfully predict their behavior and the behavior of other participants in the presented situation.

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Chapter 26

Determinants of Professional Self-motivation and Educational Motivation of Students



N. G. Grigorieva and S. M. Drutskaya

Abstract The article deals with the problem of professional self-determination of young people under the influence of social and personal factors. The classification of these factors based on the purposeful impact on the process of professional self-determination is considered. The following types of influence were identified: external social determinants, internal social determinants, and personal determinants of professional self-determination. External social determinants represent all kinds of career guidance technologies: advertising, campaigning, involvement in clubs, and so on. Internal social determinants are various forms of influence of parents and relatives on the decision of young people. Personal determinants are conscious, independent, and informed choices based on personal motives, interests, and abilities. As a result of analysis of numerous studies, scientific knowledge about the nature of motive and motivation, depending on the educational motive of professional self-determination, has been identified and insufficiently studied problem of the interdependence of the determinants of professional identity and learning motivation of University students. The conducted empirical research revealed some regularities in the development of educational motivation of students whose professional self-determination was influenced by specific determinants.

26.1 Relevance of Professional Self-determination of Young People

At all times of human civilization, the problem of training effective specialists has been and remains relevant. Only the requirements of society to professionals changed: There was a demand for highly qualified specialists of a narrow focus, and then there was a need to train competitive specialists. Now the labor market requires a

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professional with the ability to innovate, with creative, critical thinking, able not only to produce popular products and transform the world, but also to create new artifacts, create a safe environment, expand forms of cognitive activity, respond to all kinds of challenges in a mobile and productive way, and be successful in any situation.

To train modern specialists in demand, it is necessary to create an appropriate system of professionally oriented education. First of all, it is necessary to start with a qualitative change in the process of professional self-determination of young people. Professional self-determination is a responsible start in adult life. It is professionally oriented training in the period of youth that is of particular importance for the further development of the individual, since vocational training is the leading activity for young people, under the influence of which all important personal education is formed and developed, which allow a person to later take place in the profession and be a self-sufficient adult with the ability to self-realization. This dependence is noted by many researchers. “The main reason for failures in professional activity is the lack of preparation of the individual for professional self-determination and random, unconscious choice of the sphere of work” [1, p. 14].

If the professional self-determination of a young person does not take place or is ineffective, then personal time will be lost to correct the mistakes made. And the person will have to go back to the initial stage of professional self-determination. And what is the probability that the restart will not be a false start?

Much attention in the scientific literature is paid to the research of the influence of professional self-determination on the formation of students' educational motivation. At the same time, the problem of the influence of various determinants of professional self-determination, including social and personal, on the further professional identification of young people, which, in turn, forms the educational motivation of students in the professionally oriented educational process of the University, remains less studied.

Considering professional identity as a first step in self-realization in the professional sphere, however, scientists have concluded that over time, the person has the right to make changes in the course of its realization, addressing a particular stage [2]. Professional self-determination is carried out throughout a person's professional life. This is also required by the modern, rapidly changing professional structure. However, the importance of the first stage of professional self-determination for the formation of value orientations in the life of a young person is undeniable.

26.2 Determinants of Professional Self-determination

However, when choosing a future profession, certain determinants of professional self-determination are of great importance for further professional self-actualization of a person. Among them are the determinants of social responsibility, the social duty of a person, and the state or public orientation of young people to prestigious professions in terms of their importance in the development of industry and the

country's economy. In other words, those factors that influence the choice of professional self-determination that are characterized by the predicate "it is necessary" and that are chosen by a person for some reason are important. Such determinants can be called external social determinants of professional self-determination. When they are active, as research indicates, "problems arise in the course of self-realization of the individual at the first stage—the stage of self-determination and spread to subsequent stages" [2, p. 81].

Internal social determinants include the role of parents in the professional self-determination of young people. Parents have a great influence on their children in choosing their future profession. This is confirmed by the results of numerous studies. "In choosing the professional path of young people, one of the leading roles is played by parents" [3, p. 14]. "Most often, students are influenced by social motives... and in most cases, students are guided by the opinion and choice of their parents" [4, p. 126].

The personal determinants of professional self-determination include an adequate choice of profession in accordance with their abilities and interests. Obviously, parents also play a role in these determinants, but indirectly. Parents, most often, give the opportunity to develop in a variety of ways during the preschool period—they organize children's visits to various circles, sections that allow them to identify certain tendencies and abilities and develop a corresponding interest in the child. These motivational personal educations, of course, will affect the further personal development of a person and his professional self-determination.

However, to date, it is necessary to state an ineffective combination of determinants of professional self-determination. The Russian Newspaper published data that only 37% of graduates work by profession [5]. According to the Ministry of Labor of Russia, only 71% of graduates of Russian universities who completed their studies in 2015–2017 found a job in their specialty. Experts of the All-Russian Research Institute of Labor note that applicants do not consciously approach the choice of specialty, do not perceive it as a profession, in accordance with which they will be employed in the future. These data indicate that there is a real problem that arises at the first stage of professional self-determination.

Our research conducted in secondary schools also shows that there is no unified system of professional self-determination for students. In this direction, priority is given to higher and secondary professional educational institutions that compete in advertising events to attract school graduates to their educational institutions. Educational advertising, in this case, is a fundamental external social determinant of professional self-determination of students.

Thus, in reality, the choice of a future profession occurs in about half of high school students and is often based on natural factors. Moreover, even if the choice of profession is motivated, the success of professional self-determination cannot be fully guaranteed, since "the formation of a stable positive attitude to the profession occurs only in the course of professional activity itself" [3, p. 249].

Imitation or implementation of professional activities during the educational process through the planned system of practical training also often leads to the loss of professional identification because universities do not have their own practice bases.

And in organizations where students practice, they treat trainees differently, and the system of professional activity at these enterprises may not be effective enough and does not serve as a positive example of organizing professional activities.

The importance of conscious professional self-determination is obvious, and the consequences of mistakes at this stage increase the chances of disappointment, which is recorded in the research of many authors: “there is a trend of mismatch of students’ expectations for the chosen specialty at the primary stage of training (students studying in junior courses of higher education) and complete disappointment at the end of training (in older courses), which amounted to about 50% of students” [6, p. 29].

26.3 The Relationship of Learning Motivation and Professional Self-determination

The phenomenon of educational motivation has been studied by many researchers. The works of famous scientists in the field of determining the essence of the motive and motivational activity of L. S. Vygotsky, A. N. Leontiev, B. G. Ananyev, and other researchers have become basic in the scientific theory of motive formation, including the educational motive [7–10]. Despite all possible scientific approaches to determining the essence of this phenomenon, many agree that motivation is a subsystem of activity. In the absence of motivation, the activity turns into a separate operation, action, imitation of activity by the subject of activity, which can be aimless, useless, and does not lead to a positive result [11–13].

Moreover, it should be noted that the educational motive is essentially a complex phenomenon and represents a synthesis of motives related to the content of training and motives related to the learning process. The integrative nature of the educational motive is studied by many scientists, including A. K. Markova, T. O. Gordeeva, and E. A. Shepeleva [14–16]. The features of motivational success education in students in the educational process of an educational institution, when the moderators of motivation formation are teachers, were studied.

In relation to educational motivation, Bozhovich [17] defines the motive of educational activity as an incentive that characterizes the student’s personality, its main orientation, formed at the previous stage of life. In other words, for students at the university, especially in the first two years, such a vital period for determining further education was the process of forming professional self-determination, carried out in a comprehensive school. As it was noted earlier, in general education schools, there is no purposeful, systematic process of career guidance that would allow students to consciously self-identify professionally.

In the system of educational motivation of students, which is represented by processes, methods, means of encouraging students to productive cognitive activity, active development of the content of education, the fundamental place is occupied by motives—personal driving forces of learning. Considering the relationship between

motivation and motives, it should be noted that motivation, as a process of changing states and relationships of the individual, is based on motives, which are understood as specific motivations, reasons that make the individual act and perform activities.

The problem of formation of educational motivation is quite well studied, but this does not mean that this problem has exhausted its relevance. For example, Dzhioeva A. R. and Besayeva A. G. note the importance of studying this issue, defining motivation for educational activities as occupying a “core” place in the structure of educational activities, which determines not only the learning process, but also its result [18].

In addition, personal motivators of educational activity affect the professional development of students. “It is positive motivation that ensures the creative activity of an individual, develops the ability to independently design and adjust their own cognitive and professional activities” [19, p. 171].

In pedagogy, there is a concept of “motivational syndrome” to denote a set of motives. One of the forms of the appearance of motivational syndrome are cognitive and professional motives. They are relatively independent components of a single phenomenon—the motivational syndrome of professionally oriented educational activities [20].

It is obvious that self-actualization of the individual is impossible without professional self-determination, identification of the “I” with the chosen profession. “Self-determination coincides with the choice of profession in those circumstances when a person chooses a profession in accordance with their interests, inclinations, aspirations and abilities” [21, p. 50].

Thus, the dependence of educational motivation on professional self-determination is confirmed by numerous studies.

26.4 Study of the Dependence of Educational Motivation on the Determinants of Professional Self-determination

The purpose of this research is to directly study the relationship between the determinants of professional self-determination and educational motivation of students.

The study was conducted among students of technical and medical universities. The determinants of professional self-determination were identified in 105 first- and second-year students of a technical University (see Fig. 26.1).

The results of the study indicate that of all the determinants of professional self-determination, the most significant are internal social determinants (46%), that is, the influence of parents is the most important and most significant in the professional self-determination of young people. Personal determinants, explicitly self-interests, abilities, and conscious professional self-determination are in the second place in

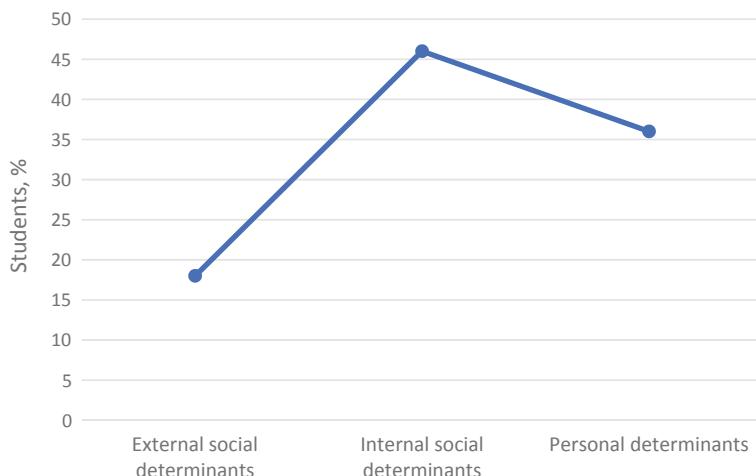


Fig. 26.1 Number of students (in %) with different determinants of professional self-determination (technical university)

importance. External social determinants are in the third place, explicitly the influence of social interests, requests, agitation, advertising, and other external factors that contribute to young people's career guidance is less significant. Moreover, external influence is less effective in influencing the professional self-determination of young people by two times compared to personal interests and by 2.6 times compared to the influence of parents.

We studied the attitude of students to their chosen profession after some time of studying at the university (one or two years of study). Questions were asked: Whether the students' attitude to the chosen specialty has changed? Whether they still want to work in the specialty or are thinking of going to work in another specialty after graduation; or they have changed their mind to study in the chosen specialty and will change their place of study; or they have changed their mind to work in the chosen specialty, but will continue to study to get a diploma. Three groups of students whose professional self-determination was influenced by the same determinants were studied separately on the above issues.

Students who have professional self-determination took place under the influence of personal determinants, change my mind and want to work—55%, do not change your mind, but will work “as necessary”—25%, and decided not to work—20% of students.

Students who have professional self-determination took place under the influence of internal social determinants, change my mind and want to work in education—24%, change my mind, but will work “as necessary”—36%, and decided not to work in the specialty—40% of the students.

Of the students whose professional self-determination took place under the influence of external social determinants, 30% did not change their mind and want to

Table 26.1 Educational motivation of students with professional self-determination under the influence of various determinants

	Students with professional self-determination under the influence of personal determinants (in %)	Students with professional self-determination under the influence of internal social determinants (in %)	Students with professional self-determination under the influence of external social determinants (in %)
Educational motivation for the acquisition of knowledge and profession	75	40	60
Educational motivation for obtaining a diploma	25	60	40

work in their specialty, but they will work “as they have to”—0% and changed their mind to work in their specialty—70% of students.

Thus, the results of the study show that most of the students changed their mind to work in their specialty among those who had professional self-determination under the influence of external social determinants (70%). And the least number of students changed their mind to work in their specialty among those who had professional self-determination under the influence of personal determinants (20%), which is 3.5 times less than in the group with the influence of external determinants of professional self-determination.

The interdependence of the determinants of professional self-determination and students' educational motivation was investigated (see Table 26.1). Educational motivation of students was studied using the test of T. I. Ilina “Method of studying motivation of education in higher education.”

These research results indicate that the most effective students are those who have professional self-determination under the influence of personal determinants: 75% of respondents have educational motivation aimed at obtaining knowledge and profession. And 80% of this group of respondents were not disappointed in their choice of profession. These results confirm that personal determinants of professional self-determination are the most effective for forming students' educational motivation.

The results of the study also indicate that students who have professional self-determination under the influence of internal social determinants study less effectively: only 40% of respondents have educational motivation aimed at obtaining knowledge and profession. Although 60% of this group of respondents did not change their mind about working in their chosen specialty, 36% of them specified that they will work “as they have to”. These results confirm that internal social determinants of professional self-determination—the opinion of parents—are less effective for

forming students' educational motivation. That is, even if students do not change their mind about working in their specialty, they do not want to study for the sake of knowledge. And the number of such students is quite large—20% of respondents.

About 60% of students whose professional self-determination was influenced by external social determinants have educational motivation focused on the acquisition of knowledge and profession. There are more such students than students who are motivated to choose a profession by their parents (40%).

A similar study was carried out among medical students. The respondents were 107 first- and second-year students.

In contrast to a technical university, it was quite difficult to separate internal social determinants and personal determinants of professional self-determination from each other in a medical University. Many students' childhood dreams of a future profession arose under the influence of parents, relatives who worked in the field of medicine, or acquaintances who adequately self-actualized in the profession. The mechanism of interiorization has transformed external factors—worthy examples in the profession, into internal value relations to the profession. And the number of such respondents was identified by 60%. The number of students with professional self-determination under the influence of external social determinants was registered at 40%. This is explained by the socially oriented profession of a medical worker.

The above conclusion is confirmed by the results of the study (see Table 26.2) to identify changes in the attitude of students to their chosen profession under the influence of increasing the social status of medical workers during the coronavirus pandemic, when society began to thank doctors who heroically fight a difficult disease, caring for their patients at a time of danger of being infected themselves.

The results of this study show the changes in the external social determinant of professional self-determination: increasing the status of a medical worker, increasing public expectations about the quality, and effective work of medical workers (almost

Table 26.2 Attitude of medical university students to increasing the importance of the medical profession during the pandemic

Approval	Number of students who agree with the statement (in %) "yes, I agree"	Number of students who disagree with the statement (in %) "disagree"
The current situation with the coronavirus pandemic has increased the prestige of the medical profession	88.8	11.2
Today's situation with the coronavirus pandemic will affect your decision to be a medical professional	88	12
Today's situation with the coronavirus pandemic has increased your desire to be a medical professional	65.4	34.6

90% of students agree with this) did not lead to changes in the personal attitude to the chosen profession in the same number (90%) of students, but only in 65.4% of respondents. Thus, in the classification of determinants of professional self-determination in relation to socially oriented professions, for example, doctors, teachers, and social workers, it is necessary to take into account the symbiosis of personal determinants and internal social determinants, which can be divided into a group of personal and social determinants of professional self-determination. And, as the results of the study show (see Table 26.2, answer to 3 approval), the personal-professional determinant of professional self-determination is not a strong factor in enhancing professional motivation, including educational motivation. The presence in this determinant of parental influence on the process of choosing a profession by young people causes a certain number of respondents to have a negative subsequent attitude to the chosen profession and to the professionally oriented educational process. Therefore, when agreeing with the opinion about the current high status of a medical worker (88.8, 80%), only 65.4% of respondents responded positively to improving their own professional and educational motivation.

26.5 The Role of Determinants of Professional Self-determination in the Formation of Students' Educational Motivation

The research has revealed the following patterns of mutual influence of determinants of professional self-determination and educational motivation of students:

1. Personal determinants of professional self-determination have the highest positive impact on the formation of students' educational motivation;
2. External social determinants of professional self-determination have an average positive impact on the formation of students' educational motivation;
3. Internal social determinants of professional self-determination have a low positive impact on the formation of students' educational motivation.

Thus, the most popular way to choose a profession is to rely on the opinion of parents, which leads to unmotivated training in higher education, mainly for the purpose of formal graduation. In the second place is an independent, informed choice of profession. And a minority of students go to university, relying on random social factors when choosing a specialty.

The results of the study indicate the existence of difficulties in the educational motivation of students associated with the difficulties at the stage of professional self-determination. The stage of professional self-determination is one of the main factors determining the further educational motivation of students. It is obvious that it is important to help graduates of secondary schools with career guidance for their further successful self-determination, high educational motivation, and satisfaction with their choice of profession.

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Chapter 27

Didactic Justification of Remote Learning for Master's Degree Students in Engineering and Technology



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Abstract Russian universities, like all global higher education institutions, experience difficulties because of the COVID-19 pandemic. The arrangement of the study process in a digital form and using remote education technologies turned out to be a serious challenge for teachers, students and university administrations, IT departments, and academic registries. With this increased onlinification, a risk arises that the quality of education may deteriorate. The quality of remote education depends on many factors. One of the most important of those is compliance with the didactic principles of this training format that set a benchmark for the best implementation of the study process. This article deals with the justification of the extension of general didactic principles of traditional education and complementing those with the principles addressing the features of remote education for master's degree programs.

27.1 Introduction

Contemporary higher education officially complies with the international format; it is a two-level system of bachelor's and master's degrees with the specialist degree remaining in some of the programs. The crisis in engineering education and ways to overcome it are discussed in [1, 2]. The development of engineering education and overcoming its crisis, among other things in the master's degree programs for engineering and technology, are influenced by factors and trends governing the current stage of civilizational development. While acknowledging the importance of globalization, a highly dynamic character of social processes, rapid updating of knowledge, techniques, and technologies, in this article the authors shall discuss the impact of computerization on the education system.

The total digitalization of all the aspects of social life affects education as well, challenging it with the implementation of e-learning (EL) and remote education technologies (RET), as well as the transition to remote education (RE) forms. Remote education is understood as a form of supporting and implementing the didactic

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process that does not require direct contact between the teacher and the students [3]. Currently, the pedagogic community has a firm opinion that the use of RE is feasible but we must note that RE is viewed as an auxiliary education format rather than a form of its own. The authors of this article believe that it is more rational to use a so-called hybrid or mixed education that combines the best practices of traditional learning and the advantages of e-learning [4].

One of the RE advantages is that it is a democratic education format, and it can be used by students without limitations by age or training opportunities. Remote learning becomes especially valuable for a specific category of master's degree students in engineering because of their age, education gaps, a shift of study area between their bachelor's and master's programs, and the necessity to combine studies and work. This creates certain difficulties for students in terms of picking up the learning content that can be relieved via the use of remote learning that helps individualize and personalize the study process by the independent planning of studies, selecting the time, the place and the duration of classes, and the opportunity to go back to the study materials and achieve the required level of knowledge.

The effectiveness of the master's degree education in the remote format shall be determined by the didactic justification of its content in accordance with the goal set and the use of relevant education patterns and principles.

27.2 Research Relevance

The extensive introduction of remote learning in the master's degree training practices in engineering and technology provoked the interest among the academic community to various aspects of this new education format. Researchers address the role of remote learning in their works, as well as the significance and relevance of media education in the context of the modern world [5, 6] and its differences from the traditional education [7, 8]. The study of student attitudes to the RE format is presented in the papers by Klimenskikh et al. [9]. When researching the current implementation of RE abroad, Dolgaya demonstrates the regulatory environment of this education form in terms of international acts [10–13]. The experience of researching an e-learning resource in the study process for one discipline is presented in the research of Lebedeva [14], and the technical aspects of RE are studied by Olnev [15]. The andragagogical requirements for the education of adults using information technologies are presented by Averchenko [16]. The problems of teachers' training are brought out in the papers of Gromova [17].

The development analysis of the remote learning implementation showed that the problems of psychological and pedagogic objectives of education in the IT environment and the didactic justification of remote learning have not been examined thoroughly, even though the practical solution of these problems shall bring about the proper quality of IT training results [18–21]. The purpose of this research is to identify the specific features of the didactic principles of traditional education to be

implemented in RE and justify their extension with a view to the specific nature of RE to support further improvement of engineering education.

27.3 Theory

The process of remote education has some features that make it different from the traditional format. They can be connected to the potential capacities of IT and the new subject of the education process (digital natives, net generation). A student that was brought up and is successfully functioning in the virtual space is not only its carrier and consumer but also its creator [22, 23]. Researchers identify the specific features of their psyche and intellect (perception based on visual images, figurative operative memory, lower ability to systematize information, mosaic thinking, and multitasking) [24].

The authors agree with the opinion of many researchers claiming that remote learning (within its mixed model) requires a fundamental rethinking of its methodological, content, technological, and didactic bases [25–27].

Since the subject matters of didactics are purposes, content, patterns, and principles and education, they discuss the changes in their content in meaning under RE [28].

Under the dominating competence approach to contemporary engineering education that implies the transition from process-oriented to result-oriented education, the goal is set by the Federal State Education Standards for Higher Education. The achievement of this goal shall be successful if the didactic principles determining the best conditions for the educational process are used. These principles act as benchmarks for the organization of education processes. The system of remote education is naturally based on the general didactic principles (scientific, systematic, and research character of training, continuity, accessibility, awareness, activity, visualization, connecting theory, and practice, resilience, individualization). At the same time, the specific capacities of the new environment and the new subject of the education process allow one to extend the array of general didactic principles and identify them based on the specific features of remote learning.

The learner-centered approach in remote learning manifests its humanist nature and defines education accessibility with a view to students' individuality. Its purpose is to create conditions for the development of potential abilities and capacities of the students in accordance with their personal goals of education. Based on the aforementioned facts, the authors can identify *the principle of student orientation and subjective position of students* as a key principle of remote learning, including among other things master's degree programs. Being a subject of the education process, students can be initiative and active and make decisions about planning their educational trajectory and developing the schedule for picking up study materials. It can be possible with the modular study content system. Thus, *modularity* is the second principle of remote learning for RE study programs or specific disciplines. It will help personalize the study process. The modular representation of content will

facilitate the implementation of nonlinear education technologies with more than one sequence of shifting from one module to another.

The next principle is connected with the IT system's capacity to immediately react to user requests. This facilitates the feedback between the user and the IT that implies the *interactivity principle*, i.e., the intensive exchange of information in systems like teacher–student and student–student. The interactivity principle is connected to the fundamental property of education as interaction and mutual influence between the subjects in this process. Putting up a problem for discussion via a multimedia conference system facilitates the discussion of everyone with everyone. Asynchronous computer-mediated conferences implement communication in the offline mode.

If viewing remote learning as a cognitive activity based on self-education and stipulating minimum real pedagogic interaction, the authors can identify an *independent cognitive activity principle*. Taking into consideration that even master's degree students do not have proper skills for organizing independent learning, they need methodological guidelines on how to organize their education with consultations and control from teachers, which supports the rational organization of independent activity of the master's degree students.

Designing the pedagogic process for remote learning stipulates the clear identification of students' goals for each module, as well as the respective results of learning, which manifest the *diagnostic learning result definition* in RE. We must note here that, currently, there is a problem of controlling the learning process and its results in the remote mode due to, among other things, the problem of identifying the student.

The principle of pedagogic feasibility of using new information technologies provides requirements for the pedagogic design of the learning process in the IT environment and stipulates for the conceptual understanding of the implementation of course in the given conditions.

The authors believe that the pedagogic feasibility of RE has something to do with the depth of its use in the learning process. There is a research [9] illustrating the attitude of students toward RE. On a 1–10 scale, remote learning got 6.75 points among students and 6.27 among teachers. Those surveyed drew attention to the “lack of live human contact,” “remoteness,” “loss of person-to-person connection,” etc. One can assume that RE is fit for highly motivated students, and even in these cases, the researchers point out that a mixed education would be more rational. Mixed education within the flipped classroom framework allows alternating the forms of learning, including the pre-class, classroom, and post-class activities of students aimed at the absorption of the study materials. Under such conditions, the pedagogic feasibility principle states that it is rational to divide the study content into the classroom and e-learning parts.

The activity approach to RE requires the involvement of students in the activities aimed at solving personally important problems of professional activity. This is especially relevant for the master's degree students who combine their studies and professional activities. The implementation of the uniformity principle for learning, research, and professional activities in RE requires the inclusion of professionally significant research problems in the master's degree program [29].

27.4 Implementation Experience

The didactic principles rationalized above are used in the implementation of master's degree programs for 09.04.03 applied informatics, 27.04.04 management in engineering systems, 22.04.02 metallurgy, and 20.04.01 technosphere safety at the Institute of Nonferrous Metals and Material Science of Siberian Federal University. EL and RE are used within a mixed education model (with the exception of the pandemic when the isolation of teachers and students made it possible to only have the RE practices).

The master's degree program and each discipline taught in accordance with the curriculum have a modular structure. The modules have different content and functions. A variable part of the curriculum includes elective courses, such as computer vision or information protection, simulation software for management systems and processes, or automated information processing resources.

The presence of variable modules helps students address their needs and build their learning routes by expressing their position according to the student orientation principle. The problem-oriented structuring of disciplines encourages the cognitive interest and motivation of students to absorb the study materials and calls for discussions, bringing forth ideas and hypotheses, which results in the interactive nature of the learning process. The problem statement in the content of a topic can be exemplified by a discussion on the Current State of Automations: Main Problems and Development Areas for Metallurgic Process Automation. The study of each module uses reverse design logic. Firstly, the goal of tackling study materials is set that predicts the results as the formation of certain competencies, and the content supports the achievement of this goal. The Moodle system used at the university is an interactive platform that facilitates the use of forums and control via the academic calendar.

The topics of master's degree papers in these programs have practical and professional focus. They are relevant to students' professional activities correlating with the uniformity principle for students' research and professional activities. In particular, the students work on the following topics: The Improvement of Ore Degradation Management, Developing Pneumatic Control Components for Treatment Processes Using Modern Design Means, Developing Software, and Logic for the Quality Analysis of Control Circuits for Operational Parameters of Treatment.

27.5 Conclusion

The digitalization of all aspects of human life affects the education system via the use of RE in the new conditions, and it significantly relies on compliance with the didactic principles describing the best conditions for learning. This article justifies the didactic principles associated with RE and master's degree training programs. These principles include the following:

- student orientation and student subjective positions;
- modularity of discipline content;
- interactivity;
- student independence;
- diagnostic definition of learning results;
- pedagogic feasibility in the depth of using EL and RE;
- uniformity of student research and professional activities.

The practical application of these principles in the implementation of master's degree programs showed an increase in the motivation of students due to the orientation on their values.

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Chapter 28

The Essence of Political and Legal Systems in the Technogenic World



M. V. Mamichev

Abstract The development of political and legal systems of the modern world is in progress along with human society. Today, political and legal systems are divided into democratic systems and antidemocratic ones. The abovementioned political systems exist in the technogenic world, which is based on science, technology and production. In this study, the author makes a close study of the essence of political and legal systems in the conditions of technogenic development of society and the world as a whole. When conducting the research, the author uses the analysis of political rationality. Political rationality is expressed in the ability of the subject of political action (authority) to choose goals aimed at the development of the world and the rational choice of means necessary to achieve these goals. This study uses the methodology of the socio-natural approach. The fundamental basis of this theory forms the works of V. I. Vernadsky on the change of the biosphere by the scientifically organized human mind and the formation of the noosphere. The socio-natural approach to the study of the world consists in the study of society and nature, the Earth's reality on the basis of their interconnected socio-natural development. The formation of political and legal systems is dominated by factors of unreasonableness and irrationality, which create a serious threat to humanity and the environment as a whole. The development of political and legal systems in the technogenic world should take into account not the economic or industrial aspects of the technogenic society, but also the integrity of the biosphere.

28.1 Introduction

Modern political and legal systems are divided on the basis of making power decisions and the volume of intervention in public relations. Democratic and antidemocratic political systems are distinguished on the basis of the abovementioned factors.

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Turning to the legal meaning of political systems, it can be noted that these phenomena have a sign of institutionality, i.e., an organized structure. The components of the political system are clearly defined social organizations (associations, institutions) that represent the interests of certain social classes (strata) and are the primary participants in politics and political relations [1, p. 209].

It remains an undeniable fact that democratic principles are not fully prevailing in the modern world. The development of modern society has shown that any state, when aggravating various types of crises, whether social, environmental or political, often does not solve them or solves them insufficiently, and using this fact, tries to strengthen the control over society, forgetting about democratic principles and traditions. In part, this behavior of the state machine can be justified, since the state, as noted by the prominent politician and scholar A. Gore, is primarily the main institution of the political system [2]. At the same time, we must not forget about the primacy of human rights. The most interesting and the main question of the future is: Which political and legal system will prevail in the society of the future—democratic or antidemocratic? The greatest relevance of this research is given to the consideration of possible scenarios for the development of a technogenic society and the definition of the borderline when a democratic regime turns into an authoritarian one, and the authoritarian one, in its turn, is transformed into a totalitarian one. The study also raises the question of how these processes are interconnected with the preservation of the biosphere and the reasonableness of scientific and technological solutions. Our research will allow us to understand what factors will influence the political and legal system of the world of the future, a world where a socially formed artificial environment of life—the technosphere and a technogenically developing society—will prevail. The technogenic society is directly connected with the formation of the technosphere. This is the technical shell of the Earth, created by machine technologies and human scientific activity. The scale of the technosphere in its power and mass is similar to the remnants of the biosphere, which is gradually losing its functions for the reproduction of life. The technosphere is concentrated in the urbanized environment of cities, in which more than half of the world's population—4.6 million people—live in 2019. Under the influence of scientific and technological activities of mankind, a global technogenic socio-natural system of life in the technospheric urban environment is formed, in which the technogenic society, the technogenically changed nature (biotechnological plants and living organisms) and the remnants of natural environment coexist. An important component of the abovementioned system is a technogenically altered man with weakened natural health and various inclusions of artificial components in the body to support life—from drugs to biotechnological organs. This is a new technogenic and even post-biosphere world, which the researchers of socio-technological processes write about [3–7]. The evolution of life on Earth with a focus on the values of material goods leads to the absolute primacy of the technosphere and the degradation of the biosphere. In this scenario, the world is in danger of losing not only the biosphere as a self-developing system, but also the complete destruction of democratic principles of society.

28.2 Methods

The political development of the modern world is progressive, which is noted in the works of A. Gore, F. Fukuyama, M. Oakeshott, J. Habermas, J. Rawls and other authors who study the political structure of the world. We should not forget that humanity and rationality of the political systems of the technogenic world are possible only with a careful attitude to the biosphere. It should be noted that the biosphere is an incubating shell for the development of society, and society is directly dependent and connected with the living shell of the Earth. The existence of exchange processes between society and the biosphere indicates the existence of socio-natural relationships. These relationships determine the need to take into account natural factors when planning sociopolitical development. In this work, along with the theories of I. Wallerstein and J. Gelbraith, generally recognized in social philosophy, the methodology of the socio-natural approach is applied, based on the works of V. I. Vernadsky of the first half of the twentieth century on the biosphere and noosphere, as well as the works of modern researchers of socio-technical processes E. V. Girusov, I. K. Liseeva, E. S. Demidenko, E. A. Dergacheva, N. V. Popkova and others. The works of the above-mentioned researchers are devoted to the study of the relationship between social (with the predominance of the technosphere) and natural changes. Political and legal systems are the product of the life of society, and society is the product of the biosphere. Based on the above, the technogenic development of society and its political management should take place without destroying the biosphere balance, and moreover, the principle of coevolutionary harmonious interaction of society and the biosphere should be a priority.

28.3 Results and Discussion

Over time, human society has developed two political and legal systems—a democratic system and an antidemocratic one, which are the opposites.

Today, the apogee of social justice in society can be called the primacy of the democratic political regime. A just society cannot be called a utopia, and the abandonment of its construction may cause public concern and disturbance [8, p. 125]. The most important conditions for democracy are the emerging civil society and the law-based state. It should be mentioned that the consideration of different interests and equality in society serve as the main form of relations in a democratic society [9, p. 144].

Let us refer to the opinion of the famous researcher J. Habermas. J. Habermas considers “just society” an important part of a democratic regime. “Just society” allows all individuals to “manage their life time” as they wish. It guarantees everyone equal freedom to develop the ethical self-understanding in order to actually implement the personal concept of “good life” in accordance with their own capabilities and good intentions [7, p. 8]. Social justice can be considered as the main attribute

of democracy in the technological development of the world. An interesting opinion on the issue of the principles of justice is expressed by John Rawls. He identifies three principles of justice: The first is the principle of equal freedom. The second is the principle of fair equality of opportunities, and the third is the principle of difference [10, p. 81]. Speaking of the first principle, it implies equal distribution of rights and freedoms, and the second principle implies equal opportunity to achieve certain goals. The principle of difference says that everyone is born with different standards of living or social status, but democratic freedoms should be available to all layers of population. Antidemocratic political and legal regimes are the opposites of democratic ones. An antidemocratic regime is a political and legal regime based on the violation of individual rights and freedoms and the establishment of dictatorship of one person or a group of persons. Antidemocratic regimes are divided into totalitarian, authoritarian, and military. Antidemocratic political regimes are now a frequent phenomenon. The reason for this is the quintessence of creating weapons and the desire to impose their ideology on others.

It should be noted that over the past centuries, civilization has made significant progress in science, health, arts, and by the highest standards and has been able to bring economic prosperity. And yet, along with this, an honorable role in this civilization is assigned to the development of weapons, the military threat and the war as such. Total extermination became the highest achievement of human civilization

Revolutions play an important role in the predominance of a particular political and legal system. Revolutions do not always have a negative result. An example of this is the scientific and technical revolution that took place in the twentieth century. The scientific and technical revolution, as a consequence of the Second World War, produced a radical qualitative transformation of productive forces, a qualitative leap in the structure and dynamics of the development of productive forces, which served as a fundamental basis for the development of the technogenic society and the technosphere as a whole. In addition, the scientific and technical revolution made it possible the emergence of further scientific revolutions of the end of the twentieth-twenty-first centuries. It is impossible not to mention the social revolutions of the nineteenth-twentieth centuries, which determined the value of science and modern moral attitudes of society, for example, the priority of humanism. It is important to note that the scientific and technical revolution affected all countries of the world, including Russia. Today, the Russian Federation has developed a strategy for scientific and technological development, the essence of which is the interaction of man and nature, man and technology, man and science at the current stage of the global development. This strategy is based on the concept of sustainable development, which includes social and economic changes.

It should be noted that in 2015, 193 countries, including the Russian Federation, adopted a number of strategic goals aimed at the unity of economic, social and environmental development. These goals include the following: to eliminate poverty in all its forms on a joint basis, to eliminate hunger, to ensure food security, to improve nutrition, to promote sustainable agricultural development, to combat global climate change and so on [11].

One of the important elements of forming a political system is political rationality. The founder of the study of rationality in politics is M. Weber, who believed that the sign of rationality in politics is that sociopolitical problems cannot be solved only on the basis of technical considerations. In this case, it is necessary to use social aspects as well [12, p. 350].

John Galbraith speaks of political rationality as the basis for the enlightened community. And any enlightened community—liberal in the USA, social-democratic or socialist in Europe and Japan—is based on an economic or a similar reason [13, p. 16].

Reforms (innovations) are an integral part of political rationality. The concept of rational reforms is emerging. These reforms take into account the needs of groups of people, aimed at alleviating their poverty and reducing their sense of alienation. At the same time, all reforms in society and the state cannot be completely rational, and some of them will be irrational. They will not take into account the interests of the majority, but at the same time, the combination of rational and irrational reforms makes it possible to understand the political picture of the state and see whether political rationality prevails in the state or not. As a result, we can note that according to Weber, rationality in politics is determined by the degree of participation of people in political life and political power in particular.

The famous English philosopher M. Oakeshott, speaking of political rationality, noted that it has two characteristics—perfection and uniformity. But the essence of rationalism in politics is a combination of the two components mentioned above [14, p. 11]. Perfection in politics implies a process when political norms fit the realities of human society and cannot only keep them within reason, but also improve them, making people's lives better.

Uniformity, on the other hand, means that the norms are consistent with each other and that they do not contradict each other. The political and legal tradition is also a part of the political system, which is an integral complex of legal phenomena, due to the specifics of the development of a particular society [15, p. 156].

According to A. Gore, the modern political system is dominated by irrational motives based on profit and squeezing the natural potential, which destroy not only human society, but also the environment as a whole. Moreover, A. Gore notes that political elites resist the truth about the existence of irrationalism in society, because at the moment of recognition, society will face its moral duty to act and to act means to recognize the mistakes of its activities [2, p. 3].

Technogenic rationality plays an important role in building political and legal systems in the technogenic society. This concept was introduced into scientific and philosophical use by E. A. Dergacheva. Describing this phenomenon, the emphasis is placed on the combined interaction of economics, science and technological innovations that accelerate the trends of man-made transformations in society and nature. Technogenic rationality is a set of interrelated, interdependent mutually reinforcing economic, scientific, technical and technological rationalities that comprehensively affect society, the technosphere and the biosphere in the technogenic society.

The dominant factor in this trinity is market economic rationality, since it determines the priorities for the development of science and technology (technogenic

development). The phenomenon of technological rationality is contradictory in its basis, because along with the positive trends of technological development manifested in the welfare of the population, there is a negative trend—global destruction of the biosphere and the biological life in the context of the technospherical planet. This is stated in detail in the scientific report of the Russian Academy of Sciences “From global degradation to the change in the evolution of life” [16].

However, market economic rationality is not the only factor shaping the direction of world development, scientific and technical solutions. Moreover, the rationality of the market, aimed only at making a profit, leads to the inability of interaction between ordinary citizens and political elites [17, p. 121].

Thus, in our opinion, political rationality in the technogenic society is a system of reasonable, purposeful, conscious regulation of mutual agreement of social, economic, scientific and technical interests and decisions on planning socioeconomic spheres of activity that are promising from the point of view of the country’s future. These areas include biotechnology, genetic engineering and the creation of artificial life (cloning). These directions determine how the areas of business development (economic rationality) and science (scientific rationality) are related to the expansion of the technosphere (technogenic rationality).

The study of technogenic rationality is given in the works of scientific researchers such as Dergacheva E. A., Dergachev K. V., Demidenko E. S., Popkova N. V., Trifankov Yu. T. and others. Based on their works, it follows that the technogenic socio-natural system includes society, the technosphere it created and the remnants of the natural environment [16, 18–21]. Speaking about the predominance of the technogenic factor in the modern world, an undeniable fact is the market-oriented direction of development of social thought, when the market economy takes over many creating functions of nature, regardless of the laws of the biosphere development, which negatively affects the state of the biosphere as a whole.

It should be noted that economic rationality is a part of technogenic rationality. It is the economic rationality of industrial and post-industrial society that is the main means by which humanity is rapidly destroying the biosphere and the biosphere world and in the end—the biosphere man himself [18–20]. The civilization living in the technogenic world can also be called technogenic, i.e., living in an artificially created environment [22, p. 3]. Studying technogenic rationality, we also should mention that this concept is often used when analyzing the perceived aspects of technical activities and technologies in general. Technologies are the engine of progress. Moreover, they support the world system in a certain balance [23, p. 281]. Based on the above, we believe that technogenic rationality considers the objects of the surrounding world as raw materials and human capabilities as labor resources that require the creation of technical systems for their implementation. It forms ideas about any natural object as used for human purposes and about any methods of knowledge and action as tools. The system of strategic guidelines set by technogenic rationality acts as a matrix for building technogenic social practices as typical strategies for implementing human activity. On the one hand, it reproduces the existing configuration of interactions with the natural environment established in the technogenic society, and on the other hand, it forms these interactions itself, permeating all levels and forms of activity.

An interesting aspect of technogenic rationality is the consideration of objects of the surrounding world as raw materials and human capabilities as labor resources. The specific character of implementing regulation depends on the specific situation and may have different implementation mechanisms.

In modern society, technogenic rationality is aimed at obtaining new products that simplify human existence. An example of such a product generated by a technogenic society with a priority of technogenic rationality is biofuels and biotechnology in general. Biofuels are represented as an energy source that is obtained from plant or animal raw materials. It can be liquid, solid and gaseous. Biofuels can fully serve as a source of energy for the future without harming the environment. This is what will create optimal conditions for social development, without losing natural resources and ecological balance. Biotechnologies (genetic engineering) are also a sign of the future society. At the same time, biotechnologies have minimal legislative supervision both within states and at the international level, which does not allow society to monitor their rationality and humanity [6, p. 256].

It should be noted that the creation of a humane political and legal system in the society of the future, i.e., in the society living in the environment of the technogenic world, is one of the main problems of our time. It should be noted that the processes of globalization taking place in the world at present lead to the convergence of various political and legal systems, contribute to their interaction and interpenetration [4, p. 5].

An important sign of a humane political and legal system of the future, created within the framework of the technogenic development of the world, will be a social contract and legal consciousness obtained through legal education. It is legal education that can be considered as the main form of ideological influence on public legal consciousness [24, p. 69].

28.4 Conclusion

Living in an era of change, the social processes of humanity have a particularly strong impact on changes in the world around them. Political and legal systems of our time are universal, and their development depends only on the society itself. An important factor that should prevail in the political and legal system of the future is political and technogenic rationality with the predominance of humanism and the priority of human rights. Note that political rationality is the policy component, which forms the regulatory environment for the functioning of the state. Political rationality develops and functions in an inseparable complex “politics-economy-technics-technologies” and thus complements technogenic rationality. Political rationality strengthens the technogenic orientation of the world development. In conclusion, we note that all political and legal systems are aimed at the construction of the technosphere.

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Chapter 29

Blended Learning Technique in the Educational Process



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Abstract One of the reasons for the existing crisis in the education system and the decline in the quality of students' professional training is the "catching up" type of higher education arrangement. In the context of life and public communications virtualization, the need for introducing new more adapted to the needs of today's students approaches to learning and the changing role of a teacher becomes obvious. The "blended learning" technology, or the so-called Academician Suleiman Khan technology, which is a form of blended learning, has become widespread in educational institutions of developed countries of late. This article presents the main characteristics of this technology and analyzes the various possibilities of its implementation in Russia, as well as its advantages and disadvantages.

29.1 Introduction

The development and improvement of modern educational systems and processes are inextricably linked with the innovative educational technologies introduction. One of the promising innovations is the blended learning technology, which is confirmed by the practice of this technology implementation at various education levels. The use of diverse terminology in the implementation of this technology (flipped classroom, flipped lesson, blended learning) is due to the fact that in the learning process at different education levels, general secondary, special secondary, higher and additional adult education are combined with traditional ones. A distinctive feature of the flipped classroom is the full or partial transfer of the knowledge transfer process to independent study. At the same time, the freed up class time is used for interactive activities that help to develop critical thinking and creativity. The English definition of a flipped classroom ("reading at home and homework in the classroom"), according to many French educators, is too simplistic. M. Lebrun, one of the authors of the "Inverted Pedagogy," writes that blended learning is not essentially a new method,

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but rather a new way of thinking, the purpose of which is to optimize classroom work with students through extracurricular activities aimed at in-depth study of the subject [1, 2]. In this case, the teacher's task is to motivate students to independently search for knowledge outside the classroom, teach not only to search for information, but also to verify its authenticity, analyze, critically interpret and to achieve an active intellectual reaction to the educational material in class, which is a prerequisite for the new knowledge development.

The philosophy of connecting students to thinking and inclusion in interactivity goes back to Socrates and his method of thinking stimulating and the truth establishing—mayevtis, the art of getting the right answers among students. Socrates' method was based on a dialog between two students for whom the truth and knowledge are not given ready-made, but are a problem and require a search and require preliminary preparation for the lesson, respectively. Socrates' task was to encourage his students to find the truth themselves by means of discussion and raising more and more questions. Despite the fact that the term “flipped classroom” came into usage not so long ago, teachers have used some of its principles for a long time, in particular, new approaches to the educational material submission and assimilation.

The term “flipped classroom” was first used in 2007, when two chemistry teachers at a high school in the USA, D. Bergman and A. Sams, began to distribute to their students not printed materials, but video lessons that could be used to study new teaching materials at home. The school where Bergman and Sams worked was in the countryside; students often missed classes. To save their time and not to conduct additional lessons with the students who missed the class, teachers came up with the idea of recording their lessons on video. The feasibility of using this technology is due, *inter alia*, to the features of the Z generation, which, as a rule, includes those born in the period from 1995 to 2012. The distinctive features of these young people are practicality, the desire to demonstrate their uniqueness and personalize their ability to influence others and the ability to coordinate interests and others [1–9].

29.2 Methods

The blended learning technology is based on the following conceptual basis: activity in training, the use of quality information on the Internet, involvement in group work, a combination of traditional and distance learning, the ability and responsibility of the student to control their pace and training time. The attention of the teacher focuses on shifting the emphasis from knowledge mastering to the competencies formation, in particular, the basic competencies of life problems solving: initiative, taking responsibility, focusing on results and sociability [10–13].

Let us consider the essence of blended learning, which is based on a different organization of the teacher and students activities. In the blended learning, the content of homework, independent work and work in the classroom changes. The theory is studied at home, and in the lesson the practical tasks on the topic are carried out, and the most difficult questions are analyzed. Students get an instructional video

or electronic educational resource to study new material as a homework. In the lesson, the teacher should organize joint activities on the topic: discussion in groups, solving problems, creating mini-projects, conducting experiments, etc. If the classes are organized, then it can be the implementation of mini-projects by students and discussion in a virtual seminar [14–17].

An essential aspect of the blended learning technology is the involvement of students in the educational process. Instead of completing a dozen home examples and creative tasks, which often cause confusion and bewilderment among students, they are given access to electronic resources and the opportunity to learn new material at their own pace. Finally, a systemic or combined model of an inverted class involves, as its name implies, a combination of the first two models. The essence of this model is to change not the place of a certain type of activity performance, but to rearrange the key educational process components.

The traditional sequence of involved competencies is changed (memorization, understanding, application, analysis, synthesis, evaluation). Indeed, independent study of lecture material at home not only frees up time for practical tasks in the classroom, but allows participants in the educational process to freely interact with each other as well. If such training takes on a systemic character, a kind of monitoring of the individual trajectory and learning outcomes is carried out, then teachers can determine what the problems of students are and are able to provide pedagogical support efficiently.

The need of students in communication with the teacher should be noted as the most important factor in the education effectiveness. Studies show that those students, who interacted with teachers a lot during the training and worked on projects and gained practical experience, achieve significant success in their future professional activities and feel better psychologically.

We believe that in order to stimulate extracurricular work of students, it is necessary to organize the educational process in such a way that students are aware of their independent work benefits and actively use its results in the educational process. According to scientists, it is advisable to use active forms of activity, requiring preliminary independent training. This may be the abstracts preparation for presenting them in the audience, questions for interviews, round tables or debates and development of tasks for a business simulation games.

Preparing a teacher for a specific flipped lesson involves the following:

- methodological analysis of the syllabus requirements, including training topics; readiness of students for independent material study; selection and (or) development of information resources that will be recommended to students for independent study, assessment of their compliance with the content of training and age characteristics;
- lesson planning, including goal setting, determination of the content of activities at each stage, determination of criteria for educational results assessing; thinking over the homework that needs to be done after viewing and studying the recommended educational resource (answer to the key question of the topic, wording of the questions arising in the process of independent work with materials, compiling

tables, diagrams, supporting abstracts that reflect the main content of the topic) and developing assessment criteria of completed homework.

Thus, in the process of blended learning technology application, the content of the lesson and home-independent work, the activity of the teacher (he has to be an organizer, a tutor and a consultant, he can form a habit and ability to learn) and students' activities and attitudes toward learning (active participation in the educational process, responsibility for results) are changed.

Let us dwell in more detail on the technology of the OPK-2 competency formation "The ability to use the basic laws of natural sciences in professional activities, apply the methods of mathematical analysis and modeling, theoretical and experimental research" in the study of the discipline "Mathematical methods of the experiment results processing." Training is conducted in a mixed version, using the Moodle platform.

Organization of the process:

1. On the platform, the teacher offers to study the proposed theoretical material, and a link to additional material is also given.
2. During the classroom work, the solution of the technological content problem is considered, for example, after studying the theoretical material [5, 6], and tasks of this type are proposed as follows: 6 wells are drilled simultaneously in the oil-bearing area. Each well strips the deposit independently of others with a probability of 0.1. What is the probability of stripping the deposit? How many wells should be drilled so that the probability of stripping exceeds: (a) 0.7; (b) 0.8; (c) 0.5; (d) 0.9?

Students receive projects on courses that are discussed both in the classroom and virtually in the "seminars" tab, in the Moodle platform (Figs. 29.1 and 29.2).

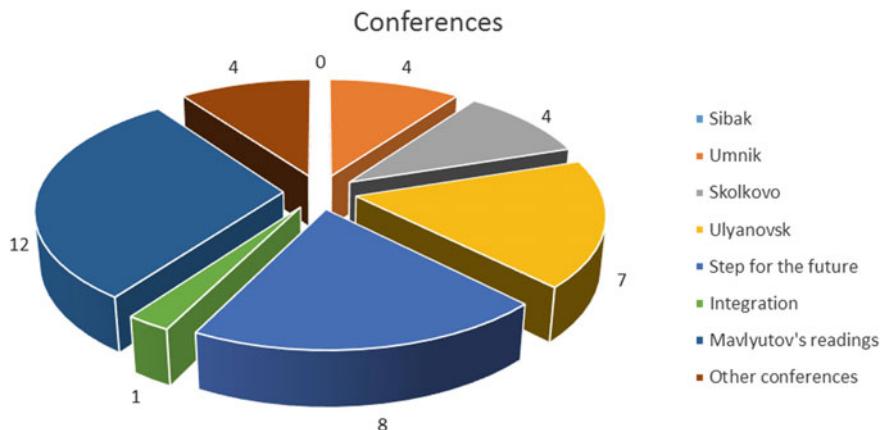


Fig. 29.1 Results of student participation in various competitions

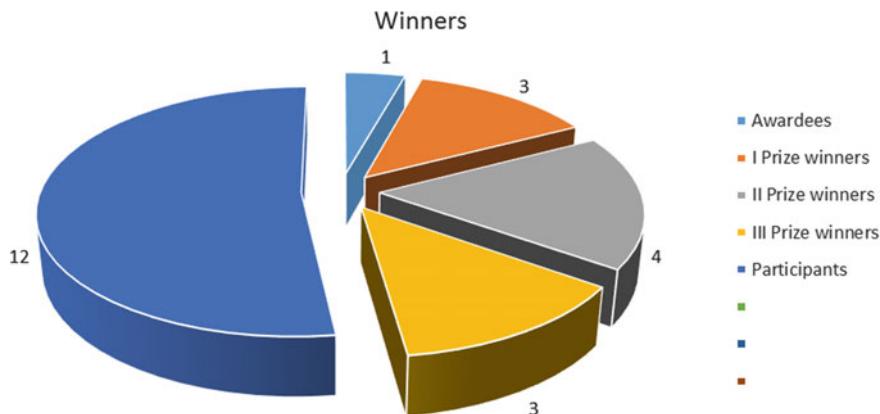


Fig. 29.2 Results of student participation in various competitions in 2018–19 academic year

29.3 Discussions

Taking into account the experience of teachers practicing blended learning in the educational process at different education levels, a number of its advantages should be highlighted: rational use of study time, the possibility of multiple material viewing, the ability to carry out an individual approach, the involvement of students in the learning process, the formation of independent work skills, collective interaction, favorable cooperation conditions and opportunities for personal development.

However, there are some drawbacks and limitations in this type of training the application: the time-consuming process of your own educational content creating, thematic electronic resources choosing, the need to motivate students to watch videos and complete assignments, thinking through assignments and criteria for their implementation, teachers not being ready to work under the new system, including, due to the low level of computer technology knowledge and others.

Currently, the blended learning is being implemented in domestic education, mainly at the level of general secondary and higher education.

29.4 Conclusions

The specificity and effectiveness of this technology allow us to talk about the possibility of its use at different levels of training. The problem is the technical equipment. Blended learning requires appropriate technical equipment of all classrooms, as well as the personal information space of the teacher and students, stable access to the Internet, but even in this case, no one is safe from “failures” in the equipment operation.

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Chapter 30

Gender Features of the Attitude to the Career of Managers and Ordinary Employees



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Abstract The article considers the study of gender characteristics of the attitude to the career of managers and ordinary employees using Bem Sex-Role Inventory and Schein Career Orientation Inventory. It was revealed that the majority of managers and employees have pronounced androgynous indicators. Pronounced “male” personality traits are characteristic only for representatives of the senior management. In addition, the group of managers has a significantly less (3.98 times) feminine traits than for the group of employees. The leading career orientations of both groups are “stability of places of work,” “service or dedication to a cause” and “integration of lifestyle.” Significant statistical differences between the career orientations of managers and employees were found by the career orientation “general managerial competence” (U-Mann–Whitney test), which emphasizes the difference between managers and employees in terms of their functions. A significant negative correlation was also found between feminine indicators and the “challenge” career orientation.

30.1 Introduction

In the psychology of management, a fairly large number of studies of the psychological aspects of management have been carried out. At the present stage of economic development, the success of an organization is largely determined by the human factor. In connection with the changes that have occurred in the modern labor market, which makes serious demands on the personality of workers, their attitude to work in general and career development, the need for career planning is growing.

In a broad sense, the concept of “career” can be considered as the main line of human development in leading areas of life. In accordance with this, most often a career is understood as the acquisition of high social status and a large number of powers.

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Analysis of the scientific literature on the career problem allows us to highlight some approaches to the study of this problem [1]. The economic approach explores a career as a set of chronologically changing positions occupied by an employee in the hierarchy of an organization and is measured by the level of earnings and the functions performed in a professional activity. The leading motives in the implementation of career aspirations in this case are material security and the level of power that allows you to receive the maximum income from your professional activity [2]. The sociological approach represents a career as a part of the process of socio-professional mobility and is interpreted as the promotion of the most capable individuals along the steps of a professional, social, industrial or other hierarchy [2] and explores social and cultural influences on the formation of gender identity. The psychological approach considers a career from the perspective of a person becoming aware of his abilities and professional opportunities, professional experience and the motivational-need sphere [3].

The orientation and nature of a career achievement can be determined by various factors, among which are self-perception of a person, motives and desires that are not always realized, but often act as guiding forces or “anchors.” In the concept of “career anchors,” E. Shane identified the fundamental values that a person primarily focuses on when pursuing a career: technical-functional competence, general managerial competence, autonomy/independence, service or dedication to a cause, challenge, entrepreneurial creativity, security/stability of residence and places of work, integration of lifestyle [4].

Investigations of its gender aspects are important for understanding the problems of building a career. The problem of gender has been relevant to psychology for many decades, since gender characteristics largely determine a person’s behavior in different spheres of his life. In most cases, gender is defined as the sociopsychological gender of an individual and is one of its basic characteristics.

The concept of gender based on research using the Bem Sex-Role Inventory emphasizes that gender types do not oppose each other, and a person can have both feminine and masculine traits, that is, be androgynous, which is not only not a deviation from the norm, but, on the contrary, helps social adaptation [5, 6]. A significant number of studies of gender are devoted to the study of gender attitudes and stereotypes, the specifics of gender roles, gender socialization, etc. In the field of management psychology, studies of the gender characteristics of leadership are mainly carried out.

The study of gender characteristics of the attitude of managers and ordinary employees to the career is important for understanding the psychological characteristics of career planning and psychological support and psychological support for employees of the organization.

The hypothesis of our study is the assumption that there are differences in the career orientations of people with different gender characteristics.

30.2 Research Methods

During the study, the following methods were used:

1. Bem Sex-Role Inventory.
2. Schein Career Orientation Inventory.

The study was conducted in organizations of the city of Bryansk (Russia). The subjects were mid-level managers and employees of organizations ($N = 60$) aged 25–52 years.

30.3 Research Results and Discussion

Consider the main results of the study. To identify the severity of masculine and feminine personality characteristics of senior and ordinary employees, we used the Bem Sex-Role Inventory (Table 30.1).

The extreme severity of masculine or feminine traits is not found in the study participants. The results show that most of the subjects have pronounced androgyny indicators; therefore, both representatives of the management team and ordinary employees are dominated by a combination of traditionally female and male traits— androgyny, which determines a person's behavior depending on the situation. This combination allows employees to adapt better, showing in some situations, for example, empathy, sympathy for customers and in other situations, demonstrating rigid “male” personality traits. It is interesting to note that the pronounced masculine traits are characteristic only for representatives of the senior management (13.3%), which may be related to the performance of management, control, evaluation and other functions. In addition, the group of managers has a significantly lower percentage of feminine traits than the group of employees (6.7 and 26.7%, respectively).

In order to identify the career motivation of the subjects, ordinary and managerial employees, the method of E. Shein “Anchors of a career” was used (Fig. 30.1).

As can be seen from the data presented in Fig. 30.1, the profiles of the results of managers and employees are very similar. To identify statistical differences in the indicators, we used the U-Mann–Whitney Test; they were found only by the “general managerial competence” indicator (47.5, $p < 0.05$), which also emphasizes the differences between managers and employees by performed functions,

Table 30.1 Results of the study of the severity of gender characteristics of managers and employees

Key index indicator	Managers (%)	Employees (%)
Masculine traits	13.3	0
Androgynous traits	80.0	73.3
Feminine traits	6.7	26.7

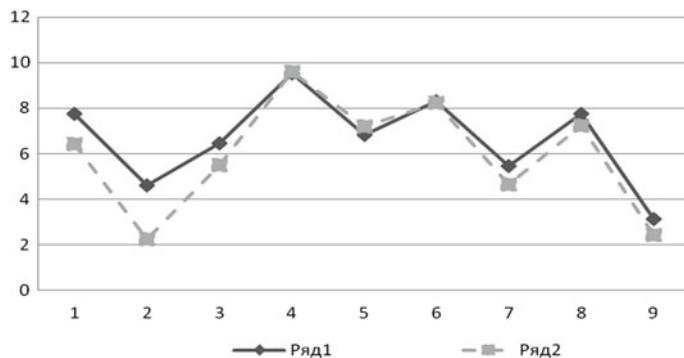


Fig. 30.1 Average career orientations of managers and employees according to the Schein Career Orientation Inventory. Legend 1—technical-functional competence; 2—general managerial competence; 3—autonomy; 4—stability of the place of work; 5—stability of the place of residence; 6—service; 7—challenge; 8—lifestyle; 9—entrepreneurial creativity; Row 1—managers; Row 2—employees

since managers have to constantly organize employees according to official duties to perform production tasks.

Consider the results in more detail. The first place among those who took part in the study is the career orientation “job of the place of work” (9.51 points for managers and 9.61 points for employees). Obviously, this result is explained not only by loyalty to the organization, but also by the difficulties of finding work in the modern labor market. The career orientations “service” (8.29 and 8.23 points, respectively) and “lifestyle” (7.76 and 7.24 points, respectively) also received high indicators. The presence of a pronounced career motivation of managers and employees associated with serving people means, in our opinion, that they are not formally related to their official duties, they consider their work necessary and useful to people. The high career orientation “lifestyle” among managers and employees means that they are all modern professionals who strive to make their life harmonious and balanced. The leaders also have a high career orientation “technical-functional competence” (7.76 points), which allows us to talk about the desire for professional self-realization and skill. The employees also have a high career orientation “stability of residence” (7.21 points). Therefore, employees are also attached to their organization because of this factor, which can significantly limit career flexibility. The lowest level in both groups is in the “entrepreneurial creativity” career orientation (3.12 points for managers and 2.44 points for employees). Obviously, this is due to the fact that the subjects are self-employed and do not seek independent entrepreneurship in the current situation.

To identify the relationship of gender characteristics and the attitude of senior and ordinary employees to the career, a correlation analysis of the relationship between masculinity, femininity and androgynous indicators and career ideas was carried out using the K. Pearson correlation coefficient. A significant negative correlation was found for the career orientation “challenge” ($-0.426, p < 0.01$). It can be assumed that the higher the femininity indicators, the lower the career motivation based on

competition and the desire to challenge difficult situations and problems. For other indicators, correlation is not found. Therefore, career orientations in most cases are not related to the gender characteristics of managers and employees.

30.4 Conclusion

Thus, it was found that androgyny indicators prevail among most managers and employees. The leading career orientations of both groups are “stability of the place of work,” “service or dedication to a cause” and “lifestyle.” Using the statistical criterion U-Mann–Whitney, statistical differences were found between the career orientations of managers and employees in the career orientation “general managerial competence.” A study of attitudes toward career among middle managers and employees of organizations showed that gender differences in career motivation are not statistically significant; however, there is a significant correlation between femininity and career motivation associated with overcoming difficulties and competition.

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Chapter 31

The Attractiveness of Khabarovsk Territory in the Modern Communicative Space



I. A. Avdeyenko, E. R. Drozdova, L. A. Lisina, and O. Y. Nazmova

Abstract The article discusses the ideas about the attractiveness of the Khabarovsk Territory, recorded in the official media, feedback from communicatively active Internet users, the results of an associative experiment and gives recommendations to increase the attractiveness of the Khabarovsk Territory, aimed at reducing the population exodus from the region. It was revealed that one of the reasons for the population exodus is the contradiction between an idea of the attractiveness of the Khabarovsk Territory in the official media and daily languages. It is noted that the regional newspaper “Tihookeanskaya Zvezda” broadcasts the idea exclusively about the investment attractiveness of the region. Thus, all statements of journalists are about tourist attractiveness and attractiveness for life. At the same time, negative reviews about the attractiveness are not found. Negative reviews prevail in the statements of socially active Internet users. Moreover, the main characteristics relate to the living conditions of the population (prices, climate, ecology, access to education, medicine). The reactions of the participants in the associative experiment show the dominance of the semantic fields of nature, climate, home (housing, family), and the least relevant reactions are associations with adverse natural events and living conditions. It is proposed to formulate a strategy to increase the attractiveness of the Khabarovsk Territory for residents of the region and to increase media coverage of this particular aspect.

31.1 Introduction

The relevance of the study of ideas about the attractiveness of the Khabarovsk Territory is determined by the socio-economic demands of modern Russian society. Among these demands is a solution to the contradiction between the need for economic development of the region, which requires an increase in resources and “human capital,” and the population exodus, which prevents the attraction of resources. The study of the attractiveness of the territory in modern science is carried

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out in several areas, including natural attractiveness [1], including the territories of Russia [2], tourist attractiveness [3–5], the use of the territory's brand [6], the history and archeology of the region [7], the attractiveness of the territory for representatives of another culture [8], the territorial identity of industrial regions [9], internal migration [10], including in Siberia and the Far East of Russia [11], the socio-economic aspect of attractiveness [12], including Siberia and the Far East of Russia [13], competition of urban and rural territories [14], comfort of the urban environment [15], territory development projects [16], factors of administrative-territorial innovation [17]. Modern Russian science pays special attention to investment attractiveness, which reflects the main trend of modern Russian regional policy, for example [18–23]. At the same time, the idea of the attractiveness of the Khabarovsk Territory in the modern communicative space remains unexplored.

The image of the Khabarovsk Territory in the minds of its residents consists of information gathered from official media, social networks and from personal experience. Since the image of the region is based on the image, the formation of the right image strategy requires the study of the image that is expressed in the media and social networks.

This study reveals the degree of conformity of the images of the Khabarovsk Territory broadcast by the media and formed in the linguistic consciousness of the region's inhabitants, which in the future may become the basis for optimizing mass communication.

31.2 Methods and Research Material

In order to study the image of the Khabarovsk Territory and its symbolic capital in the media, all publications of the Tihookeanskaya Zvezda newspaper for 2018 were analyzed, in which the word "attractiveness" was used, as well as its derivatives "attractive" and "attract" (in meaning "to be evaluated positively") in the same context with the nomination "Khabarovsk Territory." A continuous sample of these texts, comprising 113 units (132,686 words, 6919 sentences), was subjected to statistical semantic analysis using the program. The resulting information about the importance of keywords and their compatibility formed the basis for a qualitative analysis that reflects the idea of the attractiveness of the Khabarovsk Territory broadcast by the official journalism of the region.

The image of the Khabarovsk Territory is expressed in the reviews of communicatively active Internet users. During the study, the texts devoted to the cities of Komsomolsk-on-Amur and Khabarovsk, posted on the forums <https://otzov-mf.ru>, <https://nesiditsa.ru>, were analyzed. The estimates presented on these resources were also subjected to statistical semantic analysis.

Finally, the image of the Khabarovsk Territory in the consciousness of native speakers, identified through an associative experiment, allows us to evaluate, first of all, the personal experience of the recipients. Students of the Amur Humanitarian Pedagogical State University acted as respondents to the associative experiment.

Thus, we planned to determine what image of the Khabarovsk Territory developed among its residents, with the further possibility of correction of this image in the direction of greater attractiveness for the population.

31.3 Research Results

An analysis of the frequency and significance (importance) of keywords related to the word “attractiveness” shows that the word “investment” and its derivatives “invest,” “investor” and “investment” occupy the highest position in the significance of relations with the word “attractiveness” (“83.75% of contexts with the word” attractiveness “and its derivatives). For example: “This year, the region entered the twenty most attractive regions for investment, rising immediately by 22 units.” Of these, 32.8% of contexts correlate investment attractiveness with rating. For example: “Today, one of the main criteria for assessing the investment attractiveness of the country’s regions is a national rating.” In 86% of them, investment attractiveness is associated with improvement and increase. For example: “This year, in the national rating of the investment climate of the regions of the Russian Federation, the region improved its position immediately by 22 units.”

In addition to “investment” as the main associate of this group of relations of the word “attractiveness,” the use of the word “business” is noted (13%). For example: “He will share his experience in creating attractive conditions for business, implementing key projects for the development of the territory with the participation of Russian and foreign companies.” Thus, the compatibility of the word “attractive” in the texts of the newspaper “Tihookeanskaya Zvezda” in 2018 mainly and directly correlates attractiveness with the possibility of investing in the economy of the region.

The second position in the significance of relations with the word “attractiveness” is occupied by the word “tourism” and its derivatives “tourist,” “tourist”(adj.) (11.25% of contexts with the word “attractiveness” and its derivatives). For example: “Historically, architects are trying to make the city more attractive and accessible for its residents and tourists.”

The correlation of the category “attractiveness” directly with life in the Khabarovsk Territory was recorded only in 5% of contexts with the word “attractiveness” and its derivatives. For example: If in your imagination old age evokes pictures depicting illness, decrepitude, dementia and so on, then a long life will not be attractive to you.

Localization of the sign of “attractiveness” is carried out within:

- (1) Region (50% of the contexts correlate “attractiveness” and “region”). For example: “Our hero and his team considered that such a measure would help attract and consolidate specialists to our region”;
- (2) Territories (26% of contexts correlate “attractiveness” and “territory”). For example: “Solving the environmental problems of the city, landscaping and

greening all its territories, increasing the tourist attractiveness of the regional center is also among the primary goals”;

- (3) Cities (24%) of contexts correlate “attractiveness” and “city.” For example: “And, of course, we need a decision by the regional authorities on how to make the historical centers of cities more attractive to tourists.”

The volume of analyzed statements of active Internet users amounted to 303 units. Of these, 39 were positive assessments of Komsomolsk-on-Amur, 112 were negative; positive reviews of the city of Khabarovsk—64, negative—88. The analysis showed that negative assessments prevail, and the difference in the number of negative and positive assessments of Komsomolsk-on-Amur is more pronounced and amounts to 3–1. Among the negative characteristics of the image of Khabarovsk, high prices (16 ratings) and an unfavorable climate prevail (15 ratings), loutishness and rudeness (12 ratings); Komsomolsk-on-Amur—poor ecology (15 ratings), dirty city (14 ratings), lack of highly qualified medical care (10 ratings), rapid price increases (9 ratings). Among the positive characteristics of Khabarovsk, the beauty of the city prevails (18 ratings), many attractions and places of recreation (12 ratings); Komsomolsk-on-Amur—the opportunity to get a stable job (7 ratings), the availability of kindergartens (6 ratings), the gradual development of the city (6 ratings).

During the associative experiment, 322 associative reactions to the Khabarovsk Territory stimulus were obtained and processed.

The largest group (27%) was made up of words included in the semantic field “nature.” In this group, we distinguished three subgroups: “animals” (10%), “inanimate nature” (10%) and “forest” (7%).

The second and third groups according to the frequency of reactions (10% each) were words included in the semantic fields “climate” and “house.” At the same time, in the “climate” group, opposite representations were recorded: “cold,” “snow,” “harsh climate,” “cold winter,” but “sultriness,” “heat,” “sun,” “rains,” “fog,” “unstable weather” and “strange weather.” The reactions included in the group “house” characterize different meanings of the word “house”: “building” (houses, large houses), “housing” and “family” (“small homeland,” “homeland,” “native land,” “family,” “parents” and “friends”).

The fourth group (8%) consisted of reactions, which are also toponyms. Moreover, most reactions are the word Khabarovsk. Other reactions call settlements, which, apparently, are the birthplace of the recipients: Komsomolsk-on-Amur (5 reactions), Dzhonka, Elban, Amursk, Nizhne-Tambov settlement, Komsomolsky district. In addition, the toponyms Far East (three reactions), Sikhote-Alin and Vladivostok fell into this group.

The fifth group of reactions (7.5%) is combined in the semantic field “city.” The evaluative reactions included in this semantic field are exactly the opposite, for example, small streets—huge streets, a bunch of shops—closed stores. Basically, this group was composed of reaction words that called the attributes of the city: embankment, motor ship, ferris wheel, park, monument, plant. In addition, this group included evaluative reactions: a lot of cars, a lot of people and noise.

The sixth and seventh groups consisted of evaluative reactions, and there were slightly more negative evaluative reactions (6%: poverty, garbage, dirt, gloom, sadness, boredom) than positive evaluative reactions (5%: love, friendship, happiness, fun, beautiful, huge, numerous, unforgettable).

The eighth group of reactions included in the semantic field “flood” is extremely situational (although it can become conventional during repetitions). It accounts for 4% of reactions (deluge, flood, flooding, dams).

The remaining semantic fields contain an approximately equal number of associative reactions (3.5% each). These are groups “moving in space” (station, trips, travel), “opportunities” (opportunities, development, but unpromising), “infrastructure” (poor infrastructure, terrible roads), “study.” The smallest group of reactions of all are reactions: Nanai, indigenous peoples.

31.4 Conclusions and Recommendations

An analysis of the idea of the attractiveness of the Khabarovsk Territory in the modern communicative space shows that at the moment, positive information about the Khabarovsk Territory is mainly aimed at business representatives, and negative information, which has a touch of scandal, is aimed at an ordinary resident of the Khabarovsk Territory. Thus, one of the basic principles of PR is violated—the mismatch of the image (desired conception) and reputation (real conception) of the region.

As ways to resolve the contradiction, we propose: (1) to develop a strategy to increase the attractiveness of the Khabarovsk Territory, focused not only on investment, but also on the quality of life, a positive attitude toward a small homeland, nature, culture; (2) orient the official mass media on the broadcast of the idea of the Khabarovsk Territory as a territory for a comfortable human life.

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Chapter 32

Methodological Approaches to the Summarizing and Quantitative Integrated Assessment of Consumer Preference Research Results for Measuring Brand Strength



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Abstract This article presents the research results of approaches to assessment of brand strength, substantiates the need for an integrated approach to solving this issue, proposes a system of indicators for brand strength assessment, and a methodology for presenting consumer survey results in a quantitative aggregated form. The article describes the methodology for generalized quantitative assessment of the results of respondents' answers to various categories of questions. The strength indicators of "The Real Vologda Product" regional brand are calculated, its market potential is analyzed according to the survey using the theoretical principles of BAV model building, developed by the marketing company Young & Rubicam. The research results allowed to give a characteristic of the main factors determining the strength and potential of the brand, to identify weaknesses, and to propose possible ways to strengthen the brand's market positions.

32.1 Introduction

The modern market and competition conditions require manufacturers of branded products to be in trend, to ensure their position through an active communication policy and branding. Branding, as a specific systemic activity, implies not only the creation, but also the support, as well as the development of the brand, both in terms of products and organization and functioning of the brand [1, 2]. One of the important elements of effective branding is the analysis and monitoring of brand strength, the identification, and regulation of factors that determine its market potential.

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The brand strength assessment is based on the procedures for selecting, describing, measuring, calculating, analyzing, and interpreting its defining indicators. The collection of empirical information, calculation, and analysis of indicators characterizing the brand strength should be carried out in coordination with the goals, objectives, and policies of the brand. This dictates the need to take into account, firstly, those indicators that reveal specific aspects of the market position of the brand and brand members, and secondly, by implementing an integrated approach, to operate with integrated indicators, which generally make it possible to assess the place of the brand and its producer, and the contribution, which it makes to the development of the regional economy [3].

Branding involves not only monitoring the existing position of the brand in the market, but also assessing its potential, predicting development with the goal of developing a system of measures to strengthen the brand's position and expand its sales territory. In this regard, it is important to implement a comprehensive approach to assessing brand strength, developing a methodology for assessing its potential by interpretation qualitative respondents' responses obtained in the course of traditional surveys of consumer preferences into a quantitative form. In addition, it is important to develop ways to integrate obtained quantitative assessments into a single indicator of brand strength.

32.2 Relevance and Scientific Significance of the Issue

Despite the variety of indicators presented in the literature, a number of measurers can be distinguished, which are regarded as major by most experts and are used in many patented methods by well-known consulting companies in Europe and the USA [4–10].

The results of the analysis of the level of indicators use in brands researches described in the scientific literature show that there is no single integrated approach to building a system of indicators for brand strength assessment [6–17].

The greatest success in brand strength assessment and implementation of the methodology, in our opinion, was achieved by the international consulting company Young and Rubicam, which developed and implemented the Brand Asset® Valuator (BAV) model [18, 19].

This company conducted the studies in 1993–1994 to assess the strength of existing brands at that time in 26 countries (about 40 thousand consumers were surveyed). Following studies covered a larger number of states (in 2001 there were already 40 participating countries), besides, additional questions were included and brand lists were expanded. More than 180 studies have been conducted in 44 countries [19, 20].

The main idea of the BAV model is to analyze the evolution features of consumer perception of a new brand, which as a factor affects its successful development. According to the developers, first consumers should distinguish, get to know the brand, get interested in it, evaluate it, and then form their opinion about it [19].

The developers of this technique disclose not only the meaning of each factor, but also model their relationship with each other, as a result of which “brand strength” and “brand potential” appear, and all this is the essence of the BAV model.

After many years of testing its methodology, Young and Rubicam developed a brand potential matrix (PowerGrid), which allows analyzing the stages of the brand's life cycle and the development of the above factors [19].

32.3 The Objective, Tasks, and Methods of Research

A review of various approaches to assessing brand strength made it possible to determine the optimal set of indicators that are used in most existing and practiced methods. The indicators we have determined to form an interconnected system, which can be demonstrated through the application of methodological approaches to assessing brand strength proposed by the marketing company Young & Rubicam [19].

The system includes 14 indicators that comprehensively measure brand strength in the main categories of its development, reflecting both the level of consumer perception and the level of market functioning efficiency. The values of indicators are aggregated indexes having a coefficient obtained on the basis of a methodology for summarizing the respondents answers to consumers' questionnaire survey.

To collect empirical information, the population of the Vologda Oblast and neighboring regions was asked about consumer preferences on the regional product brand “The Real Vologda Product”. The questionnaire included 28 main questions and 2 auxiliary ones (which allow determining the respondents age group and their status by place of residence with the aim of further assessing the structure of the surveyed target audience). The questionnaire was distributed electronically via the Google Form, by posting information about the purpose of the survey and link to the survey form (on the Internet (<https://forms.gle/VfmjQcMiiAUJGv5Z6>) in the social networks VKontakte, Odnoklassniki, mailing by e-mail to the addresses of respondents, on the website of the Vologda State Dairy Farming Academy). Further distribution of the link to the survey form was carried out directly by the respondents who took part in the survey.

The list of 28 main questions of the questionnaire included questions of four types, for which various methods for interpretation the results of respondents' answers into quantitative form, their aggregation and rationing were applied in order to obtain a quantitative coefficient estimate of the total result of respondents' survey for each question.

32.3.1 Questions with a Clear Choice of Answer

Method for measuring the respondent's opinion: the proposed answer option (formulation).

Conditional quantitative estimate of the answer option (Q_i): from 0 to $N - 1$ (where N is the number of answer options to the question), while the value "0" is assigned to the answer option with the lowest level of respondent's positive attitude to the brand, and the value " $N - 1$ " is assigned to the answer option with the highest level of respondent's positive attitude towards the brand.

Way to summarize the respondents' answers: based on indicators of the respondents' share who have chosen one or another answer option (D_i), a weighted average value of the conditional quantitative estimate is calculated by the formula:

$$Q_{cp} = \sum Q_i \cdot D_i \quad (32.1)$$

Method for rationing and interpretation into a coefficient estimate: the ratio of the obtained value of the weighted average conditional quantitative estimate to the maximum possible value of this estimate for this question ($Q_{max} = N - 1$) is calculated by the formula:

$$K_j = Q_{cp}/Q_{max}, \quad (32.2)$$

where j is the question number in the questionnaire.

32.3.2 Questions with a Multi-Choice Answer Option

Method for measuring the respondent's opinion: the proposed answer option (formulation).

Conditional quantitative estimate of the answer option (Q_{ii}): it is very difficult due to the fact that each respondent can choose several answer options and the total share indicator has a value of more than 1. It is taken as a conditional quantitative estimate for each answer option to take the value of the variation indicator in the respondents share, calculated by the formula:

$$Q_i = D_i \cdot (1 - D_i), \quad (32.3)$$

where D_i is the proportion of respondents who have chosen this answer option;

$1 - D_i$ is the proportion of respondents who did not select this answer option.

Way to summarize the respondents' answers: for the obtained values of the conditional quantitative estimate (Q_i), the average value is calculated as an indicator of the standard deviation of the fraction variation (the arithmetic square root of the

variance of the fraction calculated according to the question answers) according to the formula:

$$Q_{cp} = \text{SQRT} \left(\sum Q_i / N \right) \quad (32.4)$$

Method for rationing and interpretation into a coefficient estimate: the ratio of the obtained value of the average conditional quantitative estimate to the value of the share of respondents equal to 0.5 is calculated, since with this value the indicator of the fraction variation will be the maximum possible:

$$K_j = Q_{cp} / 0.5, \quad (32.5)$$

where j is the question number in the questionnaire.

32.3.3 Questions Without Repetitions with a Certain Choice of the Answer Option on a Quantitative Scale

Method for measuring the respondent's opinion: the proposed answer option (number of points).

Conditional quantitative estimate of the answer option (Q_i): equal to the number of points (answer option) chosen by the respondent.

Way to summarize the respondents' answers: a weighted average value of the conditional quantitative estimate is calculated based on indicators of respondents share who have chosen one or another answer option (D_i), according to formula (32.1).

Method for rationing and interpretation into a coefficient estimate: the ratio of the obtained value of the weighted average conditional quantitative estimate to the maximum possible value of this estimate on this issue (Q_{max}) is calculated by formula (32.2).

32.3.4 Repeat Question with a Certain Choice of Answer Option on a Quantitative Scale

In such a question, the respondent can give the same estimate from the proposed quantitative scale to several evaluated objects, therefore, the total share indicator will have a value more than 1.

Method for measuring the respondent's opinion: the proposed answer option (number of points).

Conditional quantitative estimate of the answer option (Q_i): is determined in the same way as for questions from the second category, according to formula (32.3).

Way to summarize the respondents' answers: for the obtained values of the conditional quantitative estimate (Q_i), a weighted average value is calculated as an indicator of the standard deviation of the fraction variation (arithmetic square root of the variance of the proportion, calculated according to the answers to the question, taking into account the weight coefficients) according to the formula:

$$Q_{cp} = \text{SQRT}\left(\left(\sum Q_i \cdot f_i\right)/\left(\sum f_i\right)\right), \quad (32.6)$$

where f_i are weights, the values of which are from 0 to $N - 1$ (where N is the number of possible answers to the question), while the value “0” is assigned to the weight of the answer with the lowest level of positive respondent's attitude to the brand, and the value “ $N - 1$ ” is assigned to the answer option with the highest level of positive respondent's attitude towards the brand.

Thus, for the answer option, when the respondent puts the studied brand on the last place “ N ”, i.e., gives him the lowest comparative rating among all the proposed brands, the weight coefficient will be zero ($f_{\min} = 0$). For the answer option, when the respondent puts the studied brand on the first place “1”, i.e., gives him the highest comparative rating among all the proposed brands, the weight coefficient will be equal to its maximum possible value ($f_{\max} = N - 1$).

Method for rationing and interpretation into a coefficient estimate: it is calculated as the ratio of the obtained value of the weighted average conditional quantitative estimate to the value of the respondents' share equal to 0.5, according to formula (32.5).

At the next stage, the obtained coefficient estimates of the overall result of the respondents' survey for each question were aggregated according to the relation of each question in the questionnaire to one or another of the 14 indicators of brand strength. Since the aggregated indicators are coefficients, to summarize them and determine their average value, the geometric mean methodology was used. Thus, the aggregated values (SBI) for each of the 14 Brand Strength Indicators were obtained (*Brand Strength Indicator*).

32.4 Research Results and Discussion

Based on the methodology of the Young and Rubicam marketing company, our system of brand strength indicators was distributed in accordance with the BrandAsset® Valuator (BAV) model into two blocks of indicators—Brand Strength and Brand Growth Potential. The indicators of each block, in turn, were divided into two groups, assessing the degree of influence for each of four main factors that determine the brand strength and its potential in accordance with the model: indicators of differentiation, relevance, respect, and knowledge of the consumer (see [Table 32.1](#)).

Table 32.1 Distribution of strength indicators of the brand “The Real Vologda Product” in accordance with the BrandAsset® Valuator model (BAV)

Brand Strength			
“Differentiation”		“Relevance”	
indicator	value	indicator	value
Perception and brand recognition indicator	0.634	Brand accessibility indicator (brand physical accessibility indicator)	0.829
Brand position understanding indicator	0.697	Brand emotional relationship indicator	0.731
Brand personality indicator	0.316	Brand protection indicator	0.760
Aggregated value	0.519	Aggregated value	0.773
Brand Growth Potential			
“Respect”		“Knowledge”	
indicator	value	indicator	value
Brand loyalty indicator (brand loyalty indicator, “heart share”)	0.797	Brand awareness indicator (brand memorability indicator, “memory share”)	0.750
		Market share (market share, sales share)	0.830
Perceived brand quality indicator (brand quality indicator)	0.822	Brand leadership indicator	0.789
		Brand advertising popularity	0.791
Aggregated value	0.809	Aggregated value	0.790

The group of indicators of the “Differentiation” factor, which determines the unique advantages of the brand, included indicators that assess its individuality, perception and the image recognition, and understanding of its position.

The group of indicators of the “Actuality” factor, directly related to consumer needs and expectations, included indicators that assess the accessibility of branded products, the emotional relationship of the consumer with the brand and the level of security of its position.

The indicators of such a factor as “Respect”, which characterizes the loyalty of the target audience with respect to the brand, included indicators of the level of consumer commitment (his “heart share”) to the brand and the level of perceived quality of the offered products.

The indicators, which measure the degree of “Knowledge” factor, included indicators that assess the level of awareness about the brand, its market share (consumer demand), the leadership degree, and advertising popularity.

The procedure of aggregating the indicators values in each group was carried out on the basis of the methodology for geometric mean calculating in accordance with formula (7). Aggregated indicators values are presented in Table 32.1.

After analyzing the combination of the considered factors degree in the obtained BAV model, and after comparing the aggregated values of indicators for each group,

we can give the following qualitative characteristic of the viability of the brand “The Real Vologda Product”:

BSI “Differentiation” < BSI “Relevance”: the products of the brand members are quite widespread on the regional market and beyond, the most part of these products are the daily demand food products (dairy, meat, bakery products). On the domestic market, consumer expectations are almost completely satisfied with the goods offered by the brand members. This naturally led to the fact that the products of the brand “The Real Vologda Product” moved into the category of mass goods and this is a kind of threat to lower the level of brand identity perceived by the target audience.

BSI “Respect” ≥ BSI “Knowledge”: with a sufficiently high level of consumer loyalty to the brand, shown in the demand for branded products on the market and confidence in the products quality, the level of information accessibility about the brand is insufficient. It is limited only by the trademark on the packaging of goods, which is insufficiently noticed by buyers; it is necessary to conduct active marketing communication, aimed at the consumer as a source of additional brand information.

In accordance with the proven methodology and matrix developed by Young & Rubicam, the potential of the brand “The Real Vologda Product”, according to the achieved stage of its life cycle, corresponds to the category of “Fading or Losing Its Positions Leader”.

According to Young and Rubicam, “Fading Leader” is a brand with a high level of relevance, respect, and knowledge, but due to the appearance on the market of other similar competing brands, its differentiation weakens and it loses its leadership position.

Partly, we can agree with this definition, but given the real uniqueness to the brand “The Real Vologda Product” [21–23], not only within the region, but also in Russia, we can hardly talk about the presence of competing brands. Most likely, it can be argued that there are competitors in relation to the enterprises participating in “The Real Vologda Product”, which offer products of other very diverse product brands, known both in Russian and foreign consumer markets.

32.5 Conclusions

Considering the high values of the estimates on the factors of “Relevance”, “Respect” and “Knowledge”, it is enough to strengthen the leadership position of the brand “The Real Vologda Product” in relation to the factor “Differentiation”.

Over the years, “The Real Vologda Product” has accumulated a fairly high potential, its status positions, primarily on the domestic market, are very strong, sales are actively developing in other regions and abroad, however, the brand strength requires support through high-quality branding. Its absence or lack of efficiency can lead to a weakening of brand status. The decrease in the level of differentiation (uniqueness) for “The Real Vologda Product”, as was already noted above, is partly natural due to the fact that branded products, for the most part, constitute everyday food for the intra-regional consumer.

The brand members can and should play a significant role in enhancing the differentiation of the brand: improving the quality of the offered products, its attractiveness in comparison with competing for similar products of other narrowly marketable brands, an active policy to expand the sales territory, opening brand stores not only within the region, but also for its bounds. The information component in the form of active and regular advertising campaigns is also important here. We must not allow the consumer, who knows about the brand, experiences high respect for these products and trusts in their quality, to cease to feel the significant difference between these products and those ones of competitors. The lack of active branding in this situation will lead to the fading of consumer interest in the brand, and the loss of its loyalty.

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Chapter 33

Innovation Development of the FEFD Regions: Rating Methodology



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Abstract The innovation development of the Far-Eastern Federal District (FEFD) was considered. It was defined that in accordance with the Association of the innovative regions of Russia most of the FEFD regions fall in to the category of the medium-low innovators indicating the low level of the innovation development. The constraining factors which retard the innovation development of the Far East were determined in the report. We used the methodology which gave consideration to internal specificity of the region. The system of indicators which are responsible for rating of the region's innovation development is composed of five projections characterizing the different aspects of the innovation development. It turned out that the "Scientific-technical potential" has the least value among all the presented projections. Meanwhile, the reasonably good socio-economic conditions for innovation activity (F_1) were provided in the FEFD. The average value of F_1 for all constituent entities is maximal.

33.1 Introduction

At the present time, the growth in the economic indicators of the state is indissolubly related to the development of innovation activities. This factor not only forms the basis of the sustainable growth but also provides the high level of competitive power of the state. It is worth noting that any country's government is the principal initiator of the innovation activity development [1–3]. One of constituent entities which have an

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effect on the development of both economic and innovation activities of the Russian Federation (RF) is the Far-Eastern Federal District (FEFD) [4–8].

It is worthy of note that the level of the country's innovation development is composed of the region's development ratings. The Association of the innovative regions of Russia (Qualifying Committee of AIRR) has worked out a number of indicators for monitoring the innovation development of the RF constituent entities being members of the Association. This rating allows us to divide the regions into 5 groups: high innovators, medium–high innovators, medium innovators, medium–low innovators and low innovators [9–12].

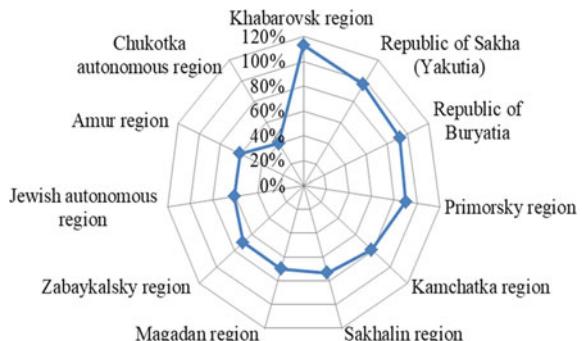
Let's consider the innovation development of the Far-Eastern Federal District in accordance with the AIRR rating. In Fig. 33.1, the positions of the FEFD regions are shown, the averaged over the RF value of rating was taken as 100%.

Analyzing Fig. 33.1, it can be said that the regions of the Far-Eastern Federal District correspond to four categories of the AIRR rating:

1. Medium–high innovators—Khabarovsk Region (KHR);
2. Medium innovators—Republic of Sakha (Yakutia) (RSY), Republic of Buryatia (RB) and Primorsky Region (PR);
3. Medium–low innovators—Kamchatka Region (KR), Sakhalin Region (SR), Magadan Region (MR), Zabaykalsky Region (ZR), Jewish Autonomous Region (JAR) and Amur Region (AR);
4. Low innovators—Chukotka Autonomous Region (CHAR).

It follows from the above that most FEFD regions fall in the category of the medium–low innovators indicating the low level of the innovation development. The Government of the Far-Eastern Federal District should pay attention to this fact as the Far East, at the moment, is the strategic reserve and support for developing the RF economy.

Fig. 33.1 Positions of the FEFD regions in accordance with AIRR rating



33.2 Method

It is necessary to determine the constraining factors which retard the innovation development of the Far East. Let's appeal to methodology which will give consideration to internal specificity of the region. The numerous research works in this sphere revealed that there is no one-size-fits-all approach to evaluation of the innovation index. However, a valuable role is here played by instrumentarium and list of indicators allowing to evaluate the innovation development of the economic systems and carry out their ranking on totality of indicators [13–16]. Presently, there is the sufficient quantity of methods of the region development level evaluation. These are an international approach, the European approach, the Russian approach and approach using the particular indicators [17, 18]. In our opinion, the methodology of [19] is best suited for evaluation of the innovation activity of the Far-Eastern Federal District. The system of indicators is composed of five projections characterizing the different aspects of the innovation development (ID). They include the following ones.

1. The socio-economic conditions for the innovation activity (IA)— F_1 . These include the following indicators of the region's innovation development: gross regional product (GRP) per capita, wear degree of fixed assets, number of students receiving training by academic programs of the higher education per 10,000 people of population.
2. The scientific and technical potential (F_2) includes the intramural expenditures for research and development activities in regard to GRP, number of persons occupied with scientific-research technologies (Bachelor's, Specialist's, Master's degree programs) per 10,000 people of occupied population, coefficient of invention activity and number of available production advanced technologies.
3. The innovation activity is characterized by the following indicators (F_3): innovation activity of institutions, extent of expenditures for technological innovations, share of innovative products of industry, share of organizations occupied with technological innovations.
4. Infrastructure and transfer of innovations include the system of following indicators (F_4): share of investments allocated to reconstruction and modernization, number of used advanced production technologies and number of used objects of intellectual property.
5. The efficiency of innovation activity is characterized by the following indicators (F_5): efficiency coefficient of investments in the technological innovations, share of expenditures for research and development works in the structure of expenditures for technological innovations and share of innovative products in the total export volume [20].

The methodology of determining the index of innovation development of regions includes the following stages:

1. Collection of statistical data for each projection of each region. The source of data collection in our study is the official site of the Federal State Statistics

Service—“Rosstat”. We used the data for the period from 2017 to 2018 because of the fact that the site of “Rosstat” for 2019 contains only fractional data and information on some indicators for some regions of the FEFID is completely absent [21].

2. Reduction to the non-dimensional form. We used the minimax normalizing. The minimax normalizing is widespread when determining the index of the innovation development in the most such studies [22]. The calculations are carried out by formula (33.1):

$$\tilde{x} = \frac{X - X_{\min}}{X_{\max} - x_{\min}}, \quad (33.1)$$

where x is the actual value of the indicator; x_{\min} is the least value among the RF constituent entities; x_{\max} is the highest value for the RF constituent entity.

3. Aggregation of indicators into broad-based (integrated) indices was made by formula (33.2):

$$F_i = \sum_{j=1}^m s_j * x_{ij}, \quad (33.2)$$

where x_{ij} is the j th indicator of the i th projection; m is the number of indicators in composition of this projection; s_j is the weight of j th indicator.

The weights were selected so as the condition $\sum_{j=1}^m s_j = 1$ was satisfied.

When determining the weight of indicator, the expert method was used.

4. The calculation of the broad-based index of the innovation development of regions is determined as an amount of the broad-based indices of all projections of the system with the consideration of their significance and is calculated by formula (33.3):

$$G = \sum_{i=1}^l r_i * F_i; \quad (33.3)$$

where r_j is the weight of i th projection of the innovation development of the region; l is the number of the system projections.

In our case, $l = 5$ and the weights of projections were selected in accordance with the methodology of authors of [19]:

$$r_1 = 0.15; r_2 = 0.2; r_3 = 0.3; r_4 = 0.2; r_5 = 0.15.$$

33.3 Results and Discussion

The results of calculating the indicators of projections F_i and the broad-based index G for each region in 2017 and 2018 are presented in Table 33.1.

It is evident that, on average, the “Scientific-technical potential” F_2 has the least value among all the presented projections. This fact can be treated as the common negative characteristic of the region which is one of the constraining factors of the innovation development.

If the constituent entities dominating in accordance with the value of projection F_4 in 2018 are considered, all of them are also leaders by index G . Therefore, the distinct interrelation between the projections with largest weights and values of the broad-based index of IA is observed. Other things being equal, the efficiency of contribution to these projections will be highest. The interesting fact is that, in the region (for the majority of constituent entities), the reasonably good socio-economic conditions for IA (F_1) were provided. The average value of F_1 for all constituent entities in 2018 was equal to 0.346 and is maximal from all projections (for comparison, the average values by projections F_2, F_3, F_4, F_5 are 0.078, 0.204, 0.211, 0.238). Herewith, these conditions have a weak impact on the broad-based index of IA. This can give evidence of the disinterest of region in innovations as well as errors at each stage of the development and introduction cycle.

In the constituent entities where the key projections were taken to the sufficient (by standards of the region and even the RF) level, it is necessary to place the emphasis on the projections with lesser weights. At each stage of the innovation development,

Table 33.1 Indicators of projections and broad-based index of the innovation development

Region of FEFD	MR		CHAR		ZR		PR		RSY		RB	
	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018
F_1	0.358	0.341	0.213	0.219	0.309	0.302	0.392	0.434	0.382	0.387	0.306	0.305
F_2	0.106	0.098	0	0	0.022	0.024	0.129	0.129	0.076	0.085	0.057	0.066
F_3	0.115	0.164	0.177	0.116	0.112	0.109	0.146	0.247	0.148	0.131	0.173	0.250
F_4	0.185	0.243	0.195	0.132	0.170	0.188	0.284	0.296	0.177	0.194	0.319	0.227
F_5	0.172	0.282	0.197	0.275	0.149	0	0.049	0.555	0.153	0.021	0.198	0.246
G	0.173	0.211	0.154	0.136	0.141	0.121	0.193	0.308	0.176	0.157	0.203	0.217
Region of FEF	AR		KHR		JAR		SR		KR			
	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018
F_1	0.383	0.377	0.442	0.449	0.264	0.265	0.489	0.510	0.223	0.218		
F_2	0.056	0.049	0.099	0.129	0.068	0.064	0.042	0.038	0.100	0.098		
F_3	0.138	0.080	0.526	0.561	0.130	0.131	0.200	0.237	0.388	0.215		
F_4	0.167	0.130	0.323	0.323	0.279	0.196	0.088	0.093	0.406	0.298		
F_5	0.004	0.143	0.855	0.669	0.233	0.222	0	0	0.207	0.209		
G	0.145	0.138	0.437	0.427	0.183	0.165	0.160	0.174	0.283	0.208		

it is advisable to abscond from evident “weak” points (projections). In case if the particular indicators of the constituent entity have the “disastrous” values or are in “infancy”, one might expect that the contribution to their development will be very effective and have the rapid effect on the IA index.

33.4 Conclusion

Generally, we observe that the value of G by the year 2018 has increased for Magadan, Sakhalin, Primorsky regions and Burytia. In other regions of the FEF, the broad-based index has decreased. The biggest increment in the broad-based index of IA has observed in Primorsky region (0.115) while maximal fall (0.074) is accounted for Kamchatka region. Therefore, for economic growth and provision of the high level competitive power of the state as a whole and its regions, it's worth paying attention to the constraining factors of the innovation development including such for the Far-Eastern Federal District.

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Chapter 34

Domestic and Foreign Experience in the Development of the System Retirement Insurance



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Abstract The article presents current trends in the development of pension insurance systems. The emphasis is on the analysis of the Russian Federation's pension system. A detailed comparison of the Russian national pension system's parameters with foreign counterparts is carried out. The focus is on considering existing German pension systems. It is noted that the imported Russian pension reforms are fully consistent with the general paradigm of development of pension systems. Conclusions show that the potential for the development of pension insurance in Russia lies in expanding the role of non-state pension provision and connecting insurance companies specializing in life insurance to the funded mechanism of compulsory pension insurance.

34.1 Introduction

The modern Russian Federation's pension system is experiencing a crisis caused by many unresolved issues related to the formation and provision of pension benefits.

Periodically conducted large-scale pension reforms have repeatedly changed the structure, parameters and basic characteristics of the Russian pension system [9], expanding the insurance component and adding funded elements. The result of almost three decades of pension reforms has become a multi-level pension system, consisting of three separate but closely interrelated subsystems: compulsory pension insurance (here and after—CPI), state pension provision and non-state provision.

CPI is the central link in the Russian pension system undergoes the greatest changes. In recent years, the CPI system has undergone a number of optimization changes aimed at reducing the financial burden of the pension system on the state budget. The question of finding new pension mechanisms is becoming relevant for the Russian Federation.

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Relevance. The issues of pension insurance for working citizens are especially relevant in Russia in connection with the ongoing pension reform. The need for both state and non-state pension insurance is obvious for all countries of the world.

34.2 Statement of the Problem and Research Directions

In the conceptual plan, two main models of pension systems are known:

- (1) a distribution model based on the system-forming principles of social insurance: solidarity, mutual assistance and responsibility of all for the state of the pension insurance system. The redistribution of funds occurs on the basis of the generational solidarity principle: the older generation, who paid insurance contributions to the pension system, retires, and the younger generation begins to pay such contributions that go to the payment of pensions of the older generation;
- (2) the funded model of pension insurance, based on the principle of individual responsibility for their own well-being upon the occurrence of the relevant insurance event. Pension savings are formed on an individual personal account at the expense of a percentage of the employee's salary and investment income from the placement of these funds in the financial market [1, p. 156].

Currently, most countries of the world (Russia was not an exception) have opted for a mixed pension insurance system, which implies the introduction of funded items in the distribution model of pension insurance [1, p. 157]. The trend observed over the past decades to abandon purely distributive pension systems is due to modern demographic trends: The ratio of the working citizens' number to pensioners is gradually approaching equality, and this inevitably predicts a crisis in pension systems. The number of elderly citizens is growing rapidly, respectively, and this entails an increase in the cost of paying pensions [2, p. 79]. Refusal from the mechanism of joint redistribution increases the risk of the insufficient level of pension payments formation as a result of low wages, underemployment and health problems. As a rule, the distribution model performs a social function while built on the funded basis model serves as a source of long-term investment in the country's economy. Accordingly, the only possible solution is a combination of these two models, which makes possible to obtain a pension system that best meets the national characteristics and interests of the country. A comparative analysis of the pension systems of Russia and foreign countries and an analysis of their experience allows us to determine the direction of development of the Russian pension system. The table shows the inter-country differences in the pension systems of developed countries [3, pp. 55–56] (Table 34.1).

The current model of Russian pension insurance has much in common with foreign counterparts. Of course, state bodies are trying to implement the most appropriate and successful decisions in Russian practice on the base of foreign experience in the development of the pension sphere analysis. So, for example, considering the

Table 34.1 Cross-country differences in pension systems

Country	Model	Types of Pension Payments	Retirement age (m/w)	seniority, years	Rate, %
Great Britain	Distribution-funded (voluntary)	Basic, seniority, non-governmental	65/65	10	23.8
Germany		Basic, private, corporate	65/65	5	20
France		Basic, non-governmental	62/62	40	16.4
USA		Basic, private	67/65	13	12.4
Japan		Basic, seniority, private	65/65	25	10
Sweden	Distribution-funded (compulsory)	Guarantee, premium, insurance	65/65	40	10
Russia		Insurance, funded (frozen) pension, non-governmental	60.5/55.5	15	22

structure of the UK pensions can highlight significant similarities with the Russian one:

- the first level is the state old-age pension (basic). In Russia, the analogue is a fixed payment for an insurance pension;
- the second level is the state long service pension (seniority). It is provided to employees and depends on the length of service and the size of wages. In Russia, this is an insurance pension;
- the third level is a non-governmental life-long pension based on length of service. In Russia, such functions are endowed with a non-state (voluntary) pension system.

34.3 Research Findings

Table 34.2 shows the statistical information of the Pension Fund of the Russian Federation (PFR) on the main indicators of the pension system [4]. According to the PFR in 2018, the average size of the insurance pension amounted to 13,729 rubles, the average size of the old-age insurance pension was 14 184 rubles, the average amount of the funded pension was 925 rubles, and the subsistence level of pensioners in 2018 was 8726 rubles. Taking into account the demographic challenges, the overall economic situation in the country, Russia was inevitably faced with the choice of the pension model of the experience of foreign countries.

The choice of a mixed model of the pension system was due to the fact that the principle of generational solidarity was violated: The distribution system could not operate with a significant quantitative gap between workers and older people.

Table 34.2 Indicators of the Russian pension system

Indicators	2016	2017	2018	2019	2020
The total number of pensioners, thousand people	45,182	45,709	46,070	46,480	46,198
<i>Of which receive pensions:</i>					
By old age	35,555	36,004	36,336	36,710	36,341
By disability	2365	2280	2202	2137	2181
On the occasion of the loss of the breadwinner (for each disabled member of the family)	1608	1628	1636	1632	1612
The total number of pensioners per 1000 people of the population	308.3	311.4	313.7	316.7	314.8
The number of employed per pensioner (average for the year), people	1.60	1.59	1.57	1.55	...

The modern model of state pension insurance in the Russian Federation began to take shape with the creation in the national pension system of a separate financial mechanism for pension provision—compulsory pension insurance, which came into force on January 1, 2002. All citizens of the Russian Federation became insured persons, and the Pension Fund acted as the insurer. Initially, within the framework of the CPI, a retirement pension was paid for old age, disability and survivor loss. Seniority (insurance) pension consisted of the basic, insurance and funded parts [5, p. 608].

The advent of the funded part has opened a place in the system of compulsory pension insurance for non-state (private) pension funds (here and after—NPF), whose legal status of NPF was subsequently fixed by a number of federal laws. It is non-state funds that today form an additional pension through voluntary payments of citizens and participate in the formation of funded pensions (previously the funded part of the seniority pension), through the mandatory pension insurance system [2, p. 80]. In 2018, 76.8 million people formed pension accumulations, of which 36.9 million people in NPFs and 39.6 million people in the state management company Vnesheconombank. We note that from 2016 to 2018 the number of persons forming savings in NPFs increased by 23.8%, while the number of persons forming savings in the state management company Vnesheconombank decreased by 14.1%, which can be explained by higher profitability in NPF.

Further reform of the pension system's distribution part significantly changed the structure of the pension insurance scheme, delimiting the areas of activity of state pension insurance (the insurance pension system has two institutes of insurers: the Russian Pension Fund and private pension funds [6, p. 20]) and non-state pension provision (assigned to private pension funds).

The pension insurance system in its current form was put into effect on January 1, 2015, and provides the payment of an old-age pension, disability pension and survivor's pension, funded pension paid in addition to the insurance pension.

In the Russian Federation from 2002 to 2014, a conditionally funded insurance pension formation scheme was in effect. In 2015, it was replaced by a point system

that takes into account a large number of factors in the calculation methodology: length of service, working conditions, size of wages, the presence of socially significant periods of life (child care, military service). For some experts, the current point system seems less successful since the uncertainty in the formation of the value of a pension point (the state determines the value of points annually by an insufficiently clear procedure) limits the possibility of determining the amount of pension in advance, up to a year of direct retirement [7, p. 212].

An example of a fairly successful application of the point system is Germany, in which an individual pension depends on the points accumulated for all labor activity and the value of the point. One point corresponds to the average wage for the year. Low (less than 450 euros per month) and relatively high (more than 215% of the average wage) earnings are excluded from the base for calculating insurance premiums and points for these amounts are not awarded.

Extra points are awarded for caring for a child, receiving unemployment benefits and working in special conditions. The point value is adjusted annually taking into account the ratio of the number of pensioners and contributors, but in 2018, a lower threshold for the value of one point was introduced to ensure the net replacement level for a pension with an average salary of 45 years, at least 48% of earnings until 2025 [10, pp. 186–187].

At the same time, conditional accumulative individual pension accounts have become quite widespread in European countries. In particular, the German pension system is characterized by the presence of voluntary deductions of persons insured in the CPI to a special (individual) funded pension account. The opening of these accounts is not mandatory, and the state is only limited to the provision of tax and other benefits. In Russia, pension funds work with the savings of citizens. Unlike in Russia, in Germany, insurance companies form and manage the pension savings of citizens. The versatility of insurance allows you to minimize the unavoidable costs [8, c. 141].

Table 34.3 Country substitution ratio, %

Country	Distribution systems	Funded systems	Total
Great Britain	32	35	67
Germany	42	16	58
France	24	36	60
USA	38	38	76
Japan	20	25	45
Sweden	34	21	55
Russia	33	2	35
The EU	47	10.6	57.6
OECD (Organization for Economic Co-operation and Development)	40.6	27.3	67.9

The data in Table 34.3 show that in the Russian Federation only 33% of average earnings are replaced with pension without taking into account the funded component, which corresponds to the average indicators of other countries. However, in combination with the funded component, the substitution coefficient in foreign countries on average exceeds the level of 60% (the worst indicator in Japan is 45%) [3, p. 58]. Moreover, the data presented in Table 34.3 confirm that in developed countries traditional distribution pension systems are not able to provide a high level of replacement of labor income pensions without the use of funded systems.

From the foregoing, it is clear that without compulsory or voluntary funded pension insurance, being limited only to the distribution pension system, it is not possible to ensure the optimal level of pension provision in the Russian Federation. Officials and researchers formulate that the distribution system will not be able to reach the recommended level of substitution (40%) in the coming years. According to more realistic expert estimates, the substitution rate will be about 35% by 2024 [11, p. 14]. The domestic distributional pension system is becoming obsolete and demonstrates its inefficiency. This is due to an increase in the number of working pensioners, an increase in the demographic burden on the economy and an increase in the pension burden on “business” [12, p. 37].

Thus, increasing the funded component in the Russian pension system is an urgent and timely task, which sooner or later has to be solved.

At the present time, it is known that the Russian government has plans to reform the funded component of the pension system, which include replacing the “frozen” funded pension formed in the state pension system and switching to voluntary pension savings under the project of the so-called Guaranteed Pension Plan (here and after—GPP) [13].

Employers will continue to deduct compulsory insurance contributions in the amount of 22% for the formation of the insurance pension of their employees. There is also the possibility of transferring additional contributions. Each citizen independently determines the amount of additional investments, forming a GPP. At the same time, it is planned to connect citizens to the new system on a voluntary basis. It is assumed that the pension savings of the compulsory pension insurance system can be transferred to the state pension system. The final version of the GPP concept has not yet been formed, although its implementation is planned as early as 2021. Since analogues of the GPP system exist in a number of countries (including Germany and the USA), the implementation of this reform will generally correspond to global trends.

34.4 Conclusion

The transformation of the Russian pension system is consistent with the current trends in the development of pension insurance systems observed in most developed and developing countries: a multi-level pension system, a mixed financing model, etc. The mixed model allows to reduce the negative impact of risks inherent in each

component: for a distributed system—the risk of an increase in the demographic load, and for the cumulative—investment risk.

It should be noted that the funded mechanism does not occupy significant places in the system of compulsory pension insurance of the Russian Federation. In addition, Russian insurance companies are not allowed to manage pension savings of citizens. Life insurers only participate in the voluntary part of pensions; however, in 2019, the number of insurance companies providing voluntary pension insurance did not exceed 15 units [14]. At the same time, the experience of many developed countries indicates that insurance companies can provide a variety of insurance products that enhance the ability of citizens to form a future pension.

The domestic experience shows that life insurance companies are able to reliably manage their savings, guaranteeing a positive minimum rate of return on insurance reserves. Endowment life insurance provides an insurance basis for the provision of long-term pension insurance services. The accumulative nature of life insurance gives insurance companies a sustainable basis for the provision of long-term pension insurance services [15, p. 65].

Accordingly, the inclusion of insurers in the system of voluntary savings and joining the CPI allows you to provide a wide range of programs offered to customers and to provide a positive social effect for the consumer [16].

Thus, the future prospects of pension insurance in Russia should be connected with the connection of insurance companies to the funded mechanism of compulsory pension insurance as well as with the need to build up and improve such a non-state pension mechanism as a voluntary funded system. At the same time, there is a risk that the voluntary funded system will not be able to provide the existing inflow of pension savings. The reason for this is that Russian citizens cannot invest in future needs. So, if in 2016, 11.1% of Russians' incomes went into savings, then in 2017—8.1%, and in 2018—5.6% [17].

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Chapter 35

Specifics of Tax Policy in Conditions of Regional Economy Diversification



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Abstract The article reveals the content of tax policy and highlights its meaning in solution of social and economic tasks. It reflects the specific features of the tax policy as the tool which enables to mitigate heterogeneity of economic development in regions. For this purpose, the article defines regional differences in taxation system in the following subjects of the Russian Federation: Kemerovo Oblast, Novosibirsk Oblast and the Republic of Altai. The differences are revealed in the context of property tax and income tax of organizations as well as transport tax and special taxation systems. The results of analysis of the regional variations in taxation system enabled the authors to assess the state of legislative regulation of taxation development in the regions. Among the regions in question, Novosibirsk Oblast was highly rated according to the criteria of local stimulation of different types of business, stimulation of regional resource base and the presence of differentiated tax rates and taxable items. The article also assesses the results of the influence of tax policy to regional economy diversification process. With the reference to the materials of this research, the authors conclude that the regions with tough legislative tax regulation normally have diversified economy which makes it possible to provide stable tax return to the budget. Regions with raw material economy require more intensive diversification. Subsequently, they need a stronger tax policy to prevent disproportionate development of different kinds and branches of economics. The conclusion of this article contains recommendations on improvement of regional tax policy.

35.1 Introduction

The characteristic feature of the Russian economics is the high extent of uneven territorial (regional) development. This discrepancy is mainly due to climate and historical factors as well as other objective reasons. Due to the influence of various factors, different regions have different specialization. Specialization in the regions has the impact upon their economic development. For instance, Kemerovo Oblast

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(the city of Kuzbass) accounts for over a half of coal mining as well as rolled ferrous metal and steel production [1] in the Russian Federation. But raw material economy cannot guarantee its good growth due to exposure to the influence of its market conditions. Application of tax policy tools will enable to give rise to increasing the efficiency of regional economy and to ensure the stability of tax returns to the budget.

The objective of this article is to reveal the specifics of tax policy as a tool of regulation of heterogeneity of economic development in regions, to develop solutions aimed at tax policy improvement on the basis of analysis and assessment of its influence on the process of regional economic diversification (as exemplified by Kemerovo Oblast compared to other regions of the Russian Federation).

The article has the following structure: Sect. 35.2 reveals the specifics of tax policy in the conditions of heterogeneity of social and economic development in the regions. Section 35.3 contains assessment of tax policy influence upon the process of diversification of regional economy (as exemplified by Kemerovo Oblast compared to other regions of the Russian Federation). The conclusion contains recommendations on improvement of regional tax policy.

35.2 Tax Policy as a Tool of Regulation of Heterogeneity of Regional Economic Development

Tax policy is the main tool to reach harmony between the government and taxpayers. Tax policy ensures formation of revenue sources for budgets of all levels and regulates the tax burden upon business entities. Justified tax policy is meant to stimulate the activities aimed at business efficiency improvement, fundraising and development of new high-tech industries. It is tax policy that defines the complex of measures aimed at smoothening of heterogeneity of economic development in separate parts of the country.

It should be noted that economic literature shows different approaches to the definition of tax policy. Before disclosing their content in details, it should be noted that tax policy is hierarchically subordinated to financial and budgetary policies but at the same time, it has an independent nature, and it is closely related to all areas of social and economic development of the country [2]. So, let us outline some definitions of tax policy. From our point of view, these definitions reveal its content in more details and more precisely.

According to the Economics Dictionary edited by Arkhipov, tax policy is defined as “a system of legal norms and organizational and economic measures of a regulatory nature, adopted and implemented by state authorities (at federal and regional levels) and local governments in the field of tax relations with organizations and individuals” [3]. In this definition, tax policy acts as an active form of the presence of the state in a certain region where it is obviously necessary to get the state involved into the economy to regulate its development. The definition of Romanovsky and

Vrublevskaya is focused on the means of tax policy. These are the means of regulation of tax relations between the main participants—the government and business entities. “Tax policy is a set of tax activities aimed at the achievement of some goals (eg: tax exemptions)”. Tax exemptions, objects and rates act as tools of tax policy [4].

Therefore, tax policy is a system of measures implemented by state authorities in terms of tax application for development of economy in general as well as its separate fields and industries. In this case, the tax policy is determined by tax relations between the government and business entities.

Regional taxes and special taxation systems are the tools of tax policy on the level of regional economy. Tax rates and tax exemptions determine regional differences in taxation system. Let us demonstrate such differences on the example of Novosibirsk Oblast, Kemerovo Oblast and the Republic of Altai. The stated regions are selected as main competing areas with a considerable level of taxpayers migration. Those taxpayers are legal entities and sole proprietors from Kemerovo Oblast.

The objects of comparison in this research are corporate property tax, transport tax, corporate income tax and special taxation systems.

Regional differences in corporate property taxation are determined by tax rate which depends on the type of taxable property. Thus, lowered tax rates have been established for non-commercial immovable property in Kemerovo Oblast. 2% rate instead of maximum 2.2% is applied for administrative and business centers, office facilities, retail facilities as well as public catering and consumer services located in separate non-residential buildings. Organization property tax rate is also set at 2% in Novosibirsk Oblast. It is noteworthy that non-profit real estate objects are subject to taxation at this rate. In the Altai Republic, preferential rates are set for a certain category of investment entities which produce agricultural products. In this case, the stimulating orientation of regional tax policy is obvious. Clear differentiation of taxation objects is widely applied in this region due its recreational specialization.

The negative point for Kemerovo Oblast is that the tax rate is substantially reduced only for non-commercial objects. This circumstance may be considered as one of the stop factors for business development in the region.

Transport tax is also mandatory for all the respective subjects of the Russian Federation. Transport tax is actively applied in all spheres of business, and it includes trucks and buses. The lowest tax rate for the specified objects is applicable in the Republic of Altai. There is no difference in transport tax for trucks in Kemerovo and Novosibirsk Oblasts, but for buses of different capacity, transport tax in Kemerovo Oblast is two times lower than in Novosibirsk. Presumably, this difference is offset by the tax rate on cars: The rate for cars in Novosibirsk Oblast is significantly lower than in Kemerovo Oblast. At the same time, according to Rosstat (Federal Statistics Service), Novosibirsk Oblast ranked 32nd in terms of quantity of own cars per 1000 people while Kemerovo Oblast ranked 60th [5]. This fact points out higher quality of life of the population of Novosibirsk Oblast which has an indirect influence upon the level of its economic development.

The main corporate income tax rate makes 20%: 2% to the federal budget (3% in 2017–2020) and 18% to the budget of the subject of the Russian Federation (17%

in 2017–2020). Tax rates in the areas analyzed in this research are the same as those stated in the Tax Code of the Russian Federation. Reduced income tax rates are set for separate categories of taxpayers and act as a certain way of tax exemption.

Establishment of tax exemptions normally determines the difference between regional tax policies of different subjects of the Russian Federation. Such difference is based on the acting legislation for tax exemptions—regional tax exemptions are established and canceled by Tax Code of the Russian Federation and/or tax laws of the subjects of the Russian Federation. The same procedure is provided for local taxes subject to tax regulatory acts of representative bodies of municipal structures.

Let us demonstrate the nature of such exemptions in the analyzed regions.

Tax exemptions for businesses operating in Kemerovo Oblast are set by six regional laws [6–11]. For instance, for residents of science parks and investment entities involved in extraction of natural gas (methane) from coal deposits in Kemerovo Oblast as well as for the recycling companies, the income tax rate (the tax returned to regional budget) is reduced from 18% to 13.5% and property tax rate is reduced to 0%. For residents of priority social and economic development areas (PSEDA), income tax rates are reduced to 5% (within five tax periods) and property tax rates are reduced to 1.1%. Therefore, we can conclude that the regulatory effect of those taxes in Kemerovo Oblast is aimed at local stimulation of separate kinds of business and does not cover those sectors of industry which may predominantly involve small business.

Tax exemptions for businesses operating in Novosibirsk Oblast are set by two regional laws [12, 13]. Property tax rate reduction to 0% is provided for the economic entities engaged in investment activities in the form of capital investments in Novosibirsk Oblast, as well as residents of PSEDA. A privilege to stimulate the growth of the tax base on property tax of industrial enterprises is noteworthy. The amount of tax from the increase in the tax base of the reporting (tax) period may be reduced when calculating property tax. The prerequisites for applying this tax benefit are as follows: (a) ensuring revenue growth of minimum 10% (this measure is meant to stimulate the growth of business activity); (b) the absence of arrears in tax and insurance payments (this procedure is aimed at ensuring payment discipline of a taxpayer enterprise); (c) ensuring that the level of profitability of the products sold is minimum 5% (a measure to stimulate the growth of competitiveness and importance of the enterprise). Understanding of such role of tax exemption is essential for a taxpayer. Its main task is encouragement the renewal of fixed assets of goods producers as well as ensuring the development of production factors in the region.

Current transport tax in Novosibirsk Oblast is aimed at stimulation of agricultural development. The tax rate for organizations and individual agricultural producers is reduced to 0 rubles for buses, trucks and other self-propelled caterpillar-tracked vehicles. Using of natural gas as transport fuel is stimulated by setting 10% tax rate from certain tariffs. Sphere of influence of income tax is rather diverse—from PSEDA residents and participants of regional investment programs providing the tax rate reduction from 18 to 0% and from 18 to 10% for industrial enterprises. Economic development of industrial enterprises is stimulated by encouragement of growth of income tax base. So, an excess of the tax base by 1.3 times or more is followed by

income tax rate reduction from 18 to 14.5%. Therefore, we can make a conclusion that tax exemptions in Novosibirsk Oblast provide stimulation of investment activity of economic entities, and it is also aimed at the development of industrial enterprises in the region.

Tax exemptions for businesses operating in the Republic of Altai are set by five regional laws [14–18]. They are aimed at financial support for the investors implementing investment projects in the Republic of Altai. Reduced corporate income tax rate to be returned to the budget of the Republic of Altai is 13.5% for recreational businesses, for social investors and the companies implementing investment projects of regional significance. Corporate property tax rates are meant to stimulate commissioning of the objects with high energy efficiency. Transport tax is aimed at the support of social investors participating in republican investment program in social sphere. Therefore, we can make a conclusion that tax exemptions in the Republic of Altai are aimed at the development of social sphere and tourism.

Each region has unique spheres which are subject to special taxation systems. For instance, simplified taxation system in Kemerovo Oblast covers such areas as production of chemical materials and products, transport manufacturing; collection, treatment and disposal of waste, etc.; in Novosibirsk Oblast—manufacturing, creative, cultural and entertainment activities, stone and metal processing services, jewelry manufacturing, repair of electronic and optical equipment, etc.; in Altai Republic—provision of electricity, gas and steam, air conditioning, construction, repair and maintenance of equipment and mechanisms, transport services, household activities that involve employees, etc.

Note that unique (quite specific) spheres subject to special taxation systems in each region do not apply to those kinds which could diversify the economy of the region and expand specialization in separate manufacturing or service sectors that show the necessity of improvement of regional tax policy.

We would like to point out that according to the tax laws of Kemerovo Oblast for the taxpayers which use special taxation systems, tax exemptions are provided for some kinds of manufacturing activities which have influence upon regional economy diversification. These are such spheres as crop production, livestock and forestry, as well as some sectors of consumer goods industry (e.g., production of clothing, textiles, etc.) that are subject to the simplified tax system (rate 3%) or patent taxation system (rate 0%). Meanwhile, 3% rate in simplified taxation system applies to income that makes it impossible for taxpayers (especially legal entities) to reduce tax base due to expenses in material-intensive and labor-intensive activities. Therefore, it does not sufficiently stimulate the choice of the above-mentioned industries. Patent taxation system is used by sole proprietors. However, they do not always have an opportunity to ensure development of diversified sectors due to the required high amount of investments which are often not affordable for sole proprietors.

Therefore, we can make a conclusion that among the analyzed regions, Novosibirsk Oblast has a high level of legislative tax regulation of economic development according to the criteria of local stimulation of certain types of entrepreneurship as well as stimulating the development of the regional resource base and the presence of

differentiated tax rates and objects of taxation. The regional system of tax exemptions meets the principles of selectivity and the flexibility of provision thereof.

35.3 Assessment of the Results of the Influence of Tax Policy on the Process of Regional Economy Diversification

The key factor of regional economy diversification is the structure of gross regional product (GRP) by economic sectors. Based on the GRP structure, one may determine the leading spheres of specialization in the region and the spheres which influence the economic and financial status of the region. It also provides the opportunity to predict and/or state structural changes in the regional economy resulting from its economic regulation including tax regulation as well.

Analyzing the data from Federal State Statistics Service, we may conclude that there were insignificant changes in the sectoral structure of the GRP of Kemerovo Oblast [19]. Here is the most up-to-date regional statistics. In 2017, the share of mining made 29.7% (compared to 25.6% in 2016), manufacturing ranked second (16.5%), and other activities were in the third place (13.4%). Wholesale and retail trade, repair of motor vehicles, household goods and personal items are on the fourth place (9.6%). In 2018, there were some structural shifts toward strengthening the position of the leading industry; mineral production accounted for 36.6%, while manufacturing enterprises reduced their share to 14.3%, and other sectors of economy consolidated their positions in the third place (13.4%). Meanwhile, GRP structure in the neighboring regions is unstable. In the Republic of Altai, the leading industry was agriculture in 2016–2017 (17% and 18%, respectively, in the GRP structure), in 2018—wholesale and retail trade as well as repair of motor vehicles and motorcycles (16.6% in GRP structure). The GRP structure of Novosibirsk Oblast in 2018 had three leading segments with approximately equal shares. Those segments were wholesale and retail trade, repair of motor vehicles and motorcycles (15.5%), transportation and storage (15.4%), manufacturing (13.8%). The immovable property sector held the predominant position in 2016–2017 (21.5% and 22.9%, respectively). According to the existing structural shifts, we can point out that trade and industry are becoming the leading sectors of the regional economy. We can also focus on other sectors the share of which fluctuates from 15.3% in 2017 to 11.9% in 2018. The analysis of sectoral structure allowed us to identify Novosibirsk Oblast as a region with a high degree of economic diversification.

The existing regional GRP structure has an impact on the dynamics of taxes and fees and other obligatory payments.

The analysis of tax reports materials allowed us to reveal the unstable dynamics of taxes and fees from economic entities of Kemerovo Oblast. Thus, compared to 2015, in 2016, absolute amounts of payments were reduced by 5%, but in the following periods, we can observe their growth—by 51% in 2017 and by 16% in 2018. In Novosibirsk Oblast and in the Republic of Altai, taxes and fees are stably paid, and

there is an annual growth of tax payments as well as other obligatory payments. It may be noted that annual growth is approximately the same with no sharp fluctuations of tax flows either upward or downward: 12% in 2016, 9% in 2017 and 13% in 2018 in Novosibirsk Oblast; 5%, 8% and 11%, respectively, in the Republic of Altai [20]. This may indicate a more rational tax policy implemented at the regional level and ensuring a steady increase in tax payments, as well as the stable financial status of taxpayers engaged in entrepreneurship in these regions.

Therefore, we can make the following conclusion. The regions with high level of legislative tax regulation normally have diversified economy which makes it possible to provide stable tax return to the budget. Raw material regional economy is susceptible to the influence of the market conditions. In the event of deterioration in the financial situation of specialization industries, tax losses of the budget are inevitable. Regions with raw material economy require more intensive diversification. Subsequently, they need a stronger tax policy to prevent disproportionate development of different kinds and branches of economics. In this regard, tax policy improvement measures should have a direct (not indirect) impact on the regulation and stimulation of the regional economic development.

35.4 Conclusion

The proposals for improvement of regional tax policy may cover three aspects.

1. Applying the means of stimulation of industrial enterprises. It is exemplified by the positive experience of Novosibirsk Oblast. In Novosibirsk Oblast, this function is implemented by two kinds of tax—corporate property and income tax. The effects of the taxes include stimulation of tax bases growth. At the same time note the different nature of such effects. Corporate property tax provides for the use of a scoring mechanism in calculating the amount of tax. For corporate income tax, the so-called regressive taxation scale (applying a reduced rate as the tax base is growing) is applied. These exemptions find adequate reflection in the formation of a rational structure of GRP in the economy of Novosibirsk Oblast.
2. Application of reduced rates for the taxpayers which choose simplified taxation system, “income reduced by the amount of expenses.” It makes sense to apply reduced rates with regard to the activities that affect the diversification of the regional economy and are characterized by high material intensity (over 30%) or labor (capital) intensity of production. The amount saved on taxes will allow the taxpayers for at least partial compensation of their own working capital and provide an opportunity to maintain their competitiveness. This measure is aimed at small and medium businesses involved in production.
3. Creation of conditions for increasing “Other activities” sector of the regional economy. For this purpose, the limit value of annual income has to be stated

in special taxation systems (simplified/patent taxation system) not as the absolute amount, but in conjunction with the regional minimum wages. According to the acting legislation, the limit value of annual income that entitles to use simplified/patent taxation system is the same for all regions of the Russian Federation—150 million rubles for simplified taxation system and 60 million rubles for the patent one. At that the differentiation of the subjects of the Russian Federation according to their social and economic statuses is not considered. As a rule, the minimum living wages are based on the data of cost of living in the region or on the average salary which to a certain extent characterizes the economic situation in the subject of the Russian Federation. Determination of the amount of income depending on social and economic situation in the region will increase the potential audience for simplified and patent tax system and reduce the risks associated with the loss of the right to use these taxation systems [21]. Regional authorities are empowered to establish an additional list of types of entrepreneurship which may be eligible for simplified and patent tax system. Local authorities are interested in the opportunity to enlarge the list with any activities that are important to the region. Regular monitoring of demand for new types of economic activity will provide an opportunity to justify decisions on their implementation in the region.

Therefore, the focus of tax exemptions to regional economic diversification will allow creating conditions for further stable development of the regions with raw material economy as well as for the increase of investment and business activities of economic entities and the population.

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Chapter 36

Model Selection Strategy for the Training of Personnel



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Abstract Learning, development and training of personnel are an important means of ensuring the competitiveness of the organization. Success in realization of the major strategic goals of an enterprise largely depends on the extent to which staff is aware of the contents of strategic goals, and how he prepared to work to achieve them. The need to continuously improve the skill level in the conditions of rapid obsolescence of professional knowledge emerges as front of high qualified employees and to employees who have just finished schools. The training of personnel in the organization is a factor in the development of internal labor market, internal mobility, efficiency and motivation of employees. The paper proposed a model selection strategy for the training of personnel. To identify determinants of choice of strategies for staff training were used a logistic regression model. Total allocated and describes five strategies for retraining, as well as differences in the enterprises included in the corresponding clusters. When analyzing the strategies of retraining also is a distinguishing categories of workers by industry, experts focus on small and medium enterprises in the field of business services, trade, communications and skilled workers in large and medium industrial enterprises. The study showed that the choice of the methods of learning depends not only on the characteristics of enterprises (size, industry, etc.), but also from belonging to a certain category of personnel (specialist, worker, etc.).

36.1 Introduction

The most important element of investment in human capital is staff training enterprise. As practice shows, the need for training of employees arises in several cases:

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- For employees who have been affected by vertical or horizontal mobility and for existing staff with the aim of improving their qualifications, in connection with the introduction of new technologies, etc.;
- Adopted for new employees with experience; for the company employed graduates.

The problem of learning may be particularly relevant in the context of shortage of certain categories of workers. When the organization is faced with the problem of shortage of personnel, it may engage in retraining/Gaabucayan the already working employees to fill their vacant posts [1]. The training of personnel in the organization is a factor in the development of internal labor market, internal mobility, efficiency and motivation of employees. Hiring new staff, the company often also faced with the fact that the qualifications, skills, principles the beginners do not quite meet the expectations and standards of the company. So inevitable is their retraining, adjustment to a new team [2].

Training of the personnel of the enterprise is not only a problem of growth of human capital, but also with the problem of maintaining them. Increasing the qualification of employees, employers create a “positive aura,” allowing not only to attract new highly qualified employees, but also to keep already employed within the company.

The need to continuously improve the skill level in the conditions of rapid obsolescence of professional knowledge emerges as front of high qualified employees and to employees who have just finished schools.

36.2 Materials and Methods of Research

Increase skill level of staff can be carried out independently (by the employer), and through outsourcing (schools, coaching companies, etc.), the choice of methods is usually determined by the analysis of the advantages and disadvantages of each option.

A variety of approaches to staff training is possible through four main types of policy: functional, problem-oriented, perspective-oriented and creative [3].

Problem-oriented policy of staff training takes into account both the needs of the organization and the preferences of your employees. With this method of learning is dominated by the situational needs and interests of the employee, there is no focus on the future development of companies and professionals.

Prospectively oriented policy in the training of the personnel aimed at achievement of results by the organization. In such companies, the object of learning often becomes heads of departments and key personnel, and the effectiveness of training is evaluated after each workshop/training, etc., training events. Unlike companies with functional policy learning, their employees often are encouraged to refer to the process of education aimed at acquiring knowledge, not skills [4].

If creative policy of the company creates a learning work groups and teams with a continuous process of education. Such organizations often resort to non-standard training programs which can be unpredictable. This type of policy learning is focused primarily on the needs of the employees [5].

It is possible to allocate three groups of companies according to the degree of development of their systems of education. The first group includes companies for which training is not independent and meaningful activity. The second group—firms for katarinavagen staff represented by the function implemented by the HR manager.

The third group includes companies for which training is a strategic task of management.

The teaching method used in the enterprise—training in the workplace, which does not always allow to acquire the necessary knowledge in case of changes in the production process. Retraining is mainly skilled workers, leaving other categories (low- and semi-skilled workers) outside of training.

Thus, it is possible to allocate following characteristics of the organization, influencing strategy staff training:

- Staff of organizations (large companies are more likely to train staff);
- Organizations with strong labor unions;
- Enterprises with branched structure (branches, networks, holdings);
- Enterprises with a flexible and highly efficient production system; the high-tech industries;
- Organizations, activities of which are characterized by a high-level standardization necessary training;
- Enterprises in which new employees undergo a long probation;
- Companies where employees after passing the probationary period pass the exam;
- Enterprises from regions and markets with low unemployment, etc. [6].

To identify determinants of choice of strategies for training staff was chosen the logistic regression model, the aim was to highlight key characteristics of the enterprise that affect the methods of training of personnel of different categories. The analysis was divided into several stages: Separately addressed each of the staff categories, the set of predictors differed only on one variable depending on the study category. So, when studying decision-making about training leaders in the predictor variable was assessed the need of retraining the newly hired employees in this category.

As predictors we used characteristics of the enterprise: number of employees (in groups: less than 50 persons 51–100 persons, 101–500 persons 501–1000 persons more than 1000 persons), the ownership of enterprise (public, private), the financial position of an entity relative success compared to other enterprises, the logarithm of wages, level of skills (soft skills and hard skills variables) and also to assess the need for additional training of employees by categories.

The model was estimated based on the data on 100 enterprises (United sample for 2016–2018). The control group was large (over 1000 employees) companies and the industry, financially sound, successful, whose employees have a high level of skills. Logistic regression analysis with the dependent variable “Organized whether you are

retraining for employees in the past year?" (Yes = 1) For various managers, professionals, employees and office workers, skilled workers have revealed differences of important factors for these categories of staff.

B—values of coefficients of regression equation.

Sig—*p* is the significance level of the coefficients (the probability of mistakenly accepting the hypothesis of the existence of nonzero regression coefficients), the smaller, the higher the significance. Retraining of managers, according to the results obtained (Table 36.1), at a significance level of 5% depends on the industry to which the enterprise belongs (belonging to the telecommunications sector increases the probability of training this category of personnel by 1.2 times, and in the field of trade—by 1.4 times). Relative success in comparison with enterprises located in the same locality also affects the likelihood of retraining of managers, namely: a successful company often trains its employees than less successful. At the same time, the larger the size of the company (number of employees), the more developed is the training structure and the more attention is paid by management to the training of its employees. The logarithm of wages also has a direct impact on the likelihood of management training.

Another important predictor of executive retraining is the level of “soft” skills that are significant only for this category of staff. If, according to the assessment of the head of the enterprise, newly accepted employees in managerial positions needed training, then such enterprises also increase the probability of retraining this category of personnel. This indicates that one of the main areas of retraining is the training of newly hired employees. The most powerful predictor of the model is the soft skills level, which increases the probability of managers being trained by more than two times when the value is low. This result for the category “managers” confirms the hypothesis about the significance of differences in the categories of personnel and areas of retraining of employees.

The importance of the so-called soft skills (the ability to retrain, master new knowledge, the level of labor discipline and general culture, the ability to work in a team, creative approach to business, focus on results) for the category “managers” is high, because they are the role model for their subordinates, demonstrating effective behavior patterns. If at this level in the organization, the importance of the desire to learn new things improves the overall culture, as well as the attitude to their own work is not as important as the financial results of the company, then the training policy will be appropriate. If the top management of the company does not share the idea of the importance of training and development of personnel and consider personnel costs not as an investment, but as a costly budget item, then the organization’s strategy in the field of retraining of personnel will be appropriate [7].

The probability of making a decision to train specialists is significantly higher in enterprises in the field of communications. The number of employees is also a significant factor—if it is less than 500 people, it reduces the chances of specialists being trained. The logarithm of wages also turns out to be significant: The higher the salary of employees of the enterprise, the more likely it is to train and develop personnel in the organization. Lack of knowledge among newly hired specialists is a predictor of this group’s training.

Table 36.1 Binary logistic regression: dependent variables “executive retraining,” “retraining of specialists,” “retraining of office employees” and “retraining of skilled workers”

Variable	Executive retraining						Retraining of specialists						Retraining of office employees						Retraining of skilled workers					
	B	Sig	Exp (B)	B	Sig	Exp (B)	B	Sig	Exp (B)	B	Sig	Exp (B)	B	Sig	Exp (B)	B	Sig	Exp (B)						
1	2	3	4	5	6	7	8	9	10	11	12	13												
Industry and services	0.005			0.002				0.233			0.000													
Communication (without regular mail)	0.137	0.502	1.147	0.261	0.216	1.298	0.216	0.331	1.241	-0.285	0.200	0.752												
Construction	-0.262	0.162	0.770	0.006	0.973	1.006	-0.134	0.540	0.874	0.393	0.046	1.482												
trade (wholesale and retail)	-0.392	0.056	0.676	-0.187	0.360	0.830	0.134	0.563	1.143	-0.338	0.127	0.713												
Transport	-0.281	0.136	0.755	-0.420	0.030	0.657	0.280	0.183	1.324	0.247	0.216	1.280												
Business services	0.302	0.199	1.352	0.439	0.061	1.552	-0.192	0.488	0.825	-1.524	0.000	0.218												
Industry	-	-	-	-	-	-	-	-	-	-	-	-												
Form of ownership: state	-0.210	0.209	0.811	-0.228	0.177	0.796	-0.130	0.492	0.878	-0.211	0.250	0.810												
Financial position	0.995			0.042			0.086			0.059														
Successful	-0.025	0.918	0.975	-0.652	0.007	0.521	-0.284	0.317	0.753	-0.214	0.433	0.808												
Average	0.019	0.913	1.019	-0.362	0.035	0.696	-0.521	0.011	0.594	-0.238	0.235	0.788												
Good	0.023	0.878	1.023	-0.209	0.156	0.811	-0.160	0.328	0.852	0.219	0.197	1.245												
Excellent	-	-	-	-	-	-	-	-	-	-	-	-												

(continued)

Table 36.1 (continued)

Variable	Executive retraining				Retraining of specialists				Retraining of office employees				Retraining of skilled workers		
	B	Sig	Exp (B)	B	Sig	Exp (B)	B	Sig	Exp (B)	B	Sig	Exp (B)	B	Sig	Exp (B)
Relative success	0.000			0.039			0.295			0.002			0.002		
Unsuccessful	-0.627	0.006	0.534	-0.253	0.267	0.776	-0.282	0.316	0.755	-0.068	0.790	0.934			
The average	-0.591	0.000	0.554	-0.352	0.011	0.703	-0.242	0.130	0.785	-0.507	0.002	0.602			
Successful	-	-	-	-	-	-	-	-	-	-	-	-			
Number of employees	0.000			0.000			0.000			0.000			0.000		
<= 50	-1.586	0.000	0.205	-1.681	0.000	0.186	-1.335	0.000	0.263	-1.942	0.000	0.143			
51-100	-1.199	0.000	0.301	-1.516	0.000	0.219	-0.777	0.000	0.460	-1.585	0.000	0.205			
101-500	-0.791	0.000	0.453	-1.071	0.000	0.343	-0.935	0.000	0.393	-1.290	0.000	0.275			
501-1000	-0.343	0.158	0.710	-0.696	0.007	0.499	-0.240	0.323	0.786	-0.708	0.006	0.493			
More than 1000	-	-	-	-	-	-	-	-	-	-	-	-			
The logarithm of the wage	0.558	0.000	1.747	0.494	0.000	1.638	0.411	0.008	1.508	0.179	0.247	1.196			
Hard skills	0.606			0.421			0.296			0.424					
Proficiency level 2 (low)	0.324	0.632	1.383	-0.855	0.246	0.425	-0.936	0.393	0.392	0.750	0.336	2.116			
Proficiency level 3	0.024	0.910	1.024	0.145	0.495	1.156	-0.172	0.506	0.842	-0.106	0.664	0.900			
Proficiency level 4	0.161	0.246	1.175	0.136	0.327	1.145	0.156	0.330	1.169	0.138	0.393	1.148			

(continued)

Table 36.1 (continued)

Variable	Executive retraining			Retraining of specialists			Retraining of office employees			Retraining of skilled workers		
	B	Sig	Exp (B)	B	Sig	Exp (B)	B	Sig	Exp (B)	B	Sig	Exp (B)
Proficiency level 5 (high)	–	–	–	–	–	–	–	–	–	–	–	–
Soft skills	0.002			0.789			0.872			0.033		
Proficiency level 2 (low)	0.957	0.031	2.603	–0.218	0.613	0.804	0.129	0.796	1.137	0.231	0.635	1.259
Proficiency level 3	1.045	0.001	2.844	0.016	0.953	1.016	–0.058	0.857	0.943	0.525	0.123	1.690
Proficiency level 4	0.725	0.011	2.065	0.094	0.717	1.098	0.045	0.883	1.046	0.132	0.686	1.141
Proficiency level 5 (high)	–	–	–	–	–	–	–	–	–	–	–	–
Lack of knowledge among managers	–0.661	0.000	0.516	–0.899	0.000	0.407	–1.000	0.000	0.368	–1.371	0.000	0.254
Constant	–4.470	0.001	0.011	–2.379	0.079	0.093	–3.232	0.036	0.039	–0.010	0.995	0.990

Training of office workers and employees is determined by the size of the enterprise (large enterprises also lead here), higher wages at the enterprise, as well as the insufficient level of skills of newly hired employees.

The regression model describing the probability of retraining skilled workers has the greatest predictive power. The result obtained on two similar questions concerning “financial success” and “relative success” turned out to be quite interesting: The “financially successful” and “relatively unsuccessful” tend not to train their employees. The number of employees and the need to retrain newcomers also have an impact [8].

Table 36.2 summarizes the results of a regression analysis of factors that affect the training strategy for personnel categories.

Thus, the main characteristics of the enterprise that determine the training strategy in the enterprise are the number of employees (firms with a size of more than 500 people, compared to smaller enterprises, train employees of all categories, using the widest range of training methods); the lack of skills of employees is the second significant factor. Differences by category of personnel: Managers’ training is affected by the level of soft skills that is insignificant for other categories; wages are insignificant only when making a decision to train qualified workers (regardless of success, financial situation or remuneration). Predictors were insignificant: form of ownership, financial position of the company and hard skills.

The definition of groups of companies depending on the policies of the training was carried out on the basis of cluster analysis by *K*-means method on variable “How were retraining staff categories (managers, professionals, office employees and skilled workers). Five groups of enterprises were identified that differ in staff training strategies (Tables 36.3 and 36.4).

The first group does not provide training for any category of employees. The second—trains its managers and specialists in retraining and advanced training courses and does not train other categories. The third group of companies trains managers and specialists in partner companies that are not part of the organization,

Table 36.2 Estimation of factors influencing the personnel training strategy based on the results of regression analysis

Factors	Managers	Specialists	Office employees	Skilled workers
Industry and services	+	+	—	+
Number of employees	+	+	+	+
Soft skills	+	—	—	—
Hard skills	—	—	—	—
Financial position	—	—	—	—
The relative success of	+	+	—	+
Form of ownership	—	—	—	—
The logarithm of the wage	+	+	+	—
Lack of skills for beginners	+	+	+	+

Table 36.3 Percentage of objects in the cluster (as a percentage)

The cluster number	% samples
1	59.5
2	21.6
3	5.7
4	6.5
5	6.6

Table 36.4 Cluster centers (shows the percentage of enterprises in the group that use this type of training for this category of personnel)

Category	Learning technology	The cluster centers				
		1	2	3	4	5
Managers	At the enterprise, under the guidance of more experienced employees, as well as in branches and structures that are part of the company	0.01	0.01	0.23	0.38	0.39
	In partner companies and organizations that are not part of this company	0.02	0.02	0.7	0.12	0.02
	At retraining and advanced training courses, in institutes of advanced training, in training centers	0.05	0.79	0.33	0.86	0.1
	In universities	0.02	0.1	0.06	0.31	0.06
	In institutions of secondary special or primary vocational education	0.01	0.01	0.06	0.00	0.00
	In business schools	0.03	0.15	0.05	0.25	0.05
Specialists	Overseas	0.02	0.06	0.12	0.11	0.04
	At the enterprise, under the guidance of more experienced employees, as well as in branches and structures that are part of the company	0.00	0.03	0.027	0.036	0.80
	In partner companies and organizations that are not part of this company	0.01	0.00	0.96	0.12	0.06

(continued)

Table 36.4 (continued)

Category	Learning technology	The cluster centers				
		1	2	3	4	5
	At retraining and advanced training courses, in institutes of advanced training, in training centers	0.12	0.85	0.44	0.86	0.19
	In universities	0.04	0.09	0.05	0.29	0.05
	In institutions of secondary special or primary vocational education	0.02	0.02	0.03	0.04	0.02
	In business schools	0.02	0.02	0.07	0.12	0.04
	Overseas	0.00	0.01	0.06	0.03	0.01
Technical employees	At the enterprise, under the guidance of more experienced employees, as well as in branches and structures that are part of the company	0.02	0.02	0.14	0.54	0.44
	In partner companies and organizations that are not part of this company	0.02	0.00	0.24	0.03	0.02
	At retraining and advanced training courses, in institutes of advanced training, in training centers	0.01	0.01	0.23	0.38	0.39
	In universities	0.02	0.04	0.03	0.05	0.00
	In institutions of secondary special or primary vocational education	0.01	0.02	0.00	0.02	0.02
	In business schools	0.02	0.02	0.01	0.04	0.03
	Overseas	0.00	0.00	0.00	0.00	0.01
	Skilled worker	At the enterprise, under the guidance of more experienced employees, as well as in branches and structures that are part of the company	0.05	0.06	0.09	0.8

(continued)

Table 36.4 (continued)

Category	Learning technology	The cluster centers				
		1	2	3	4	5
	In partner companies and organizations that are not part of this company	0.02	0.01	0.24	0.12	0.13
	At retraining and advanced training courses, in institutes of advanced training, in training centers	0.07	0.42	0.08	0.32	0.02
	In universities	0.02	0.02	0.02	0.04	0.00
	In institutions of secondary special or primary vocational education	0.02	0.05	0.01	0.15	0.02
	In business schools	0.00	0.00	0.02	0.01	0.01
	Overseas	0.00	0.00	0.02	0.01	0.00
Unskilled worker	At the enterprise, under the guidance of more experienced employees, as well as in branches and structures that are part of the company	0.00	0.01	0.02	0.00	0.00
	In partner companies and organizations that are not part of this company	0.00	0.00	0.00	0.02	0.02
	At retraining and advanced training courses, in institutes of advanced training, in training centers	0.00	0.02	0.03	0.05	0.00
	In universities	0.00	0.00	0.00	0.00	0.00
	In institutions of secondary special or primary vocational education	0.02	0.01	0.00	0.01	0.00
	In business schools	0.00	0.00	0.00	0.00	0.00
	Overseas	0.00	0.00	0.00	0.00	0.00

and other categories do not train. The fourth cluster provides training and retraining for managers and specialists in advanced training courses, employees, office workers and skilled workers—at the enterprise under the guidance of mentors. In the fifth group of enterprises, only specialists are trained under the guidance of mentors; other groups are not trained.

The data in Table 36.5 allowed us to describe the differences between the selected groups of enterprises. The first cluster includes small businesses that are financially unsuccessful, whose employees have an average level of skills and do not need training. This group of companies does not conduct training, and since according to the head of the newly hired employees, there is no need to retrain. Thus, it can be concluded that the issue of training in small enterprises is decided on the basis of an assessment of the skills of newly hired employees: If they do not have a lack of skills, then training is not performed. Employees who are already working are rated as having average skills, which is considered sufficient to complete the tasks. The main factor determining the training strategy here is the assessment of newly hired employees. This group is the largest, with more than half of the sample.

The second cluster consists of medium-sized enterprises with average and above-average financial position. Lack of skills is observed in 60% of all categories of personnel. Training for specialists and managers is conducted at refresher and advanced training courses, in training centers.

The third cluster consists of 25% of small businesses (up to 50 people) and 40% of medium sized (101–500 people) with a stable high financial position, the industry communications and business services. Most of the existing employees have soft and hard skills at an above-average level, while 63% of newly hired employees lack skills. Managers and specialists of this group are trained in partner companies.

The largest number of training methods and categories of personnel to be trained in cluster 4. This includes large successful communications companies with a good financial situation; a lack of skills is observed in 73% of new employees, with 28% of managers, 43% of specialists, 31% of employees and office workers and 61% of skilled workers. In this regard, training is provided for all the above categories of personnel: Managers and specialists are trained at advanced training courses, office employees and skilled workers are trained under the guidance of the most experienced employees (mentors). The main factors that determine the types of employee retraining are the size of the enterprise and the assessment of the skills of newly hired employees.

The fifth cluster is represented by small successful communication enterprises, whose staff has a high level of soft skills, and 66% of newcomers lack skills. It should be noted that 65% of employers do not note a lack of skills in skilled workers, while 27% believe that managers and office employees lack the necessary skills, and 40%—that specialists also do not have the necessary level of training, while training is only for specialists: They are trained by mentors on the job. Perhaps, the reason is that this is the main category of employees who make a profit in the field of communications, the most numerous, and whose qualifications, according to the manager, need to be improved to the greatest extent.

Table 36.5 Characteristics of enterprise training strategies

Evaluation criterion	Cluster 1 59.5%	Cluster 2 21.6%	Cluster 3 5.7%	Cluster 4 6.5%	Cluster 5 6.6%
1	2	3	4	5	6
Size of enterprise	Up to 50 people 89%	Up to 100 people 31%	Up to 50 people 39%	101–500 people 26%	Up to 500 people 76%
Size of enterprise		101–500 people 39%	101–500 people 39%	More than 1000 people 45%	
Financial position	28% low, 59% average and higher	31% average, 35% high	22% average, 59% high	20% average, 58% high	25% average, 52% high
Relative success	Average value 52%	Average value 46%	Average value 33%	Average value 21%	Average value 35%
	Successful 35%	Successful 43%	Successful 62%	Successful 71%	Successful 60%
Soft skills	Average level 42%	Average level 48%	Average level 33%	Average level 50%	Average level 32%
	Above average 48%	Above average 46%	Above average 61%	Above average 47%	Above average 57%, excellent 10%
Hard skills	The average level of 12% above average 58%	Above average 64%	Above average 62%	Above average 68%	Above average 58%
	High level 30%	High level 30%	High level 30%	High level 20%	High level 35%
Lack of skills	No lack of skills 57%	Lack of skills 59%	Lack of skills 63%	Lack of skills 73%	Lack of skills 66%
Lack of leadership skills	No lack of skills 89%	No lack of skills 82%	No lack of skills 77%	Lack of skills 28%	Lack of skills 27%
The lack of skills from the specialists	No lack of skills 84%	No lack of skills 75%	No lack of skills 70%	Lack of skills 43%	Lack of skills 40%
Lack of skills in office employees	No lack of skills 84%	No lack of skills 84%	No lack of skills 33%	Lack of skills 31%	Lack of skills 27%
Training by category of personnel	No	Managers and specialists in courses	Managers and specialists in partner companies	Managers and specialists in courses, office employees and skilled workers with mentors	Specialists with mentors

Only a few companies are willing to allocate funds to improve the skills of their employees. The necessary qualification training is mandatory at some enterprises, while other companies do not have strict regulations governing the training policy. The main trends in professional training remain unchanged: Employees are trained in short-term courses and seminars (duration 1–3 months). Additional training of personnel is more often held at courses/seminars organized by companies in the same sector or related sectors, as well as by personnel/training agencies, private trainers. Less often, employers turn to training courses organized by educational institutions—universities, colleges, technical schools, professional lyceums or schools. On average, at the beginning of 2008, 48% of the enterprises surveyed financed the training of their employees in educational institutions or other structures. Most often we are talking about financing additional training of employees at training courses, vocational training courses—37% of enterprises incurred such expenses.”

In any form, 36.5% of companies in 2016 and 38% in 2018 did not finance the retraining of their employees (Table 36.2). Among those who provide funding, most organizations transfer money to educational institutions, without giving it to employees. This method of payment is more convenient for organizations in all respects—cashless payment by transferring funds, and there is no need to monitor the payment by an employee, etc. In a situation where a company sends its employee to study at an educational institution, as a rule, a three-way student agreement is drawn up between the educational institution, organization and employee. The terms of such agreements are different: Some provide for the employee's share in the payment of training, while others provide for a certain period of work for such an employee at the enterprise. This method of securing the responsibility of the parties is typical for expensive training, training for changing professions, long-term professional development and retraining, which allows the employer to minimize the risks of losing employees and funds for their training and allows to increase the efficiency of such investment.

The cost of training personnel consists of maintenance costs of educational institutions in the structure of the enterprise, the organization and carrying out of internal training (workshops, training), purchase of specialized textbooks, financial assistance to employees for education (including student loans), the costs of external training (in institutions of primary, secondary, higher professional education) [9, 10].

The assessment of current expenses, as well as the plan of expenses for the next year, gives an idea of the place of training in the overall development strategy of the company. The cost of training an employee per year, measured as the cost of training per year in relation to the average annual number of employees, gives an idea of the system of training and development of personnel (Table 36.6).

According to the site Trainings.ru, the average cost of training per employee in 2018 was 14.4 thousand rubles. According to the IEO, 80% of organizations spend less than three thousand rubles a year.

The assessment of training costs is also an indicator of the effectiveness of the personnel service responsible for training employees. This assessment includes the following criteria: training coverage, promotion of employees from the talent pool,

Table 36.6 Cost of staff training

Types of training expenses	2016	2017	2018	On average
1	2	3	4	5
Share of companies that carried out the cost (interest)				
Expenses for professional training, promotion qualifications of employees of this company last year—total	63.5	64.7	62.0	63.4
Expenses for the maintenance of educational institutions that are part of this enterprise (except for pre-school institutions)	22.4	11.6	21.5	18.5
Expenses for organization of training seminars, trainings, advanced training courses	26.8	24.5	31.9	27.7
Within the company (without involvement and payment of third parties)				
Expenses for purchasing educational, scientific literature, educational software, etc	49.0	29.6	33.8	37.5
Financial assistance to employees of your company to pay for education/training, including loans (loans)	42.8	15.9	23.9	27.5
Funds transferred to “external” organizations—educational institutions and other organizations or individuals for training and retraining of employees of this enterprise, total	59.3	52.0	57.2	56.2
The AVERAGE amount of EXPENSES PER EMPLOYEE at the ENTERPRISE (thousand rubles) among the enterprises that made such expenditures				
Expenses for professional training and professional development of employees of this enterprise in the past year—total	1.94	1.86	1.66	1.82
Expenses for the maintenance of educational institutions that are part of this enterprise (except for pre-school institutions)	1.03	1.40	0.73	1.05
Expenses for organization of training seminars, trainings, advanced training courses within the company (without involvement and payment of third parties)	0.56	1.63	0.94	1.02
Expenses for purchasing educational, scientific literature, educational software, etc	0.41	0.47	2.41	0.95
Financial assistance to employees of your company to pay for education/training, including loans (loans)	1.35	1.30	1.22	1.29
Funds transferred to “external” organizations—educational institutions and other organizations or individuals for training and retraining of employees of this enterprise, total	1.94	1.86	1.66	1.82

the percentage of non-attendance of employees for training, the prevalence of individual development plans, turnover of employees from the personnel reserve and newcomers, employee satisfaction with training, closing of managerial positions by internal candidates and an hour of training per employee [11].

Costs are divided by type of training: external and internal training costs. According to the results of the study, external training leads in terms of costs, it is less affected by such characteristics as the success of the enterprise, its financial

position. An important predictor is still the number of employees in the organization: For example, internal training is not funded by small organizations, while large enterprises spend significant funds on it [12].

A small number organizations are more likely to finance external training, and large organizations have an internal structure for training and staff development. Regardless of the financial situation, companies allocate funds for external training, while financially successful companies can afford to finance internal training.

36.3 Recommendations

Based on the results obtained in the course of the study, we can talk about the dependence of the probability of employee training on search costs: The higher the search costs, the more likely it is to retrain. This conclusion is most true for such groups of workers as engineering and technical personnel and skilled workers. Training of managers at various levels, “nurturing” their own managerial personnel can also be identified as a trend in intra-company training [13, 14].

Training employees at the enterprise allows you to minimize the cost of hiring an employee with the necessary qualifications, especially in cases where these costs are very high, i.e., it is difficult to find an employee with the required skills. In addition, the study showed that if it is difficult to find and hire new employees, enterprises are forced to hire employees without the necessary skills and spend money on training not only specific, but also industry-specific and general skills. This applies, in particular, to the employment of graduates of educational institutions with further training and retraining for the needs of the organization. It was also found that the share of training costs does not vary much with the growth of the number of employees in the enterprise. This can be explained by the fact that many use an informal way of training, mentoring or “attaching” an employee to a more experienced employee for on-the-job training, on-the-job training. This method proved to be the most popular among the companies that participated in the study.

36.4 Conclusions and Prospects of Development of This Direction of Researches

According to the results of the study, we can say that the assumption of heterogeneity of personnel training policy was confirmed, and a number of influencing factors were identified. Strategies of enterprises for retraining specialists and skilled workers were identified. There are two areas of retraining: retraining of newly hired employees in the external labor market and retraining/advanced training of already hired personnel.

The analysis of retraining strategies also traces the specifics of the studied categories of employees by industry: Specialists concentrate on small and medium-sized enterprises in the field of business services, trade, communications and skilled workers—in large and medium-sized industrial enterprises. The choice of training methods used depends not only on the characteristics of the enterprise (size, industry, etc.), but also on the employee's belonging to a certain category of personnel (specialist, worker, etc.), and this statement is confirmed in previous studies.

Summarizing the results of the analysis, we present the main factors that affect the training strategy—the number of employees (firms with a size of more than 500 people, compared with smaller enterprises, train employees of all categories, using the widest range of training methods)—lack of skills for beginners—the factor that increases the probability of training managers is the level of soft skills, insignificant for other categories—the level of wages is insignificant when making a decision to train only qualified workers (regardless of success, financial situation, remuneration at the enterprise). A number of factors (financial situation of the enterprise, form of ownership, level hard skills) that would seem to have a direct influence on the strategy of staff training turned out to be insignificant. In terms of training costs, external and internal training costs were allocated.

External training is leading in terms of costs, and it is less affected by such characteristics as the success of the enterprise, its financial position. An important predictor is still the number of employees in the organization: For example, internal training is not funded in small organizations, while large enterprises spend significant funds on it.

Based on the research, we can conclude that most Russian companies do not have a well-established system of training and staff development as such. At the same time, the available information on Western experience and emerging information on successful Russian companies suggests that attracting and adapting new employees are a less effective tool for the firm than increasing the return on existing employees based on their continuous training.

That is why the issue of employee training is relevant not only to solve the problem of scarcity, but also to improve the overall efficiency of the organization. Program planning personnel training is one of the components of general labor planning, along with calculating the need for personnel and drawing up recruitment schedules, career planning.

In companies where in-house training is conducted systematically, training is a continuous process that constantly increases in-house human capital. At the same time, the specialists responsible for training the company's employees must clearly understand that the goals of training are the company's business objectives and not only and not so much the wishes of employees.

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Chapter 37

Web Quest as Efficient Edutainment Technology in Teaching Russian as Foreign Language



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Abstract This article analyzes edutainment technologies (game technologies) in teaching Russian to international students. The analysis of academic publications and Internet resources allows the authors to identify the specific features of edutainment as an education technology with a number of methodological advantages and prospects. A web quest is proposed as an efficient edutainment tool. The article details all the possible ways of developing a web quest for studying Russian as a foreign language: from using a preset on the Learnis platform to the implementation of a signature project, the Welcome to Vladivostok web quest, which is a web-application with a mobile version. Through using web quests in their training, international students will be able to solidify their knowledge, acquire significant volumes of information and control their results independently.

37.1 Introduction

Currently, the use of foreign languages in speech and written communications during the education process is becoming increasingly relevant for various types of edutainment technologies. The researchers work with the efficiency and mechanisms of gaming techniques that are implemented in innovative information, communication, and Internet technologies.

These terms stand for the “information channels and software for communication, storage, transmission, processing, and using the information via computers and multimedia tools, the operation of which leads to the formation of the informational and educational environment [1, p. 188].

Besides, the use of edutainment (gaming) technologies in teaching Russian as a foreign language has not yet been described fully in terms of the systemic implementation of the technical capacities of modern educational resources that shape both the attractiveness and consistency of the educational process.

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There are various research carried out to identify the specific features and techniques of implementing edutainment technologies, various approaches are being developed to teaching Russian as a foreign language to beginners and advanced-level students, but the procedural component of this problem seems to be underdeveloped due to a constantly changing set of instruments for developing various information and communication learning tools.

37.2 Method

The problem of introducing edutainment technologies into the process of teaching foreign languages in Russian and foreign methodological traditions has not been addressed comprehensively (in both didactic and technical aspects). At the same time, the implementation of any gaming technology is a relevant current trend in contemporary teaching methodology for Russian as a foreign language.

Edutainment as a specific gaming technology was the subject matter of numerous Russian and foreign research works. As a rule, the description of edutainment technologies is focused on the didactic analysis of gaming and computer (gaming) resources (Okan [2], Buckingham [3], Smith and Baber [4]).

Gartsov acknowledged the wide opportunities of electronic linguodidactics within the framework of innovative language education. He also noted that it is necessary to develop “innovative didactic and procedural teaching tools for foreign (Russian) languages that would feature high adaptability, target and functional orientation of the materials, as well as their variability and flexibility” [5, p. 13]. The implementation of edutainment technologies in training students in oral communication in a foreign language, according to Kobzeva, will lead to the improvement of “bachelor degree student skills of oral communication inside and outside the classroom” [6, p. 12]. Gamification as an effective component of the educational process was highly praised by many researchers (Bykhovsky [7], Kornilov [8], Tolmacheva [9]).

When formulating the main techniques for teaching Russian as a foreign language, Fedotova did not use such terms as “edutainment” or “gamification” but she attached great importance to the practice-oriented tasks that virtually were some kind of quests [10]. Kaznyshkina also gave a detailed description of the mechanisms of communicative games at the lessons of Russian as a foreign language [11]. Kolomova suggested introducing some elements of literature quests into teaching Russian as a foreign language for law students. As an example, she created several quests on Crimes Against Person that were “based on a fiction text (excerpts from Ivan Bunin’s story Light Breathing) with a partial adaptation of some pieces [12, p. 157].

Besides, the integration of edutainment technologies into the educational process may facilitate the improvement of pronunciation skills because “in foreign language learning, the processing of speech signals and teaching foreign students the correct pronunciation is as important as grammar” [13].

Edutainment technologies are used effectively not only in teaching foreign languages but in other disciplines as well. Popov, for instance, gives detailed

recommendations on introducing marketing games in the communication process when teaching effective marketing and advertising communication skills [14]. The researcher introduces the notion of “advertisegame” that stands for a “continuous advertising communication in a game form that was created specifically to solve a client’s marketing problems <...> It is usually uploaded on the Internet and has a viral effect” [14, p. 153].

Thus, there are developed techniques that target the improved communication in learning foreign languages using computers and those dedicated to various education methods using computing and multimedia capacities of computers. A significant number of papers on computerized education consider a specific practical experience of teaching using various methods and technical solutions. As a rule, these methods are not closely connected with the theoretical bases of teaching languages. The scope of application for computer technologies in teaching is expanding, so this current state of affairs is natural.

The arguments for the introduction of new technologies vary. They may include economic causes like minimization of the costs of education, including the time costs, and the global practice of introducing remote education technologies that not only condition the saving of time and money but also provide more opportunities to test new methods remotely.

Research papers demonstrating the efficiency of computer technologies in the development of cognitive functions play an important role in the promotion of these technologies [15–17]. According to the results of such research, verbal information, i.e., oral and written communications, should be complemented with a system of images and symbols to visualize imaginative and conceptual aspects of objects, notions, relations and their transformations. The interaction with computer technologies, such as the Internet and videogames, increases the efficiency of both education and professional activities, reduces the response time and improves image recognition [18]. Besides, the use of gaming technologies may improve the cognitive abilities of disabled people [19].

The key new technologies used in education are often referred to under a general term of edutainment that can be interpreted as the implementation of contemporary education formats, integrated into generic (conventional) classroom activities. The recent time has seen an increase in the development of educational mobile apps (Yermolayeva [20], Nadkha [21]). Educational mobile apps, according to Yermolayeva, are aimed at specialized learning of vocabulary and grammar. Yermolayeva divides all of the educational mobile apps into five main types: (1) apps for visual learning of the Russian language; (2) apps aimed at practicing Russian grammar; (3) apps for translation (dictionaries); (4) reading apps, (5) communication apps [20].

Currently, there is a pressing demand in research works dealing with the development of efficient edutainment technologies. Up to the moment, the solution to this problem was impossible because there were no instruments that became available under the modern digital reality. The current development level of information and communication technologies, as well as the methods of teaching Russian as a foreign language, allows people to solve this problem efficiently.

37.3 Results and Discussion

The interpretation of edutainment technology as a term is based on the conceptional category of edutainment which comprises two English words: education and entertainment. The term “edutainment” has been used by Russian researchers for quite a time already, and its descriptions can be found in the research in such fields as pedagogics, philology, and psychology. “Edutainment is an integral part of educational technologies that combines gaming, communicative, and creative techniques and implements the idea of teaching through entertainment” [22, p. 11].

A web quest is a type of edutainment technology that spread widely in recent times. It is an implementation of infotainment technology (information + entertainment).

A web quest stands for various categories: (1) it can be the process of searching for a solution; (2) the game itself; (3) a problem; (4) a kind of research activity; (5) an education resource (website/educational platform); (6) technology (in some cases, an educational one). A web quest is a “scenario of student project activity on any topic using any of the Internet resources” [1, p. 210].

Tolmacheva, who described Dodge’s methods of creating web quests, claims that a special formula of web quest should include “the following obligatory components: 1. An introduction presenting a problem, situation and background information. 2. A task that is interesting for students. 3. Resources: a list of all information sources necessary to complete the task and picked out by the teacher <...>. 4. The process: a description of actions that will lead students to the completion of the task <...>. 5. Conclusion where the quest results and student new knowledge are summarized, and directions for further work are given [9, p. 86].

In the contemporary interpretation, the structure of a web quest looks as follows: (1) introduction; (2) tasks; (3) algorithm; (4) evaluation and self-assessment.

Web quests as an educational technology may belong to various types, including the scientific quest, media quest, environmental and engineering quest, excursion quest and game quest.

An example of a successful multi-profile educational project is the Learningapps (<https://learningapps.org/createApp.php>), which contains a great deal of classic educational web quests. One can access various types of classic web quests for foreign language studies (including English, German, Spanish, French, Russian as a foreign language, etc.), as well as engineering, music, psychology, physics, etc. LearningApps.org is a Web 2.0 application that aims to support the educational process via interactive modules. These modules can be used as a component of the educational process (as a part of a lesson/class) and they can be transformed according to the current study objectives.

LearningApps.org combines the functions of a training aid and a web quest editor.

During the classes “that use computer technologies based on educational Internet resources, the students acquire the following skills:

- Searching for the information on the Internet.
- Identifying the topic/problem in the data.
- Classify information as primary and secondary.

- Retelling the text.
- Expressing and supporting their opinions on the topic.
- Evaluating actions and characterizing characters, facts, and events.
- Taking part in topic discussions.
- Clarifying the information in the text using auxiliary sources on the Internet” [23, p. 211].

Having analyzed all the possible options in developing web quests for teaching Russian as a foreign language, the authors came to the conclusion that it is necessary to use the Laernis.ru platform, developed by Novikov. Learnis is an interesting resource that helps integrate edutainment technologies into the educational process. The Learnis.ru service allows its users to create web quests, along with quizzes, and explain it to me game.

Creating a web quest does not require any special programming skills while the time inputs are minimum. The users are encouraged to create web quests where the players need to get out of the room by using various items, finding hints and solving logical problems.

First of all, one needs to select a quest room location. The selection of quest rooms is diverse and regularly updated (see Fig. 37.1).

In each of the rooms, you can select different sequences of actions, and besides, there are hints. The teacher needs to upload the tasks, enter a code generated on the basis of the answers to the tasks; this code is used to open the door.

After selecting a room, it is necessary to enter the web quest title and add 3 or 5 tasks (depending on the web room). The tasks can only be added as pictures.

After saving the web quest layout, it gets a number that can be used to complete the quest (see Fig. 37.2).

To complete the web quest, students need to select a web room (using the number or a QR code), and they have to do certain things in the room and solve the problems based on the hints. The answers to the problems generate the room exit code.

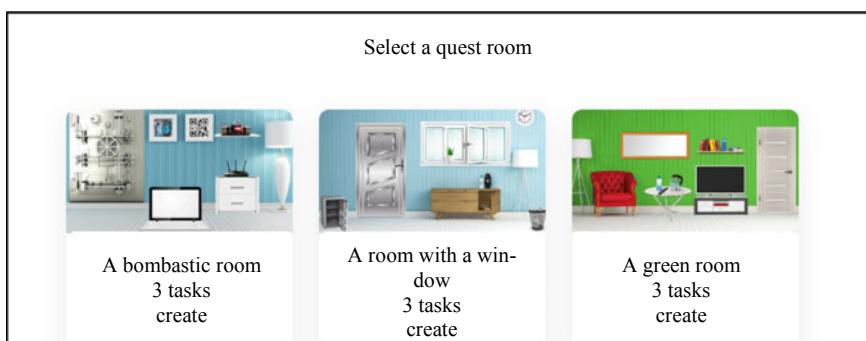
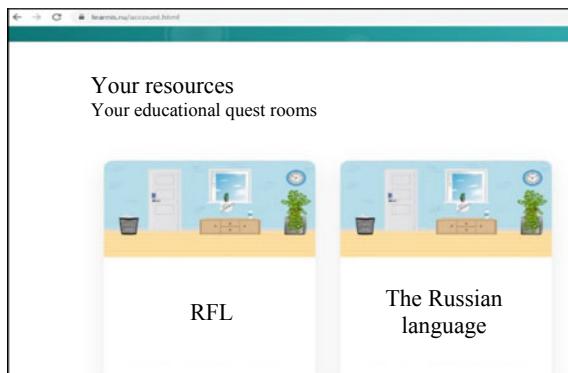


Fig. 37.1 Set of quest rooms on Learnis

Fig. 37.2 Presentation of a web quest by numbers



The Learnis platform only supports the upload of tasks in the form of graphic, audio and video files, while the content of the tasks may include tests, conundrums, logical correspondence exercises, etc.

Thus, the introduction of web quests in the training process of international students who study Russian as a foreign language helped intensify both individual and group work, facilitated the rates of learning grammar rules, and expanded the classroom space via the completion of the quest during the webinar, etc.

Along with that, one should note the changes in the psychological atmosphere of the education process. First of all, the standing of teachers who can create various web quests to train vocabulary and grammar topics when teaching Russian as a foreign language is improved. Secondly, student cognitive activity and personal interest in the achievement of the study goals become more interesting for them.

Apart from the described method of web quest development (using a ready-made layout from the Learnis platform), the personnel of various departments of the Far Eastern Federal University (department of Russian as a foreign language and the computer security department) develops their own web quest that is represented by the Welcome to Vladivostok web app with a mobile version.

The authors think that mobile apps that operate under various systems (Android, Apple iOS, Microsoft, etc.) and are supplied for free (or freemium) through Google Play or App Store generate a lot of interest among those who study Russian as a foreign language.

Educational capacity is a feature of not only specialized apps for learning Russian as a foreign language but also various free (or freemium) mobile apps (AccuWeather, Google Maps, Kinopoisk, Kupibaton, etc.). They can be successfully integrated into the study process to practice the skills necessary for all kinds of speech activity. With these mobile apps, it is possible to organize student individual work to cover such topics as verbs of movement, adjectives (object description), numerals, etc. The students studying in Vladivostok are keen on the 2Gis (<https://2gis.ru/vladivostok>) because it contains the names and descriptions of objects located in Vladivostok and the Primorsky territory.

The students, studying Russian as a foreign language, actively use the following mobile apps: (1) Lean&Go (a cross-platform mobile app to study verbs for beginners), (2) KALINKA (a mobile app for learning Russian levels A1 and A2, interactive teach-yourself guide), (3) TALK2RUSSIA (a mobile beginner-level app for those studying Russian as a foreign language, levels A1 and A2), (4) Speak Russian: Learning Russian Offline (a mobile beginner-level app for learning Russian with the capacity of translating words into students' native languages—a wide selection of native languages).

Currently, there are over a hundred efficient programs for learning Russian as a foreign language in Google Play and App Store.

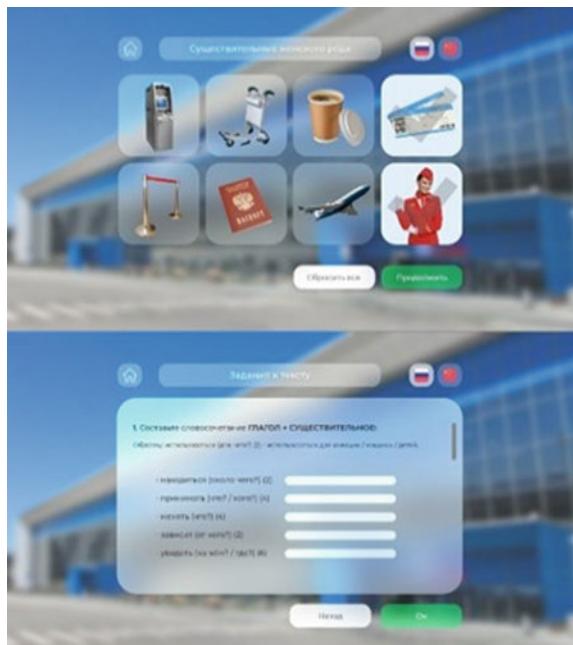
Nevertheless, it is necessary to develop similar mobile apps taking into account the regional specificities.

Thus, the authors suggest introducing web quests into the Welcome to Vladivostok mobile app.

Its main sections represent the following locations in Vladivostok: (1) Airport; (2) Railway station; (3) Lighthouse on Tokarevskaya Koshka; (4) Oceanarium; (5) Vladivostok fortress; (6) Mariinskiy theater. Primorskaya stage; (7) FEFU; (8) Cathedral of the Intercession of the Most Holy Theotokos; (9) Golden Bridge; (10) Cable railway. The interface of the web app (and the mobile version) is quite uncluttered (see Fig. 37.3).

Each of the sections comprises three modules: 1. text; 2. audio/video file; 3. gallery (accompanying photos for all locations). All of the modules include informative texts

Fig. 37.3 App interface (airport)



on the locations in Vladivostok, lexical and grammatical comments, several language and speech exercises, reading and listening tasks, as well as the keys to them.

Welcome to Vladivostok web and mobile apps will help international students that come to study at Far Eastern Federal University to improve their B1-level Russian, as well as their verbal skills for routine communications, and to adapt to the city faster. The authors believe this didactic means is a complementary one that supports conventional learning formats, which is necessary for the contemporary educational environment.

Web quest elements are implemented in the ways of moving from one location to another. The transition is done the same way as in hidden object games. To move from one location to another, players must find certain objects using the previously set parameters. They are presented with a picture (image) with randomly distributed objects.

For instance, the task in a game targeting the knowledge of grammatical categories is formulated this way: *Find all objects that are feminine nouns*. A list of all objects: *cash machine, ticket, visa, entrance, coffee, belt (luggage belt), passport, airplane, flight attendant, display (with the information about flights), cart (for luggage), suitcase*. The objects to be identified: *visa, belt (luggage belt), flight attendant, cart (for luggage)*. After the students have correctly identified the objects, they move to the airport location. Hidden object tasks for other locations can be presented as follows: *Find all objects that are masculine nouns; Find all objects that are neuter nouns, Find all objects that are animate (WHO?) nouns; Find all objects that are feminine nouns ending in -L*, etc.

The games, aimed at practicing lexical categories, can be implemented as follows. For example, the entrance to the airport starts with this task: *Find all objects that you cannot take with you into the cabin*. The object list includes a *suitcase, nail scissors, clothes, razor, laptop, medicine, stroller, lighter, baby food and cigarettes*. After the correct identification of the objects (nail scissors, razors, a lighter, cigarettes), students transfer into the airport. The entrance to the railway station starts with this task: *Find all words that are not connected to the railway (list items: platform, reserved seat, pedestrian, carriage, train attendant, flight, track, commuter train, traffic lights, captain)*; the entrance to the Primorskaya stage of Mariinskiy theater—*find all ballets whose music was written by Pyotr Ilyich Chaikovsky* (list items: *Sleeping Beauty, Corsair, Swan Lake, Giselle, Eugene Onegin, Anna Karenina, Cinderella, Nutcracker, the Queen of Spades, Iolanta*); to the cable railway—*find all of the transport means that cannot be found in Vladivostok* (list items: *train, tram, ferry, commuter train, metro, bus, water taxi, trolleybus, shuttle bus, cable railway*).

All in all, there are 10 games to move between locations and they encourage students to use the knowledge of grammatical and lexical categories. The student completing the quest gains points. After the game, students can revisit the first location and do the web quest again trying to get more points.

37.4 Conclusion

This approach to the acquisition of study materials for Russian as a foreign language allows the authors to see web quests as both a teaching method and a form of awareness-raising work because edutainment technologies are more familiar to contemporary students and are not perceived as something compulsory but not very attractive. The introduction of web quests into the educational process as elements of edutainment technology makes students more result-oriented and determined to succeed than under traditional education practices.

Currently, developing web quests is very accessible and convenient, which will make this type of didactic means spread more widely in learning and teaching Russian as a foreign language. This brings about a new quality of study communication between teachers and students. If web quests are used efficiently in the study process, international students will be able to successfully solidify their knowledge, acquire significant volumes of information, and—in some cases—control their results independently.

Edutainment technologies generate increasing interest among philologists, teachers, psychologists and programmers, as well as specialists from related fields. Web quests and other types of edutainment technologies can be successfully applied both in higher education and in preschool and secondary school educations, as well as on-the-job training of various personnel. When completing a web quest, students are motivated to succeed in both studies and any other joint professional activities. Edutainment technologies help us actively improve the methods of acquiring new knowledge and facilitate the alignment of information overload, i.e., they are perceived more as leisure rather than a hard work from the emotional point of view.

To implement a web quest, it is necessary to create a gaming atmosphere, employ web technologies and fill the web quest with the subject content of the discipline in question.

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Chapter 38

Harmonization of Russian and Foreign Approaches to the Organization of the Employee Remuneration Accounting System



Yu. Malakhova, E. Badeeva, F. Tuktarova, I. Sazonova, and A. Goldina

Abstract The analysis of methodological and methodological aspects of accounting processes for the formation and disclosure of information about employee benefits in corporate reporting in the context of integration of Russian and international accounting systems. The research is devoted to substantiating the need to create a Russian accounting standard “employee benefits.” The standard should reflect accounting rules that comply with international standards. The basis of the research was the normative acts in the field of regulation of the accounting procedure for employee benefits, as well as research works on the subject. Article contains a comparative description of the requirements of Russian and international standards in the field of regulating the accounting of employee benefits. The structure of the Russian accounting standard “employee benefits” is proposed. The provisions of the standard will optimize the procedure for the formation and disclosure of information on employee benefits used in Russia, coordinate it with the requirements of international financial reporting standards.

38.1 Introduction

International financial reporting standards (IFRS) are now actively implemented and used by companies around the world. International financial reporting standards (IFRS) are a set of accounting rules and regulations that explain how specific types of transactions and other events should be reflected in the financial statements. The purpose of the standards is to maintain financial information and transparency.

The process of transition to IFRS in almost all countries was systematic. Many countries developed their own interpretations of standards based on current accounting principles and methods. Emphasis was placed on standards related to the disclosure of information about financial instruments, income taxes, reserves and

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employee benefits. The application of IFRS recognition and disclosure requirements has resulted in a significant increase in the assets and liabilities of companies.

The following activities were carried out at the company level: changes in accounting policy for preparing financial statements in accordance with IFRS; training and retraining of staff in the practical application of IFRS; involvement of an external IFRS consultant; creation of internal teams responsible for the formation and implementation of the IFRS transition plan. In some cases, it was required to disclose activities undertaken to implement IFRS on company websites [1–4].

Further, the development of IFRS implementation will lead to an increase in the disclosure of information about the activities of companies. This will subsequently improve efficiency by attracting foreign investment.

Active processes of introduction of international accounting standards in Russia have caused the need to develop and adopt new Russian accounting standards (RAS). The main task of the Ministry of Finance of the Russian Federation is to optimize the accounting procedure, make it more understandable and open to users of accounting information. In addition, the provisions of modern RAS should maximize the compliance of accounting rules to IFRS.

In their activities, many Russian companies, mainly those with foreign branches or representative offices, use IFRS for generating financial reporting indicators when searching for business partners in order to attract capital and additional investments on more favorable terms. The organization of the remuneration system, which includes employee benefits, is an important issue in the accounting, formation and disclosure of information for any Russian organization that affects the timeliness and accuracy of calculating the cost of output. In addition, a rational accounting of employee benefits determines the quality of initial information for operational management, calculation of financial planning indicators and analysis of productivity [5–9].

38.2 Relevance of the Scientific Problem

Employee benefits include all forms of remuneration and payments made by the company to employees for their work in accordance with IAS 19. These are types of earnings paid from various financial sources: bonuses, holiday allowance, payments in non-monetary form, payments for unworked time, contributions to state and non-state social, health and pension insurance.

In addition, the modern accounting of employee benefits should be aimed at the formation of comprehensive information on the total compensation, which should meet the interests of all interested users. For this purpose, it is necessary to systematize information on the constant and variable part of the benefits, short-term and long-term bonus plans, social types of motivation, etc. [10, 11].

In the international accounting system, disclosure of information about employee benefits is regulated by IAS 19 “employee benefits” and supplemented by such standards as: IAS 24 “related party disclosure” and IAS 1 “presentation of financial statements” [12]. In the Russian accounting system, such standards are not applied

and many methods of accounting of employee benefits adopted in international practice are not used in Russia. One of the reasons for this situation is the absence of approved RAS “employee benefits” [8–11, 13–17]. An acceptable solution to the possibility of applying the international experience in the field of employee benefits is currently being sought, as this issue is essential for Russian companies and corresponds to the social orientation of state policy.

38.3 Problem Statement

The main reasons for the prompt development and implementation of RAS, and also in relation to employee benefits accounting, include the elimination of contradictions in accounting treatment between IFRS and RAS statements; expansion of analytical opportunities for owners of organizations; a clearer definition of the financial condition and performance of business entity activity.

The main difference between the Russian and international accounting systems in the field of employee benefits is that modern accounting rules in the Russian Federation cover only labor costs and insurance premiums paid to the budget and extrabudgetary funds. IFRS, in its turn, in addition to these payments include an accounting procedure for all types of benefits and supplementary financial compensations paid to the employee [14–26].

The second difference is such an important point as employee benefits in retirement. The provisions of Russian legislative acts, including Federal Law dated May 07, 1997 № 75-FL “On Non-State Pension Funds” and Federal Law dated December 15, 2001 № 167-FL “On Compulsory Pension Insurance in the Russian Federation” contradict international accounting rules. This leads to difficulties in applying the IFRS requirement in transforming the financial statements of Russian organizations. Periodic contributions for mandatory pension insurance are recorded in the same reporting period in which payments are made, without calculating long-term liabilities as required by IFRS.

In Russian practice, expenses on employee benefits are taken into account based on what exactly is paid. At the global level, accounting is conducted on the basis of why it is paid. For example, if an organization incurs expenses for paying its employees various kinds of subscriptions for sports and fitness, then these expenses will be included in the other ones and reflected in the debit of account 91. According to IFRS, these expenses will be accounted for as part of labor costs. Thus, the recognition of labor costs and other payments in accordance with Russian and international practice is carried out in different ways.

Distinctive features regarding the formation and disclosure of information on employee benefits in Russian legal documents and international standards are presented in Fig. 38.1 [14–28].

In Russian practice, employee benefits are generally considered to be short-term and include labor costs, paid holidays, bonuses, allowances, etc. Regulatory documents do not explain or divide employee benefits into long-term and short-term, since

Differences in the provisions of Russian and international standards		
Russian accounting system	SIGN OF COMPARISON	International Accounting Standards
The procedure for accounting for employee benefits is regulated by AR 10/99 "Organization Costs", AR 8/2010 "Estimated Liabilities, Contingent Liabilities and Contingent Assets", AR 1/2008 "Accounting Policies of an Organization", Federal Law of 07.05.97 № 75-FZ "On Non-State Pension Funds", Federal Law of 15.12.01 № 167-FZ "On Compulsory Pension Insurance in the Russian Federation" and the Federal Law "On Compulsory Social Insurance for Temporary Disability and Due to Maternity" dated 29.12.2006 No. 255-FZ	<i>1 Disclosure of accounting for employee benefits</i>	The accounting for employee benefits is fully regulated by IAS 19 "Employee Benefits"
The Labor Code of the Russian Federation defines labor remuneration, classifies its forms and systems	<i>2 Definition of the concept and composition of employee benefits</i>	IAS 19 "Employee Benefits" details the definition and composition of employee benefits
AR 4/99 "Accounting Statements of an Organization" defines arrears to staff of an organization as short-term liabilities	<i>2 Maturity date</i>	IAS 19 "Employee Benefits" divides wage obligations into short-term and long-term
AR 10/99 "Organization expenses" classifies labor costs as expenses for ordinary activities. The Federal Law "On Compulsory Social Insurance for Temporary Disability and in Connection with Maternity" dated December 29, 2006 № 255-FZ establishes the procedure for financing the payment of temporary disability benefits to insured persons - for the first three days of temporary disability is carried out at the expense of the insured and the rest period at the expense of the budget	<i>3 The procedure for allocating labor costs and the amount of disability benefits</i>	IAS 19 "Employee Benefits" classifies labor costs as expenses for ordinary activities. Amounts of accrued disability benefits and childcare are included in current expenses
Federal Law of 07.05.97 № 75-FZ "On Non-State Pension Funds", Federal Law of 15.12.01 № 167-FZ "On Compulsory Pension Insurance in the Russian Federation" do not disclose requirements for remuneration programs	<i>3 Availability of post-employment benefits programs in the organization</i>	IAS 19 "Employee Benefits" classifies remuneration programs in accordance with established payments and contributions of employers

Fig. 38.1 Significant differences in the provisions of Russian and international standards on the formation and disclosure of information on the accounting of employee benefits

there are only general principles reflected in Accounting Regulation 4/99 "accounting statements of the organization."

According to the Russian accounting and reporting principles, the organization can create reserves for the planned payment of holidays and benefits on the basis of the results of work for the year. However, these payments must be regulated by the accounting policy of the organization.

38.4 Results of Research

Therefore, there is a reasonable need to create the RAS "employee benefits," the main provisions of which should be close to the requirements of IFRS. The authors propose the following structure of RAS "employee benefits."

Section 1. “Generalities.” The section will contain general information: definition of “employee benefits,” determination of the object of accounting for employee benefits, the composition and structure of the benefits, as well as the subjects to whom these benefits apply.

Section 2. “Procedure for recognition and determination of the size of employee benefits.” This section will disclose the procedure of recognition and determination of benefits and will regulate the process of accounting and reporting of long-term employee benefits using the liability discounting method.

Section 3. “Estimated liabilities for employee benefits.” This section will include information: conditions for recognizing the economic benefit of the organization when performance the estimated liabilities; types of estimated liabilities (incentive payments, severance pay) and terms of recognition; determination of the value of the estimated liability; features of the assessment of the value of the estimated liability when the term of performance of such an obligation is more than 12 months; recognition of termination of the employment agreement before the expiration of the relevant employment contract.

Section 4. “Accounting and reporting of employee benefits expenses and estimated liabilities employee benefits.” The section should include the procedure for recording in accounting the obligations of the organization for paid breaks, insurance premiums, and estimated liabilities.

In addition, the section should also explain the following information:

- Ways of accounting of employee benefit obligations and estimated liabilities if the value of payments exceeds accrued costs, if the amount of liabilities changes or/and in case of changes in labor and other agreements;
- Cases when employee benefits liabilities can be recognized as expenses;
- Reasons for changes in the amount of employee benefit liabilities (verification at the end of the year, occurrence of certain events, etc.);
- Procedure for formation and recognition of liabilities with undefined value or period of performance more than 12 months (for example, different types of bonuses, severance payments and other retirement benefits).

Section 5. “Recognition, accounting and payment of accruals at the end of employment.” Post-employment benefits include: payments in accordance with pension plans; health insurance benefits; payments under other social programs and guarantees. The main principle for determining and calculating the amount of post-employment payment should be the accrual principle. It assumes that the company calculates and accrues long-term liabilities for each employee on an annual basis. Such plans should be revised and changed annually, as the employee increases his rights to future payments every year, approaching the retirement age.

Section 6. “Disclosure of employee benefits in the financial statements.” Organizations must disclose the information about employee benefits in their accounting policies, statement of profit or loss, balance sheet and notes to them. An accounting policy should provide the information about the methods used for recognition of various types of employee benefits, about pension and compensation plans, about techniques of actuarial valuation of employee benefits and actuarial assumptions.

The statement of profit or loss should disclose information about expenditures for defined contribution plans and for compensation plans using equity instruments. The balance sheet should include information on employee benefits as recognized assets or liabilities.

This section should contain the procedures for disclosure following points in financial statements:

- The total amount of wages, social contributions and insurance premiums, remuneration for certain types, if their value is significant;
- Accrued estimated liabilities, amounts of unused estimated liabilities, increases in the amount of the liability, the nature of the liability and the term of its performance, if there are uncertainties about the term of performance.

Also, there must be an answer about how an organization will disclose the information in its accounting policy if it has estimated obligations under defined benefit schemes.

Section 7. “Generation of reporting information and the form of its provision.” Indicators of financial (accounting) statements should disclose information on employee benefits in the context of each type of remuneration (basic wages, bonuses, vacation pay, etc.). It is best to make appendices to accounting statements by dividing remuneration by the urgency of payments (short-term and long-term remuneration). In this regard, it is proposed to add Table 5.3.1 in paragraph/Sect. 5 “Accounts receivable and accounts payable” of notes to the financial (accounting) statements. This table should include information on short-term and long-term employee benefits (Table 38.1, as an example).

The indicators presented in the table are of a recommendatory nature and can be supplemented by organizations depending on the objects of accounting. Other benefits may include remuneration for years of service, including awards, valuable gifts; tourist, sanatorium and resort vouchers; paid or creative vocation for employees with long work experience; long-term disability payments.

38.5 Conclusions

The development of the RAS “employee benefits” should be carried out in order to bring the methods of calculating and reflecting employee benefits in accounting reports as close as possible to international standards. The proposed structure of RAS “employee benefits” will allow to optimize the system of accounting for employee benefits in Russian organizations and to reflect reliably the information on employee benefits in financial statements.

Table 38.1 Disclosure of information on short-term and long-term employee benefits, in rubles

Indicators	Period (Year)	Balance at the beginning of the year	Changes for the period	Balance at the end of the year
Short-term benefits	2020	1,200,000	3,700,000	1,400,000
<i>Total</i>	2019	950,000	3,120,000	1,020,000
<i>Including</i>				
Labor costs excluding vacation pay expenses	2020	480,000	810,000	520,000
Expenses for vacation pay, including expenses incurred from reserves	2020	290,000	480,000	240,000
Mandatory pension, medical and social insurance expenses	2020	231,000	390,000	230,000
Voluntary health insurance costs	2020	180,000	1,400,000	210,000
Expenses for payments in non-monetary form	2020	19,000	620,000	200,000
Long-term benefits	2020	620,000	2,800,000	580,000
<i>Total</i>	2019	590,000	2,640,000	450,000
<i>Including</i>				
Post-employment benefits (pension), including		620,000	2,400,000	580,000
– State pension provision	2020	340,000	1,600,000	310,000
– Mandatory pension insurance	2020	230,000	700,000	200,000
– Non-state (supplementary) pension provision	2020	50,000	100,000	70,000
Others	2020		400,000	

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Chapter 39

Application of the Discounted Cash Flow Method to Assessment of the Business Investment Attractiveness



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Abstract This article considers the prospect of applying the discounted cash flow method to assessment of the attractiveness of Russian business for businessmen. The authors describe the importance of improving the national investment environment for international cooperation between Russia and other countries. The authors propose a clarified definition of the concept “investment attractiveness.” The article describes possibilities, advantages and drawbacks of applying the discounted cash flow (DCF) method to the business attractiveness assessment. The authors pay attention to the importance of improving country’s investment attractiveness, point to the issues of Russian assessment standards and propose methods of improving the business attractiveness assessment using the DCF method. The authors consider such method to be the most appropriate in terms of investment motives, since investors aim to achieve a financial benefit and purchase revenue that will be earned in future rather than tangible facilities. The DCF method is based on the fact that the measurement criterion for estimated business revenue that is taken into account is not the profit, but is the cash flow. The authors argue that it is appropriate to apply such method in case of assessment of the investment attractiveness of the companies undergoing the stage of sustainable economic development and having featured successful market performance over a long period of time.

39.1 Introduction

Attracting investment flows are one of the main issues of the socioeconomic development of countries, regions, industries and economic entities in the existing economic reality. The emergence of new information technologies leads to accelerated market processes and, consequently, increased market dynamism and investment risks. These factors have a substantial impact on investors’ decisions in regard to assessing the investment environment and investment attractiveness of potential investment targets.

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The current investment environment in the Russian Federation is not favorable for investment inflow. However, the attraction of investment flows to the domestic market remains an important condition for the effective performance of a national economy. Russia needs to extend its investment base to spur innovative activities and improves the economic potential of its national economy. One of the most obvious methods to address this issue is an intensive integration of the Russian Federation into the global community. It should be noted that insufficient attention is currently being paid to the potential of cooperation with the neighboring countries to address the tasks Russia is facing, especially those related to increasing the country's investment potential. Thus, a full-fledged inclusion of Russia and, above all, the Russian Far East and Siberia in the system of global economic relations constitutes one of the key conditions for the country's socioeconomic development and improvement of the investment attractiveness of Russian business. The investment field should become the main direction of the strategy of cooperation between the Russian Far East and Siberia and the global economy. Russian business entities are interested in improving the profitability, productivity, competitiveness and financial independence. These indicators are directly correlated with the current level of investment activity and business investment attractiveness of a business. Since any investment is a risk, assessing the investment attractiveness of a company is one of the effective methods aimed at reducing such risk. There are numerous indicators and methods that are used for this purpose, including the discounted cash flow (DCF) method. Using this method for domestic companies is the most acceptable, since it allows you to influence the opinion of foreign investors from the Asia-Pacific countries about the investment attractiveness of Russian companies. This is primarily due to the fact that the shares of most companies not only in Russia but also in the Asia-Pacific countries do not circulate on exchanges, which make assessing investment attractiveness difficult, compared to companies participating in exchange trading. In this regard, the use of the DCF method as a method of the income approach helps to assess the possible future economic benefits of investment activities, both of the Asia-Pacific countries investing in Russian entrepreneurship, and vice versa. A high level of investment attractiveness forms and strengthens visible and hidden advantages of a company against its competitors [1] and is also the factor of its activity performance. Since investment implies receiving future economic benefits, investment decision-making requires comparing the expectations of future revenue with the current cost of capital investment. The issues of investment and investment attractiveness are of applied nature, since addressing them ensures not only a high performance of particular company, but also an economic growth as a whole.

39.2 Literature Review

The issue of assessing the business investment attractiveness is discussible and has been considered in papers of many Russian and foreign scientists, such as Shapiro [2], Kossov [3], Sheremet [4], Saifulin [5], Yankovsky [6], Mukhar [7] and Blank

[8]. Their papers describe the issues of investment's economic essence, techniques for assessing the investment attractiveness of companies using the financial analysis tools, including the cash flow analysis.

A significant contribution to the development of the discounted cash flow theory has been made by such scientists as Smolyak [9], Sheremet [10], Valdaytsev [11], Kokurin [12], etc.

There are a lot of theoretical features of assessment of the company investment attractiveness that still remain undescribed and thus need to be studied and put into practice. The discussible nature of the issue confirms the lack of a commonly recognized definition of the concept "company investment attractiveness." There is also no determined system of attributes for scientifically recognized investment attractiveness classification and clear identification of such phenomenon's place in the country's investment market.

The authors argue that one of the most pressing current issues is the necessity to establish a unified analytical system of qualitative and quantitative indicators that could be used for comprehensive assessment of the company investment attractiveness. Normally, the entity investment attractiveness is currently assessed using different groups of indicators and tends to be based on imperfect techniques, which affects the reliability of the results.

Various methodological materials presented in the special literature, Internet and periodical press and related to assessment of the business investment attractiveness usually suggest the use of mainly quantitative factors. This does not allow to take into account the whole array of characteristics required for qualitative assessment of the business investment attractiveness, which in turn leads to unreliable conclusions.

The appropriateness of applying the discounted cash flow (DCF) method to assessment of the business investment attractiveness is currently not sufficiently justified. Possible reasons may be that effective application of the DCF method requires taking into account and analyzing numerous quantitative and qualitative factors, and their scope sometimes exceeds the number of factors required for assessment of the business investment attractiveness. Thus, the scope of labor inputs to the discounted value assessment is huge, so many members of the business community have not appreciated this method, which leads to distorted results of both discounted value and business investment attractiveness.

The article aims to find out the objectiveness and adequacy of using the DCF method in assessment of the investment attractiveness of the Russian business. Its object is the investment attractiveness assessment technique, while its subject is discounted cash flow for assessment of the Russian business attractiveness.

The first thing that needs to be done to conducting this study is to define the concepts of investment and investment attractiveness.

Investment means capital investment aimed at receiving particular benefits in future, which may be expressed as [13]:

- Making profit (cost reduction, production extension, manufacturing of new products);

- Social effect (job growth, guaranteed occupational stability safety, improvement of environmental conditions of economic activities).

Making an investor want to invest the funds in a particular company requires the letter to have the investment attractiveness that is determined by such investor through analysis of numerous factors.

It should be noted that although the investment attractiveness is crucial for understanding numerous investment activity issues, it has so far not been construed among researchers in a unified way, particularly, in the economic field. The discussable nature of these terms is supplemented with a great variety of approaches to defining the category “financial condition of a company.”

Let us analyze opinions of the researches specializing in the issues of the essence of investment attractiveness. For instance, Birman and Schmidt define the investment attractiveness as a set of indicators describing the financial state of a company [14]. Blank points to its direct link to a company’s life cycle stages [15]. Krutik et al. define the investment attractiveness as a common characteristic of all the drawbacks and advantages of a company in question [16, 17].

In Kreinin’s opinion, the investment attractiveness comprises the multiplicity of fundamental and fund indicators of an investment target [18]. Bukhdruker considers it as a target’s integral characteristic in terms of return on investment, development prospects and existing level of investment risks [19]. Dontsov and Bocharov bring the investment attractiveness into correlation with the reliability of goods and services produced by a company [20, 21]. Kontorovich recognizes the investment attractiveness as a system of economic relations between economic entities in regard to the efficiency of business development and maintaining its competitiveness, which includes formal and informal indicators of a company’s activity aspects [22]. Formal indicators are calculated on the basis of financial statement data. Mukhametshina considers the investment attractiveness as an independent economic unit being an aggregated characteristic of the investment potential of a company, which in turn reflects the effective use of company assets and existing level of investment risks.

The foregoing definitions seem not be without their drawbacks that make it impossible to recognize them as perfect. The authors argue that such definitions cannot be considered as reflecting the whole set of factors important to describing the investment attractiveness with absolute precision, so it seems necessary to formulate this concept from an investor’s point of view. Given an investor’s interest, the authors propose the investment attractiveness should be defined as a system of external and internal factors that have qualitative and quantitative composition, describe financial and economic condition of a company and its level of investment risks and reflect a company’s effective demand for investment [23].

The concept of discounted cash flow should also be clarified for further study. A company’s cash flow is an aggregation of revenues and expenses distributed over time and generated by its economic activities. The concept “company cash flow” can be described as an aggregated phenomenon, since it includes a large number of various flows that make it possible to maintain economic activities. Cash flows should be

analyzed and settlement transactions should be performed with consideration for the time factor, which is the reason for using the DCF method.

The discounted cash flow method has been applied to assessment of the investment attractiveness for quite a long time. This method is simple and based on assumption that potential investor making an investment would not exceed the sum that is the current amount of expected revenue of a company, while the owner would not reduce the company value below the amount expected as future revenue. When cooperating on the issues of determining the company value, the parties will thus settle on the purchase/sale price that equals the amount of future revenue.

Such method is considered as the most appropriate in terms of investment motives, since investment is accompanied not by tangible facilities of a company, i.e., its buildings, equipment and assets, but by the revenues expected in future, with the purpose of receiving financial benefit. An analysis of companies operating in any field of economic activity using the method in question leads to the conclusion that each of them the only type of product, i.e., money. The DCF method is based on the fact that the criterion for measuring expected business revenue is cash flow, not the profits expected to be gained from a company's activities.

The authors argue that the DCF method can be used for assessment of activities of any company, regardless of its financial condition, market position and industry affiliation. At the same time, in some cases, the use of such method is the most justified, particularly, when the subject of assessment is the investment attractiveness of the companies that have long been present on the market and have profitable economic activities or the companies undergoing the stage of growth or stable economic development. However, in case of the companies featured by systematic losses, the application of this method is the least appropriate.

A certain degree of caution is required when applying this method to assessment of activities of recently established companies, even if their initial performance suggests they might be promising. In this case, it is practically impossible to conduct a retrospective long-term analysis and determine the consistency and regularity of profits.

Thus, the authors argue that the DCF method is extremely useful tool to assess the business value. Although the actual application of this method requires a lot of efforts and resources, its analyticity and variability help determine the discounted (adjusted) company value. However, a significant share of the analyzed theoretical data does not answer the question of how to use this method in "controversial" cases, e.g., recently started or loss-making activities. Also, insufficient attention is paid to the time factor within the discounted cash flow assessment.

39.3 Research Methods

The theoretical framework of this study comprises Russian and international regulatory documents on accounting and audit regulation, legislative and regulatory acts of the Russian Federation, Uniform Standards of Professional Practice and Advisory

Opinions in the USA, papers of modern foreign and domestic scientists in this field and national statistical data.

The methodological framework of this study comprises common scientific approaches (namely, systemic, comprehensive and logical ones) and methods (analysis and synthesis; systematization and classification; simulation and visualization; induction and deduction; comparison and generalization; expert survey; economic and statistical methods; and ranking method). The authors applied the project method to adjust the objectives in the course of the study and obtaining the results [24].

39.4 Research Results

The following conclusions were made on the basis of the results of this study. In regard to the DCF method, the American Uniform Standards of Professional Practice and Advisory Opinions specify that [25] “due to mutually reinforcing effects, even small input errors can increase and lead to implausible results,” yet no required conclusions are made on the reliability of the method itself which may lead to implausible results.

The net cash flow is normally an only small part of the revenue; for instance, in the iron and steel industry, the net cash flow to equity’s share is 8–25% of the revenue, while the semi-fixed costs included in the product cost account for the lion’s share (75–92%) of the difference between revenue and net cash flow. Hence, a 20% error in the product price forecast and, consequently, revenue forecast leads to an error in the net cash flow forecast. Reducing a forecast error in regard to the revenue in the first forecast year event to 10% is currently deemed to be practically impossible. When comparing one-year revenue forecasts specified in companies’ business plans over the past years and actual revenues, the difference varies between 10 and 30%.

Thus, to achieve a 20% accuracy of assessment of a company’s business value, an assessor must be capable of forecasting the product cost for the forecast period’s years with an accuracy of several percentage points, which is basically unachievable. For in most cases, even the top-brass managers of medium and large companies cannot confidently forecast the product prices of their companies even for the following year.

Through simulation computer experiences with the use of the Monte Carlo method, Luzhansky [26] studied the accuracy of the discounted cash flow method on a specific example of market assessment of a company accompanied by real change of random and uncertain factors, i.e., initial information and internal model parameters, which values are determined by assessor. Thus, when there were changes in the values within the actual range, the discounted cash flow values in these experiments varied from 10 to 230 million dollars. In other words, when the model parameters changed within the “reasonable” range, the upper “reasonable” and “proved” value of a company based on the DCF method differed from the lower “reasonable” and “proved” one by 23 times. All these experiments convincingly illustrate the zero value of the discounted cash flow method for objective assessment of company business and its true pricelessness for “biased” assessment.

The paper by Zimin and Trishin provides the results of approximate calculations of the values of share stocks of four Russian companies which take into account the new data having been assessed by leading global auditing companies using the DCF method [27]. The authors converted two of these four hard-copy reports into Excel format and completely re-calculated the available product price forecasts at the time of assessment and the actual ones over past years, as well as the new current forecasts for the remaining years of the forecast period. As the calculations made by the authors showed, the value of share stocks of these two of the four companies is actually 5–6 times higher. It should be noted that the reports were prepared at a high level by existing standards, while such a significant error in determining the market value of the companies, in the authors' opinion, was due to the fact that it was the results of the long-term forecast that were taken into account at the initial discounting. The long-term market price environment has changed significantly under the conditions of the market environment uncertainty. These calculations demonstrate a high dependency of the DCF method on changes in the forecasts of a company's product prices and the inability to assess objectively and adequately the investment attractiveness of a company for the long term.

39.5 Implications and Recommendations

Thus, based on the results of these study, the author proposes the following methods of improving the quality of assessment of the business attractiveness with the use of the DCF method, which aims at improving the overall investment attractiveness of Russian business in the global community:

1. The company assessment methods (models) that enable an assessor to arbitrarily set the company value within too wide possible range should be excluded from the assessment practice and assessment standards.
2. The model (method) should not be logically contradictory and the relevant field (fields) of application should be selected for it. The impact of the model parameters depending on the distant future should be minimized in the “reasonable” model.
3. The DCF method is appropriate for using in assessment of the attractiveness of medium and large companies, provided, however, it has been modified to reduce the impact of a forecast error by the end of the forecast period, and also the terminal value. There a lot of possible modification options, so it is the calculation practice that should demonstrate which one is more appropriate in real terms.
4. The final section regarding the value selection should not be a single-page one, as is often the case in the current reports, and should contain a detailed analysis by assessor of company activities and also assessor's assumptions, doubts, logical conclusions and justification of his or her decision to select the final value.

The customer in turn should be entitled to choose whether to agree with such assessor's logic or not.

5. To ensure protection against "incorrect" assessment, a buyer and a seller may specify future financial indicators of a company (revenue, gross profit, EBITDA, FCF), and in case, the budget plan has not been fulfilled (or has been substantially exceeded) such seller and buyer would undertake the obligation to reimburse the other party for the damage.

Summarizing the foregoing, it should be noted that Russian assessment standards need to be radically updated, subject to participation by the renewed members of the Expert Advisory Board of the Ministry of Economic Development and Trade of the Russian Federation that develops these standards together with actively participating representatives of self-regulating assessor organizations. The measures proposed by the authors will help improve the quality of assessment of the investment attractiveness of Russian business for potential investors.

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Chapter 40

The Spatial Dimension of Chinese Trade with Russia: Evidence from Regional Data



D. A. Izotov and K. I. Tochkov

Abstract The present study estimates the magnitude of trade barriers between Chinese regions and their trading partners. The analysis shows that trade barriers between Russia and the Chinese regions are comparable with South American countries and Pakistan, but they are higher vis-à-vis Hong Kong, Taiwan, Kazakhstan and Southeast Asia. A common border with a foreign country leads to a significant increase in trade of Chinese regions. The results explain the unevenly distributed trade between Chinese regions and Russia. Other institutional factors—common language and colonial ties—contribute to an increase in bilateral trade and a reduction of trade barriers. Transport infrastructure, built during Tsarist/Soviet control over some parts of China in the nineteenth and twentieth centuries, contributes to the concentration of Sino-Russian trade interactions in these Chinese regions. The findings also indicate that due to globalization and the growth of the overall economies of scale, trade costs decline with increasing distances between the trading Chinese regions and foreign countries. This, to some extent, explains the obtained values of trade barriers for Russia.

40.1 Introduction

Strong engagement with the global economy is an important source of rapid economic growth for the Chinese economy. China is characterized by a large territory, population and differentiated development of regional economies. At the same time, openness to foreign markets positively influenced the economic growth of all Chinese regions. The complex process of trade and economic integration of the national market also contributes to the economic development of the regions of

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China. However, China's trade in the domestic market and with foreign countries is constrained by the barriers that appear at the regional level.

The total trade turnover between the Chinese regions and Russia by 2019 increased to \$109 bn. Over the past two decades, the interest of the Russian and Chinese sides in further developing and deepening strategic partnership with each other, coordinating joint actions in solving various problems has noticeably increased. Against the background of increased competition in the markets of developed countries, Chinese companies see the markets of developing and transit countries, including Russia, as an alternative. Chinese business relies on developing countries, as well as on a number of post-Soviet countries.

Russia and China have a long land border, and some border regions in China are characterized by close trade and economic ties with the Russian market. However, the Chinese economy interacts unevenly with the Russian market. By 2019, almost half of Chinese exports to Russia came from Zhejiang, Guangdong and Jiangsu provinces, and about 70% of imports from Russia to China were provided by Heilongjiang, Beijing and Shandong. The potential for further expansion of Sino-Russian cooperation is determined not only by the level of structural complementarity, by the comparative scale of supply and demand, but also by the comparative potential of expanding bilateral cooperation in each region of China. From this point of view, in order to assess trade barriers that hinder China's interaction with Russia, it is necessary to take into account the spatial structure of the Chinese economy, i.e., feature of interactions at the regional level in China. At the same time, it can be assumed that various barriers at the regional level of China may hamper trade interactions between Russia and China.

40.2 The Relevance of the Research and Literature Review

One of the most common methods for quantifying trade barriers is to build gravity dependencies to determine the “border effect” [1], understood as a set of trade and economic costs arising from the goods crossing any border. Gravity models describe one of the most stable empirical dependencies in economic analysis, having a high explanatory power of the variables that form trade flows [2]. Therefore, on the basis of this approach, there are a large number of studies of the Chinese economy's interaction with various countries of the world, both at the level of the national economy [3, 4] and at the industry level [5]. Also, barriers to trade interactions between Chinese regions among themselves are being actively studied [6, 7].

In recent years, there is a lack of studies on border effects and comparative assessments of trade barriers, as well as studies on the intensity dynamics of trade of China's regions with foreign countries. In addition, an important point is the correctness of the estimate of the gravity dependence, since the experience of a large number of empirical studies allows us to formulate the following recommendations [8]: Whenever available, panel data should be used to obtain structural gravity estimates; panel data with intervals should be used instead of data pooled over consecutive years in order

to allow for adjustment in trade flows; gravity estimations should be performed with intranational and international trade flows data; in accordance with gravity theory, directional time-varying (importer and exporter) fixed effects should be included in panel trade data; pair fixed effects should be included in gravity estimation with panel trade data; estimate gravity with the Poisson pseudo maximum likelihood (PPML) estimator, which solves the problem of heteroskedasticity [9]. Also, this method makes it possible to include “zero” trade flows in panel data, since there is no need for logarithms. The application of PPML shows satisfactory results, even if the proportion of “zero” trade flows in the panel data is very large [10].

40.3 The Purpose of the Study and Methodology

The present study extends the existing literature on assessing the border effects of Chinese regions in recent years. We have consistently studied the border effects by comparing intra-regional and external trade and economic interactions of Chinese regions. In this article, we also examine the influence of the distance factor and institutional factors, explaining the trade of Chinese regions with various countries, including Russia.

In this study, we follow the aforementioned recommendations, with the exception of highlighting time intervals in panel data due to the short time series. The dependent variable is bilateral trade adjusted for the size of economies i and j to solve the endogeneity problem [11] and to guarantee the absence of a significant correlation between errors and regressors [12].

The equation was estimated in a nonlinear form by the PPML method:

$$\frac{x_{ijt}}{y_i y_{jt}} = \exp[k + (1 - \sigma)\rho \ln d_{ij} + (1 - \sigma) \ln b_{ij} - (1 - \sigma) \ln P_i - (1 - \sigma) \ln P_j] \times \varepsilon_{ijt}, \quad (40.1)$$

where x_{ij} —exports from region/country i to region/country j ; y_i —the size of the economy of region/country i ; y_j —the size of the economy of region/country j ; b —the barriers to trade; d —the physical distance between trading regions/countries; P_i —the average value of trade costs between region/country i and its trading partners; P_j —the average value of trade costs between region/country j and its trading partners; σ —the elasticity of substitution. The ad valorem tariff equivalent of the border effect ($b-1$) is calculated using an elasticity of substitution in the range between 5 and 10.

Physical distances between the analyzed objects can be represented in various ways [13]. There are databases on distances between countries specifically for the purpose of gravity modeling (e.g., CEPPII). However, as analysis has shown, these databases include linear distances between national economies, which in most cases are significantly less than nonlinear (real) distances. For this reason, in this study, distances were calculated independently: for sea and transoceanic transportation and for land transportation in kilometers. It should be noted that for the countries of North

and South America, Australia and Oceania, Africa, Western Europe and for most countries of Asia and Central Europe, trade with China is carried out mainly in the framework of sea and transoceanic transportation. Therefore, for the vast majority of China's trading partner countries under consideration, the distance to Chinese territory was initially calculated to the nearest largest port (Shanghai, Guangzhou, Dalian, etc.) and then to the rest of China based on the distances of highways and railways.

The rest of the countries have transit railway and automobile infrastructure with border checkpoints with the internal Chinese regions or have access to it: most countries of the former Soviet Union, some countries of Central Europe, Finland, Mongolia, Pakistan, a number of countries in South and Southeast Asia. For most of these countries, the distance to the border of interior Chinese regions was calculated on the basis of direct roads and railways connecting it with other regions—first by sea and transoceanic transportation, then by land. A special case for determining the distance to Chinese regions is Russia, since this country covers a large territory: Exports from China are mainly oriented toward the western part of Russia; imports are mainly carried out from the Russia's eastern part. Therefore, distance for exports and imports is different. For Chinese exports to Russia, Moscow is selected as the focal point, and for imports from Russia to Irkutsk.

Distance within Chinese regions is defined as the distance between the two largest regional agglomerations (for the cases of Beijing, Tianjin, Chongqing and Shanghai—the distance between the most distant parts of cities) along highways and railways. Distances between Chinese regions are calculated both by road, rail and sea routes.

Bilateral trade of Chinese regions with foreign countries is reported by Chinese customs statistics based on the location of exporters and importers for three years: 2017–2019, covering 217 countries and territories. Accordingly, exports are presented in FOB prices (“on board”), and imports are presented in CIF prices, i.e. including transportation and cargo insurance costs. In some studies, transportation costs are determined by subtracting “mirror” exports (in FOB prices) from imports (in CIF prices) [13]. Thus, transportation costs are already included in the cost of imports in CIF prices, which, along with an assessment of the effect of physical distance on bilateral interactions, leads to a deviation in the gravitational dependence. Therefore, exports and imports should be presented at the same price. For this, the import of Chinese regions based on an indirect estimate [14] of travel time and average transportation costs based on calculated nonlinear distances between regions/countries was reduced to FOB prices. Zero values were also included in the export and import data set.

In line with the aforementioned recommendations for gravity model estimations, it is necessary to include intranational trade in the equation. We distinguish border effects within Chinese regions and between them by including intra- and inter-regional trade. In the existing data set, intra-regional trade in China is measured as wholesale and retail trade turnover excluding exports and imports. Missing data for 2019 are calculated using the moving average method over the 12 previous years. The dynamics of inter-regional trade were calculated employing the proportions

from earlier input–output tables [15], and the exports and imports of goods for the corresponding regions for 2017–2019 were used as the basic indicator for the assessment.

The size of the economies of foreign countries (GDP) is measured by the existing and forecast values reported by the IMF. Data on the size of China's regional economies (GRP) were obtained from the China's National Statistical Bureau, forecast estimates from Bloomberg, the Economist Intelligence Unit, HKTDC Research and statistical agencies in several Chinese provinces.

Variables expressing values are denoted in US dollars at current prices, allowing us to avoid errors that often arise in empirical estimates of gravity equations [16, 17].

For our purposes, Eq. (40.1) is presented in the following form:

$$\frac{x_{ijt}}{y_{it}y_{jt}} = \exp[\lambda_i + \lambda_j + \eta_t + \beta_0 + \beta_1 \ln DIST_{ij} \\ + \beta_2 CONT_{ij} + \beta_{3\dots n}(CN_{1\dots 31} \times N_{1\dots m})] \times \varepsilon_{ijt}, \quad (40.2)$$

where x_{ij} —exports from region/country i to region/country j ; y_i —GRP/GDP of region/country i ; y_j —GRP/GDP of region/country j ; t —time; $DIST_{ij}$ —distance between trading regions/countries i and j in km. The other independent variables are dummies. The dummy variable $CONT_{ij}$ reflects the existence of joint borders between the Chinese region i and its trading partner j . Other dummies characterize the effects of borders on trade by Chinese regions (CN) with their partners (N) consisting of 31 Chinese provinces and 217 countries and territories of the world. Variation across time and cross-sectional factors are controlled via fixed effects for years (η) and exporting and importing regions and countries (λ). The model in Eq. (40.2) was estimated as panel data with fixed effects using PPML. The initial data set describing bilateral trade covers three years (2017–2019) and involves 43,244 observations.

Due to the large number of China's trading partners, only the main ones were singled out, while the rest were either grouped in terms of their membership in economic entities, or assigned to others. As a result, the model in Eq. (40.2) is adjusted as follows:

$$\frac{x_{ijt}}{y_{it}y_{jt}} = \exp[\lambda_i + \lambda_j + \eta_t + \beta_0 + \beta_1 \ln DIST_{ij} \\ + \beta_2 CONT_{ij} + \beta_3(CN) + \beta_4(CN \times CN)] \\ \times \exp[\beta_5(CN \times RU) + \beta_6(CN \times JP) + \beta_7(CN \times KR) \\ + \beta_8(CN \times USA) + \beta_9(CN \times HK)] \\ \times \exp[\beta_{10}(CN \times TW) + \beta_{11}(CN \times EU) \\ + \beta_{12}(CN \times AUSNZ) + \beta_{13}(CN \times AFRICA)] \\ \times \exp[\beta_{14}(CN \times SAMERICA) + \beta_{15}(CN \times CAN) \\ + \beta_{16}(CN \times MEX) + \beta_{17}(CN \times KZ)] \\ \times \exp[\beta_{18}(CN \times PAK) + \beta_{19}(CN \times IND)]$$

$$+ \beta_{20}(CN \times GULF) + \beta_{21}(CN \times ASEAN)] \\ \times \exp[\beta_{22}(CN \times OTHERS)] \times \varepsilon_{ijt}, \quad (40.3)$$

where CN —trade within Chinese regions; $CN \times CN$ —between Chinese regions, $CN \times RU$ —with Russia, $CN \times JP$ —with Japan, $CN \times KR$ —with the Republic of Korea, $CN \times USA$ —with the USA, $CN \times EU$ —with the EU-28, $CN \times HK$ —with Hong Kong, $CN \times TW$ —with Taiwan, $CN \times AUSNZ$ —with Australia and New Zealand (Agreement on Close Economic Relations), $CN \times AFRICA$ —with African countries (55 countries of the African Union), $CN \times SAMERICA$ —with South American countries (12 countries that are full and associate members of MERCOSUR), $CN \times CAN$ —with Canada, $CN \times MEX$ —with Mexico, $CN \times KZ$ —with Kazakhstan, $CN \times PAK$ —with Pakistan, $CN \times IND$ —with India, $CN \times GULF$ —with the Gulf countries (6 members of the Council for Cooperation of the Arab States of the Gulf), $CN \times ASEAN$ —with 10 countries of ASEAN, $CN \times OTHERS$ —with other countries.

It should be noted that: Firstly, including intranational trade can significantly weaken the effect of physical distance on the dependent variable, due to the relatively large volumes of trade within and between Chinese regions compared with foreign trade; secondly, the liberalization of foreign economic activity, mass transportation, including container transportation, combined with fragmentation of production of transnational corporations between different countries contributed to the fact that the distances over which goods are transported increased significantly [18]. In other words, due to the economies of scale, the relative costs of transporting goods between geographically remote economies have declined significantly, especially in transoceanic transport [14]. Therefore, even if countries are located at a considerable distance from each other, but their trade is included in transoceanic logistics routes, it can be assumed that the effect of the borders between them may be less than with countries closer by.

Taking this fact into account, Chinese regions and countries were divided into groups in terms of the distance ranges between them [19, 20]: up to 750 km, from 750 to 1500 km, from 1500 to 3000 km, from 3000 to 6000 km, more than 6000 km. Further, these groups were included in the transformed model in Eq. (40.3) as dummy variables, whereby physical distance and contiguity were dropped to avoid multicollinearity.

Accordingly, the impact of different distance ranges on bilateral trade was assessed by transforming Eq. (40.1) as follows:

$$\frac{x_{ijt}}{y_{it} y_{jt}} = \exp[\lambda_i + \lambda_j + \eta_t + \beta_0 + \beta_1 DIST(0 - 750) + \beta_2 DIST(751 - 1500)] \\ \times \exp[\beta_3 DIST(1501 - 3000) + \beta_4 DIST(3001 - 6000) + \beta_5 DIST(> 6000)] \\ \times \exp[\beta_6 LANGUAGE_{ij} + \beta_7 COLONY_{ij}] \times \varepsilon_{ijt} \quad (40.4)$$

where $DIST(0\text{--}750)$ —the distance between objects is up to 750 km, $DIST(751\text{--}1500)$ —from 750 to 1500 km, $DIST(1501\text{--}3000)$ —from 1500 to 3000 km, $DIST(3001\text{--}6000)$ —from 3000 to 6000 km, $DIST(>6000)$ —more than 6000 km, *LANGUAGE*—a common language, *COLONY*—the colonial ties of a Chinese region over the period 1840–1945.

Two new variables were included in the model. The first one is a dummy variable, reflecting the common language of Chinese regions with foreign countries. Singapore, Taiwan, Hong Kong and Macau are characterized by a common language with all Chinese regions. As for other countries, the main criterion for assigning values was the common language with the national minorities living in a particular Chinese region, which, in most cases, have territorial autonomy. Thus, it was determined that Mongolia has a common language with Inner Mongolia and Gansu province; North Korea and the Republic of Korea—with the provinces of Jilin and Liaoning; Kazakhstan, Kyrgyzstan, Uzbekistan and Turkmenistan, as well as Turkey—with Xinjiang; Myanmar—with the provinces of Yunnan, Qinghai and Tibet; Bhutan and Nepal—with Tibet.

The second dummy variable reflects the colonial past. In most cases, the long-term ties between the mother country and its dominions resulted in the creation of a joint transport infrastructure, as well as the accumulation of experience in trade and economic interactions, which can positively affect bilateral relations for a long time. In the years 1840–1945, the territory of today's China was unevenly distributed in time and space into spheres of influence between the largest empires in the world [21].

As a result, the dummy variable for colonial ties assumes a value of one for the following country/region pairs: Russia—Inner Mongolia, Xinjiang, Heilongjiang and Jilin; Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan and Turkmenistan (as part of the Russian Empire and the USSR)—Xinjiang; Great Britain (including Canada, Australia, New Zealand and Hong Kong)—Shanghai, Jiangsu, Zhejiang, Anhui, Jiangxi, Hunan, Hubei, Chongqing, Sichuan, Guangdong; France (including Vietnam)—Hainan, Guangxi, Yunnan, Guizhou, Guangdong; Germany—Shandong; Japan (including North Korea, Republic of Korea, and Taiwan)—Inner Mongolia, Heilongjiang, Jilin, Liaoning, Beijing, Tianjin, Hebei, Shanxi, Shandong, Jiangsu, Anhui, Hubei, Henan, Zhejiang, Fujian and Guangdong; Portugal (Macau)—Guangdong.

40.4 Results

A benchmark for comparing the border effect should be based on a category excluded from the number of dummy variables in the model. The results show that trade within Chinese regions exhibits the lowest border effects relative to trade between Chinese regions and trade with foreign countries. Border effects between Chinese regions amounted to 67.5% relative to intra-regional barriers. India and other countries record the highest border effects with Chinese regions (491.3 and 500.4% in ad valorem

tariff equivalents, respectively). The border effect with Russia was 437.1%, which is lower than for most other trading partners of China and is comparable with South American countries and Pakistan. Countries with the lowest border effects included Hong Kong, Taiwan, Kazakhstan and the ASEAN countries (Table 40.1).

The presence of a joint border between a foreign country and a Chinese region contributed to a significant increase in bilateral trade—almost 16 times more ($e^{2.83} - 1 \approx 15.95$), reducing trade barriers in the ad valorem equivalent by 51%. This may explain some disproportionality in Russia's trade with Chinese regions, given the long land border between the two countries.

The estimates indicate a negative effect of distance on Chinese regions' trade; however, its magnitude is not large. On the one hand, the premise of a lesser effect of transportation costs (distance) on trade has already been included in the model used

Table 40.1 Border effects of Chinese regions, 2017–2019

Variables	β	Robust standard errors	Border effect (%)
$CN \times CN$	-2.06***	0.12	67.5
$CN \times RU$	-6.72***	0.25	437.1
$CN \times JP$	-7.03***	0.18	479.8
$CN \times KR$	-6.84***	0.17	453.2
$CN \times USA$	-6.92***	0.20	463.9
$CN \times EU$	-6.85***	0.21	453.7
$CN \times HK$	-5.41***	0.17	286.6
$CN \times TW$	-6.68***	0.17	431.9
$CN \times AUSNZ$	-6.86***	0.19	455.8
$CN \times AFRICA$	-6.82***	0.22	450.6
$CN \times SAMERICA$	-6.72***	0.22	436.8
$CN \times CAN$	-6.93***	0.20	465.9
$CN \times MEX$	-6.82***	0.20	450.4
$CN \times KZ$	-6.66***	0.18	429.1
$CN \times PAK$	-6.75***	0.20	440.4
$CN \times IND$	-7.11***	0.19	491.3
$CN \times GULF$	-6.88***	0.20	458.4
$CN \times ASEAN$	-6.27***	0.19	379.6
$CN \times OTHERS$	-7.17***	0.17	500.4
<i>CONT</i>	2.83***	0.05	-50.7
$\ln(DIST)$	-0.13***	0.03	
Constant	-26.38***	0.23	
Obs	43,244		
<i>PseudoR</i> ²	0.82		

Note *** $p < 0.01$. The tariff equivalent of the border effects (in %) is shown in bold assuming an elasticity of substitution $\sigma = 5$

for evaluation in comparison with the OLS [9]. On the other hand, there is no clear evidence of bilateral distance between trading regions/counties leading to higher trade costs and, accordingly, border effects. This circumstance requires additional evaluation.

Our findings suggest that a common language increases bilateral trade by a factor of 5 ($e^{1.76} - 1 \approx 4.81$), and colonial ties—by almost 100% ($e^{0.67} - 1 \approx 0.95$), reducing the average trade barriers by 36% and 15%, respectively (Table 40.2).

For Russia, this means that the presence of an associated transport infrastructure (mainly the railways) in Northeast China and partially in Xinjiang, built during Tsarist/Soviet control over these territories, facilitates, *ceteris paribus*, the concentration of Russian–Chinese trade within these Chinese regions.

It is worth mentioning that the estimation of border effect by distance ranges is conditional, since the physical distance is not included in the model due to multicollinearity. To determine the conditional border effect, a group of countries and Chinese regions were adopted as a benchmark, the distance between which does not exceed 750 km. In fact, this group covers intra-regional and part of the inter-regional trade interactions of China. The results indicate a surge in cost with increasing distances but if distance between a Chinese region and its trading partner exceeds 6,000 km, and the conditional border effects are lower. In other words, if a Chinese region and a foreign country are at a considerable distance from each other, then the conditional border effect between them might be lower than with trading partners that are closer by. This, to some extent, explains the low levels of border effects, especially for Russia, estimated via Eq. (40.2).

Table 40.2 Results for model (4) estimation

Variables	β	Robust standard errors	Border effect (%)
DIST (751–1500)	-3.07***	0.05	115.1
DIST (1501–3000)	-4.43***	0.05	203.2
DIST (3001–6000)	-5.05***	0.06	253.3
DIST (>6000)	-4.94***	0.09	244.1
LANGUAGE	1.76***	0.10	-35.9
COLONY	0.67***	0.04	-15.4
Constant	-34.94***	0.19	
Obs	43,244		
Pseudo R^2	0.33		

Note *** $p < 0.01$. The tariff equivalent of the border effects (in %) is shown in bold assuming an elasticity of substitution $\sigma = 5$

40.5 Conclusions

Trade interactions between Chinese regions and Russia are unevenly distributed. Trade within Chinese regions exhibits the lowest border effects compared to inter-regional trade and trade with foreign countries. The border effects for trade between Russia and Chinese regions are comparable to South American countries and Pakistan, but are higher than for Hong Kong, Taiwan, Kazakhstan and Southeast Asia. If a Chinese region shares a border with a foreign country, bilateral trade increases significantly compared to other regions. This pattern might explain a certain disproportionality in the trade of Chinese regions with Russia.

Other institutional factors—common language and colonial ties—contribute to an increase in bilateral trade and a reduction in trade barriers. For Russia, this means that the presence of transport infrastructure built during the Tsarist/Soviet control of these territories contributes to the concentration of Russian–Chinese trade within these Chinese regions.

The findings indicate a reduction in trade costs with increasing distances due to the process of globalization and an increase in the overall economies of scale. Therefore, the costs of trade between a Chinese region and a distant foreign country can end up being similar to those with neighboring countries, which, to some extent, explains the estimated trade barriers with Russia.

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Chapter 41

Assessment of Socio-economic Factors in the Problem of Managing of Households Savings



P. O. Derevyankina 

Abstract Household savings are a valuable source of investment that is necessary for the sustainable development of national economic systems. However, in Russia the share of households with investment strategy behavior is extremely low. An urgent task is to increase it by reducing the share of non-savers households, taking into account the relationships between the elements of the economic system. The study looked at the household's savings in the middle class of the Russian region (Perm Region). The middle class is the core of society, which contains its most educated, productive and financially active part. The author's attention was focused on assessing the region's economic environment as a result of managing the share of non-savers. The paper considered a conservative scenario of region's development, which provided reducing the share of non-savers in the middle class from 53 to 40%. According to this, goal target indicators of the economic environment were presented: plan of reducing the share of non-savers households in time, based on the mathematical model of optimal control of savings, as well as the necessary average income, gross regional product production and investment volume that were established by correlation and regression analysis. The possibilities of attracting household investment to the regional economy were analyzed. The share in the necessary investment growth, which can be ensured by such a successful investment tool as an individual investment account, was defined. The recommendations for the development of tax and institutional incentives to increase household investment activity were given.

41.1 Introduction

A sustainable development of national economic systems largely depends on the savings behavior of the middle class of society, since savings are a valuable source

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of long-term financial funds [1], and the middle class is the main working resource of the nation, which concentrates its human capital [2].

The main stages of the development of savings behavior theory are connected with next hypotheses: J. Keynes' theory of absolute income, M. Friedman's permanent income hypothesis and F. Modigliani's life cycle hypothesis. Empirical works (in particular [3–5]) highlight the impact of various socio-economic factors on the savings of the population. Another research direction, with respect to savings strategies, that highlights the question of what is especially relevant in countries with a high share of the shadow economy and allows to take into account various indirect data, is mathematical modeling of savings. In the works of Chernavsky [6, 7], Erofeenko and Kozlovskaya [8], Gulmamedova and Oruzhiev [9, 10] a dynamic distribution model of households by savings was constructed and its calculations were applied to a limited amount of cases. However, a comprehensive analysis of the impact of management actions on the savings of middle-class households with subsequent assessment of the characteristics of the economic environment was not carried out.

41.2 Problem Statement

In Russia, the majority of households (about 80%) adhere to the consumer strategy of financial behavior (i.e., non-savings), and the share of households with an investment strategy of behavior among savers is extremely low (about 2%) [11]. In relation to the middle class solely, these indicators are slightly shifted toward an investment strategy behavior. Taking into account the fact that the middle class can rationally invest their savings, take responsibility for their decisions and transmit the culture of investment to the lower layers of society, the current socio-economic task of public administration is to reduce the share of non-savers and increase the financial inclusion of households in the middle class of society to ensure the sustainable development of the national economic system.

41.3 Research Questions

This article presents quantitative methods of strategic management of socio-economic systems and focuses on the study of quantitative relationships of socio-economic factors and the share of non-savers in the middle class of the Russian region. The distribution of middle-class households by the average monthly savings is considered. By default savings refer to that part of the income that has not been spent. Earlier [12], we showed how to determine the optimal law for reducing the share of non-savers, depending on the desired distribution of households by size of savings. Using the mathematical model of optimal savings management and performing its numerical calculations, we consider how to obtain quantitative estimates of the target

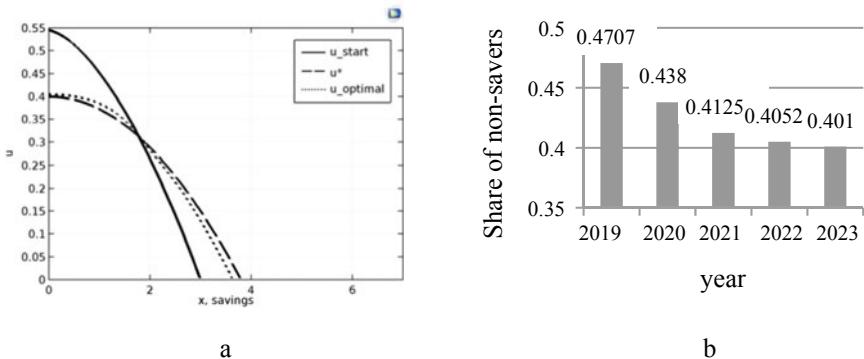


Fig. 41.1 **a** Initial u_{start} (solid), target u^* (dotted), and optimal $u_{optimal}$ (dash-dotted) distributions of households by savings in the middle class of the Perm region; **b** Optimal law of reducing the share of non-savers over time ($upr_{opt} = u(0, t)$)

indicators of the economic environment of the region, the implementation of which will lead to a decrease in the share of non-savers under this optimal law. Next, we will explore possible directions for implementing the law on reducing the share of non-savers in order to give recommendations on the policy of stimulating savings.

41.4 Purpose of the Study

The aim of this work is to obtain new regularities of the influence of control actions on the savings of middle-class households in the Perm region. The share of non-savers in the middle class in Russia is 53% (at the end of 2018), and the distribution curve of households by savings is shown in Fig. 41.1 (calculated using the approach described in [12]). The current savings spread is 0.0.3 subsistence minimums. We consider a conservative version of the region's development, which provides for reducing the share of non-savings to 40% by 2023. It is necessary to calculate the optimal law of reducing non-savers over time, based on which to obtain quantitative estimates of the factors of the economic environment of the region, and on their basis to make recommendations for the implementation of a conservative development plan for the region.

41.5 Research Methods

In this paper, we used a mathematical model of distribution of households by the amount of savings of Erofeenko and Kozlovskaya [8], described by the initial boundary value problem:

$$\begin{cases} \frac{\partial u}{\partial t} + \frac{\partial}{\partial x}(F(x, t) \cdot u(x, t)) - \frac{1}{2} \frac{\partial^2}{\partial x^2}(b \cdot u(x, t)) = 0 \\ u(x, 0) = u_{\text{start}} \\ u(0, t) = u_0(t) \\ u(L, t) = u_L(t) \end{cases} \quad (41.1)$$

In parabolic equation of the system (41.1), the desired function $u(x, t)$ describes the number of households with savings in the range from x to $x + \Delta x$ ($x \in [0, L]$), b is the diffusion of the Wiener process that models the system's uncertainty, $F(x, t)$ is the speed function of money change.

To estimate the model parameters, we used official statistical data of the Perm region for the period 2003–2019, also survey data, including the Russian monitoring of economic situation and population health HSE (RLMS HSE) [13], an analytical report “Russia’s Middle class” by Institute of sociology of the Russian Academy of Sciences [14], the surveys by VCIOM (Russian Public Opinion Research Center) [15], surveys by Levada-center [16], expert evaluation (according methodology Chernavsky [6]). Next, the optimization problem was set and consisted in finding such a law of change the share of non-savers (a control parameter) $upr = u(0, t)$, which would ensure the maximum approximation of the savings distribution to a predetermined target distribution $u^*(x, t)$:

$$\int_0^\tau \int_0^L (u(x, t) - u^*(x, t))^2 dx dt + \alpha \int_0^\tau |upr(t)|^2 dt \rightarrow \min,$$

where α is a positive control parameter.

Based on the modified Lagrange principle [17], the necessary conditions for the optimization problem were formulated as a system of differential equations with respect to the desired function $u(x, t)$ and the conjugate state function $p(x, t)$:

$$\begin{cases} \frac{\partial u}{\partial t} = -\frac{\partial(F(x) \cdot u)}{\partial x} + \frac{b}{2} \frac{\partial^2 u}{\partial x^2} + f(x, t), \\ u|_{t=0} = u_{\text{start}}, u|_{x=0} = -\left(\frac{b}{2\alpha} \frac{\partial p}{\partial x}\right)|_{x=0}, u|_{x=L} = u_L, \\ \frac{\partial p}{\partial t} + F(x) \frac{\partial p}{\partial x} + \frac{b}{2} \frac{\partial^2 p}{\partial x^2} = u(x, t) - u^*(x, t), \\ p|_{t=\tau} = 0, p|_{x=0} = 0, p|_{x=L} = 0. \end{cases} \quad (41.2)$$

The optimal law of reducing the share of non-savers was determined by the formula

$$upr_{opt}(t) = -\left(\frac{b}{2\alpha} \frac{\partial p}{\partial x}\right)|_{x=0} \quad (41.3)$$

Numerical model calculations were performed using Comsol Multiphysics.

Next, a correlation and regression analysis was performed in MS Excel, which allows us to quantify the relationship of the share of non-savers with the factors of

the socio-economic environment for the case of the Perm region. For this purpose, we used data from official statistics of the region [18].

41.6 Findings

Let us describe the results obtained by calculating models for the middle class of the Perm region. The mathematical model (1) describing the distribution of households by savings was numerically calculated and the distribution of the middle class of the Perm region by savings at the end of 2018 was found, which is shown in Fig. 41.1a.

We considered a conservative version of the region's development, according to which the share of non-savers should be 40% by 2023, while the distribution curve will flatten and the spread of average monthly savings will widen: 0.0.3.8 subsistence minimums (Fig. 41.1a). The optimal law of reducing the share of non-savers within the middle class in the Perm region, calculated using the Formula (41.3), is presented in Fig. 41.1b. In this case, the savings curve is really close to the target, as it is shown in Fig. 41.1a.

Since the main determinant of savings is income, we have constructed an equation of linear regression of the share of non-savers from the average monthly income in the middle class of the Perm region. The inversely proportional dependence of the share of non-savers on the average monthly income (Fig. 41.2b) allows us to calculate what the growth of the average monthly income in the middle class should be over time (Fig. 41.2b) by the end of 2023 year, the target of the average monthly income in the middle class should increase to 119,000 rubles.

Since income is a reflection of the economic development and growth of the region, the key measure of which is the value of the gross regional product produced, we have built a model of linear regression of average GRP income per capita. Based on the established direct-proportional dependence of average income from GRP per

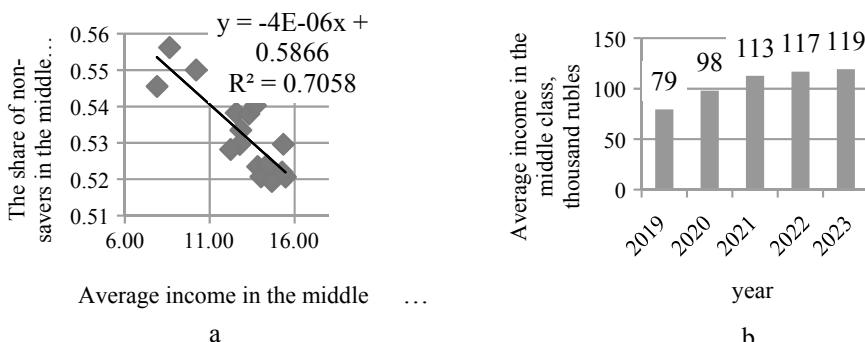


Fig. 41.2 **a** Linear regression of the share of non-savers from the average monthly income in the middle class; **b** Average monthly income target growth in the middle class over time

capita, shown in Fig. 41.3a, we calculated the target for GRP growth per capita for 2019–2023 (see in Fig. 41.3b).

In turn, the growth of regional GRP is provided by investment, as evidenced by the regression equation in Fig. 41.4a.

Thus, based on the obtained dependencies, the planned target for the level of investment for 2019–2023 is calculated (Fig. 41.4b), which, through its influence on the economic system of the region as a whole, will lead to a decrease in the share of non-savers to 40% by the end of 2023.

In the structure of investment volume in the Perm region, the main part is accounted for by investments of organizations, whereas investments in the household sector (including deposits) are insignificant and account for about 10% (for 2009–2018), and the share of investment products in their volume is only 3% [19]. This indicates

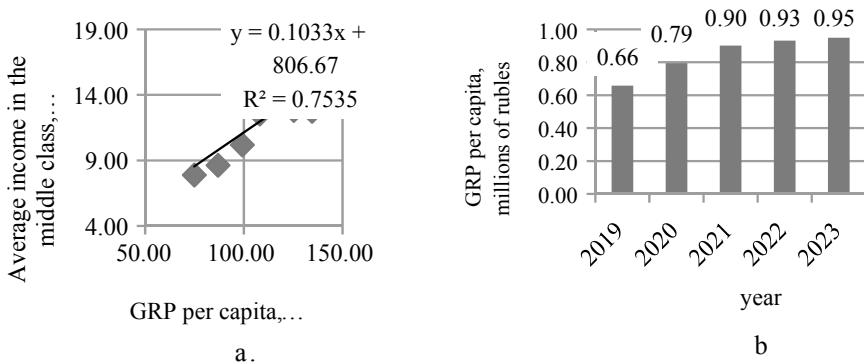


Fig. 41.3 a Linear regression of income from GRP per capita; b GRP per capita target growth over time

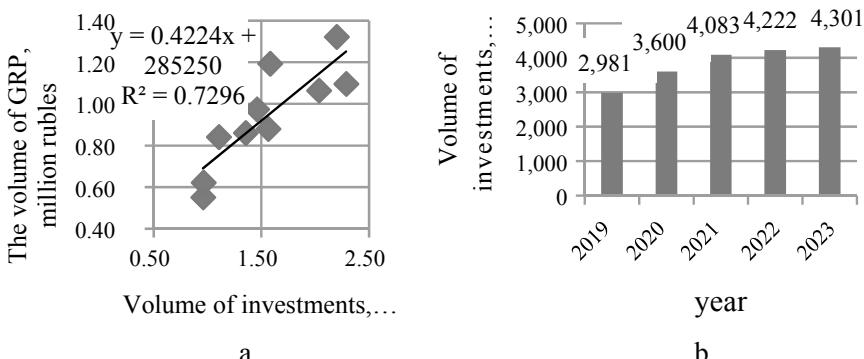


Fig. 41.4 a Linear regression of the volume of GRP from the investment volume; b target investment volume growth over time

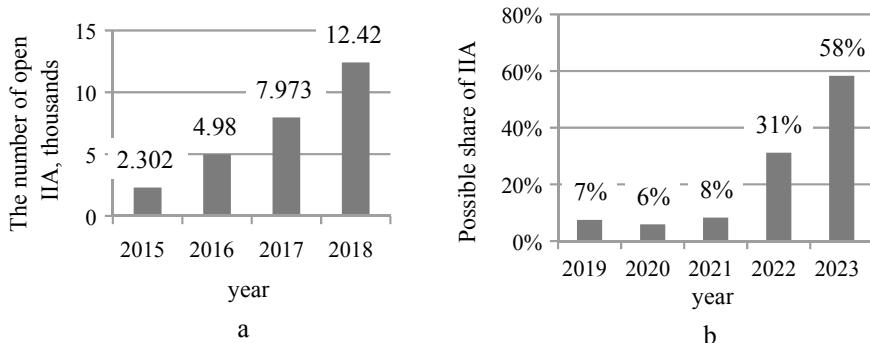


Fig. 41.5 **a** Number of open IIA accounts in the Perm region; **b** Possible share of IIA accounts in the required increase in household investment

the immature and unstable state of the financial market of the Perm region and Russia as a whole. However, if we consider the investment products presented on the Russian market, the only investment instrument that has been successful in recent years and attracts many private investors is the individual investment account (IIA). It started functioning on 01.01.2015, and it was created on the basis of the world experience of stimulating investment activity of citizens (first of all, there are IRA accounts in the USA, ISA in the UK, etc.). The advantage that an investor gets when opening an IIA is the possibility of receiving a tax deduction from the state, which allows compensating for the risks of unstable markets and Amateur mistakes. The dynamics of opening IIA accounts in the Perm region is shown in Fig. 41.5 [18]. Almost half of all IIA are opened as the first brokerage account, i.e., they serve as an effective means of attracting new investors.

Thus, by opening new IIA, it is possible to partially ensure the planned increase in investment, shown in Fig. 41.4b. taking into account the extrapolation of the rate of opening of IIA, the possible share of IIA in the necessary increase in investment in the Perm region is calculated and presented in Fig. 41.5b. However, in order for the share of non-savers to fall to 40%, as the above calculations show, one IIA tool to attract private investors is not enough, it is necessary to develop various new mechanisms within the framework of the policy of stimulating savings: for example, to extend the IIA mechanism to target accounts (in particular, pension and other types of goals), to develop pension schemes. In fairness, we note that the work in this direction is being carried out correctly: In 2021, it is planned to introduce a guaranteed pension plan.

At the same time, it should be borne in mind that in the world experience, tax incentives are the most common type of financial incentives for investment activities of households, which increase the attractiveness of investments by increasing their profitability. In our opinion, the following proposals for the development of the tax incentive system in Russia and its regions are appropriate:

1. expand the range of investment products subject to tax deductions;

2. Lower the personal income tax rate
 - on income from dividends on securities;
 - on the amount of contributions under voluntary life insurance contracts;
 - on the amount of contributions to non-state pension funds;
3. Establish a direct dependence of the tax benefit amount on the investment period;

Another important characteristic of investments, in addition to profitability, is their riskiness. To increase the involvement of households in the investment process, it is necessary to reduce the level of investment risk. To solve this problem, the priority task in Russia is to develop a system of insurance and protection of investors' rights for the non-banking sector (the banking sector in Russia has a Deposit insurance system since 2004) [20]. Such compensation systems operate in many countries. Taking into account the world experience, this practice should be adopted and mastered in Russia.

41.7 Conclusion

In this study, new regularities of the control actions influence on the savings of middle-class households in the Perm region were obtained. The results of calculating the targets of the conservative regional development plan were presented: the optimal law of reducing non-savers over time and important indicators of the economic environment of the region (average income, gross regional product output, investment volume). Recommendations for implementing the policy of stimulating household savings were given.

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Chapter 42

Analysis of Factors Contributing to the Formal Self-employment Development in the Context of Digitalization



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Abstract The purpose of the study is to analyse the influence of unemployment, education and Internet subscriptions on the level of official self-employment as a form of entrepreneurial activity in the era of digital production. The authors applied a method of fixed-effects panel analysis to investigate the influence of studied factors on the dynamics of own-account workers. The dataset covers statistics of 36 OECD countries with sustainable development for 2000–2019. The study revealed that the level of compulsory education, as well as fixed broadband Internet subscriptions, is of the most significant importance for the development of official self-employment. Also, we discovered an inverse relationship between the growth of own-account workers and the unemployment rate among people with intermediate education. The results of the analysis allow to identify the significance of the factors studied in the development of formal self-employment, to recognize trends in the self-employment development, and to formulate a policy for managing official self-employment taking into account relevant factors. The presented study empirically promotes knowledge about the role of education, unemployment, the Internet subscriptions in official self-employment development, as a form of entrepreneurial activity, and as an alternative to regular employment.

42.1 Introduction

42.1.1 A Subsection Sample

At present, one of the significant problems of socio-economic development is the provision of employment for the entire labour force. Employment in a

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market economy usually provided by hiring a workforce, less commonly by self-employment. Self-employment can be officially registered, and then it can be considered as a form of entrepreneurship, and not registered, i.e. informal. In this case, it functions as a type of informal economy. According to Tarnawa [1–19], self-employment can be seen as formal and non-formal employment, as well as secondary employment. Self-employment in a digital economy takes on a new role when machines and artificial intelligence replaces living labour. The greatest successes in the development of official self-employment have been achieved by the Organisation for Economic Co-operation and Development countries. This experience formed the basis of this study of the formal self-employment development factors in the context of digitalization.

In the era of scientific and technological progress, self-employment gains new characteristics and acquires special significance. Self-employment can be applied in various sectors of the economy, producing different types of goods and services, including unique ones. The diversity and heterogeneity of self-employment have been the subject of many studies, such as the Centre for Research on Self-Employment [7]. According to Constant and Shachmurove [8], self-employment may be used due to the lack of the possibility of formal employment, the desire to express oneself, the ability to receive a higher income for labour, the reluctance to work “for somebody else” and many other reasons.

The presented study aims to determine the significance of such socially important factors as unemployment, the level of education and Internet access for the official self-employment development as a form of entrepreneurship in the era of digital production. For this, the authors formulated the following tasks: to examine existing approaches to determining the nature and content of the category of self-employment; to determine the factors affecting the level of official self-employment in the transition to digital production; to select and justify the criteria for selecting countries for analysis and assessment of the impact of socio-economic factors on the development of official self-employment; to analyse the influence of some factors on the development of official self-employment.

The paper is structured as follows: the first section describes and analyses previous studies of the self-employment category and factors influencing its development. Section 2 includes the methodological aspects of our study, a description of the variables used and the applied model of econometric analysis. Section 3 contains the results of econometric analysis and investigates the opportunities for the official self-employment development in different countries. In conclusion, the main findings of the study are summarized, and possible further stages of development of this research are outlined.

42.2 Previous Research Review

Self-employment, as an activity, has a long history. Furthermore, as a type of entrepreneurial activity, it has been relatively well studied, including various methods

for assessing entrepreneurship and self-employment as noted by Henrekson and Sanandaji [14]. Some researchers like Levi [18] consider self-employment as specific complex relations between an employee and an employer, including entrepreneurs who are equal partners. Others, such as Constant and Zimmermann [9], consider self-employment as a forced way out of the unemployment situation and an attractive option during the downturn phase of the business cycle. However, we do not consider self-employment as a necessary measure of seeking income, but as an alternative to regular employment and as a type of entrepreneurial activity. We are primarily interested in what factors contribute to the development of official self-employment. We also took into account that not all countries have developed official self-employment that has state registration. Aistov et al. [1] as well as Belitski et al. [3] note that not all own-account workers are eager to register, and there are some reasons, such as the obligation to pay taxes, provide reports, obtain a business licence, etc. Böheim and Mühlberger [6] remark that self-employment is a more flexible form of employment that is adaptable to changes in the consumer market. Therefore, the same person can carry out several activities, both simultaneously and depending on changing market conditions. If we get away from the conditions of compulsory registration of activities, then in general terms self-employment can be considered as activities performed by one or several persons participating in the production of goods and services on equal conditions.

In previous studies, little attention was paid to socio-economic factors determining the level of official self-employment, and not the informal one. For now, we did not take into account the conditions that have political, legal and economic aspects, which have their specifics for each country. However, we consider official self-employment as an alternative to regular employment in the context of digitalization. As already noted, people choose self-employment for a variety of reasons. According to Feldman and Volino's [12] survey conducted in the USA, people chose self-employment because independence was essential for them and self-employment implies escaping from regular company restrictions.

Benz and Frey [4], as well as Dawson et al. [10], named such factors of self-employment as self-realisation, financial success, innovations. Studying the income generation processes of own-account workers and ordinary employees among German citizens and migrants, Constant and Shachmurove [8] identify the following significant factors for choosing self-employment as a type of entrepreneurial activity that relates to the characteristics of human capital: school education, state of health, age, marital status, children, wealth, citizenship. These results show that migrants are launching self-employment in order to avoid unemployment. Following the report statistics, self-employment seems to be a practical choice for all groups of the population when the control over working conditions and the labour market is carried out. Iglesias et al. [15] noted that people with intermediate education receive the most significant benefits from self-employment. In most cases, according to Fritsch et al. [13], the income of own-account workers is higher than the benefits of comparable employed professionals, although this trend is not supported in the countries of the Mediterranean and the former socialist bloc.

A peculiarity of the modern world is the development of automated and robotic labour, based on the progress of digital technologies and communication facilities. Under the influence of these processes, manual labour is being replaced by machine one. The creation of advanced artificial intelligence in the future will lead to the replacement of living manual labour and, probably, a significant part of living intellectual work by machines and artificial intelligence (AI) as noted by Jarrahi [17]. According to the law of returns to scale, cost recovery for the creation of robotic and AI production will be achieved with mass production or through monopoly power. Mass production is characterized by a high degree of standardization of the manufactured product, while a significant part of the population requires products with unique characteristics. Therefore, the alternative to mass-produced products can be goods and services produced by small business or own-account worker. One of the features of self-employed labour is a quick response to changing market conditions. Thus, self-employment in the context of the development of digital production is able to present an alternative competitive product not only in the consumer market but can be an alternative to employment in the regular labour market.

As Denderski and Sniekers [11] reported what technological development requires new knowledge and has vast potential for use in small business and for self-employed workers, in our analysis, we put forward the following hypotheses: H1: The development of the service sector has a significant impact on the growth of own-account workers; H2: The development of Internet technology increases the growth of own-account workers; H3: The dynamics of self-employment depends on the level of education of the population [20].

42.3 Methodology and Data Used

Based on the objectives of the study, the authors selected for analysis variables of employment, unemployment, education and service sector presented in Table 42.1. To study the impact of these variables on the growth of own-account workers, the authors used data from 36 member countries of the Organization for Economic Cooperation and Development (OECD) for the period from 2000 to 2019.

To prevent multicollinearity, we carried out a pairwise correlation analysis. Hereupon we excluded labour force variables from the econometric model since the correlation coefficient with unemployment rate was 0.895, and the variable service imports, since the correlation coefficient with value-added services was 0.822. As a result, the obtained country data demonstrate similar characteristics about the development of self-employment, which should give a reasonably valid result of econometric studies. The regression analysis was performed across the pool of countries using 596 observations.

At the next step, we run the panel data analysis. Own-account workers is the dependent variable, and variables 3–12 are explanatory variables. Panel testing through the

Table 42.1 Variables used in analysis

No.	Full name	Source
1	Own-account workers (thousands)	International Labour Organization, [16]
2	Labour force 15+ (thousands)	International Labour Organization, [16]
3	Unemployment (thousands)	International Labour Organization, [16]
4	Youth not in employment, education or training (thousands)	International Labour Organization, [16]
5	Fixed broadband subscriptions (per 100 people)	World Bank, [20]
6	Mobile cellular subscriptions (per 100 people)	World Bank, [20]
7	Time required to start a business (days)	World Bank, [20]
8	Compulsory education, duration (years)	World Bank, [20]
9	Unemployment with basic education (% of total labour force with advanced education)	World Bank, [20]
10	Unemployment with intermediate education (% of total labour force with advanced education)	World Bank, [20]
11	Unemployment with advanced education (% of total labour force with advanced education)	World Bank, [20]
12	Services, value added (current US\$)	World Bank, [20]
13	Service imports (BoP, current US\$)	World Bank, [20]

Hausman and Breush–Pagan tests showed the effectiveness of estimation with fixed-effects model. Diagnostics of panel variables for unit root, performed by Levin-Lin-Chu tests for balanced variables and Fisher-type unit root for less balanced variables (Compulsory education and Unemployment with intermediate education), showed the stationarity of time series. Distribution of free Wald test for heteroskedasticity showed the presence of heteroskedasticity in the model. As a result, PCSE standard errors, proposed by Beck and Katz [2], were used in the model. The robust test for differing group intercepts p-value 7.27863e–158 allows us to reject the hypothesis that the groups have a common intercept. Joint test on named regressor p-value 8.54289e–14 allows rejecting the hypothesis that all the slope coefficients are zero. The results or estimation presented in the next part of the paper.

42.4 Empirical Results and Discussion

The results of the econometric study presented in Table 42.2 allowed us to evaluate the significance of the influence of the selected factors on the own-account workers variable.

Table 42.2 Impact of variables studied on own-account workers variable

	Coefficient	Std. error	t-ratio	p-value
Constant	1202.64	123.002	9.777	1.52e-11
Fixed broadband subscriptions	4.41466	0.926942	4.763	3.28e-05
Mobile cellular subscriptions	-0.489840	0.453690	-1.080	0.2877
Compulsory education, duration	28.9206	11.0836	2.609	0.0133
Unemployment with intermediate education	-6.65308	1.63907	-4.059	0.0003

The fixed broadband subscription is significant at the 1% level. The positive impact of fixed broadband subscriptions on the own-account workers variable shows the increasing impact of Internet use by own-account workers. So the addition of 1 broadband Internet subscription per 100 people as a whole increases self-employment by 4.41466 thousands. The insignificant impact of mobile Internet subscriptions for a dependent variable shows that at the moment, the development of mobile communications does not yet have a notable influence on self-employment, in contrast to the more traditional fixed broadband subscriptions. Significant at the 5% level is the compulsory education variable. The development of self-employment as an independent sphere of activity is positively influenced by the minimum required level of education. Without this minimum, it is challenging to conduct their own business, register and maintain reports on the activities of formal self-employed.

The percentage of unemployed with advanced education and the rate of unemployed with basic education were not statistically significant, while the percentage of unemployed with intermediate education was significant at the 1% level. It shows that a considerable part of the self-employed is people with intermediate education. Also, there is an inverse relationship between unemployment data and an increase in the number of own-account workers. It confirms that the increase in the self-employed is associated with a decrease in unemployment of people with intermediate education and, conversely, an increase in the number of unemployed with intermediate education by 1% is related to a reduction in the growth of self-employed by -6.65308 thousands.

Based on the panel regression, the services, value-added variable turned out to be insignificant, which contradicts the hypothesis about the significance of service sector growth for the development of formal self-employment. Obviously, at the moment, it can be suggested that the official registration of the self-employed is not sufficiently developed in the service sector. The number of days required to start a business was also not significant. It can be explained that the business organization for the own-account worker is quite simplified and does not require a lengthy registration procedure. The lack of statistical significance of overall unemployment impact on the own-account workers' development indicates that, on the one hand, the self-employed person does not belong to the category of unemployed and is officially registered as engaged in economic activity. Also, this category is more reliable for job preservation. The statistical insignificance of the youth not in employment, education

or training variable shows that this category of the population, if it is engaged in any activity, then this activity is not officially registered.

In general, the econometric model showed a relatively good predictive ability. A significant deviation of the actual values from the predicted ones was observed in Japan, Republic of Korea and New Zealand, which is explained because of the significant gaps in the variables of unemployment with basic education, unemployment with intermediate education and unemployment with advanced education.

42.5 Conclusion

The study was supposed to confirm or refute the three hypotheses: the development of the service sector has a significant impact on the growth of own-account workers; the development of Internet technology increases the growth of own-account workers; the dynamics of self-employment depends on the level of education of the population.

The study did not confirm the hypothesis that the phenomenon of self-employment is associated with the service sector growth. It contradicts Bogenhold and Fachinger [5] research where self-employment is highly linked with service sector development. Enough formal own-account workers are involved in the production process. Hypothesis 2 was partially confirmed: the positive effect of fixed broadband subscription on the growth of formal self-employment was proved. Hypothesis 3 was confirmed: the positive effect of compulsory education on self-employment was shown, a connection was established between the own-account workers variable and the level of unemployment with an intermediate level of education. Thus, in the context of digitalization, self-employment tends to grow as an alternative form of regular employment.

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Chapter 43

On Method for Calculating Integrated Structures Effectiveness



Yu. V. Mishin

Abstract The purpose of this research is to substantiate and develop methodological approaches for evaluating the effectiveness of organizational projects for the formation of integrated corporate structures. The relevance of the topic of this article is explained by the fact that currently no existing “accurate” methods for assessing the synergistic effect are available, which does not allow for performing calculations with a sufficient degree of accuracy. In this paper, based on a deep and detailed analysis on the qualitative (content) and quantitative (formalized) level of existing methodological approaches, a system of indicators for the effectiveness of integration processes is substantiated, procedures and algorithms for their calculations are developed, and a mechanism for selecting organizational projects is proposed. The methodological basis of the paper is the dialectical method of scientific knowledge, as well as systemic and institutional approaches. In the course of its writing, the following methods were used: mathematical induction and deduction, analysis and synthesis, as well as comparison and analogy. The information and methodological foundation of this article is based on foreign and domestic sources on the problems of economic integration and corporate management. The proposed mechanisms, procedures and algorithms for calculating both local and integral criteria can be used by government authorities, companies (corporations, conglomerates, holdings, etc.) and research organizations in the process of developing organizational projects for the formation and development of an integrated structure.

43.1 Introduction

Today, the economic development and international competitiveness of any state are ultimately determined by the effectiveness of the integrated corporate structures operating on its territory.

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Therefore, one of the conditions for solving this problem is to use the advantages of corporate integration in accordance with state priorities in the development of the industry structure and specific industry complexes.

The main disadvantages of organizational projects for forming integrated structures, which to a certain extent hinder their development, first of all, include poorly elaborated concepts and foundations for corporation building, issues related to the justification of the corporation structure, forms and mechanisms of integration.

This situation is largely caused by insufficient methodological support for the organizational design of corporate structures. At the same time, issues related to the assessment of the feasibility of the integration and development of special criteria that make provision for the selection of optimal options to form corporate structures are the least researched, poorly justified and need of additional study.

In this regard, this paper presents methodological recommendations developed by the author on the economic justification of organizational forms of integration of economic entities based on the formation of an assessment of the effectiveness (synergetic effect) of projects for corporate structures' formation.

43.2 Methodology

The selection of an organizational project option for building an integrated structure is based on the results of a comprehensive and in-intensity analysis at the qualitative (content) and quantitative (formalized) levels, as well as on substantive calculations of the criteria proposed by the author: characteristics of the intensity and effectiveness of integration processes.

43.3 Review of Literature and Research

The Russian and foreign literature on corporate management presents a significant number of methodological approaches to assessing the synergistic effect of integration [1–12].

Avdonina [1] offers a methodology for quantitative assessment of cluster performance based on the calculations of market value indicators of its member companies. As a result of a detailed and in-intensity analysis of strengths and weaknesses of existing methods (expensive, analog and profitable), the author comes to a conclusion that the most accurate quantitative evaluation can be obtained on the basis of the income method of the evaluation of companies' price. The sources of income in this case are the net profit and depreciation received as a result of investment project implementation. The quantitative assessment of the synergistic effect of the investment project implementation, or the weighted average cost of the capital, is calculated based on the opportunity costs of all sources of capital, weighted by the relative contribution of each participant to the total capital of the company.

Orekhov [6] suggests calculating the synergistic effect of absorption by discounting cash flows. In this case, their increment is determined by subtracting from the total income the amount of incremental costs, tax deductions and additional investments in working capital and fixed assets.

Khramova [13], in turn, identifies the following five elements as the main components of the synergistic effect: increasing the supply of material resources, optimizing production in business segments, expanding the range of products, reducing transaction costs in business segments and the integrated structure as a whole. However, it seems somewhat far-fetched to share the author's idea of simultaneously reducing transaction costs, both for business segments and the company as a whole. Still, the reduction of transaction costs by eliminating the duplication and centralization of functions will occur primarily at the lower level of the company's management, namely, business segments. Moreover, the parent company does not yet exist, it is only being designed.

Uzbekova et al. [7] propose a methodological approach to determining the synergistic effect, which consists of "comparing the resulting indicators of the cluster activity and local indicators of a separate group of enterprises." The "algorithm for evaluating the synergistic effect" presented in the paper consists of five stages: selection of the resulting evaluation indicator, its calculation for the local as a whole and a group of objects, selection of the forecasting method, calculation of the resulting indicators, comparison of the calculated indicators and drawing conclusions based on the developed scales and criteria.

At the same time, they suggest using as criteria both indicators of "financial, social, scientific and innovative positive effect (average growth rate of revenue from sales of products, payroll, investments in fixed assets, etc.) and negative (overdue accounts payable, wage arrears, risks and losses)."

This approach has a number of significant drawbacks. First, the proposed system of evaluation criteria, to put it mildly, is not properly justified, since it lacks a number of important indicators of the efficiency of production and economic activities of enterprises, organizations and corporate structures, namely, profit and cost of production.

Secondly, there are no recommendations on methods for calculating the resulting indicators, choosing forecasting methods, comparing calculated indicators and forming an assessment of the synergistic effect. Instead, the authors provide links to two of their own research works: the abstract of the PhD thesis by Ms. A. Uzbekova and the scientific article by Ms. Uzbekova and Mr. K. Kolesov and Mr. N. Shibanov.

It seems that they have already solved all these issues previously. Then, what was behind the need of making such a "non-specific, generic article"? It turns out the article has been written for the sake of publication only.

Thirdly, the authors declared the use of financial, social, scientific and innovative indicators. With some assumption and under a closer examination, using a magnifying glass, not a microscope, you can find indicators of only two groups: financial and social. Where are the other indicators of other groups?

The views of researchers are summarized in Table 43.1. The information provided in it clearly shows that the majority of scientists: 90% (9 out of 10) give priority to

Table 43.1 Main components of the synergy effect when forming corporate structures

Name	Researches	Ansoft I	The website “quality management”	Orekhov	Life-prog. Ru website	Khasanov	Chramova	Kozenkova et al.	Uzbekova et al.	Galperin et al.	Avdoninann
1	2	3	4	5	6	7	8	9	10	11	
Indicators of the economic effect of asset consolidation											
Savings caused by the scale of the production	+	+	+	+	+	+	+	+	+	+	
Reducing overhead costs	+		+	+	+	-	+			+	
Savings on transaction costs	+	+		+	+	+	+			+	
Better sales	+	+	+	+	+	+	+	+	+	-	
Wage fund		-			-		+			-	
Overdue accounts payable		-			-		+			-	
Overdue salary arrears		-			-		+			-	
Lower production risks		-				+				+	

(continued)

Table 43.1 (continued)

Name	Researches	Ansoft I	The website “quality management”	Orekhov	Life-prog. Ru website	Khasanov	Chramova	Kozenkova	Uzbekova et al.	Galperin et al.	Avdoninann
1	2	3	4	5	6	7	8	9	10	11	
Reducing market risks		–			+				+		
The reduction of financial risks			+			+			+		
Reducing costs by eliminating duplication of management functions and production	–	+	–	–					+		

(continued)

Table 43.1 (continued)

Name	Researches	Ansoft I	The website “quality management”	Orekhov	Life-prog. Ru website	Khasanov	Chramova	Kozenkova	Uzbekova et al.	Galperin et al.	Avdoninann
1	2	3	4	5	6	7	8	9	10	11	
Use of innovative advanced integrated structure technologies by its participants	–	+	–	–	–	–	–	–	+	+	
Increasing market influence	+		+	+	+	+	+	+	+	+	
Tax optimization	–		+	+	–	–	–	–	–	+	
Getting state support	–		–	+	–	–	–	–	–	–	
Growth of internal and external investment opportunities	+	+	+	+	–	–	+	+	+	+	+ g

(continued)

Table 43.1 (continued)

Name	Researches	Ansoft I	The website “quality management”	Orekhov	Life-prog. Ru website	Khasanov	Chramova	Kozenkova	Uzbekova et al.	Galperin et al.	Avdoninann
1	2	3	4	5	6	7	8	9	10	11	
Increase in R&D and innovation											
Indicators of the integration processes intensity											
Internal cooperation coefficient	+					–		+		+	
Diversification coefficient	–										
Coefficient of integration in marketing	+				–					+	

(continued)

Table 43.1 (continued)

Name	Researches	Ansoft I	The website “quality management”	Orekhov Life-prog. Ru website	Khasanov	Chramova	Kozenkova	Uzbekova et al.	Galperin et al.	Avdoninann
1	2	3	4	5	6	7	8	9	10	11
Coefficient of integration in investments	+									+
Coefficient of integration into innovation activity	-									+
Capacity utilization rate for internal needs of the integrated structure	+				-		+		+	-
Internal integration coefficient	+				-		+		+	-

(continued)

Table 43.1 (continued)

Name	Researches									
	Ansoft I	The website “quality management”	Orekhov	Life-prog. Ru website	Khasanov	Chranova	Kozenkova et al.	Uzbekova	Galperin et al.	Avdoninann
1	2	3	4	5	6	7	8	9	10	11
Overall controllability ratio	—	—	—	—	—	+	+	+	—	—
Proportion of the costs of the management company in total cost of management	—	—	—	—	—	+	+	+	—	—
Share of R&D performed by research institutes and design bureaus for internal needs	—	—	—	—	+	+	+	+	—	—

(continued)

Table 43.1 (continued)

Name	Researches	Ansoft 1	The website “quality management”	Orekhov Life-prog. Ru website	Khasanov Life-prog. Ru website	Chernova Kozenkova Uzbekova et al.	Galperin et al.	Avdoninann
1	Share of products produced on the basis of the innovations of their own research institutes and design bureaus in the total production of the integrated structure	—	3	4	5	6	7	8
	Participation of the integrated structure in the authorized capital of research institutes and design bureaus	—	—	—	—	+	+	—

the growth of product sales. The next priority is given to increase in internal and external investment opportunities: 80% (8 out of 10), followed by savings caused by the scale and reduced transaction costs of—70% (7 out of 10). Last on the list is the factor of reducing overhead costs—60% (6 out of 10).

Meanwhile, most of these parameters, both explicitly and implicitly, are associated with one of the generalizing indicators of the production and economic activity effectiveness, namely, the profit from the sale of marketable products. These include: the growth of internal and external investment opportunities and sales, the amount of savings from production scaling up, the amount of savings in transaction costs, the amount of operational savings due to the elimination of duplication of management functions and their centralization in the parent company of the integrated structure.

One should also pay attention to the proximity in the main link of the constituent elements of “overhead” and “transaction costs.”

In fact, in our opinion, at the level of enterprises and corporate structures, transaction costs are transformed into overhead costs. The approximate nomenclature of overhead items is taken from the “standard guidelines for planning, accounting and calculating the cost of scientific and technical products” of 15.06.94 No. OP-22-2-46 approved by the Ministry of Science of the Russian Federation. The degree of their compliance is shown in Table 43.2.

Among other features, most authors (except for Mr. I. Ansoff, Ms. S. Avdonina, Mr. S. Galperin, and Ms. T. Kozenkova) focus only on the first group of criteria—the indicators of economic effect obtained from asset consolidation—the synergistic effect, while completely ignoring the problem of the intensity (closeness) of interaction between the participants of an integrated structure.

43.4 Research Results

The sequence of steps and calculations in the context of the main stages and sub-stages for assessing the synergistic effect of forming an integrated structure is shown in Fig. 43.1.

At the first stage, the options for establishing the nomenclature and product range in physical terms are determined for economic entities-production participants of a corporate structure.

At the second stage, an objective assessment of the degree of feasibility of the annual production program is made in terms of the level of utilization of production potential equipment and labor.

Sub-stage 2.1. Definition of a production plan for each product (within the minimum and maximum values) in physical terms. At the same time, the upper limits (maximum) are set based on their marketing assessment of demand for this product (maximum capacity utilization: 75–90%), and restrictions on output from above: the minimum possible volume of production, non-profit output—the value of its break-even output, a so-called break-even point, as well as the actual values of the market share, and the desire to keep this share.

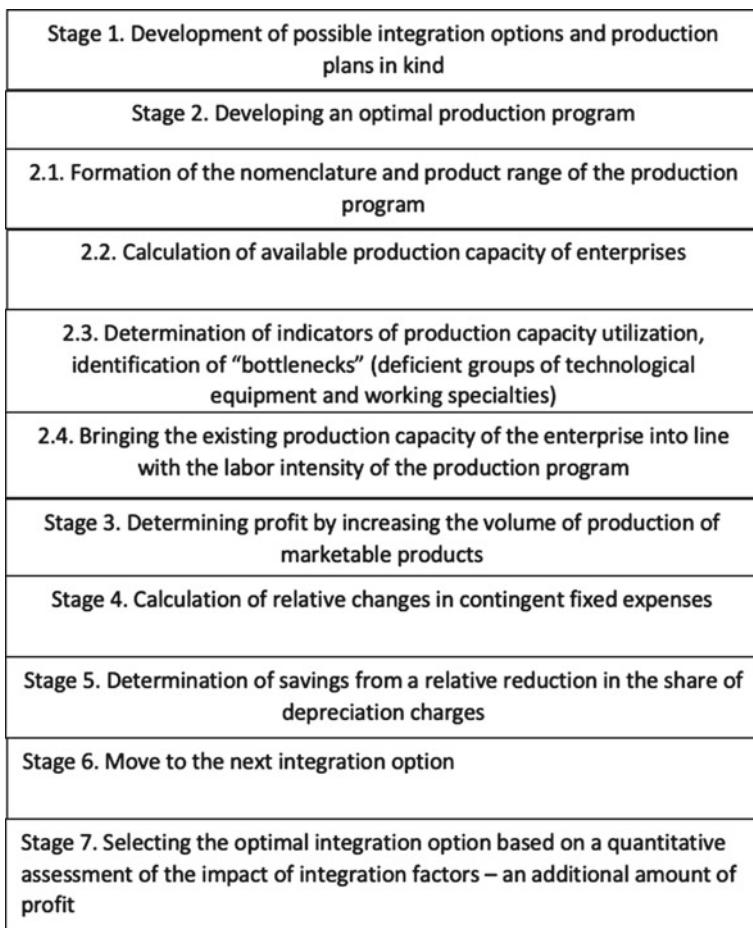
Table 43.2 Degree of compliance of transaction costs with overhead costs of enterprises

No.	Cost components	Items	Characteristics and content
1	2	3	4
1	Search for information	Costs for scientific and technical information and product certification	Expenditures for the wages of employees of the scientific and technical library, information and patent licensing services Purchase of books or periodicals, patent and technical information and literature on inventions, maintenance of library inventory and library equipment, scientific and bibliographic work, patent and information fund acquisition and processing of the fund, other expenses Payment for mandatory product certification Expenditures for maintenance of and servicing computer centers and computer equipment, expenditures for related works (including software support)
2	Negotiations	Cost of labor	Labor costs for employees of the management apparatus
		Representation expenses	Expenses of the organization for receiving and servicing representatives of other enterprises and organizations (including foreign ones) who arrived for negotiations in order to maintain cooperation
		Miscellaneous	Expenses for maintenance and servicing of communication centers, telephone and radio stations, postal and telegraph expenses Payment for consulting, information, legal and audit services

(continued)

Table 43.2 (continued)

No.	Cost components	Items	Characteristics and content
3	Measurements	Maintenance and repair of buildings, facilities and equipment	Expenses for metrological support of equipment, payment for verification, certification and branding of test equipment devices, scales and other equipment
		The cost of labor	Labor costs for employees of the management apparatus
4	Specifications and protection of property rights	The cost of labor	Labor costs for employees of the management apparatus

**Fig. 43.1** Sequence of steps to determine the synergistic effect

Next, the efficiency (profitability) indicators of the annual production program (E_m) of the m -th product are calculated:

$$E_m = \frac{(P_m - C_m)}{G_m} \cdot K_m$$

where:

- P_m unit price of the m -th product (thousand rubles);
- C_m production cost of the m -th product (thousand rubles);
- G_m production cost of the m -th product (thousand rubles);
- K_m annual production program of the m -th product (pieces);
- m product number.

When used as a criterion for the volume of production, the effectiveness of the production program for the production (E_m) of the m -th product is calculated using the following modified formula:

$$E_m = \frac{P_m}{G_m} \cdot K_m$$

Sub-stage 2.2. Calculation of the total time fund (F_i) of the i -th group of equipment (type of work) is determined by the following formula:

$$F_i = F_i^{\text{year}} * O_i * K_i^{\text{cm}}$$

where:

- F_i^{year} working time fund of the i -th group of technological equipment for the year (machine hours);
- O_i number of machines of the i -th group of technological equipment (pieces);
- K_i^{cm} planned coefficient of shift working arrangements of the i -th group of technological equipment (coefficient).

The operating time fund of the i -th group of equipment as a whole for the year is calculated as follows:

$$F_i^{\text{year}} = F_i^{\text{avail}} - F_i^{\text{serv}}$$

where:

- F_i^{avail} available time fund of the i -th group of technological equipment;
- F_i^{serv} regulated time fund for maintenance of the i -th group of equipment (repair, adjustment, changeover, etc.).

The available time reserve of the unit of the i -th group of equipment is determined by the following formula:

$$F_i^{\text{avail}} = n * c$$

where:

- n is the number of working days per year (days);
- c is the duration of the working day (hours).

Sub-stage 2.3. To calculate the capacity factors of the production potential, use the indicator of labor intensity for manufacturing the entire annual output of the j -th product for the i -th type of work (L_j^i):

$$L_j^i = \frac{l^j \cdot k_j}{k_j^o}$$

- l_j^i is the complexity of manufacturing the j -th product for the i -th type of work;
- k_j^o is the annual product release program of the j -th product (pieces);
- k_j^o is the coefficient of overworking by workers according to the norms for the i -th type of work.

A consistent comparison of the labor intensity of the production program T_j^i of products by type of work with the remaining time reserve of equipment groups F_i (for the first product with a common fund) allows one to determine the load for each type of work. If the remainder of the operating time fund of the i -th group of F_i equipment after inclusion in the product production plan has a negative value, then this group of equipment has an overload (“bottlenecks”), or on the contrary, underloading (excess).

Sub-stage 2.4. Expansion of the “bottlenecks” identified in the previous sub-stage is carried out primarily through organizational measures: the use of overtime, the redistribution of labor in the main and auxiliary production, increasing the shift rate of scarce groups of technological equipment, changing the product release program, etc.

Stage 3. Savings on conditionally fixed expenses due to increase in the volume of production of commercial products (E^{prod}) is determined by the following formula:

$$E^{\text{prod.}} = \Delta P \times R_s \div 100$$

where:

- R_s the amount of conditionally regular expenses in the corporate structure as a whole;
- ΔP growth rate of commodity products in the corporate structure in comparison with the total volume of production of commodity products of the participants of the corporate structure;

The growth rate of marketable products (ΔP), in turn, can be calculated using the following formula:

$$\Delta P = (P_0 - P_1) \div P_1 \times 100$$

where:

- P₀** the total volume of production of commodity products by the participants of the corporate structure (before its organization);
- P₁** consolidated volume of commodity production by the corporate structure as a whole.

Stage 4. Savings from eliminating duplication and centralization of management functions, as well as reducing management costs (**E_{manag}**) are calculated using the following formula:

$$E_{\text{manag}} = (F_0 \div P_0 - F_1 \div P_1) \times P_1$$

where:

- F₀** the total cost of maintaining the management apparatus by the participants of the corporate structure (before its establishment);
- F₁** costs for maintaining the management apparatus after its optimization in the corporate structure as a whole.

Stage 5. Savings due to a relative reduction in the share of depreciation charges (**E_{dep}**) are determined similarly to the indicator of savings in management expenses:

$$E_{\text{dep}} = (D_0 \div P_0 - D_1 \div P_1) \times P_1$$

where:

- D₀** the total amount of depreciation accrued by members of the corporate structure (before its establishment);
- D₁** the consolidated amount of depreciation charges for the corporate structure as a whole.

Stage 6. The calculation of the synergistic effect is made by comparing the amount of additional savings (profit) as a result of the implementation of the advantages of combining and joint activities with the amount of money required for the establishment of the integrated structure.

At the same time, for each integration option and the corporation participant, the total savings (synergy effect) (**S⁰_e**) are calculated by subtracting the cost results from the integration factor within the corporation:

$$S_e^0 = (E^{\text{prod}} + E_{\text{manag}} + E_{\text{dep}} - (C^{\text{ree.}} + I^0)) > 0$$

where:

- E_{prod}** savings from increase in sales due to the expansion of areas and types of activities;
- E_{manag}** reducing costs by eliminating duplication and centralization of functions performed, as well as reducing the cost of maintaining the management apparatus;
- C_{ree}** costs for technical re-equipment, reconstruction and expansion of existing production;
- I⁰** the amount of money required at the initial moment for the organization of the integrated structure.

The optimal option is considered to have the maximum value of S^0_e .

43.5 Conclusions

The practical significance lies in the possibility of applying the results of this research for practical calculations of evaluating the effectiveness of integration processes in the Russian industry.

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Chapter 44

Sales Increase via New Approaches to Motivation and Incentive Programs for Retail Staff



A. A. Dokukina and M. V. Zarudnaya

Abstract The paper discusses the problem of stimulating sales staff in the electronics retail industry. Factors influencing sales staff efficiency in the company are revealed. The case of Samsung Electronics Co., Ltd. is considered as an experience of audit of sales personnel's stimulation system aimed at development of motivational elements. The main findings are related to managerial decisions resulted in decrease in staff turnover rate, growth of sales volumes and effectiveness and sales personnel productivity. A program to stimulate sales staff in order to increase the company's sales is proposed.

44.1 Introduction

Modern organizations operate in fast developing and highly competitive environment which allows turning any advantage into a prerequisite for fostering the company's position in business. For example, companies strive to gain such kind of competitive advantage that would generate a larger market share. In order to increase revenue companies build up their sales volumes by hiring new employees, perfecting sales techniques or investing more in marketing. However, nowadays, many companies implement more flexible approaches to enhancing economic effect. Alongside with implementation of traditional approaches to increasing profit, companies analyze their own performance and focus on their internal resources determining their intangible constituents, self-development capacity and possibilities for higher staff involvement. Turning to personnel motivation as one of the company's priorities, businesses determine it as one of the major management vectors. This refers to companies operating in different areas of economy including the retail sector [1, 2].

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Topicality of the article is based on the fact that social and motivation aspects are becoming increasingly important and, in some cases, even crucial values in both public and business environments. Development of the retail sector, especially in case of high-tech products, proceeds gradually due to decrease in the length of a product lifecycle, new forms of interaction between sellers and consumers and tough competition. Thus, motivation and provision of incentives to salespeople can become the main tool to ensure effectiveness of production processes and improvement of the quality of services provided.

The article outlines the experience in developing a program aimed at boosting productivity of sales personnel working in the market of consumer electronics. The provided material is the result of a study of the influence of personnel on sales volumes and possibilities of motivational profile development. The main purpose is development of a complex program aimed at intangible aspects of enhancing staff productivity.

44.2 Theoretical Framework and Research Methods

The underlying theoretical framework of this research is based on publications of such authors as K. Cybulsky, E. A. Rodionova, T. O. Solomanidina. The publications used as fundamentals for this study are mostly devoted to specifics of retail industry and sales personnel; however, the conceptual issues regarding human resources management and labor productivity have been also carefully studied [3–6].

One of the theses which is investigated in the conducted research is that professional development of personnel, especially sales staff, allows the company to improve its potential that is reflected in economic efficiency.

Polling and in-depth interview were applied as methods of the field research. In the course of the research, the systematization method and comparative analysis of collected materials, connected with ways and types of staff motivation, as well as information about the company's performance, obtained from official information resources and available documents, including internal sources in Samsung Electronics Co., Ltd., were used [7–10].

Samsung Electronics Co., Ltd. as an object of the research was studied by means of activity-based costing (ABC) method which allows to consider an activity as a cost driver. An audit of the company's sales personnel motivation system was applied as a tool to assess the current level of staff involvement in the company development. The potential results of the proposed program are forecasted on the basis of sales profitability and expected turnover.

44.3 Results

44.3.1 *Motivation of Sales Personnel as a Basis to Increase Their Productivity and Sales Volumes*

Nowadays, issues of sales staff motivation are among the most debated aspects of a company's human resources strategy. The quality of sales staff performance impacts the effectiveness of not only a particular outlet, but also the company as a whole [11]. In order to encourage staff to be productive, an employer has to deal with a tough task of providing appropriate motivation and incentives to sales staff.

Obviously, development of staff motives for better performance will facilitate the effectiveness of a company's sales growth, thus increasing sales volumes and the company's profits.

It should be mentioned that profit and cost effectiveness are considered to be the major indicators of effective commodities sales in retail [12–14].

Traditionally, simple indicators, such as enhanced individual results of sales representatives versus the reported previous period, were considerate as a basis for results evaluation. Although sales volumes remain an important part of overall evaluation of sales staff productivity, modern companies tend to pay increasing attention to sales efficiency, individual productivity of each employee and the company's market share or the degree of the company's presence in a retail chain [3].

Sales staff have numerous opportunities to enhance their commercial effectiveness [1]. Segmentation of potential consumers and verification of them being prepared to purchase allow sales staff to concentrate entirely on valuable customers who are interested, at least potentially, in buying goods and services they are offered.

Effective time management enables sales staff to maximize the share of personal contacts (face-to-face contacts, customer calls) with customers over the working time which leads to potential sales growth [15].

Sales volumes and commercial costs can be compared within the framework of analysis and evaluation of a company's commercial effectiveness and cost recovery from staff performance. The effectiveness is evaluated on different levels within a company, with application of different analytical and diagnostic tools, such as consideration of costs and profits, gross income analysis and analysis of performance-related costs (ABC method) [3].

Evaluation of commercial staff productivity is often based on the analytical model of entrance/exit, which is a variant of costs and performance analysis [5]. The method facilitates in measuring the effectiveness of a company's sales and the share of costs allocated on sales staff development.

In accordance with the theoretical analysis and empirical research by E. A. Rodionova (conducted at the end of XX—beginning of XI centuries), a complex approach to solution of the problem of sales staff motivation was developed [4].

The approach is based on the fact that each company is unique. It means that when developing a motivation program, peculiarities of the company's corporate culture and motivational potential of sales personnel, results of staff capacity analysis and

job descriptions (and the correlation between the parameters) as well as distinguished demotivate factors should be considered.

The complex approach is especially effective in conditions of financial restrictions, as it enables a company to maximize the effectiveness of human resources [16].

Development of the complex system of motivation of sales personnel productivity can be divided in the following two stages:

1. Audit of the motivation system: analysis of the existing incentive system in the enterprise, development of an added value block of the system (evaluation of feasibility of motives conversion in the company, motivational potential of the company, evaluation of staff motivational profile, coordination of motivational potential of the company's sales staff, determination of motivational factors).
2. Development and implementation of a system of organizational, personnel-focused and socio-psychological events aimed at boosting sales staff motivation and job satisfaction, determination of remuneration principles and optimization and its coordination with the company's norms and goals, and with the enterprise's performance in order to improve staff's motivation and the process of optimization and monitoring (assessment and control of the enterprise's system of sales staff motivation management using both objective performance criteria (KPI) and indicators of the sales personnel real motivation) [15].

Thus, the developed incentive system is based on the real needs of sales personnel and is focused on the enterprise's motivational profile. The results suggest that in the current situation, when companies experience financial crises exploiting the potential of intangible incentive is crucial.

Further, the approach to the problem solution will be observed.

44.3.2 Motivation of Sales Personnel as a Basis to Increase Its Productivity and Sales Volumes (the Case of Samsung Electronics Co., Ltd)

Samsung Electrics Co., Ltd. (further—Samsung) was established in 1938 and is a transnational corporation and a global leader in high-tech electronic equipment and home appliances manufacturing. Foundation of the company is closely connected with the global surge in consumer electronics development in the 60–70s of XX century, when the company started to export products under Samsung Electronics brand [8].

Samsung is one of the most successful and innovative companies on the modern market. It has a well-established incentive system, which, however, has not been changing over a lengthy period. Despite the stability in this respect, the current system affects both sales intensification and staff motivation and obviously needs corrections. This fact defined the necessity of the complex research of Samsung's sales personnel in order to define problems and possible ways to resolve them.

An audit of the company's sales personnel motivation system was selected as the tool for this research as it provides the effective evaluation of motivational and incentive factors that the company currently exploits. It allowed to establish the vector for the company's motivational potential revitalization [4].

For the purposes of this research, the following activities were included in the audit: determination of special characteristics of Samsung's sales personnel, in particular, in audio-video equipment (televisions and soundbars) retail department, description of the actual structure of a field workforce in the company, study of structure of the company's sales personnel, the average headcount in the company and the current motivational system. At the final stage of the audit, a profile of motive implementation in Samsung's personnel professional activities was created via staff questionnaire basing on the methodology introduced by Dominiak [4].

The following aspects were included in a detailed audit of the retail staff incentive system:

1. Description of the sales personnel team structure. At this stage, the level of executive and managerial chains in the company's sales field team and interaction between the cogs distribution forms and labor cooperation were determined.
2. Analysis of the sales personnel condition. This step was aimed at the analysis of average headcount, their length of service, age, education and sales staff turnover in the company.
3. Study of the current system of sales personnel motivation. The study resulted in description of existing motivational procedures in the company.
4. Creation of the profile of motives implementation in sales personnel professional activities. At this final stage, overall motivational profile of sales personnel was evaluated, and demotivating factors were determined.

In addition, Samsung's basic financial indicators and sales of audio-video equipment were considered which allowed to assess the actual company's sales effectiveness and productivity of sales personnel.

One of the key results of the audit was the clarification of characteristics of the company's field staff. According to the research, the majority of the employees are males between 26 and 30, who have a university degree and have been with the company for at least one year. Staff turnover rate is slightly different from the average rate for sales personnel due to a prevailing number of students, who quickly become disinterested in such a job.¹

Besides, a portrait of sales personnel motivational profile, which revealed poor development of motivational procedures and lack of the feeling of job security, was drawn up. Lack of job security is, in turn, caused by an ongoing reduction in the list of focus models and/or insufficient number of models in regions of Russia, unrealistically high sales targets and low level of the variable part in comparison with competitors' sales staff. Such a situation decreases staff's loyalty to the organization

¹ How to manage staff turnover in retail companies. Experience of State Corporation "Allo". <https://trademaster.ua/zakon/1015> (last accessed: 2019/10/27).

Table 44.1 Samsung financial indicators used for sales effectiveness calculation (adapted from [9])

Indicator	2017	2018 r	Q1 2019
Sales revenue, trillion rub	13.58	13.82	2.95
Operational profit, trillion rub	3.04	3.34	0.35
Sales profitability (%)	22	24	12

and serves as a reason for a declining interest in the job and low involvement in effective performance.

To calculate sales effectiveness, such indicators as operational profit and sales revenue were considered. These indicators can be used to calculate sales profitability which indicates return per each ruble received from sales [5, 12].

Table 44.1 illustrates that the company's sales profitability remains positive over the whole period, and however, a downward trend was observed in Q1 in 2019. Such dynamics in 2018 was due to sales profit increase received from selling Samsung products. In 2018, there were numerous technological breakthroughs and innovation achievements in different areas of Samsung business which provide and foster the basis for further growth [9].

The research determined peculiarities of in audio and video sales department's performance. Main results are provided below.

In 2018, sale of audio and video sales department accounted for 582,013 m rub, which is 8% higher than in 2017. Such a growth is based on the premium segment development, particularly, the sale of high-end televisions with QIED technology. Unusually, high demand for television sets was mainly generated by World Football Cup which was held in Russia [7].

However, in Q1 of 2019, sales of audio and video sales department decreased because of the low season conditions. Thus, sales dropped by 3% versus the same period in 2018 and by 38% versus Q4 in 2018. The decrease in sales could be due to television sets prices growth that was 5% higher than in 2018 after VAT increased to 20% [7, 9].

Finally, the research revealed the effectiveness of Samsung sales personnel. One of the findings relates to the audio and video sales department staff, who generate 60–70% of the overall sales volume. In 2017–2018, the share demonstrated an upward trend. In 2018, the share of sales made by retail personnel accounted for 67% which was twice as high as in 2017. Such significant growth was generated by expansion of targeted programs of promoter allocation in different company outlets where the demand for television sets was high due to the World Football Cup. However, in Q1 of 2019, the sales share of retail personnel made up 54% which is 12% below the result achieved in 2018 [7].

The dynamics of the analyzed period is characterized by increasing effectiveness of sales personnel performance which is reflected in growing productivity indicators. Product turnover rose due to the higher demand coupled with better performance and sales staff number optimization.

In 2018, productivity increased by 23% in comparison with 2017; absolute sales volumes per 1 employee increased by 57.6 m rub and reached 104.4 m rub [7, 9].

At the same time, productivity indicators of sales personnel in Q1 of 2019 declined. Thus, in Q1 of 2019, it was 16.7 m rub which is 27% lower than at the same period of 2018. The downward trend was the result of staff dissatisfaction with high sales targets, low commission for focus models and insufficient stock of products in certain outlets and low level of the variable part and high staff turnover. At the beginning of 2019, there was high staff defection which had an impact on the company sales, working atmosphere and lower motivation of staff. Sales personnel becomes disinterested in meting sales targets and, probably, looking for more attractive working prospect from Samsung competitors [9].

Thus, in terms of Samsung economic indicators over the studied period 2017–2019, general positive sales effectiveness could be observed apart form Q1 of 2019 when there was a downward trend. The same trends could be observed in respect of sales personnel [9].

44.3.3 Development of Sales Personnel Incentive Program Aimed at Sales Volume Increase

The conducted audit of Samsung sales personnel incentive system revealed two major issues: decrease in sales personnel motivation and high staff turnover which has a negative impact on the organization and decrease in sales volumes. These aspects determined the main goal of the sales personnel incentive program aimed to increase personnel motivation and decrease staff turnover, which should result in boost in the company's sales volumes.

The following tasks had to be dealt with in order to achieve the set goals:

- Sales staff professional development and quality performance improvement;
- Development of a new scheme of variable part of wages calculation;
- Ensuring organizational security of staff;
- Increasing sales personnel loyalty;
- Attraction of highly professional specialists aspired to develop and promoted in the area of sales;
- Increasing transparency of sales targets calculation and scheme of focus models selection;
- Development of sales personnel image;
- Increase in of sales personnel productivity;
- Increase in the company's sales effectiveness.

The incentive program's target audience was Samsung's existing sales personnel and potential employees. A corporate strategy of the company's effectiveness management which focuses on staff competence development provided foundation for the program. Thus, the first stage of Samsung sales personnel incentive program was a course in professional development for the staff. Further steps were taken in

accordance with the set goals. Specific decisions taken regarding some of the steps are described below.

1. Personnel professional development.

It was suggested to divide the professional development course for Samsung personnel into two parts—internal and external. The internal part is going to be delivered by attracting Samsung internal resources, in particular, its team of trainers. This part of the program should include product training, presentation skills, ways to establish contact with a client and their needs determination, methods of dealing with dissatisfaction and purchase refusal, purchase closure. The external part of the course includes a special seminar “Basics of professional negotiations and sales” which was conducted in Moscow during 2019 [7, 17].

2. A new scheme of calculation of the variable part of wages.

The company considers reaching 70% of target sales to be an acceptable result [7]. The program suggests defining the marginal acceptable share for each outlet. In other words, a threshold value, that each promoter should aim to achieve, and which takes competition into consideration, should be calculated for every Samsung outlet selling television sets. The outlet, in turn, should maintain the share and increase it whenever possible.

3. Communication with sales personnel.

If a company does not have well-established channels of horizontal and vertical communication, which are aimed at creation of an ongoing dialog with regional managers, then an objective characteristic and, moreover, sales personnel effectiveness assessment are impeded [18]. This, in turn, prevents expectations determination and information exchange concerning the enterprise’s mission, values and goals.

Consequently, it is recommended to introduce quarterly meetings of sales personnel and their supervisor. Information, received during such meetings, will facilitate in creating an objective opinion for selection of focus models for sales personnel, see their sales targets and the company’s share on the market, learn about new product lines, review the position of Samsung competitors on the television set market and so on. Besides, such meetings enable the company to inform personnel about novelties in calculations of sales targets, change in the schemes of focus models selection and calculation of the variable part of wages. The latter is of a paramount importance—approaches to calculations of the variable part of wages should be absolutely transparent and clear for the personnel. It is crucial to build a feedback system that would allow staff to express their opinions and suggest their ideas about productivity enhancement, current problems solution or optimization. Thus, being

a kind of profit leverage in retail outlets, sales personnel will be more involved in the company's working atmosphere and will become a fully fledged participant of current problems solution.

4. Personnel image.

It is a well-known fact that a company's image impacts the number of customers on sales volumes. A company's name and brand often become a key factor when making a purchase as they exploit the perception of the company that a customer builds. It is equally important to consider the things that a customer encounters when entering an outlet—the outlet employees, their behavior and appearance that can form the aptitude to the company as a whole and, thus, seriously influence the sales volumes.

The image of sales personnel is perceived as an integral perception that includes appearance (hairstyle, outfit) and the manner of communication with a customer. Thus, the type of the uniform is critical in perception of experience, reliability and status of those who wear it. This, in turn, creates an integral image of the company and helps clients to easily identify the company's employees [6, 19].

The incentive program includes recommendations on how to develop and introduce a common uniform for Samsung sales personnel, which has been undervalued until recently. A uniform helps to easily distinguish a company representative among other sale staff of the outlet that encourages a buyer to address a certain company representative for a consultation. A neat and attractive appearance coupled with Samsung sales personnel knowledge of business etiquette will win a customer's attention to the brand and increase customer loyalty which, in turn, will generate sales increase. Finally, a common style creates a team unity, boost corporate spirit and culture of each staff member.

5. A new position in the structure of a field team.

One of the most effective ways of employee motivation is career growth opportunities. Career prospects can inspire and motivate to achieve high results, which ensure not only personal satisfaction, but also the company's overall success. At the same time, career development opportunities should be realistic as it is essential to create an obvious link making efforts and achieving a new position. Thus, it seems to be reasonable to introduce a position of senior promoter, which is currently non-existent, into the structure of a field team. It can be taken by the most effective promoters who will be selected from sales personnel to work in potentially important sales points in order to increase and maintain the company's share on the television set market and the shelf share in retail chains. The selection will be conducted on the competitive basis with special sales targets and market share gain assigned to the candidates. The strategic purpose of this organizational decision is to accelerate the development of regions with low Samsung share.

6. Non-material motivation.

In order to deal with the above-mentioned issue of inadequately developed non-material motivation of Samsung sales personnel, the incentive program suggests to hold a number of events, namely:

- Sales personnel contest aimed to increase sales and market share of Samsung on the television set market. The contest should be conducted for all sales staff in Russia. A promoter can apply for participation in the contest if they meet sales target and maintain the share of their outlet.
- Corporate event for field force and their supervisor that would allow the employees to communicate in informal environment. That facilitates fostering team spirit, learning to communicate effectively, building trust and understanding in the team, improving motivation, cementing horizontal connections and the administration authority.
- Gift certificates in case of selling QLED 8K TV, as one of Samsung's short-term strategic tasks is to increase sales volumes of the TV.

Non-material motivation of sales personnel is of crucial importance as it is beneficial for both the company and its sales personnel. Non-material incentive helps personnel foster relationships, builds connections with the administration and receives an opportunity to increase their wages and even to win a prize. The company, in turn, will have potentially loyal employees, high sales volumes of television sets and growth of market share.

44.4 Discussion and Conclusion. Effectiveness and Evaluation of Suggestions on Sales Personnel Motivation

The suggested program of sales staff motivation includes personnel training and competence development, new remuneration system that includes commission and bonus calculation, improvement of communication inside teams, image and staff loyalty enhancement, events aimed at non-material motivation.

The expected results of the program implementation are increased personnel motivation and decreased in staff turnover rate, growth of sales volumes and effectiveness and sales personnel productivity.

The program's important advantage is the fact that it is based on non-material that it focuses on non-material motivation and development of a wide range of personnel motivational directions and includes a wide range of personnel motivational directions. Due to the complex nature of the suggested events, it is possible to expect growth of sales personnel productivity and the overall company's effectiveness.

The analysis of economic value of the program allows forecasting the following results:

- Sales personnel qualifications improvement;
- Employee loyalty growth;
- Samsung's TV market share expansion by %;
- Increase of the variable part of the wages;
- Enhancement of sales personnel image;
- Development of non-material motivation;
- Fostering job security in the company.

The potential economic effect generated by the sales personnel incentive program implementation was calculated on the basis of sales profitability and with consideration of costs and expected turnover.

Thus, as a result of implementation of the events included in the program, Samsung's television sets sales effectiveness reaches 34% versus the previous indicators which were below 31%. At the same time, sales personnel productivity increases by 5% which means that the above-mentioned events are effective and will be beneficial for the company. Besides, it is expected that the staff turnover will decrease which eventually will ensure more stable profitability an overall sales effectiveness increase in Samsung.

The article presents basic approaches to a corporate motivation system and personnel motivation formation in a specific sphere of audio and video devices retail sales. There is no doubt that a certain program adjustment will be required in the course of its implementation, depending on the effectiveness of the included events and the company budget. Regarding the latter, in particular, it is recommended for the company to split it depending on the company's current needs.

The experience of sales personnel incentive program development presented in this paper has already been applied and is definitely valuable not only for Samsung, but also for other companies operating in the sphere of consumer electronics retail sales, although specific features of each individual company should be considered. In any case, implementation of the abovementioned events will ensure higher stability of sales personnel which, in turn, will lead to staff loyalty and will decrease staff turnover. Consequently, the company will have highly motivated personnel and increased sales volumes.

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Chapter 45

Differentiation of Human Capital Development in Russian Regions



A. Yantranov, N. Atanov, F. Khandarov, and A. Kutumov

Abstract Currently, special attention is paid to the development of human capital. The article focuses on the assessment of the differentiation of human capital in the regions of Russia and the analysis of the mutual influence of human capital on socio-economic development. For these purposes, a data set of 19 parameters of 2018 for 84 regions of the Russian Federation was formed. Special technical tools were used for factor and cluster analysis including Python and SciPy library. Interregional differentiation in the development of human capital leads to a strengthening of the positions of the leading regions and an increase in the backlog of “outsiders”. The concentration of human capital is observed in regions where large industrial enterprises, strong universities and scientific organizations have historically coexisted.

45.1 Introduction

Taking into account the beginning of the transition to the sixth techno-economic paradigm, characterized by the rapid development of nano- and cognitive technologies, photonics, biotechnologies, intelligent systems, etc. [1], in highly developed countries, special attention is paid to the development of human capital.

In Russia, the high rates of economic growth demonstrated in the early 2000s, largely determined by favorable conjuncture in the energy market, a high share of the actively productive population, and growing solvent internal consumer demand reinforced by active lending [2], contributed to ignoring the development of human capital.

The problem is compounded by interregional inequality not only in terms of human capital development, but also in terms of socioeconomic parameters. So in 2018, the gross regional product per capita differed by 6 times, budget expenditures per student-by 4 times, the average score of the unified state examination for budgetary admission in regions excluding Moscow and St. Petersburg differs by 20.9 points. Significantly increased funding for education in the period from 2000

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to 2015 was also distributed unevenly [3]. This work is devoted to the assessment of inter-regional differentiation of human capital and its relation to socioeconomic indicators.

45.2 Theoretical Base of the Study

The study is based on the model of Barro and Lee, which is used as indicators of human capital that affect economic growth: the ratio of the number of teachers to students, the average salary of teachers [4], consolidated budget expenditures per student. Our model uses 19 indicators, which are shown in Table 45.5.

45.3 General Presentation of the Study

Data set formed of 19 parameters of 2018 for 84 regions of the Russian Federation is used. The analysis consists of two parts: factor analysis and cluster analysis. Factor analysis for 19 parameters was implemented by using Python (the `scipy`, `matplotlib`, `factor analysis`, `sklearn`, `seaborn`, `Pandas` and `numpy` packages). For visual representation of regional clusters, a correlogram was used, which was created using `SciPy` library.

45.4 Introduction

45.4.1 Factor Analysis

Bartlett's test characteristics are: $\chi^2 = 1567.04$, $p = 3.04e-224$. The p-value is close to 0, so the test was statistically significant. The **Kaiser–Meyer–Olkin (KMO) Test** value is 0.62 that is satisfactorily. Then, we are to find out the number of eigenvalues which are greater than 1 (Table 45.1).

There are only five suitable eigenvalues, so next we are going to consider only five factors. On the chart, it could look more clearly (Table 45.2).

Factor 1 has high factor loadings for consolidated budget, monthly salary, GRP and expenses of the additional and general education (region financial well-being).

Factor 2 has high factor loadings for age of teachers and share of men in teaching stuff, number of schoolchildren and share of spending on education (prestige of teaching).

Factor 3 has high factor loadings for number of teachers and schools per student (education sufficiency).

Table 45.1 Factors eigenvalues

No.	Eigenvalue
1	5.573434
2	4.419486
3	2.377273
4	1.616452
5	1.028929
6	0.810261
7	0.697667
8	0.542234
9	0.39863
10	0.350539
11	0.297381
12	0.255611
13	0.226701
14	0.182799
15	0.10426
16	0.05732
17	0.039951
18	0.013828
19	0.007243

Factor 4 has high factor loadings for results of USE in regional universities and population (power of local universities).

Factor 5 has none of the high loadings for any variable. Accordingly, a detailed analysis of the four factors has been proceeded (Table 45.3).

There are some patterns that lead to the following hypotheses:

Factor 3 demonstrates that schools with a large number of teachers perform better than schools with fewer teachers. Factor 3 demonstrates that creating conditions for young teachers in peripheral schools reduces inner emigration and proportion of urban schoolchildren but has more expensive maintenance costs.

The most interesting hypotheses are associated with Factor 4. It looks like investing in preparation of Vseross prizewinners could influence population outflows. Obviously, it is also correlated with local universities enrollees' quality. Simply put, the participation of local universities in school education and the quality of University students are interdependent. Get variance of each factor (Table 45.4).

Financial well-being is the reason for 28% regions variance. A total of 67% of cumulative variance explained by four factors.

Table 45.2 Five-factor analysis

Parameters	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Average monthly salary of teachers (calendar year), rubles	0,966422	0,011709	0,164424	0,071875	0,068986
Consolidated budget, rubles per person	0,966107	0,031959	-0,04186	-0,18041	-0,06679
General education system costs per child, rubles	0,946836	0,1204	-0,21401	-0,01212	-0,05558
Average monthly salary by region	0,932784	-0,00744	0,205053	0,02346	0,050476
Expenses of the additional education system for 1 child, rubles	0,926075	-0,04124	-0,10171	-0,0376	0,032228
GRP per thousand people	0,7905	-0,00335	0,061185	0,063358	0,158917
Share of teaching staff under 40, %	0,246088	0,890206	0,217965	-0,10257	-0,1047
Average age of teaching staff, years	-0,1182	-0,88417	-0,18304	-0,00298	0,077074
Number of school students per 100 people (as of September 1)	0,082188	0,742579	-0,0834	-0,38889	0,147146
Share of men in the total number of teaching staff, %	0,048343	0,696314	-0,27989	0,060709	-0,20162
Share of spending on education	-0,20301	0,631979	-0,23717	0,109038	0,38529
The proportion of urban school students	0,367012	-0,63002	0,097065	0,311815	0,338453
Distance from the capital of the region to Moscow, km	-0,08377	0,35629	-0,1308	-0,20199	-0,0975
1 teacher per student on average	-0,01433	-0,28321	0,768009	0,055141	0,230921
Schools per 1000 students	-0,04282	-0,05782	-0,74256	-0,10047	-0,02013

(continued)

Table 45.2 (continued)

Average Unified State Exam score enrolled in budgetary places in universities of the region	-0,11044	-0,1669	0,209217	0,870291	-0,00726
Population, thousand people	-0,06249	0,114749	0,458764	0,629587	0,04383
Average number of Vseross winners per 100 thousand people	0,062345	-0,1547	-0,15965	0,41406	-0,02929
The ratio of the actual load of teachers to the calculated	0,154284	-0,20465	0,282792	-0,0605	0,592098

45.4.2 Region Clustering

Let us see on correlogram of our parameters. The parameters are described in Table 45.5 (Fig. 45.1).

The following relationships between parameters are observed in cluster analysis:

- (1) Parameter “p5u” is lightly correlated with “p19” and “p2”.
- (2) “p19” is correlated with “p1” and lightly correlated with “p11” and “p2”.

Russian regions were clusterized by these parameters (see Fig. 45.2): Abbreviation in the beginning of region names is its federal districts (FE = Far Eastern, V = Volga, NW = Northwestern, NC = North Caucasian, S = Siberian, U = Ural, C = Central, S = Southern). The dendrogram is constructed by the farthest point algorithm or Voor Hees algorithm in SciPy library.

Orange cluster 1 is Southern, Caucasus regions and, suddenly, Yakutia. Violet cluster 2 is strong Russia regions, and blue cluster 3 is poor and far Russian regions. Green cluster 4 is usual Russian regions.

Red cluster 5 is the most successful regions with large budgets and/or large expenses for education.

45.5 Conclusions

Ignoring interregional differentiation in the policy of human capital development leads to strengthening the positions of leading regions, increasing the lag of “outsiders”, followed by an increase in migration outflows. Thus, the highest concentration of human capital is observed in the regions (purple, red and green clusters),

Table 45.3 Four-factor analysis

Parameters	Factor 1	Factor 2	Factor 3	Factor 4
Average monthly salary of teachers (calendar year), rubles	0,965839	-0,00443	0,190017	0,071566
Consolidated budget, rubles per person	0,961397	0,023287	-0,04114	-0,17537
General education system costs per child, rubles	0,951848	0,097466	-0,2117	-0,02404
Average monthly salary by region	0,929785	-0,01786	0,224562	0,028569
Expenses of the additional education system for 1 child, rubles	0,928293	-0,06572	-0,07268	-0,05038
GRP per thousand people	0,792199	-0,03061	0,113429	0,050057
Share of teaching staff under 40, %	0,254515	0,909456	0,161	-0,07483
Average age of teaching staff, years	-0,12904	-0,90323	-0,13014	-0,02785
Number of school students per 100 people (as of September 1)	0,099827	0,716204	-0,04051	-0,39416
Share of men in the total number of teaching staff, %	0,062136	0,701354	-0,3526	0,066048
The proportion of urban schoolchildren	0,359782	-0,65675	0,201645	0,274361
Share of spending on education	-0,16412	0,529724	-0,11946	0,029396
Distance from the capital of the region to Moscow, km	-0,07844	0,361369	-0,15421	-0,20208
1 teacher per student on average	-0,02964	-0,26457	0,822874	0,082471
Schools per 1000 students	-0,02996	-0,09039	-0,69575	-0,14622
Average Unified State Exam score enrolled in budgetary places in universities of the region	-0,113	-0,16443	0,162769	0,889245
Population, thousand people	-0,06493	0,127247	0,42294	0,653829
Average number of Vseross winners per 100 thousand people	0,064381	-0,16672	-0,17548	0,40446
The ratio of the actual load of teachers to the calculated	0,158818	-0,23528	0,403024	-0,06346

Factor1 – Financial well-being of the region.

Factor2 – Prestige of Teaching.

Factor3 – Education sufficiency.

Factor4 – Power of local universities/population.

Table 45.4 Parameters for variation of factor values

Parameters of variation	Factor 1	Factor 2	Factor 3	Factor 4
SS loadings	5.422868	3.710493	1.958518	1.739437
Proportion Var	0.285414	0.195289	0.10308	0.091549
Cumulative Var	0.285414	0.480703	0.583783	0.675332

Table 45.5 Description of parameters

Parameter	Parameter description
p0	Distance from the capital of the region to Moscow, km
p1	Population, thousand people
p2	The proportion of urban students
p3	Share of spending on education
p5u	Average number of Vseross winners per 100 thousand people
p6u	GRP per thousand people
p7u	Consolidated budget, rubles per person
p8u	Number of school students per 100 people (as of September 1)
p92u	Schools per 1000 students
p11	One teacher per student on average
p14	General education system costs per child, rubles
p15	Expenses of the additional education system for one child, rubles
p18	Average monthly salary of teachers (calendar year), rubles
p19	Average Unified State Exam score enrolled in budgetary places in universities of the region
p20	The ratio of the actual load of teachers to the calculated
p21	Average monthly salary by region
p24	Average age of teaching staff, years
p25	Share of men in the total number of teaching staff, %
p26	Share of teaching staff under 40, %

where historically large industrial enterprises, strong universities and scientific organizations (Krasnoyarsk territory, Volgograd, Samara, Saratov and Voronezh regions, etc.) are adjacent.

Regional support and encouragement of local universities through various financial and non-financial instruments to work with schoolchildren and the teaching community can help reduce the migration outflow of talented applicants. This will help to maintain and increase the quality of human capital in the structure of the university population and correspondingly in the structure of the population of the region. In order for universities to have the resources to work with the school and teaching communities, they need additional financial resources and corresponding powers, to conduct educational activities with school students.

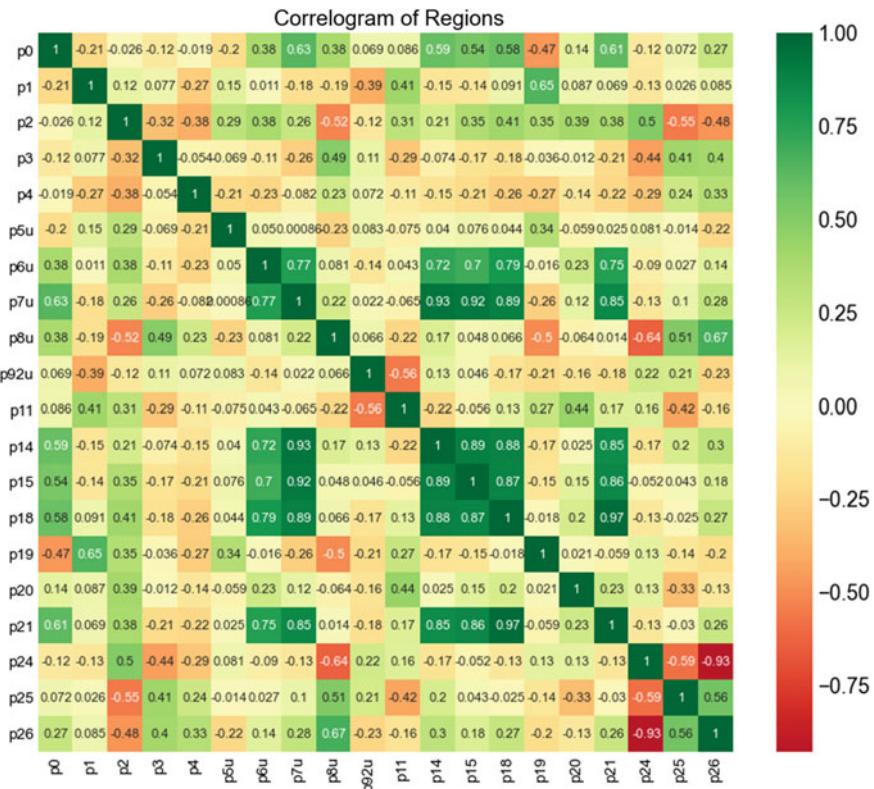


Fig. 45.1 Correlogram of regions

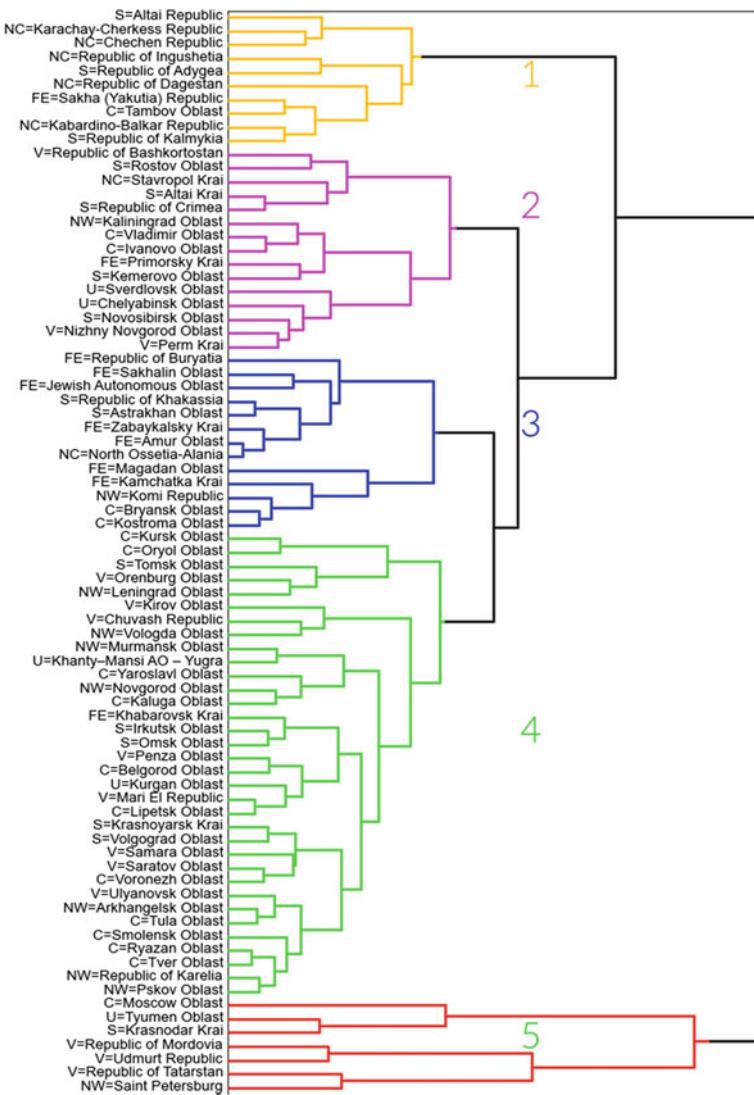


Fig. 45.2 Dendrogram of regions constructed by the farthest point algorithm

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Chapter 46

Impact of Trademark and Patent Registering Activity on Economic Growth in Countries of Different Levels of Inventive Development



O. Buchinskaia and E. Stremousova

Abstract The study aims to estimate the impact of patents and trademarks registered by residents and non-residents on high-technology exports and charges for the use of the intellectual property and through it on economic growth. For the study, a cluster analysis of the innovative development of countries was carried out. For the analysis, we used data on 50 countries from 1994 to 2017. The study confirmed the positive and increasing dependence of economic growth on the increase in deductions for the use of intellectual property, but the less variable effect of high-tech product exports. The influence of resident trademarks has a positive effect on high-tech exports and intellectual property income. Residents' patents generally have a positive impact on both dependable variables, but there are cases of negative impact, depending on the innovative development of countries. Trademarks of non-residents mainly have a positive impact on the growth of high-tech exports but a negative impact on the growth of charges for the use of the intellectual property. Patents registered by non-residents, as a rule, reduce income from intellectual property, but their influence on the growth of high-tech exports is controversial. The results of the study may find a practical application for the development of measures to stimulate innovative activity in industrial and post-industrial countries. The originality of the paper is the study of individual clusters of countries to identify diversity in the influence of the studied variables in countries with different levels of innovative development.

46.1 Introduction

The difference in tempos of economic growth is one of the essential concerns of the recent investigations in the economy. New technologies and the introduction of

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new commodities are producing a significant part in economic divergence. Many of those new commodities include the intellectual property components or sold under the trademarks registered. Those means provide a considerable advantage for the intellectual property owners. Payments for the use of intellectual property create additional profits for owners even if the product itself is transferred to the countries with lower costs of resources. So, the benefits from the goods and services protected by intellectual property rights are collected in developed countries. Besides, emerging markets usually produce relatively fewer intellectual property objects to make high profits from royalties.

Section 46.1 of the paper gives a brief overview of previous studies that served as the theoretical basis for this work. Section 46.2 describes the research methodology and the instruments used. The practical results of the study and their discussion are presented in the Sect. 46.3. In conclusion, the main findings are summarized.

46.2 Previous Research Review

The study of the influence of patents and trademarks on innovation has been reflected in the theoretical and empirical works of many authors. However, these studies are quite controversial. In one of the pioneer papers on the influence of non-residents' application of trademarks on the economy of less developed countries, Chudnovsky [1] reveals that the real winners from this partnership are the countries that own the trademark. In contrary, the receiver country misses these advantages. In the study of the influence of trademarks and patents on countries with different income levels, Kitch [2] denotes that less developed countries pay proportionally smaller amounts for using patents than developed countries.

Millot [3] broadly describes the positive impact of trademarks on innovative activity, but in this paper, there is no distinction between trademarks registered by domestic and foreign economic agents. Yang [4], in turn, notes a meager share of foreign trademarks in China. Moreover, judging by the statistics of WIPO [5], this gap tends to increase.

Nam and Barnett [6], analyzing the global patent and trademark distribution through the Gini coefficient, show a decrease in the uneven distribution of patents and brands. Türedi [7] found a positive one-way causality relationship from patent applications to growth in OECD countries. However, no answer has yet been given to the possibility of equalizing the opportunities for the economic growth of developing countries by increasing innovation activity.

Bay [8] notes the significant influence of brands on financing innovative production, which, in turn, has a considerable impact on the economic development of the entire state. Ennis et al. [9], while analyzing inequalities in the development of OECD countries, note that patents and trademarks may involve the creation of market power accompanied by a positive impact on the incentive to innovate.

In the study of IP protection in 124 developing countries, Gold et al. [10] did not find a significant correlation between IP deployment and growth. We suggest

that this phenomenon may be related to the overflow of innovative activity in more developed countries and the development of production protected by foreign patents in developing countries.

The use of cluster analysis on the number of scientific articles, patents, and trademarks registered by residents allowed Kamath and Kamat [11] to identify three groups of countries by the level of development of R&D. However, further development of the study of individual clusters of countries has not yet been developed.

Based on previous studies, we decided to pay attention to the analysis of the current difference in countries' reactions with different levels of innovative activity to the dynamics of patents and trademarks registered by residents and non-residents. Some researchers, e.g., Mendonça et al. [12], mention patents and trademarks as indicators of the economic development and export of high technologies, the studies of the impact of patents and trademarks on charges for the use of the intellectual property is rather rare. A large part of the research in this area is related to the specifics of protecting the intellectual property and the structure of property rights in various countries.

Based on this, we put forward the following hypotheses:

H1: Countries with different levels of innovation will have a different response to change in trademarks and patents, applied by residents and non-residents.

H2: Patents and trademarks registered by residents have a positive effect on the growth of high-tech exports and charges on the use of the intellectual property.

H3: Increase in the registration of patents and trademarks by non-residents has a negative impact on the growth of both high-technology exports and charges for the use of the intellectual property.

H4: Patents and trademarks through the export of high technologies and charges for the use of the intellectual property have a different effect on GDP growth depending on the level of innovative activity in the country.

46.3 Methodology

We took the following indicators as regressors for the study:

- patent applications, residents is the patent application filed with a patent office of a given country by the resident of this country;
- patent applications, non-residents is the patent application filed with a patent office of a given country by an applicant residing in another country;
- trademark applications, direct residents is the trademark application filed with intellectual property office of a given country by its resident;

- trademark applications, direct non-resident is the trademark application filed with an intellectual property office of a given country by an applicant residing in another country.

For the analysis, the authors used logarithms for indicators of patent and trademark applications by residents and non-residents. Those indicators allow one to understand the difference in innovative performance for different groups of states. There are two dependent variables chosen for the analysis: the logarithm of high-technology exports (in current US\$) and the logarithm of charges for the use of the intellectual property (also in current US\$). High-technology exports include exports of goods with high R&D intensity, such as in electronics, computers, pharmaceuticals, and aerospace products. Charges for the use of the intellectual property are payments between residents and non-residents for the legitimate use of patents, trademarks, copyrights, industrial processes and designs including trade secrets, and franchises. Sattar and Mahmood [13] report that the intellectual property has a positive influence on economic growth. Also, the logarithm of GDP per capita as the dependent variable was used to analyze economic growth. World Bank raw data [14] was used for the study.

To test the hypotheses, we differentiate countries by the level of innovative activity. A cluster analysis of the countries studied in terms of similarity in dependent variables was carried out using the Orange data analysis package. We computed Manhattan distances (d) [15] between rows in a dataset using Formula 46.1

$$d = \sum_{i=1}^n |y_i - x_i| \quad (46.1)$$

where

- y is the high-tech product export vector,
 x is the charges for the use of the intellectual property vector.

Thus, for the analysis, six groups of countries were selected, presented Table 46.1.

As the next step, we performed two econometric analyses for each group of countries, revealing the influence of regressors on the export of high-tech products and charges for the use of the intellectual property. Initial studies using the OLS method showed serial correlation and heteroscedasticity problems, so resulting regression was built with Prais–Winsten regression with panel-corrected standard errors. The choice of the estimation method is due to the fact that this estimator allows research on samples with first-order autocorrelation correction, heteroskedasticity, and cross-panel dependence [16] in samples where the depth of the sample exceeds its latitude.

On the final stage, we conducted a regression analysis of the dependence of the increase in high-tech exports and royalties on the use of the intellectual property. This analysis was conducted on previously formed clusters to determine differences in the levels of influence of dependent variables on economic growth. For this study,

Table 46.1 Results of clustering analysis of countries studied

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
1	China	Belgium	Argentina	Chile	Bulgaria	Bangladesh
2	France	Malaysia	Australia	Greece	Estonia	Belarus
3	Germany	Mexico	Austria	Jordan	Latvia	Bosnia and Herzegovina
4	Japan	Thailand	Brazil	Norway	Lithuania	Ecuador
5	Korea, Rep	United Kingdom	Czech Republic	Portugal	Tunisia	Georgia
6	Singapore		Finland	Romania		Guatemala
7	United States		Hungary	Slovak Republic		Jamaica
8			India	Turkey		Moldova
9			Indonesia	Ukraine		Pakistan
10			Philippines	Vietnam		Uruguay
11			Poland			
12			Russia			
13			Spain			

Source ranged by authors based on <https://databank.worldbank.org/statistics>

given the presence of autocorrelation across all sectors, as well as heteroskedasticity in a number of clusters, Price–Winsten regression with corrected standard errors was also used.

46.4 Results and Discussion

The results of cluster analysis allowed us to divide the studied countries into six groups. The first group includes countries with the highest rates of export of high-tech projection and charges for the use of the intellectual property. Subsequent clusters show a decrease in innovation activity, as it presented in Table 46.1.

The results of an econometric analysis of the effect of regressors on the logarithm of the export of high-tech products, presented in Table 46.2, show the positive effect of the exogenous variable in all statistically significant cases. Moreover, this variable takes on the most considerable quantitative significance in countries with relatively low innovative activity (clusters 5, 6, and 4). It suggests that countries that have not yet achieved a significant breakthrough in the field of high-tech exports can receive a more significant increase in exports from the registration of their own brands. It may be due to the release of MNC products under national brands. At the same time, the influence of trademarks registered by residents is strengthened if the necessary infrastructure and institutions are in place to develop the entrepreneurial activity.

Table 46.2 Results of econometric research for the impact of variables studied on high-technology exports log

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Number of observations	137	114	299	217	115	202
Constant	20.80483	20.32993	21.66645	13.02469	18.22973	2.595543
Trademark applications, direct resident, log	-0.477226 (0.646)	0.0481735 (0.638)	0.127884 (0.091)	0.3690478 (0.089)	1.01023 (<0.001)	0.3872484 (<0.001)
Trademark applications, direct non-resident, log	0.281652 (0.028)	0.1948477 (0.086)	0.011498 (0.892)	0.3654429 (0.190)	-0.5496767 (0.010)	1.298651 (<0.001)
Patent applications, residents, log	0.596849 (0.423)	0.2423952 (<0.001)	0.0824631 (0.112)	0.3387263 (0.005)	-0.303991 (0.017)	0.2776538 (<0.001)
Patent applications, non-residents, log	0.148009 (0.064)	-0.0230684 (0.533)	-0.186874 (<0.001)	-0.1994482 (0.002)	-0.0788064 (0.130)	0.0111337 (0.899)

Source Calculated by authors. P-values errors are reported in parentheses

It is illustrated by the values of the indicator in clusters 5, 6, and 4, where the highest value is observed in cluster 5, where most of the countries (except Tunisia) are members of the European Union. The value of this indicator is significantly lower for the countries of cluster 6. It can be explained by the fact that in these countries the level of development of institutions and infrastructure is not sufficiently developed. In cluster 4, the value of the growth in exports of high-tech products from the growth of trademarks registered by residents is lower than in clusters 5 and 6, even though countries with higher innovative activity are concentrated in this cluster. It can partially be explained by the fact that the results of the innovative activity of these countries are more used domestically.

The increase in the trademark applications, direct non-resident, log indicator showed a positive value in all statistically significant cases, except for cluster 5. It indicates the crowding out of local manufacturers by foreign trademarks and a decrease in the output of high-tech goods under non-resident trademarks.

The positive effect of the growth rate of trademarks registered by non-residents on the increase in the production of high-tech goods is associated with the organization in these countries of production associated with high and medium-high technologies under the control of foreign brands. At the same time, there is no intense crowding out of national industries due to their absence or cooperation within TNCs. Moreover, the less competition among national companies, the higher the growth in exports of

high-tech products from the growth of non-resident brands. It is illustrated by the fact that the 6th cluster has the maximum value of the coefficient before the variable.

The registration of patents by residents showed a positive value in all statistically significant cases except cluster 5. It is explained by a sufficiently strong leakage of qualified personnel from these countries and the inability to realize their achievements in their own country [17–19]. In clusters with a positive value of the coefficient under the variable, we see that it takes the maximum value in cluster 4. Based on the results, we can assume that less innovative countries may have more returns on patents compared to more technologically advanced states, but if there are existing institutes of registration and protection of patents, which illustrates the excess coefficient in cluster 4 compared with cluster 6.

The influence of patents registered by non-residents turned out to be significant only in clusters 1, 3, 4. However, only in cluster 1, this factor has a positive effect on the dependent variable at a 10% significance level. Clusters 2 and 3 have a negative effect of non-resident patents on the export of high-tech products. We assume that patenting plays a deterrent role in this case: Since the products patented by a non-resident can no longer be reproduced by national enterprises in the form of generics, when it comes to pharmaceutical products or similar technologies if the patent relates to the ICT industry, export growth of high-tech products in cluster countries 3 and 4 will be reduced.

The analysis of the influence of registered patents and trademarks on charges for the use of intellectual property is presented in Table 46.3. According to the table, it

Table 46.3 Results of econometric research for the impact of variables studied on charges for the use of the intellectual property log

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Number of observations	132	107	269	173	102	187
Constant	19.88725	22.53603	14.83886	13.49465	11.65422	1.84822
Trademark applications, direct resident, log	-0.1371881 (0.349)	-0.2129331 (0.138)	0.6360646 <td>0.3728733 (0.001)</td> <td>1.440149<br (<0.001)<="" td=""/><td>0.3702733<br (<0.001)<="" td=""/></td></td>	0.3728733 (0.001)	1.440149 <td>0.3702733<br (<0.001)<="" td=""/></td>	0.3702733
Trademark applications, direct non-resident, log	0.2049626 (0.201)	-0.3392651 (0.043)	0.0618291 (0.593)	0.1673377 (0.374)	-0.5070518 (0.091)	0.3137613 (0.034)
Patent applications, residents, log	0.2913318 (0.010)	0.6571455 (<0.001)	0.1616166 (0.277)	0.3199827 (0.015)	-0.1793177 (0.249)	-0.1825059 (0.001)
Patent applications, non-residents, log	-0.082141 (0.504)	-0.082309 (0.165)	-0.2745577 (<0.001)	-0.1715611 (0.004)	-0.208142 (0.002)	0.0686873 (0.408)

Source Calculated by authors. P-values errors are reported in parentheses

is clear that the influence of trademark applications, direct resident turned out to be statistically significant in 3–6, where it takes strictly positive values. As in the case of the growth in the export of high technologies, the maximum increase in charges for the use of the intellectual property is in the countries of cluster 5, which have significant reserves for further development and stable institutions for the protection of intellectual property. In second place are the countries of cluster 3, which also have reserves for the development of national economies.

The trademark applications, direct non-resident, are negative in all statistically significant cases, except for cluster 6. It is due to the fact that most of the profit, including one from using non-resident trademarks, go to the country of origin or registration of the trademark, which reduces income from the intellectual property for the countries in question. The positive value of the coefficient in cluster 6 can be explained by the development of countries' own objects of intellectual property under the influence of foreign brands.

The patent applications, residents variable turned out to be statistically significant for clusters 1–2, 4, and 6. The maximum effect on the dependent variable was found in cluster 2. However, in clusters 6, this variable shows a negative value. This aspect requires further research in connection with the possible features of the legislation of these countries and the nature of the intellectual property. We assume that in this case, although patents are registered in the countries of this cluster, they cannot be realized as part of the export of intellectual property and are later bought by foreign companies, including those operating in that country, which explains the positive effect of patents registered residents in this cluster for the export of high-tech products.

The patent applications, non-residents variable assuming a negative value in all cases of statistical significance and the most significant loss observed in cluster 3. Thus, we can unequivocally assert that patents registered by non-residents negatively affect charges for the use of the intellectual property, since income from this patent goes to the non-resident patent owner.

At the final stage of the study, we estimated the impact of charges for the use of the intellectual property and the export of high-tech products growth rates on the economic growth, and the results of which are presented in Table 46.4. Relative to

Table 46.4 Impact of growth in charges for the use of the intellectual property and the export of high-tech products on economic growth

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Number of observations	162	106	273	183	102	199
Constant	-0.574936	-0.8573446	1.439281	2.7005465	2.160373	4.96145
Charges for the use of the intellectual property, log	0.3522658 (<0.001)	0.2339194 (<0.001)	0.2204692 (<0.001)	0.1054561 (0.002)	0.13943 (<0.001)	0.0922974 (<0.001)
High-technology exports, log	0.1026208 (0.145)	0.2164491 (0.008)	0.139252 ((0.001))	0.2142322 (0.002)	0.2129453 (<0.001)	0.0652758 (<0.001)

the growth in per capita GDP relative to the growth of charges for the use of the intellectual property, there is a fairly clear trend—the more innovative the economy, the higher the influence of the analyzed factor on economic growth. There is some exception in cluster 5, but in this cluster, most of the countries are in the EU, which makes intellectual property protection institutions more effective than in cluster 4, where institutional problems in several Asian countries can cause the deviation. It coincides with results of Law et al. [20] what institutions are essential in stimulating the effect of innovation impact on economic performance.

The influence of the high-tech exports growth rate on GDP per capita growth is statistically significant and positive in all clusters studied except cluster 1. At the same time, the study showed a fairly similar result: In clusters 2.4 and 5, an increase in the export of high technologies by 1% will lead to an increase in GDP per capita by 0,21%. In cluster 3, the effect is slightly less, and an increase in high-tech exports by 1% will lead to an increase in GDP per head of population by only 0.14%. We attribute this to the fact that this cluster includes such densely populated countries as India, Brazil, Indonesia, and the Philippines. Cluster 6 countries have a minimal impact on the export of high-tech products on GDP per capita due to the weak development of the high-tech industry on their territory. Thus, we can assume that the release of high-tech products has a fairly stable effect on economic growth, *ceteris paribus*, and the further development of these economies may rather depend not on the manufacturing of the high-tech product, but on accumulating the charges for the use of the intellectual property, including one from the development of high-tech products.

This study is not without significant limitations. It is primarily due to the heterogeneity of the intellectual property. Based on the available statistics, it is difficult to separate patents related to high technology from patents related to biotechnology. The study also does not take into account the influence of non-patented intellectual property objects, which are IPR secrets. Also, when analyzing the charges for the use of the intellectual property at this stage of the study, it was not possible to separate the charges for the use of industrial intellectual property from the intellectual property of the service sector.

46.5 Conclusion

Despite the limitations, the study showed that groups of countries with different innovative activities experience different effects of patents and trademarks registered by residents and non-residents on the studied variables. A study of the influence of trademarks and patents on the growth of exports of high technology and charges on the use of the intellectual property may reveal additional sources or obstacles to intensify economic growth and strengthen the country's position in the world market of high value-added products.

As a result of our research, a partial confirmation of hypothesis 1 was found: On average, countries with lower current volumes of innovative products in relation to

more developed countries have greater potential for the development of export of high-tech products. However, regarding the influence of patents and trademarks on royalties for the use of intellectual property, this trend is not expressed.

Hypothesis 2 is also partially confirmed: It is proved that trademarks registered by residents clearly positively affect the export of high-tech products and charges for the use of the intellectual property. Patents registered by residents may have a negative effect on dependent variables, which may be due to a brain drain or the purchase of intellectual property rights by non-resident companies.

Hypothesis 3 is also only partially confirmed. Trademark applications, direct non-resident, have a positive impact on the export of high-tech products, which is a direct consequence of the development of MNC and the transfer of factories for the assembly of high-tech products to developing countries. Moreover, this indicator mainly affects the charges for the use of the intellectual property. Patents registered by non-residents adversely affect royalties for the use of intellectual property, but can have a positive effect on the export of high-tech products when it comes to countries with high innovative activity.

Hypothesis 4 was fully confirmed, while the level of charges for the use of the intellectual property will be higher, the more the country focuses on the production and use of innovation. The impact of high-tech exports on economic growth is less dependent on the level of innovation and is more likely determined by the difference and development in the country of firms not so much producing as using innovative development products.

In the first place, from forecasting the growth of the studied indicators, it is necessary to measure the strong path dependency revealed both in the dynamics of charges for the use of the intellectual property and in the export of high-tech products. On the one hand, this suggests that today's technology leaders will maintain their leadership in the coming years, as they have all the institutional, technological, and legislative infrastructure for the production of new high-tech goods and services. At the same time, it is much more difficult for lagging countries to advance in this plan, and technological growth for them requires significantly higher costs. At the same time, there is some slight movement toward convergence, since the positive effects on the studied variables on the dependent ones are higher in less technologically advanced countries. Moreover, the negative effects of variables are less than in technologically developed countries.

Thus, in order to stimulate economic growth in developing countries, we can talk about the apparent need for the countries to develop own trademarks, to spur the development of institutions for the protection of national patents and, no less important, stimulate the innovative activity of national economic agents. It applies not only and not so much to the development of large innovative formations as technological parks and technopolises, but also to encouraging and stimulating inventive activity in the fields of small and medium-sized businesses, and developing institutions to support the innovative activity of the population of countries. Studying the institutional features of the development of innovative activity is an essential step in increasing the economic activity of countries and is an interesting task for our subsequent studies.

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Chapter 47

Improving the Methodical Maintenance of Accounting of R&D in the Enterprise



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Abstract The article is devoted to the development of theoretical provisions and practical recommendations for improving the organization of accounting for expenses at stages of innovation activity and reflecting its results in reporting. First of all, the article focuses on improving elements of methodological support for accounting for expenses and results of R&D, which is an urgent task for implementing goals of sustainable development of economic structures, including in the process of creating innovative products in the direction of a given market vector. It is important to note that the existing regulatory framework for accounting (R&D), which does not allow defining a clear boundary between the concepts of “research” and “development” and regulates only the final result of these works. This leads to a distortion of formation of information about R&D expenditures and an unreliable monetary measurement of their results. In addition, the current practice still has open problems with application of international accounting standards, which negatively affects the attraction of foreign investors. As part of improvement of reporting on expenditures and results of R&D, a methodology for forming indicators of accounting financial statements on R&D is proposed, and aspects of forming an accounting and information base on expenditures and results of R&D for statistical reporting are disclosed.

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47.1 Introduction

Research of accounting issues of expenses and results of R&D is associated with increasing importance of the principle of temporal certainty as one of basic prerequisites of accounting for solving problems of reliable statement of various facts of economic life on recognition of expenses and results of R&D. Making a professional decision about capitalizing and recapitalizing these expenses in accounting is difficult, since there is not sufficient certainty about future economic benefits of resulting R&D result. As a solution to existing problems within making professional judgments, it is proposed to use fundamental principle of accounting—the principle of temporal certainty of facts of spending and obtaining R&D results. The unsolved problems in recognition of R&D expenditures and results in accounting and reporting lead to increased interest in conducting a special study to find effective methodological support for management of innovation activity that meets different needs of users of reporting.

47.2 Relevance of Improving the Methodological Support of R&D Accounting in an Enterprise

At present assessment of innovation activity is important when selecting perspective investment projects for all levels of control—from economic entities interested in implementing an innovation strategy to Federal authorities responsible for scientific, technical and innovation policy in the country. Thus, large amounts of money are invested in research and innovation both in our country (1% of GDP) and abroad (China—2.2% of GDP, Germany—3.1% of GDP, USA—2.8% of GDP, Japan—3.3% of GDP). At same time, great importance is attached to innovative development of enterprises that perform R&D in our country, which is confirmed by increase in the share of innovative research by almost 2.5 times over past five years.

Issues of organization of recognition in accounting and reporting of information about expenses and results of R&D are considered in the scientific works [1–5]. If we turn to international practice, international standards consider R&D in terms of investments that can bring economic benefits in future. For this purpose, all expenses for performing R&D works are classified as a depreciable asset in order to generate future income [6]. This approach to the organization of R&D expenses is used in standards of the UK (SSAP 13 “Accounting for Research Development”), Japan (ASBJ Statement No. 17 “Accounting Standard for Disclosures about Segments of an Enterprise and Related Information” and ASBJ Guidance No. 20 “Guidance on Accounting Standard for Disclosures about Segments of an Enterprise and Related Information”) and IAS 38 “intangible assets.” However, the purpose of investment is not just to get a return on invested capital, but the need to contribute to improving efficiency of all economic activities [7].

The scientific paper [8] provides a generalized comparative analysis of accounting and reporting of R&D expenditures in accordance with Russian and international standards and also notes that the Accounting Regulation (RAS) 17/02 “accounting for costs of research, development and technological work” does not apply to unfinished R&D, as well as to R&D, results of which meet criteria for recognition of intangible assets, in which are issued exclusive rights on results of intellectual activity. In turn, IAS 38 can be applied to unfinished work on creation of an intangible assets, as well as to the costs of preparing new production facilities and starting up work. Therefore, the Russian and international standards have different objects of regulation.

In international accounting, there is a significant difference in division of R&D creation process into phases. The costs of creating an R&D object are divided into costs incurred at: research stage; development stage [9].

Reviewing the key differences between RAS 17/02 “accounting for costs of research, development and technological work” and IAS 38 “intangible assets,” it makes sure that Russian and International R&D accounting has significant differences. In International accounting, current expenses are written off at research stage, and at development stage, they are capitalized as part of a future intangible asset (IA). In Russian accounting, expenses are capitalized from first day of research, but can be written off as current expenses if research did not bring results. This is the fundamental difference between Russian and International standards [10]. The problems of identification, classification and accounting of IA are highlighted in the article [11], and the use of their unified grouping is proposed. It is necessary to settle the issue of more detailed presentation of information about expenses and results of R&D in accounting (financial) statements [12]. The article [13] makes a general conclusion about need to create a unique classifier of accounting objects and develops a unified economic and accounting model for evaluating and accounting for similar objects for different organizations.

In addition, in the article [14], scientists propose to expand information accounting field by using management accounting accounts. This makes it possible to obtain detailed information on R&D expenditures in various sections, on deviations of actual expenditures from estimated ones in real time, thereby creating a full-fledged information base that serves as a basis for monitoring effectiveness of use of funds allocated for R&D.

All of above confirms the relevance of the topic stated in the article.

47.3 Statement of the Task of Improving the Methodological Support of R&D Accounting in an Enterprise

Many issues of organization of accounting of expenses and results of R&D in terms of their reliable recognition in accounting and reporting, as well as compliance of regulatory regulation of accounting for these objects with modern contractual relations have not been fully resolved.

Insufficient theoretical and practical development of problems of organization of accounting for expenses and results of research, development and technological work determined topic of the article, its purpose and objectives.

The purpose of the article is to develop theoretical provisions and recommendations for improving the accounting of R&D in the organization.

Research problem. Set goal involves solving the following range of problematic issues:

- To clarify economic characteristics of research, development and technological work in order to distinguish between expenditures at the research and development stages;
- Justify the use of conditions for recognizing expenses of RAS 17/02 to implement the principle of temporal certainty of reflecting the facts of spending on unfinished R&D and obtaining results of innovation activities at stages of research and development;
- Justify the procedure for documenting recognition of positive and negative results of R&D.

The subject of research in the article is determined as a set of methodological and practical issues of organization of accounting for expenses and results of research and development activities of Russian economic entities.

The object of research in the article is determined as processes of formation and disclosure of information about expenses and results of R&D of scientific production and industrial enterprises.

47.4 Theoretical Aspects of Improving the Methodological Support of R&D Accounting in an Enterprise

In spite of the importance of processes related to both implementation of scientific activities and experimental developments of new types of technologies and new types of products, there is a problem with correct definition of term of R&D, which solving depends primarily on recognition of research and development expenditures with regard to their specifics. The study of regulatory documents has shown that at present time there is no clear interpretation of R&D, and, accordingly, adequate

formation of financial information about them in accounting and annual financial statements.

Existing definitions of “research” and “development” in regulations are interpreted widely from standpoint of type of economic activity and performance of work, which leading to formation of ambiguous professional judgments about their separation.

In order to recognize research and development as objects of observation of accounting, management and statistical accounting, we suggest to use following economic characteristics:

- Scientific research works (SRW) is the conduct of original fundamental research with a theoretical justification of principles of implementing of new scientific and technical knowledge in practical activities of economic entities;
- Experimental development works (EDW) is a confirmation of results of research works in form of creating prototypes for their subsequent use in the production of new types of products, works and services.

A separate type of SRW & EDW is represented by so-called technological work, which, in our opinion, is a type of development works and is aimed at creating new technological processes for production of new equipment and services. To a certain extent, these works may be similar to EDW in the form of presenting result of their implementation in the form of a documented description of production technology of new equipment and provision of services. The difference between technological work and EDW is that it is not necessary to create prototypes and other material objects.

The result of SRW is expressed in the formation of scientific and technical information in form of a documented report with relevant calculations or confirmed experiments, with its subsequent commercialization, i.e., obtaining future economic benefits. Therefore, conducting SRW is not limited to creating material samples of products.

In contrast to Russian standard (RAS 17/02), International standard (IAS 38) identifies, as already disclosed above, two stages of independent creation of IA, which differ in characteristics of work performed and ability to establish a relationship with a specific result that can bring future economic benefits.

Comparing the approaches to definition of accounting objects in IAS 38 and RAS 17/02, we can conclude that the research stage corresponds to SRW, and the development stage corresponds to EDW. The research stage in accordance with IAS 38 is scientific research carried out with the aim of obtaining new scientific or technical knowledge in future. The development stage, in turn, involves the use of scientific discoveries for purpose of forecasting, designing new or improved reserves, technological processes, and services until their commercialization or application.

In order to correctly recognize R&D expenditures in accounting and reflect their results, we recommend to rely on professional judgment of accountant on application of the principle of temporal certainty of facts of economic activity, implementation of which is reduced to:

- (1) Recognition of amount of assets that represent expenses and results of work for each separate accounting period during R&D period;
- (2) Assessment of assets that represent expenses and results of work received (performed) as a result of R&D contracts.

The use of category “assets” is primarily due to need to distinguish between concepts of assets and expenses when forming indicators of static (balance sheet) and dynamic (statement of financial results) reporting. It should be noted that assets represent expenses incurred in order to extract future economic benefits [15].

The rules for the recognition of R&D expenditures provided for in paragraph 7 of RAS 17/02 do not take into account specifics of unfinished work and therefore cannot be applied to recognition of expenses for unfinished work.

To solve this problem, first of all, we recommend defining the object of accounting, which means unfinished R&D that should be linked to a contract or order, since in Russian standards, expenses are determined for each contract (order). However, there may be a situation when the contract can be presented as a virtual one [16], i.e., when performing R&D, one contract can be considered as several accounting objects (several virtual contracts) and, conversely, several contracts (orders) can be considered as one accounting object. Secondly, based on the principle of temporal certainty of facts of economic activity, we believe that unfinished R&D should be recognized as expenses under the contract (order) recognized in reporting period in which they are incurred. Thus, actual expenses incurred may include expenses related to work started but not completed.

Recognition of R&D expenditures is associated with problem of their evaluation, which determines reliability of generated accounting and reporting information, focused on meeting different user requests. The principle of monetary measurement is a consequence of the principle of temporal certainty of facts of economic activity, which ensures relationship between accounting data and accounting statements indicators. The way to ensure this relationship is to determine influence of time factor through cash flow discounting mechanisms, which is very effective in measuring the value of debt: accounts receivable and accounts payable. This makes it possible to neutralize current instability in solvency of funds over time, associated with inflationary processes, as well as changes in market conditions, by bringing accounting data presented at past prices in line with current monetary estimate.

All discounting operations are reduced to calculating future value using discount formula (47.1).

$$FV_{rd} = PV_{rd} / (1 + i)^n \quad (47.1)$$

here: FV_{rd} —presents the value of capitalized R&D expenditures; PV_{rd} —future value of capitalized R&D expenditures; i —discount rate; n —time frame (number of periods).

The most difficult part of discounting future value of capitalized R&D expenditures is determining rate, since it significantly affects the results of calculations.

When R&D expenditures are recognized, discount rate will vary at different time points.

Developments at a certain stage of their implementation are characterized by ability to bring certain economic benefits in foreseeable future. Therefore, from moment when the receipt of economic benefits is confidently recognized, development costs are taken to the balance sheet as deferred capital expenditures, in order to compare them with expected economic benefits in future reporting periods.

As for applied research, which is part of development, there is not sufficient certainty that costs incurred will lead to future economic benefits.

Based on IAS 38, we propose to capitalize R&D expenditures at development stage from the moment they are started.

One of the important problems is the moment of time when R&D expenditures started to be recognized, which resulted in a positive result when they were completed, but the use of this R&D result in production activities was not started immediately [17].

Research has shown that this problem does not find an unambiguous solution in modern regulations acts.

An important aspect in implementing the principle of temporal certainty is not only the moment when R&D expenses are recognized, but also the moment when capitalized expenses are written off in form of: fixed assets; IA; a positive R&D result that is not subject to legal protection, since when forming accounting statement indicators, it is necessary to reliably provide information about monetary measurement of these assets. In this case, comes to the fore problem related to choice of term of use of received asset as a result of R&D, which determines the correctness of determining innovative attractiveness of subject.

The research conducted in terms of procedure for writing off R&D expenses showed that there are problems in determining expected period of use of resulting work result, which affects the reliability of information formation in accounting.

The implementation of the principle of temporal certainty is associated with need to bring past costs to the current moment, in particular, by reviewing period of expected use of results of work. This will allow to change initial value of expected usage period. At the same time, we suggest calculating new amount of deductible expenses using the Formula (47.2).

$$a_i = \frac{1 + \Delta - \frac{T_0}{T_1}}{1 - t} \quad (47.2)$$

here, a_i —new norm of writing off cost of objects created in result of R&D for current expenses; Δ —change in write-offs of value of objects created in result of R&D for current expenses as percentage of original amount write-off (\pm); t —period of output of innovative products up to present time (months); T_0, T_1 —initial and modified terms write-off of value of objects created in result of R&D current expenses (months).

In addition to determining the moment of recognized in accounting expenses which based on application of methodological principles, other important issues are regulation of their value through composition of R&D expenditures.

In this regard, it is particularly necessary to have a reliable information base on results of SRW and EDW, formed on basis of:

- Accounting information reflected in primary accounting documents, accounting registers, financial and management reports;
- Non-accounting economic information contained in feasibility study for implementation of work results; R&D plans; estimate documentation; industry data.

It should be noted that currently, for tax purposes, the use of R&D results in production of new types of products is one of conditions for recognizing these expenses as part of other expenses evenly for one year from the first day of month following the month of completion of such research (except for organizations operating in special economic zones or performing work included in a special list) [18].

At the same time, in accordance with the decree of the Government of Russian Federation No. 988 of 24.12.2008, an organization may include R&D expenses in other expenses in the amount of actual costs using a coefficient of 1.5. However, it is necessary to make a report on R&D performed for each study or individual stage of work [19].

Based on research, the generalization and systematization of practice of primary accounting of R&D results, recommendations are given for improving primary accounting of R&D.

The recommended composition and procedure for forming composition of main primary documents for recognition of R&D results are shown in Fig. 47.1.

Performing R&D will not necessarily lead to increased economic benefits in future. In this situation, the result is recognized as “negative,” and costs for them, during implementation of which it was revealed impossibility to achieve positive results, are recognized as other expenses.

In case of failure to achieve a positive result for stage, it is necessary to draw up a primary document named “report of performance of stage of R&D with a negative result,” confirming inexpediency of conducting further work. Then, the stage manager shall attach a written justification for termination of work to this report. With research nature of SRW, there is no need to go to development stage.

In the case of introduction of R&D results are issued: (a) a feasibility study of implementation of results of work, indicating probable period of their use; (b) report of implementation of results; (c) report of acceptance tests.

Research has shown that in process of scientific development, there are often take place risks of uncertainty in receiving incomes in the case of commercialization of innovative projects. In order to neutralize any risks, Russian and foreign regulatory documents provide for the formation of valuation reserves. However, there is no provision for creation of reserves in relation to risks of carrying out work at research and development stage.

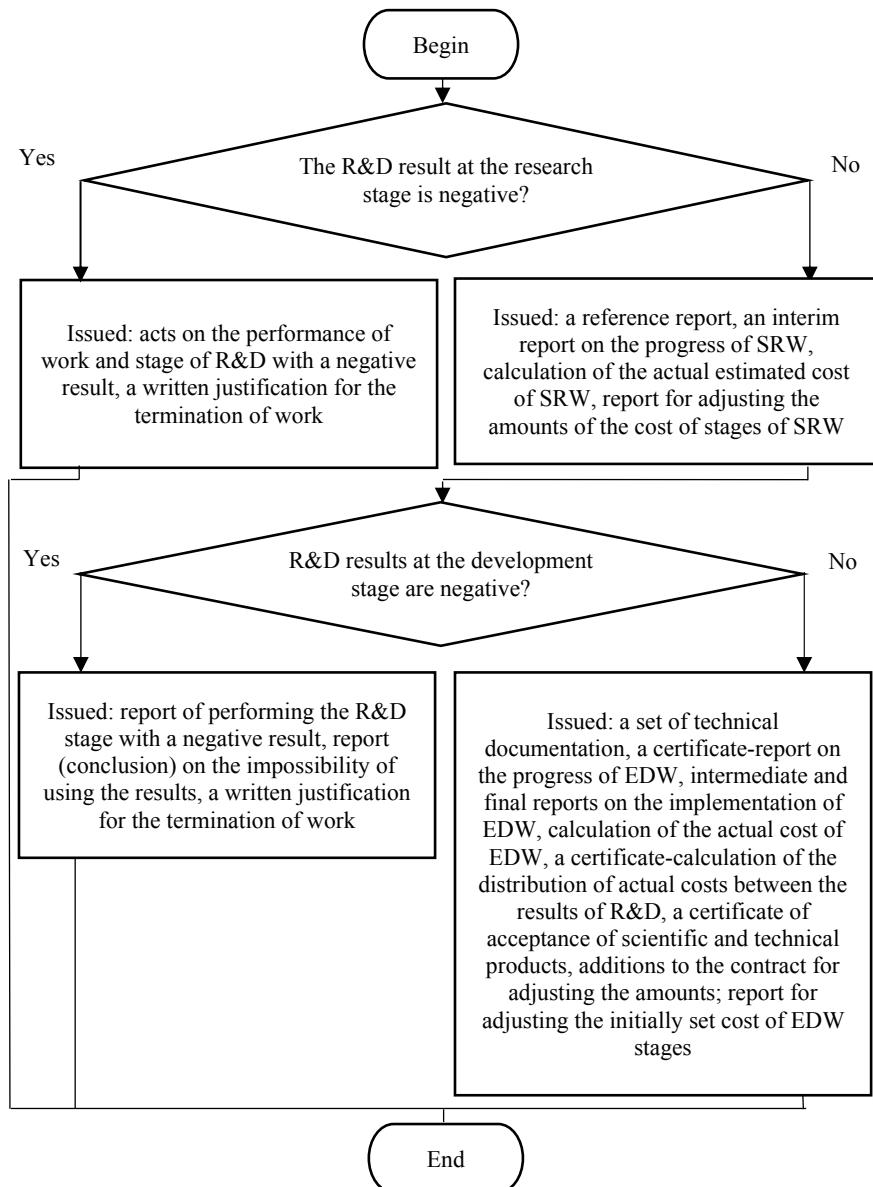


Fig. 47.1 Procedure for forming composition of main primary documents for recognition of R&D results

47.5 Practical Aspects of Improving the Methodological Support of R&D Accounting in an Enterprise

The practical significance of recommendations presented in the article is determined by use of conclusions and recommendations on improving organization of accounting for expenses and results of SRW and EDW in economic activities of economic entities.

At the same time, as objects of research were selected processes of formation and disclosure of information on expenses and results of R&D of scientific production and industrial enterprises: LLC "Kamyshinsky plant of metalwork and Assembly tools" (Kamyshin), NPJSC "GAZPROM-KRAN" (Kamyshin), LLC "Zavod Rotor" (Kamyshin), JSC "Kamyshinipishcheprom" (Kamyshin), JSC "Kamyshinsky bakery" (Kamyshin), LLC "KOPAK-Information technologies" (Volgograd).

In the conditions of successful activation of innovative activity, new proportions arise in the levels of expenditures by type of innovation: technological, marketing and organizational. In this regard, it is particularly necessary to have a reliable information base on results of research, development and technological work.

According to the study of accounting practices of surveyed organizations: LLC "Kamyshinsky plant of metalwork and Assembly tools" (Kamyshin), NPJSC "GAZPROM-KRAN" (Kamyshin), LLC "Zavod Rotor" (Kamyshin), corresponding technical or construction documentation can be presented as a result of work. However, if terms of contract do not provide documentation by customer, subsequent transfer is issued as contract of sale, which is primary document confirming performance of work.

Studying reflection of expenses and results of R&D, it was found that there are problems with accounting for income received by performers of these works under contracts.

As shown by the study of accounting practice, recognition of incomes in accounting of executing organization is carried out by ordinary accounting records on account 90 "sales" in correspondence with debit of account 62 "settlements with buyers and customers." However, this method of accounting, in our opinion, is only possible if short-term work is performed. In the case of long-term works that involves stages of their implementation, you should use the account 46 "completed stages for work in progress." The following criteria must be met:

- Availability of stages of work in accordance with terms of R&D contract;
- Ability to determine cost of each stage of work that has an independent value.

The method of calculating reserve for future R&D expenses for tax purposes is demonstrated based on results of a study of materials of LLC "Kamyshinsky plant of metalwork and Assembly tools."

The research and development program is designed for a period of 1 year, providing for cost of R&D in amount of 20 million rubles. The estimated amount of research and development expenses is evenly distributed at 4 million rubles for each

quarter of year. This indicator is divided into accounting tax periods and compared with maximum amount of deductions to reserve.

Actual research expenses for reporting periods of first year reached 4 million rubles for first quarter, 10 million rubles for half-year, 16 million rubles for 9 months and 18.3 million rubles for year.

According to results of reporting (tax) periods, deductions will amount to: 1 quarter—4.2 million rubles; half-year—9 million rubles; 9 months—13.5 million rubles; year—20 million rubles.

For year the amount of provision is more by 1.7 million rubles, which is recovered evenly throughout year in amount of: 0.425 million rubles ($1.7 \text{ million rubles}/4$) for the first quarter; 0.85 million rubles ($1.7 \text{ million rubles}/4 + 0.425$) for the half-year 1.275 million rubles ($1.7 \text{ million rubles}/4 + 0.425 + 0.425$) for 9 months; 1.7 million rubles a year.

In this case, updated declarations are made based on results of reporting periods and results of year. If a provision is created for two years, or if it is formed in a transition from one year to another, results are summed up at the end of the period of recognition of provision.

Thus, when forming a reserve for tax purposes, taxable temporary differences will occur in accounting on a quarterly basis, leading to the formation of a deferred tax liability [20].

Based on conducted research, generalization and systematization of documents used for accounting for R&D results, recommendations are given for expanding list of documents to confirm the moment of recognition of positive and negative results of R&D.

47.6 Concluding Remarks and Research Needs

The conclusions and suggestions allow us to make correctly recognize expenses and results of R&D in accounting and to reliably reflect information about them in financial statements. The basic foundations of developed theoretical aspects and methodological recommendations will improve organization of accounting for expenses and results of research and development activities of Russian economic entities.

The scientific novelty of research consists in clarifying characteristics of composition and content of expenses that are subject to recognition in accounting related to implementation of SRW (at the research stage) and EDW (at the development stage) based on a critical analysis of regulatory acts, IAS 38 and contractual practice on R&D.

Improving methodological support for accounting for R&D expenditures, results are based on a correct understanding of economic content of facts of studied objects of accounting for innovation activities. Current regulatory documents do not give an unambiguous interpretation of research, development and technological works, which leads to distortion of financial information about them in accounting and reporting.

The study of norms of Russian laws on innovation, civil and tax legislation, RAS 17/02 and IAS 38 allowed to draw a conclusion about methodological difficulties in generating information about expenditures and results of R&D at the stages of research and development. Thus, issues of differentiation between concepts of SRW and EDW are considered in RAS 17/02, which has reference rules to Federal law regulating science and state scientific and technical policy. However, this law does not disclose economic interpretation of facts of implementation of development and technological works. On the basis of norms RAS 1/2008, which allow in absence of specific decisions on organization of accounting using rules of international accounting standards, recommend EDW recognized as objects of accounting under development and SRW to be recognized as the objects of accounting at the research stage.

The study confirmed the importance of developing methodological support for accounting for facts of expenditures and results of work: research, development and technological.

Research has shown that in the process of scientific development, there are often risks of uncertainty in generating revenue in case of commercialization of innovative projects. In order to neutralize these risks in economic literature, it is recommended to form of valuation allowances in account “reserve for innovation activity.” However, the study of economic situations on adjustment of amounts specified in contracts for R&D, as well as with termination of use of positive R&D results due to their unpromising commercialization, showed need to reflect changes in amounts of estimated reserve. In addition, the account “reserve for innovation activity” proposed in economic literature requires renaming, since its information content does not correspond to its name. Taking into account these recommendations, we suggest that the sub-account “Estimated R&D reserves” should be added to account 96 with the opening of the following analytical accounts:

Account 1: “Estimated reserve for changes in the amount of expenses for conducting EDW”;

Account 2: “Estimated reserve for changes in the amount of positive R&D results.”

The developed theoretical provisions and recommendations for improving methodological support of accounting for expenses, and results of research and development activities of Russian economic entities will make it possible to reliably generate information about innovation activities in the context of research and development stages.

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Chapter 48

Taxation of the Digitalized Economy



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Abstract This article examines the state of the tax mechanism in the digital economy. The authors describe the problems of taxation of income of IT companies. The article describes the measures taken to update tax regulation in the framework of international relations. The authors draw attention to the importance of updating the mechanism for taxing digital income.

48.1 Introduction

Digital transformation drives innovations and improves the quality and efficiency of services, while there are also more inclusive and sustainable growth and welfare improvement. At the same time, the scope and speed of the changes lead to new challenges in different areas of the economy, including taxation.

Increased share of digital companies brings many benefits, for example, in terms of growth, employment and overall welfare. But it also creates a number of issues for regulatory authorities. These issues go far beyond the scope of domestic and international tax policies and affect fields such as international personal data protection law, accounting and dispute settlement.

The authors identified the following tasks: analysis of the literature on taxation of digital companies; description of existing problems of taxation of digital companies; formulation of a hypothesis based on the described issue field; identification of key problems based on the hypothesis; analysis of existing proposals for updating the tax regulation mechanism; and development of proposals for updating the tax mechanism.

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48.2 Literature Review

The issue of taxation of digital income is controversial and has been considered in the works of many Russian and foreign works, such as OECD working papers [1, 2] and IMF reports [3, 4].

In recent years, the integration of national economies and markets has increased significantly, which has led to tensions in international tax relations due to the tax rules developed more than a century ago [5]. Current rules cannot prevent tax base erosion and tax evasion, which requires from regulating authorities to take bold steps to restore confidence and ensure that profits are taxed where economic activity takes place and value is created.

Challenges in the field of taxation of the digital economy were recognized as one of the main areas of activity of the BEPS OECD project. In 2015, it found that digital economy could not be separated from the economy as a whole.

An increasing number of jurisdictions are not satisfied with the results of taxation of digital companies obtained under the current international tax system and are seeking to introduce various measures that may lead to a significant increase in the tax burden, non-compliance with double taxation rules and uncertainty.

The OECD chosen two key areas for work in 2019 [2]:

- (1) Distribution of tax rights and revision of the profit distribution rules in the course of providing digital services;
- (2) Develop rules that will grant jurisdictions the right to tax refunds in cases where other jurisdictions have not exercised their primary tax rights or payments have a low level of effective taxation.

One of the main reasons for dissatisfaction is related to how the existing rules of profit distribution and interconnections take into account the growing ability of enterprises in certain situations to participate in the economic life of a jurisdiction without appropriate or significant physical presence. Typical reasons identified include the dependence on intangible assets and the growing share of digital services in cross-border trade [6].

The evolution of business models as a whole and the growth of the digital economy in particular have resulted in nonresident digital companies operating in the jurisdiction market in a way that is different to the one that existed when international tax rules were developed [7]. For example, in the past a company could sell in one of the jurisdictions without a physical presence there, but the current progress in the field of information technology has significantly expanded the scope of such activities. Furthermore, expanding the capabilities of companies in a jurisdiction traditionally tended to require a physical presence, which was expressed in the presence of production, marketing and sales in the market. These operations in a country would have to include high-value transactions such as purchasing, inventory management, local marketing, branding and other activities that generate taxable profits in that jurisdiction. Business development combined with development of information and communication technologies and liberalization of trade policy has allowed enterprises to manage numerous functions, which used to require physical presence, in a

centralized way, which, in turn, has rendered conventional business model obsolete. In the modern world, it is becoming increasingly rare for standard business models to require physical presence in a country, a trend that is particularly visible in the digital sector and poses issues for international taxation.

In general, the main issues in the field of direct taxation of digital companies are divided into three broad categories [1]:

- Communication: the constant increase in the potential of digital technologies and the reduction in many cases of the need for a physical presence to conduct business, combined with the increasing role of network effects resulting from customer interaction, raise questions whether current rules determine income rights for tax purposes;
- Data: the increasing complexity of information technology has allowed digital companies to collect and use information across borders to an unprecedented extent. This raises questions about how to determine the value created by generating data using digital products and services, and how to characterize for tax purposes the provision of data by an individual or legal entity as part of a transaction, for example, as a free delivery of goods, as a barter transaction, or otherwise;
- Payments: the development of new digital products or services creates uncertainty about the proper characterization of payments made in the context of new business models, especially in relation to cloud computing.

These issues raise the question whether the existing international tax system is still appropriate due to the changes brought about by the digitalization of economy and new business models. The issues are also related to the distribution of tax rights between source and actual location jurisdictions. At the same time, these issues create the risk of double taxation.

The emergence of digital companies also creates issues for calculating VAT, especially when goods, services and intangible assets are purchased by private consumers from suppliers abroad [8]. This is partly due to the lack of effective international structure for collecting VAT in the consumer jurisdiction. For economic entities, in particular small and medium-sized enterprises, the lack of international standard for calculating, collecting and transferring tax to a potentially large number of tax authorities creates difficulties and high costs of compliance with the standards. From the governments' point of view of, there is a risk of revenue loss and profit distortion, as well as the issue of managing tax liabilities caused by a large volume of low-cost transactions, which can cause a significant administrative burden, but generate little revenue.

Taxation of digital companies is one of the complex issues being addressed under the Organisation for Economic Co-operation and Development's project aimed at Base Erosion and Profit Shifting (BEPS). While countries around the world are working to adopt OECD proposals on most of the items in the BEPS Plan, the global consensus remains elusive on whether and how to tax businesses that have a significant share of digital business but no physical presence in a jurisdiction, and

countries see a mismatch between taxation and value creation for digital activities [9].

In addition to the development of digital companies, government agencies are also coming to digital platforms. The situation in Russia serves as an example. There is an active implementation and provision of digital public services of the FTS of Russia, the developed automated system of tax control, the identification and development of the taxation mechanism for new products and operations, created in connection with the use of digital technologies [10].

It leads to a stricter state control. Tax authorities are changing their approaches and paying more attention to tax processes and business control [11]. Regulatory requirements for information disclosure are becoming more stringent (e.g., reporting by particular countries and related party data disclosure). Enterprises are also getting a stronger incentive to move to electronic platforms (e.g., mandatory electronic filing of tax returns in Singapore for 2020 fiscal year) [2]. In some OECD countries, the total share of electronic tax payments exceeded 75%: China, Finland, Hungary, India, Ireland, the Netherlands, Norway, Singapore, Sweden and the UK [12]. However, the tax risks of the state are currently increasing as a result of the increased complexity of economic relations, the emergence of new business models and the increased speed of the processes of creating and distributing information, which result in loss of tax revenue [13]. There is a risk of new activities in the shadow economy due to the emergence of new business models and new technologies.

Improved transparency measures and new reporting requirements, many of which are caused by base erosion and profit shifting, have had a profound impact on tax compliance and reporting functions, verification and controversy, and reputational risk. This, in turn, has increased the need for companies to develop a holistic approach to managing tax risks and conflicting relationships [14].

The process of tax mechanism development is complicated by the introduction of digital taxes unilaterally. For instance, France set the tax on digital services at 3%, but President Emmanuel Macron announced that the tax will be abolished as soon as an international agreement is reached [4]. However, the Singapore government refuses to introduce any distinction between traditional and digital businesses, with the last OECD proposal having been rejected. Brent McIntosh, General Counsel of the US Treasury, said that the Trump administration adhered to the strategy of “two ways” to combat digital taxes. The administration has begun considering responses such as the introduction of tariffs on goods from the countries that levy taxes on digital services through investigation, and participating in the development of a unified international approach to the taxation of Internet service companies. A more global issue facing participants in foreign trade relations is the development and proper functioning of the single market of services for countries. The EU countries have so far been more successful in resolving this problem [15].

48.3 Research Methods

The theoretical framework of this study includes Russian and international documents on the regulation of taxation of digital income in the Russian Federation and other countries, articles by modern foreign and domestic scientists in the field of research.

The methodological basis of this study includes generally accepted scientific approaches (namely systemic, complex and logical) and methods (analysis and synthesis; systematization and classification; comparison and generalization; expert survey).

48.4 Research Results

Thus, we will highlight the problems of taxation of digital companies:

- (1) Determining the tax base;
- (2) Determining the place of formation of the cost of services;
- (3) Approaches to determining the amount of profit subject to the new tax law and distributing this profit among jurisdictions;
- (4) Determining the effective tax rate for income received from digital activities;
- (5) Application of unilateral measures by some countries.

The issues described above are the basic ones in the field of taxation of the digital economy. Their detailed analysis is given below.

Tax legislation in general depends heavily on the classification of income when determining the rate and methods of taxation. Digitalization makes it difficult to clearly distinguish certain types of income, such as royalties, payment for services rendered and profit from activities. The issue of determining the tax base is not limited to direct taxation; it also matters for indirect taxes: VAT or GST. In the VAT system, the nature of transactions and income determines the tax rate. Digitalization also challenges traditional tax practices with new business models. Equating tradable products with digital services is also a subject of controversy. Related to this are questions about the application of duties to transfers, as countries are afraid of losing revenue from custom payments for cross-border transfers.

In the digital economy, one of the main sources of disagreement between countries is the question of where value is created. While countries agree that MNC profits should be taxed in the jurisdictions where they create value, some countries argue that the cost to companies in the digital economy is due to factors such as consumer/buyer participation or location. The lack of technologies that could identify the end user makes it impossible to control electronic transactions [16]. This raises the issue of profit distribution between jurisdictions.

Due to digitalization, there are issues with VAT collection, especially in B2C and C2C transactions. First, the cost of collecting VAT on transactions with a low value

of goods may be higher than the amount of tax revenue. Second, the complexity of collecting VAT on services and intangible transactions makes it difficult to tax cross-border online transactions. C2C transactions, which are an important part of e-commerce, are different from B2B and B2C, where a tax registration and administration system already exist. Suppliers in C2C are usually individuals and households. If the existing VAT system does not provide for a special registration and collection regime for individual suppliers, C2C suppliers are not subject to VAT.

Another important point in this issue is the tax rate. The issue of tax evasion also exists among companies that provide digital services. In this regard, there is a question in determining the effective rate. As mentioned above, digital companies are often registered in other countries, including in jurisdictions with low taxes, and transfer money across borders without hindrance. Companies engaged in online sales can easily avoid paying taxes in the countries where they carry out a less significant sales volume.

For example, France argues that the structure of the world economy has shifted toward data-based structure, making the twentieth-century tax systems archaic. According to the European Commission, in 2018 global technology companies paid an average tax rate of 9.5%, compared to 23.2% for conventional firms [17].

It is important to note that the measures aimed to solve the identified tax issues should be coordinated at the international level in order to avoid double or multiple taxation. The purpose of the stakeholders' work is to ensure the functioning of a single market for services and a new tax mechanism that can take into account the interests of each side of the digital economy.

Thus, the current tax system is obsolete and cannot effectively perform its functions due to the large-scale growth of digital services provided by companies.

While in the twentieth century this system worked quite effectively, in connection with standard business schemes, the twenty-first century brings dramatic changes. Due to an easy access to the Internet and various electronic devices, providing various services has become much easier. Companies no longer need tangible assets, just a device that allows them to use Internet resources freely.

Since companies do not need tangible assets, there is no need for special premises and, consequently, the existence of a permanent representative office, branch or autonomous division in the country where services are rendered.

Here, the old legislation does not take into account the fact that a company may provide services in a jurisdiction other than the place of registration or location. Accordingly, profits are taxed in the country of location, and not in the country where services were rendered. First of all, this affects developing countries, which are an important link in pricing and profit formation [18].

Also, the tax system is obsolete for determining the tax base, or rather for attributing it to certain types of services or goods [19]. What does an incomprehensible interpretation mean that is recognized as a digital activity? The question arises as to how foreign companies without registration in the jurisdiction of rendering services will provide reporting, since they are not actually required to do so. This raises the question of deliberate tax evasion.

Difficulties arise not only in regard to proper tax registration of foreign companies subject to such registration, but also in the administration of VAT in disputed situations. In cross-border trade in services and IA, there is a possibility of double taxation of VAT/GSM. In Russia, the federal tax service issued a letter stating that the tax authorities could not require repeated payment of VAT from tax agents and promised to consider changes in the tax collection procedure. Yet how can Russian individuals find out whether this VAT has been paid by a foreign firm or not, because no one will notify Russian clients about this?

Comparing taxation level between Russian and foreign companies, easily notice the significant difference: content for mobile devices in online stores like AppStore, iTunes and Google Play where Google tax is lower than Yandex taxes. Since the purchase is made directly from foreign companies, it is not subject to VAT. At the same time, there was no violation of the law, according to which nonresident companies that sell apps through online stores in Russia are exempt from VAT. This is exactly the reason behind the introduction of the “Google tax.” There are analogs of indirect taxes in other countries as well.

Taxation issues arise in situations where taxable income can be artificially separated from the activities that generate it, or in the case of value-added tax, in situations where transactions are not taxed or are subject to an unreasonably low tax rate on remote digital consumables in order to exempt businesses or MNCs that carry out exempt activities from taxation. These situations undermine the integrity of the tax system and potentially complicate the achievement of tax and fee revenue goals.

Taxpayers move their taxable income outside the jurisdiction where the income-generating activity takes place, and other taxpayers end up bearing a larger share of the tax burden [20].

As a result of such an obsolete tax system, the above-mentioned issues arise. It is quite easy for companies to evade taxes, apply the lowest tax rate and perform other actions to obtain an unjustified tax benefit [18].

Thus, the taxation of digital companies currently has many issues and disadvantages. The growth of digital companies points to the relevance and significance of existing issues.

In February 2020, the OECD released an interim report describing the challenges of taxing digital companies. The program under the Inclusive Framework has been approved by more than 120 countries. The report analyzes the characteristics of digital business models, including their remote presence, the predominance of intangible assets and data, as well as the active participation of consumers. By the end of 2020, the OECD is going to publish the final package of measures needed to fix the issues. The figure below shows the main meetings, the OECD, the EU and the G20, where the taxation of the digital economy is expected to be discussed.

However, while recognizing that other countries believe that temporary measures will need to be taken to strengthen their tax bases more quickly, the report lists the general principles that these countries believe should be followed in order to minimize the negative effects of such measures.

Many countries have already taken a number of unilateral measures with regard to taxation of digital economy enterprises. Countries such as Israel and India have

introduced special tests to determine the economic presence in the country for the establishment of permanent representative offices. Some countries, such as Australia, have created special tax regimes for multinational enterprises that allow a reduced rate of income tax to be applied to digital companies registered in the country, subject to a number of conditions. From April 2020, the UK will start collecting tax at a rate of 2% on the revenue of search engines, social networks and online stores. Revenue thresholds are set at 500 million pounds (about \$638 million) worldwide and 25 million pounds (about \$32 million) domestically. The first 25 million pounds will be released.

France was the first to introduce a digital tax at the rate of 3% of the gross profit received from digital activities: the provision of online platforms, online advertising services and the sale of user data. Due to the fact that most digital companies are American, there was a conflict between the USA and France, but the countries managed to agree. France has postponed the digital tax until the end of 2020. If the OECD comes up with a consensus solution, France is ready to cancel its own digital tax, but if consensus is not reached, the existing tax will be charged.

In the USA, the so-called basic tax on erosion and prevention of abuse of tax benefits (BEAT) has been introduced. The BEAT targets large American corporations that make deductible payments, such as interest, royalties and certain service payments, to related parties. If the standard income tax is lower than the BEAT, then the corporation must pay the normal tax plus the amount by which the BEAT exceeds the normal tax.

Some countries impose special taxes working capital for the target sectors. Thus, Hungary has introduced a digital advertising tax, and Italy has introduced a fee on digital transactions.

Recently, the European Union's digital taxation strategy offers both temporary measures and a long-term solution. The European Council has expressed its preference for coordinated response of tax policy to the problems arising from the digitalization of the economy at the global level. However, the EU also believes that temporary measures are needed due to the lack of consensus and limited progress made at the OECD level in implementing the global standard.

Under the temporary measure, the EU's proposed new 3% tax on digital services will apply from January 1, 2020, to revenue from certain services, including the sale of advertising space on the Internet, the creation of certain online platforms and the transfer of collected user data. In the EU, not everyone agrees that this is the right approach, and many argue that a global consensus is needed first and digital companies should be treated the same as other companies.

Some member states have already expressed concerns about DST. Since DST is a tax on revenue, so it is paid even if the company incurs losses. For the same reason, companies will pay the same tax regardless of whether they have a high or low margin. Also, DST is not an income tax, so there may be a double tax, since a foreign tax credit is not allowed to be offset in the country of the company's physical presence [21].

If a long-term global solution is not achievable, there is a risk that spreading temporary measures will become permanent, which will cause even more issues, potential double taxation and disputes between jurisdictions.

The Russian digital services market is mainly represented by the following services:

- Online advertising;
- Sales of user data;
- Marketplace services.

These groups of digital services are given special attention in the work of the OECD and the EU. It is worth noting that Russia is both a major consumer of digital services and one of the countries that has domestic competitive manufacturers. Assessing the structure of the Russian digital services market is significantly complicated by the fact that there is no available information about the volume of digital services related to Russian users and provided by foreign companies.

However, the data on the income received from the implementation of digital activities in Russia by MNCs cannot be applied for the purposes of digital tax, since they can be obtained when recalculating data on VAT paid from electronic services. This data is not applicable due to the fact that services subject to VAT differ significantly from digital services subject to DST in European countries.

Russia imposes VAT on digital services that were provided the Russian Federation by foreign organizations. In other words, services are taxed if the consumer is a Russian buyer. The tax is charged on income received from the provision of services such as online advertising, services for the transfer of user data from foreign companies and marketplace services.

Russia also plans to introduce a digital tax, while experts note that VAT and digital tax are very similar, since they are charged from revenue. Developers are faced with the issue of differences between these taxes and considering the possibility of applying VAT instead of tax on digital services. The digital tax is planned to be introduced only if the OECD fails to reach an agreement by the end of 2020.

The CSR also compares the introduction of unilateral measures and those taken under the BEPS plan [22]. According to the research, the introduction of unilateral measures is a more profitable option for Russia. But this option also has negative aspects.

48.5 Implications and Recommendations

This study has analyzed in detail the functioning of the international tax system in the digital economy. The digital economy is currently an inseparable part of the economy. In recent years, there has been a strong growth in business activity associated with the use of digital technologies. Digital technologies make it possible to move away from standard business schemes associated with binding to tangible assets, simplify many processes and automate them. Digital technologies have made it possible to

expand business opportunities, reduce costs and find new channels and markets, which allowed business to be more flexible. Thus, high-margin digital companies have emerged that are free to operate in multiple countries at the same time without permanent missions.

Based on the results of this study, the issues have been formulated as follows: The existing taxation system is obsolete and unable to perform its functions effectively due to the massive growth of digital services provided by companies.

Summarizing the results, it can be concluded that updating the taxation mechanism is one of the main tasks, as it will take into account the interests of all parties involved in the digital services market. To avoid double taxation, it is necessary to address issues related to digital companies at the international level.

Digital companies tend to go to low-tax jurisdictions to reduce their tax burden, as companies do not need to be physically present in the jurisdictions where the markets are located, and this allows them to avoid paying taxes in the countries where they generate revenue. Thus, countries with low taxes on income gain and countries where digital companies' products are sold lose possible tax revenues to the budget.

From 2015, OECD/G20 has been developing an international convention that will help solve existing tax problems. This paper has addressed some of the issues, but there are still some of the most difficult ones that require thorough elaboration.

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Chapter 49

Socio-economic Safety Ensuring of the Sakha Republic (Yakutia)



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Abstract One of the key issues of the country current security problems is economic security of the regions. The category “security” is revealed as the property of the social security system from external and internal threats. The statistical assessment results of Russian region quality and living standards including resource regions were analyzed in the article. The sociological survey data shows that the Sakha Republic (Yakutia) is included in regions with a high level of social tension. The climatic and economic bases of the region’s development instability are shown. Socio-economic and political threats types are the probable cause of social tension in the region are shown based on the regions social and economic development results analysis and their character disclosure. It is shown that the most informative indicators of the population living standard can be taken for comparative relative analysis, not GRP per capita, but the registered number of unemployment, the population proportion with cash incomes below the subsistence minimum, the gap between the incomes of 10% of the most profitable groups of the population and 10% of the lowest income, unemployment rate, purchasing power coefficient. These life quality indicators in the republic are lower than the average values of the above indicators for the Russian Federation and the Far Eastern Federal District. It is concluded that the main factors hindering the region development are the lack of transport infrastructure and the high cost of energy supply determining the unequal economy competitiveness which are in federal responsibility and competence. The main concept of economic security problem solving in the region is to make conditions for equal competing opportunities.

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49.1 Introduction

The Russian Federation as a multinational country with a federal status includes regions with different state structures. A large territory of the country consists of zones with different climatic characteristics. Therefore, living conditions, energy needs and the population life quality vary significantly. Providing energy resources in the regions is mainly carried out by large specialized enterprises aimed at own benefits in market conditions. A single individual people cannot confront the huge monopolies and their monopoly decisions. Society needs equitable security ensuring in the socio-economic sphere in the twenty-first century. The regions' social security of the Russian Federation involves the protection of civil rights of the population, the quality improving and standard of living that guaranty peace in the country and society peace.

49.2 Relevance and Issue Scientific Significance with a Brief Literature Review

Social development and social society protection are becoming a priority type of sociopolitical activity [1–5]. Social systems are complex and multifunctional. One of their main properties is safety. There cannot be absolute security for any complex systems. In this regard, security insuring is a relative concept. The individuals, society and the state safety are relatively independent concepts. The problem of the individual and society security is considered within the state security ensuring. State security increasing does not mean the individual and society security ensuring. State interests can also be implemented by reducing the security of individuals and society.

One of the key issues of the country's current security problems is ensuring regional security, in the economic importance. The essence of regional economic security includes significant concepts such as “the territories' ability to ensure sustainable development of the territory in conditions of economic independence,” “integration with the Russian economy” and “threats counteraction ability, weaken and neutralize their action.”

The essence of the category “security” is in the security from all kinds of threats. The current time is characterized by political, economic and social contradictions and threats that are dangerous to the modern society. Threats of economic security are the result of emerging contradictions, both in the internal space of the region and beyond, and are the result of a violation of the balanced development of the region's economy. Firstly, threats of regional security are appeared through phenomena, processes with a negative impact on the regional socio-economic system. The regions' economic security is determined by a variety of internal factors depending on the region economic policy and external causes, in particular, the state policy. It is necessary to understand the root causes of threats, sharpening of internal contradictions in the socio-economic development of the regions, contravention of complex, integration processes between

the Federation entities, economic sectors and the stable functioning of economic entities to ensure the country security.

49.3 Problem Formulation

The region security depends on the necessary social conditions made by society and by the state to ensure the vital activity of the population. Only the sustainably developing society when the population interests are the absolute priority can ensure security. The region security represents the social essence from this perspective. The unresolved economic situation in the region can create social threats.

Social security is in the protection state of social groups from infringement of the material and spiritual citizens' rights from certain threatening factors, in the ability to withstand adverse external and destructive internal influences. At the present time, these social safety positions are relevant: reduction of property differentiation population and irregularity preventing of the regions' socio-economic development.

49.4 Theoretical Part

The main indicators of the population social safety are set in the official statistics. Their threshold values are applied to assess the living standard—the limit indicator values characterizing the ordinary course of society development. The values exceeding of the indicator compared to threshold values indicate the presence of a potential threat to the population normal life. It can lead to the negative, destructive trends formation in the economic and social security field of the population. The main ones and their threshold values can be listed in the form: the gap between the incomes of 10% of the highest-income population groups and 10% of the lowest-income groups—8 times; crime rate (crimes number per 100 thousand people)—5 thousand; and the unemployment rate according to the ILO methodology is 7%. The above indicator statistical data presents a real picture of the population social security, the effectiveness and correctness of decision-making and actions of governmental authority and politics.

The Sakha Republic (Yakutia) main differences are the absolute low temperature in the territory and its long duration, the permafrost soils, the region's seasonal and climatic economy dependence, the weakness transport scheme, poor infrastructure and insufficient stability of its work in the special conditions of the Far North [2, 6]. Yakutia is characterized by a low population density of 0.3 people per square km. Settlements are located at a great distance from each other. Almost half of the territory is beyond the Arctic Circle with 8% population. These factors determine that the republic economy is in unstable equilibrium state. The economic situation instability is also characterized by the dominance of a monostructured economy.

A significant part of the republic and the population income is spent on transportation costs. The goods delivery to the Arctic zone has a complex transport scheme. The distance from suppliers to customers is more than 4,000 km within the republic; waterway transport with several transshipment bases is used for cargo delivery [6]. Annual stock oil products are imported by waterways in many Arctic regions in summer. The transport cost share in the goods cost reaches 80%.

The heating season duration in Yakutia is longer than in Siberia, so the energy intensity of any product is much higher compared to the European part. In this regard, any consumer goods produced in Yakutia becomes completely uncompetitive due to the high cost. Any production in the North is unprofitable and provides only the existence and survival except for the mining and monopoly industries (e.g., energy). Objectively uncompetitive production is one of the threats to economic stability.

The sociopolitical and economic management imperfections of the regions negatively affect many social groups. The tensions that arise in this case in society are associated with a sense of anxiety. In many studies, social anxiety is understanding that economic, political, social, national, cultural, vital needs and interests are at risk. There is tension from the impracticability of upholding interests legally. The work [7] discusses the measuring results of the social tension level, and citizens protest activity of the Russian Federation members carried out in 2014 as part of a research project to monitor public opinion in the interests of the Russian Ministry of Internal Affairs. The following indicators were studied: the level of dissatisfaction of citizens with the economic, political, social situation; the regional situation assessment and the regional authorities' activities; the conflict factor identification that destabilizes the social situation in the regions; and assessment of the preparedness level of the regions' population for confrontational forms of behavior in conflict situations. A group of regions is identified (25 in total) in the work, based on the sociological data comparative analysis where a high level of social tension was recorded during 2013–2014. The Republic of Sakha (Yakutia) was noted among them. The Republic of Sakha (Yakutia) is assigned to a group of regions with high rates of orientation toward protest actions in this work. It is also shown that more than half of the population in the republic is worried about uncontrolled migration and migrant behavior. According to the analysis, it was concluded that the social tension emergence depends not only on the socio-economic situation and the population living standards. For example, the Republic of Tuva belongs to the regions with a low living standard but is not included in the group with a high social tension level. One of the main reasons for the protest moods is the social stratification presence of various population segments. It is shown that the social threats accumulation and risks can increase social tension and the population protest activity.

The results of studies from various sources are considered to obtain a more realistic picture of the socio-economic state of the Republic of Sakha (Yakutia). The comparative assessment of Russian regions' socio-economic security and their basic assessment parameters have been studied in many works [8–16]. More objective information and a detailed study of the quality and standard of the population living in all regions of Russia are given in works [8–11]. Regional differentiation is considered according to the main indicators of the population quality and living standards

in 2008–2010 years across all regions of Russia in work [8]. The Republic of Sakha (Yakutia) in terms of purchasing power parity per capita takes a high place (14th), and in terms of absolute poverty it shows low values (5th place). It is in 19th place according to the human capital development index, 54—by the purchasing power of the population's cash income, Gini coefficient—30, fund ratio (14.3 times)—29. As you can see, according to average indicators the republic does not refer to the regions with low life population quality but it has low values by population living-level indicators.

Some excellent assessment is given in works [9] with the inclusiveness composite indexes of the socio-economic development of 16 resource regions of the Russian Federation (including Yakutia) by 12 indicators in four blocks of grouped indicators (population incomes and their inequality, access to health services, housing conditions, access to infrastructure). As shown in the work, the inclusiveness of socio-economic development implies adherence to the justice principles and equal opportunity which means the wide involvement of all population segments in the economic development. The data analysis showed that Yakutia ranks 16th in terms of unemployment and by the population share with cash incomes below the minimum subsistence level, 10 in terms of access to health services, 10 in terms of housing and 16 in terms of infrastructure development. The republic is in 16th place from 16 resource regions according to the overall index. Yakutia (80) with the Nenets Autonomous Area (79) was at the very end of the ranking among all Russian regions in 2008–2014. The study results allowed making a conclusion that the rich resource potential does not guarantee inclusive development. The paper has made suggestions for conducting a more active social policy aimed at equalizing social indicators at the expense of income from the mineral resource complex in order to improve the quality and the population living standard of the regions.

The work [10] presents data from a statistical analysis of the Krasnoyarsk Territory economic security as the resource-type region, by 59 indicators in comparison with their threshold values. It is said that a significant imbalance in many indicators can create threats associated mainly with unevenness in the budgetary provision level, distribution of per capita incomes, with the regional tax revenues withdrawal, with non-material population inequality and with the economic consequences of industrial expansion. It is concluded that the region cannot cope with high-quality economic system ensuring with a decent standard of the population living due to the imbalance in many economy indicators. It is shown that the region as a resource does not develop as a region for a person, but as a region for a corporation. Summarizing the study results, the authors propose developing a unified balanced state policy aimed at comprehensively improving the region's economic security which would take into account the different development paths and of different region-type problems.

The Republic of Sakha (Yakutia) is in 41st place ($IPPR = 0.457$) according to the calculation of the integral regional development indicator (IPRR) with a statistical assessment of the indicator groups (economic, social, environmental) [11]. At the same time, there is a high level of gross regional product (GRP) per capita but a low purchasing power coefficient. A low value was found by economic development indicator equal to 0.387 by indicator groups.

49.5 Practical Part

The life quality indicators of the Republic of Sakha (Yakutia) population are given in [17–21]. According to the republic statistics authorities, the main indicators of the living standards of the Republic of Sakha (Yakutia) population were collected from 2000 to 2015 (Table 49.1). It can be assumed that there have been no significant changes in dynamics over recent years comparing the living standards of the region's population by years. The republic occupies leading positions by GRP per capita and per capita incomes of the population. The table analysis indicates that a high GRP value does not show a high standard of the population living.

Absolute values of GRP per capita and per capita incomes do not show the real picture of the population living standard. The subsistence level providing the same life quality in different territories is significantly different. In this regard, the most objectively informative indicators of the population living standard can be taken the

Table 49.1 Republic Sakha (Yakutia) population living standards by years^a

Living standard indicator	2000	2005	2010	2015
GRP, million rubles	81,960	183,027	386,825	
Consolidated budget	24,323	64,514	101,223	202,444
Own income, million rubles	11,044	35,831	56,931	120,544
Subsidies		15,922	48,054	65,929
GRP per capita, rubles	85,376	191,896	403,659	782,629
GRP per capita, Far East, RUB	44,932	127,161	334,910	
GRP per capita, RF, rub	39,532	125,659	263,829	443,951
The number of unemployed, thousand people	54.5	44.9	43.7	36.7
Registered unemployment rate, %	11.2	9.2	8.9	7.3
The same, RF	10.6	7.1	7.3	5.6
The same, FER	12.6	7.9	8.6	6.3
Per capita income, rubles	3968	11,350	23,088	37,847
Per capita income, rubles (RF)	2281	8088	18,958	30,467
The value of the subsistence minimum (VMP), rub. per month	1972	4705	9145	15,140
VPM, rub. per month (RF)	1210	3018	5688	9701
The share of the population with cash incomes below the subsistence level, %	28.3	20	19.0	18.9
The same, RF	29	17,8	12,5	13,1
The funds ratio, in times	11	13,8	14,4	14,0
Purchasing power ratio	2.01	2.41	2.52	2.50
The same, RF	1.89	2.68	3.33	3.14

^aStatistical Digest. Social status and living standards of the population of the Republic of Sakha (Yakutia). Yakutsk (2017)

registered unemployment rate for a comparative analysis, the population share with cash incomes below the subsistence minimum, the gap between the incomes of 10% of the highest-income population groups and 10% of the lowest-income (fund ratio), unemployment rate and purchasing power ratio. According to these most important current indicators of the republic life quality, it is lower than the average values of the given indicators for the Russian Federation and the Far Eastern Federal District. Therefore, the republic belongs to regions with low living standards.

One of the population categories with a low level of quality and living standard is rural residents. The countryside is characterized by a low energy-level supply of and a low level or lack of transport infrastructure and engineering improvement in many settlements (Table 49.2). The life quality in the village is low, and more than half of the population lives in uncomfortable houses. More than half of the rural population does not have a permanent job; the number of people with incomes below the subsistence level is quite high. The registered unemployment rate in rural areas is much higher than in urban areas [14] (4.3 times in 2006). There is a large gap in living standards, life quality, income and employment in rural areas and industry (Table 49.3).

The life quality indicators of republic different population segments have not been adequately studied. Nevertheless, the data presented (Tables 49.2 and 49.3) characterizes the rural population state living close to the true state. Rural area citizens without transport links and social infrastructure, and amenities are the poorest non-competitive segments of the population. For this category of the population, what is determined from the point of view of market laws is unfair from universal positions. These threats can be attributed to the socio-economic type.

Table 49.2 Population living in residential premises by type of improvement, in percent [14]

The population living in residential premises equipped	1989 year		2002 year		2016 year	
	City	Settlement	City	Settlement	City	Settlement
Plumbing	68.7	7.1	80.5	7.3	81	7
Sanitation	59.4	5.3	75.6	6.3	80	8
Central heating	84.1	30.0	90.4	42.5	90	54
Hot water	51.4	4.6	64.1	4.9	76	6
Bathroom (shower)	52.8	4.4	73.5	5.6	77	7
Gas	21.9	12.9	30.4	18.2	38	21

Table 49.3 Average monthly workers and employees' salary, in rubles [14]

By economic activity type	2000	2005	2010	2015
Agriculture, hunting and forestry	2015	5259	10,866	20,816
Fishing	2317	4363	8564	15,470
Mining	9963	27,220	50,360	101,137

Some republic's settlements are located in the Arctic zone. The Arctic regions' feature is the year-round transport links that lack even between neighboring settlements and their location at large distances from each other. Providing fuel, heat and electricity to the Arctic settlements requires huge financial resources. Arctic municipalities are almost completely subsidized; the share of own security is about 7% of the required income [15]. The main energy technical sector condition is characterized by a high percentage of depreciation—from 60 to 80%. The population living proportion in veterinary and emergency homes reaches 39%. Annual product and petroleum product stocks are required to ensure the population livelihood safety. Loaned financial resources increase the cost of stocked products several times to ensure them taking into account large transport costs. The republic is trying to solve all financial overpayments through a cross-subsidization scheme, distributing and shifting costs to the population and enterprises of the republic. As a result, the cost of oil products and electricity in the central regions is significantly increasing. All this additionally increases the manufactured goods and product cost at the enterprises. This is also one of the economic threats to the Arctic regions' security cascading transmitted to the entire region economy. One of the threats is the high rural population migration, especially from the Arctic zone settlements. The population seeks to live in settlements with more comfortable living conditions. This natural process can be regulated by the living standard rising in the countryside. The rural population decrease in a large territory due to internal migration, a decrease in the number of settlements in the North and in not densely populated Arctic territories do not increase the strategic country security, that is, the preservation of these territories.

49.6 Conclusion

The conclusions made in works [7–10] are also characteristic of the Republic of Sakha (Yakutia). The given population life indicators of the republic show the real situation of the socio-economic development of the republic. In addition, a comparison of the regions' condition in comparable climatic, economic, economic and geographical, geopolitical conditions, but significantly different in the level of development, ethnic composition of the population in their territories, and economic potential, shows that the economy of the Republic of Sakha (Yakutia) is in crisis. A low living standard is determined by the low income from extractive industries that provide GRP and significant differentiation of the population incomes in different categories. As shown in the works, threats can be posed due to a significant imbalance in many indicators associated mainly with uneven budgetary provision, distribution of per capita incomes, withdrawal of own tax revenues of regions, non-material inequality of the population and the economic consequences of industrial expansion. In this regard, the region cannot cope with a high-quality economic system ensuring and a decent living standard maintaining for the population. The types of above-shown threats are a potential cause of the possibility of social stress in the region. The conclusion is

that the region as a resource does not develop as a region for a person but the region for a corporation is true for the Republic of Sakha (Yakutia).

The essential principle for region's economic security problem solving is to make conditions for equal competing opportunities. The current economic policy of the Russian Federation solves the survival problem but not on the region development. The region is in the top ten among the 85 regions of Russia by the quality and population living standard determined mainly by the climatic and transport characteristics of the region and the poor territory infrastructure. Transport accessibility and energy availability—the parties hindering the region development determining unequal competitiveness of the economy—are in federal responsibility and competence. It is necessary to develop a unified balanced government policy intended at a complete increase in the economic security of regions which would take into account the various development trajectories and regions problems of different types.

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Chapter 50

On Controversies of English as a Medium of Instruction in Higher Education in Russia



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Abstract The paper addresses the topical academic issue of English as a Medium of Instruction (EMI) in the Pacific Rim Countries with the focus on the current state of affairs in the Russian Federation. The overall strive for internationalization of higher education makes EMI a highly valuable tool and even commodity in the national systems of education. The article presents the analysis of the current sources on the topic surveying the data on EMI in the higher educational institutions of the People's Republic of China, Japan, the Republic of Korea and Russia. The data show significant advancement in the system of EMI in the first three countries under analysis, whereas in Russia the process of establishing such a system is still under development. The undertaken research reveals sufficient discrepancies between the present-day demands for the formalized layout of the EMI structure in the Russian higher education system and its functioning in work. The authors dwell on the topic at hand highlighting the importance of not only maintaining the structure of English as a Medium of Instruction in Russian universities but also designing and implementing the national system of such instruction in correlation with the global standards.

50.1 Introduction

Recent decades and the beginning of this century have established a strong educational trend called English as a Medium of Instruction, EMI for short, which can be regarded as another function of English as the international language. This major trend promotes internationalization in higher education globally, especially in non-English speaking countries, including Russia.

The English language has been dubbed “the new Latin” [1] because it is being used as a medium of instruction in a growing number of such countries where it is seen as a passport to global academic and business communities. University administrators tend to regard EMI as an opportunity to recruit high fee-paying international students and to rise up global rankings.

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The late 1990s and the early 2000s have developed a unified system of higher education for the European countries known as the Bologna process which nowadays unites nearly 50 countries including the Russian Federation [2]. The reasoning behind such unification includes several points among which are the following. The integrated educational space facilitates combinability and versatility of national higher education systems and helps raising European standing and competitive power in the world, on the one hand. On the other, economic globalization requires certain modifications regarding vocational training, which makes the unified European system adjust its teaching approach. All these help to increase Europe's educational potential and counterbalance its competitors in the USA, Canada and Southeast Asia countries.

Moreover, the new educational arrangement has established a new pattern of academic mobility [3] which, consequently, introduced professors' and students' redistribution throughout not only Europe but also the rest of the world and eventually turned out to be beneficial for many parties.

50.2 Background Research

50.2.1 *Prerequisites for the Present Research*

Educational institutions providing EMI, thus, have a great opportunity to make it an article of merchandise and to invite both international students and world-class instructors to enhance their establishments' ratings. Such tendency was acknowledged by the British council and the University of Oxford Department of Education that conducted the study between September 2012 and March 2014. In her report, scholar Julie Dearden surveyed 55 non-English-speaking countries with the purpose of identifying general trends regarding EMI [1].

Respondents in nearly two-thirds of countries reported policy changes in the past 10 years over teaching in English, but only around 40% had policies in place. Respondents, including university professors and administrators and public policy-makers, had mixed views on such an impact. Just over half—50.9%—said EMI was controversial, but 38% were in favour and none said they were against it [1].

Respondents in 83% of countries said they did not have enough qualified teachers, and just 1.8% said they had sufficient numbers of qualified teachers. Looking ahead, nearly 70% said they expected to see a growth in EMI, while just 7.3% thought it would decline, and 1.8% said it would stay the same [1].

For the purpose of the present research, we put the question of how many Pacific Rim countries were represented in the above-mentioned survey and what mainstream EMI trends those countries employ. As it turned out, the survey done by the British council and the University of Oxford Department of Education included 7 PRCs, such as: (mainland) China, Hong Kong and Taiwan in East Asia; Indonesia, Malaysia and Vietnam in Southeast Asia; and Colombia in South America. Taking into account

that the survey included the data on few countries of the region in question, we undertook the research and focused on four PRC prominent players, such as the People's Republic of China, Japan, the Republic of Korea and the Russian Federation.

50.2.2 *EMI in Pacific Rim Countries*

Internationalization and regionalization in higher education in East Asia are researched by many educators. All of them note that the growing number of incoming international students is one of the benchmarks of internationalization of higher education and is becoming major emerging trend in higher education in the East Asian region. International Programs in English as a Medium of Instruction are established to attract international students to their higher education institutes, especially at famous leading universities in this region [4–8]. These programmes can provide an opportunity to study abroad to those who are not so proficient in the host country's language, such as Korean or Japanese, for example, thus using English as a global language.

Given the widespread recognition of the hegemony of English as the most important lingua franca for business, research and membership of the global community, education policy-makers—as well as parents, students and employers—have been voicing their concerns about the current levels of access to and the quality of English-language education. Among the mechanisms that have been increasingly promoted as a solution to this problem has been the introduction of English as a teaching medium in a growing number of schools and HEIs across the region. In recent years, various kinds of regional collaborative programmes have emerged in East Asia and the Pacific region, such as University Mobility in Asia and the Pacific (UMAP) and ASEAN University Network (AUN). Currently, and discussion is taking place among China, Japan and South Korea about the creation of Campus Asia (Collective Action for Mobility Program of University Students), in which all courses will be basically delivered in English as a medium of instruction [9].

50.2.2.1 *EMI in the People's Republic of China*

In mainland China, for example, the EMI phenomenon has been gathering momentum over the past few years and is now a widely recognized feature of the country's higher education landscape. The origins of this policy can be traced to around the time of China's accession to the WTO in 2001, when the Higher Education Department of the Chinese Ministry of Education launched a set of 12 policy initiatives aimed at improving the quality of university provision in the country. Among them was a push for better English-language skills among university staff and graduates—which links national development to proficiency in English and facilitates China's access to “cutting-edge knowledge in the West” [10]. Local universities are now expected to deliver between 5 and 10% of their provision in English, while the

number of EMI courses offered by individual institutions has become an important criterion for quality evaluation [11].

Over the next few years, the number of EMI courses available at Chinese universities increased exponentially: a survey of 135 Chinese HEIs showed that by 2006 as many as 132 universities offered a substantial amount of provision through English, with an average of 44 courses per university [10].

50.2.2.2 EMI in Japan

Similar discourses linking EMI with modernization and internationalization have emerged also in other parts of East Asia. Over the past two decades, both the state and private education sectors in the country have recognized the potential benefits of, what is locally termed, “English only” education—even though at this point in time their focus appears to be mainly on offering EMI courses to international students, rather than on employing English to deliver course content to Japanese students. One recent initiative employing EMI as a mechanism for driving forward the internationalization efforts of the Japanese higher education sector has been the launch in 2009 of the flagship “Global 30” Project. The project aimed to recruit, by 2020, 300,000 foreign students, who would enroll in English-language programmes at Japan’s 13 leading institutions.

Following its disappointing results, the programme was discontinued and replaced in 2013 by the more ambitious and better-equipped “Super Global” project, under which 30 Japanese institutions have been united [12]. The new initiative aims to launch degree programmes taught entirely in English, joint or dual-degree programmes with strategic international partners, and encourage the full institutionalization of non-Japanese academic staff. Crucially, the programme is being supported through the “1500 Faculty Plan”, which paves the way for the recruitment of 1500 leading researchers from around the world to stimulate educational mobility, foreign-student recruitment and research linkages, and ultimately, to transform 10 Japanese universities into “super global universities” ranked within the world’s top 100 [13–15].

50.2.2.3 EMI in the Republic of Korea

Meanwhile, in South Korea, the implementation of EMI has been described as “one of the most substantive developments in Korean higher education”, and a major instrument for greater internationalization and competitiveness of the country’s HEIs in an “increasingly global higher education market”. In 2007, the Korean Ministry of Education produced a “Strategic Plan of Internationalization of Korean Higher Education” [16]. One of the key evaluation criteria used to compile the rankings of Korean HEIs is the degree of internationalization of individual institutions, which is based on the percentage of EMI courses and the proportion of international faculty and students at the institution [8].

In 2006, the Korea Advanced Institute of Science and Technology (KAIST) was the first Korean HEI to announce that all of its programmes would be delivered in English, while since 2010, Pohang University of Science and Technology (POSTECH) has offered EMI on 88% of its undergraduate and 95% of postgraduate programmes [8]. National figures suggest that up to 40% of all courses at most Korean universities are now taught in English [17].

The real question for local HEIs is not whether to adopt EMI but rather how to best implement it. The figures recently released by the Korean Ministry of Education demonstrate that Korea's internationalization strategy does indeed appear to be working: between 2001 and 2012, the number of foreign students enrolled in Korean HEIs grew from just over 11,000 to nearly 90,000—with Chinese students accounting for 76% of foreign enrolment. By 2023, the sector plans to increase this number of students to 200,000 by permitting universities to open departments and programmes exclusively for foreigners and by further expanding the use of English as a teaching medium—particularly in STEM (Science, Technology, Engineering, Maths) subjects [18].

50.3 EMI in the Russian Federation

50.3.1 *Current State of Affairs*

Russia's entering the European common educational environment and its joining the Bologna process in 2003 have both undeniable advantages and undesirable consequences for the Russian higher education system [2, 3]. It should be noted here that the obvious benefits to national cooperation with European education partners for talented Russian students imply the latters' prospects of earning a degree in leading European institutions, bringing their career plans to realization and gaining valuable work and study experience in Europe. Moreover, students have an opportunity to master more than one major and to obtain particular knowledge in their areas of expertise [2].

At the same time, such appeal of foreign higher education institutions contributes to the outflow of gifted young people from Russia who cannot satisfy their drive for self-realization in their home country. It becomes obvious that Russian students are likely to stay in the countries where they get their degree—in Europe, the USA, and Canada. Among the reasons are economic stability, career prospects, an opportunity to become middle-class citizens, good ecology and a sense of security. In Russia, they say, capable and talented people “find it difficult to move forward, as the country does not develop” [19].

So, the preliminary findings show that up until 2019 the number of Russian students who are eager to study abroad, to learn English as a language of instruction, to pay for their education and to get academic degrees according to international

standards has been increasing. Understandably, this paper does not take into consideration the 2019–2020 academic year due to overall global changes and disruptions. The statistics below summarizes the data of the present research, with the reference to the major international resources, such as Canada's national statistical agency, the Institute of International Education of the United States (IIE), the German academic exchange service (DAAD) with the 2019 data [20–22] (Table 50.1).

As for international students studying in the Russian Federation, there are some obvious reasons for them to get a higher education in this country (Table 50.2). The first reason is affordable pricing for educational programmes in Russian universities. The average cost is 136,333 rubles (\$2,097). Many applicants from abroad (more than 60% of the total number of foreigners) choose paid programmes.

Secondly, among other advantages of studying in Russia is a broad range of majors. Students can obtain a degree in almost any vocation in this country. Russian universities offer more than 200 training courses, from mathematical sciences to commercial

Table 50.1 Students from Russia studying abroad in 2010–2019

Years	Country of study	Number of Russian students abroad
2019	25% of Russians living abroad received the right for permanent residence in the country after studying there. Taken into consideration that a total of 1.6–2 million Russian citizens left the Russian Federation in 2000–2019, about 400,000–500,000 people could have stayed abroad after getting a degree	
2018	European Union, in particular:	12,700 students (12,000–16,000 students from Russia annually in 2014–2018)
2017–2018	Germany Czech Republic France Great Britain	13,000 students from Russia 5,200 students from Russia 3,500 students from Russia 2,600 students from Russia
2017–2018	USA	5,500 students from Russia (12.7% more than in 2012–2013 academic year)
2010–2016	Canada	1,100 students from Russia (71% increase throughout the given period)

Table 50.2 Foreign students in Russia in 2016–2019

Years	Countries of origin	Academic programmes' distribution among foreign students
2016–2019	China, India, Turkmenistan, Uzbekistan, Azerbaijan, Italy, France, Germany, Malaysia, South Korea, Turkey, Iraq, Egypt, Iran, Morocco, Tunisia, Nigeria, Angola, Ghana, Brazil, Colombia, Ecuador, USA	49.2%—bachelor courses 75.4%—five-year (specialist's) degrees 82.4%—internship 85.1%—preparatory course

art and design, and more than 650 majors of various levels. According to the statistics, engineering degrees are the most in—demand among foreign students—22.5% of applicants chose those degrees in 2016–2017 academic year. The most popular vocations are architecture and construction; metallurgical engineering, machine engineering and material processing; electricity-producing industry, power engineering industry and electrical engineering; geology, exploration and development of mineral resources; and others. Many Russian universities provide sound academic background in engineering training, for example, Moscow Institute of Physics and Technology, Lobachevsky State University of Nizhny Novgorod, Moscow Institute of Steel and Alloys, Tomsk Polytechnic University, National Nuclear Research University/Moscow Engineering Physics Institute, Samara National Research University, St. Petersburg State Electrotechnical Institute LETI, St. Petersburg, ITMO University, St. Petersburg State Polytechnical University and others [23].

Foreign applicants are also attracted by health professions, as the data show. Twenty percents of international students were enrolled into those majors in 2016–2017 academic year. Medical training programmes are provided by I. M. Sechenov First Moscow State Medical University (Sechenov University), Far Eastern Federal University, Kazan Federal University, Immanuel Kant Baltic Federal University, Novosibirsk State University, the Peoples' Friendship University of Russia and others [23].

The third most popular are economics and management majors with 13% of applicants in 2016–2017 academic year. Then follow humanities and social sciences with 12% of applicants and the Russian language studies with 11% of applicants that year. Humanities are taught, for instance, at the South Ural State University, Tomsk State University, Higher School of Economics National Research University, Siberian Federal University, Ural Federal University, University of Tyumen and other universities [23].

The top university in enrolling foreigners in 2016–2017 academic year was the Peoples' Friendship University of Russia with 9,580 international students. After it, that year came St. Petersburg State University and St. Petersburg State Polytechnical University. Kazan Federal University, Tomsk Polytechnic University and Higher School of Economics National Research University were among the top ten [23].

Finally, the overall foreign-student population enrolled in Russian universities went up from 153,000 people in 2010 to 297,900 people in 2019. These numbers show that Russia's education system standing has boosted internationally.

According to the Ministry of Higher Education of the Russian Federation, as reported by TASS, international students study at 688 Russian universities and 465 university branches. The majority of foreign students are enrolled at five higher educational institutions, such as: Kazan Federal University with 8,717 students (2.9% of the total students number); the Peoples' Friendship University of Russia with 7,248 students (2.4% of the total students number); Moscow University for Industry and Finance "Synergy" with 6,123 students (2.1% of the total students number); St. Petersburg State Polytechnical University with 4,976 students (1.7% of the total students number); and the Higher School of Economics National Research University with 4,362 students (1.5% of the total students number). The Ministry also shared

the statistics on the foreign students' distribution throughout Russia's subnational entities: 34.2% of the total number of international students study in the Central Federal District, 17.9% study in the Privolzhsky Federal District, and 14.2% study in the Siberian Federal District [24].

According to the official national Ucheba.ru website, in 2018 foreign experts ranked Russia the 26th out of 50 countries with the best higher education system. A study done by the Organisation for Economic Co-operation and Development (OECD) showed that globally, among those who have decided to get higher education abroad, about 3% young foreigners chose to study in Russia. In 2018, 15,621 foreign students were enrolled in Russian universities, which is 11.9% more than in 2014. Universities intend to further increase the number of foreign students by organizing more international conferences and educational programmes in English, as well as strengthening awareness of Russian educational institutions abroad [25].

The national Mel.ru website provides slightly different statistics compared with the numbers mentioned in the previous paragraph: at the beginning of the 2015/16 academic year, according to the site, almost 240,000 foreigners were studying in the Russian Federation, which is 5% of the total number of university students in Russia [26]. The data cover the period of time prior to 2019.

It is very unfortunate that we could not find out the data on how many of both Russian and international students do their degree programmes in EMI. Not one source analysed for the purpose of this research and cited in this paper can provide such information. Moreover, universities on the Russian periphery, unlike metropolitan ones (e.g., Moscow State University, MGIMO University, St. Petersburg University), do not attract foreign students and are not highly rated in Europe [2, 3].

50.3.2 EMI Issues in Russian Universities

It follows that good command of English as one of the major media of instruction, soft skills and high-level conversation are essential for successful implementation and advancement of academic mobility programmes. This requirement remains pertinent for both Russian students going to study abroad and international students coming to study at Russian universities.

EMI, as has been stated before, is a prerequisite of modern time, not a mere trend, but it must be acknowledged that, regrettably, its functioning in the curriculum of Russian universities as a language of instruction is not standardized. We could not come upon any source that specifies the status of EMI in Russian educational institutions and prospects for developing this branch of learning services. Despite exponential improvement in teaching English as a foreign language in the national system of secondary and higher education [27], management of learning experiences in national institutions in and of itself is not stated in regulations governing.

The Ministry of Higher Education of the Russian Federation designed a state-run website StudyinRussia.ru which offers information on a variety of learning

services and opportunities for foreign students to get a university degree in this country, including programmes in English [23]. According to the website, 21 out of 776 Russian universities—ranging from Kaliningrad to Vladivostok—can offer higher education curricula in natural sciences and STEM disciplines in English. These institutions work under the scope of the “5–100 Project” which is the international competitive growth programme for Russian universities among world-class acknowledged research and educational centres [23].

Unfortunately, the current low level of English proficiency among university instructors does not allow even first-rate Russian universities to provide the adequate level of learning services in English as a medium of instruction, as pointed out in the British Council Survey for the Higher Education Sector in Russia [28].

Taking into consideration the potential higher education institutions of the Russian Federation possess, it is not only desirable but also high on the agenda for the latters to further promote international degree programmes in English. Improving Russian universities’ competitiveness by encouraging students’ academic mobility, implementing professors’ scientific attainments, using facilities and resources of national institutions can bring in value-added and fresh ideas and promote better integration into global academia on the whole. Inevitably, current teaching technologies, learning efficiency and purposeful availment of intellectual commodity should undergo significant upgrading. As a result, advanced EMI curricula for graduate and postgraduate international students and instructors will enable national and international school community to design their own training field, as well.

50.4 Conclusion

The data of the research show that, on the whole, educators unanimously share the opinion that currently academic mobility is at the core of advancing academic cooperation [29, 30], and common educational environment promotes it both through collaboration in the material world and by means of virtual learning environment.

With regard to further promoting EMI and eliminating current functional and structural discrepancies at educational institutions in Russia, we propose the national system of higher education to incorporate the following steps into its practice in order to consolidate the experience gained from the already functioning programmes and the educational potential of the existing framework:

- To design a comprehensive set of requirements for English-language proficiency for both prospect applicants and their instructors;
- To establish a unified system of estimating the number of students doing their degrees in EMI for all Russian universities offering such degree programmes;
- To share EMI programme enrolment statistics on universities’ websites;
- To arrange a nationwide data and resource database for universities engaged in EMI programmes that can help improve the quality of instruction.

These and many other steps and advancements in the national higher education can facilitate new and already existing interaction vectors of the global academia enabling all parties of the process to develop within and beyond the borders of their degree programme, university, location and country.

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Chapter 51

Chinese Themes in the Works of N. Baikov and V. Pereleshin: The Problem of Art Space Conceptualisation by Far-Eastern Literary Immigration



E. A. Nezhivaya, O. A. Buzuev, and K. V. Borovikova

Abstract The research explores the works of one of the most significant prose writers and one of the leading poets of the Harbin branch of emigration in terms of its connection with the cultural tradition of China and its influence on such a dominant text category as art space. The paper dwells on the problem of spatial representations in short stories, travel and ethnographic essays, and lyrical miniatures of the representatives of the Harbin branch of the Russian literary emigration N. Baikov and V. Pereleshin. Philological methods such as cultural and historical analysis and the method of motive analysis are used. The authors of the paper make an attempt to prove that the art space in N. Baykov's essays and stories, and V. Pereleshin's poems have a distinctive axiological character. It was possible to identify the way the “space” category which affects the characters of N. Baikov's works: the characters of the essays and stories “stand the test of space”, which contributes to the formation or change of their worldview attitudes, determines behavioral models, realizes internal potential, leads to evolution or, on the contrary, to degradation. The literary analysis of the poetic and prosaic texts results in defining the status of spatial continuum in N. Baikov's and V. Pereleshin's works, as well as the way the writers address the pressing issues of their time (the problems of interaction between Western and Eastern cultures and of national identity, in particular).

51.1 Introduction

The emergence of Russian émigré literature is determined by a number of cultural and social factors—among them an increased interest in the philosophical, mythological,

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and artistic heritage of the Eastern countries in the late nineteenth and early twentieth centuries, “the inertial forces of “Silver Age” [1, 271], immigration flows to Harbin and the importance of the Russian diaspora in China in the 1920s [1, 271]. The poets and writers of the Far-eastern literary emigration were given a unique opportunity to get in touch with the most ancient oriental culture. However, the Russian writers who found themselves in China treated Eastern traditions in a specific way. Critics and scholars note, that Russian émigré writers were reluctant to learn spoken Chinese, not to mention characters [2, 3, 43; 4, 261]. Due to this fact, the reflection of Chinese culture in Russian émigré literature proves controversial. Some researchers believe that interaction with Chinese culture in the works of Russian émigré writers was rather superficial: at the level of Eastern realia and Chinese vocabulary (see the work of professor of philology Yinnan Li, Institute of Foreign Languages, Beijing) [1, 272]. Others write about deeper assimilation of traditions of ancient Chinese poetry, which manifested themselves not only in themes, mood and the imagery of Russian poems, but also in the form of the verses (see, e.g., the works of a famous Chinese writer, professor, poet, and translator Li Yan, the author of a multivolume collection of works of Russian emigrant writers who lived in Harbin and Shanghai at the beginning of the twentieth century).

Somehow, the writers faced the need to plumb the depths of mysteries of a new culture. Oriental and Chinese themes became the main themes in the works of many Russian authors. It was not just the result of temporary interest of poets and writers, but it was a natural process dictated by life outside Russia. Such Russian writers and poets of Far-eastern emigration as N. Baykov and V.F. Pereleshin contributed greatly to the process of studying and rapprochement of Western and Eastern cultures and literature.

51.2 Main Body

In scientific works of recent years, the problem of perceiving a foreign culture in connection with a spatial worldview that arises in the works of N. Baykov and V. Pereleshin is usually considered in symbolic, ideological, and axiological aspects. For example, the Russian researcher A.A. Zabiyaka in her articles and monographs studies the marginal space of the Manchu taiga and describes the system of the taiga mythologems (tiger, ginseng, sacred places) in literary and journalistic texts, memoirs, and epistolary heritage of Russian Harbinians. According to the author, these mythologems generated the “frontier text” of the Far-Eastern émigré prose (N. Baykov’s stories and essays, in particular) [5, 6]. Whereas the Chinese literary critic Cui Lu writes about the “Chinese text” in the Russian Far-Eastern émigré poetry of the 1920-1950s and the way the life and culture of China is reflected in the poems of V.F. Pereleshin. The author of the paper analyzes central oppositions of the “Chinese text” (“Us vs. Them”, “Self vs. Other”, “East vs. West”, “Memory vs. Oblivion”) and comes to the conclusion that two opposite dominant motifs in the poetry of Russian

emigration are formed: the motif of alienation from a “different” culture and the motif of its comprehension [7, 8].

The paper dwells on the way the spatial characteristics of the text are determined, on the one hand, by the author’s representations, and, on the other hand, by the genre of the text and artistic methods of the authors.

Space is the dominant category of literary worldview in any text, but, in our opinion, it acquires special significance in the works of N. Baykov.

N.A. Baikov, who was one of the first to explore Manchuria lands, aims, in the first place, at acquainting the reader with geographical and climatic uniqueness of the region, and cultural concepts of local peoples. In European consciousness, nature is treated as something that surrounds people and exists per se, as the habitat that is external to a person. For Asians, Chinese in particular, nature is, first of all, something inherent in a human being; it is the fundamental element of human existence, which unites everything. Thus, “nature” is understood as being or “following oneself”. In the East, man was not placed above nature and declared “divine”, but it was commonly believed that the cosmic order depended on people’ actions (be it right or wrong). Human beings are neither above nor below nature, and they are its soul. European culture is based on anthropocentric ideas—“man is the measure of all things”. In the eastern cultural tradition, “the measure” has existed forever, it is the Path of the Universe, a pre-established world rhythm, which can be called the measure of things in the sense that life processes depend on it: It can disrupt them and cause natural disasters, or it can be the “soul of the Universe”.

In his stories and essays, the author-narrator tries to master Chinese cultural concepts, concentrates on ethnophilosophy, and idealizes the taiga. In N.A. Baikov’s works, the taiga is associated with a space of true spiritual freedom and characters’ true destiny. Characters resolve conflicts (“Drachenok” in Russ.), find out their real worth (“Christmas night” in Russ.), and get what they deserve (“Taiga Truth” in Russ.). For example, in the story “Christmas Night”, a self-confident and frivolous engineer K. came to the taiga as he “considered himself an experienced and efficient hunter” [9, 54]. However, when deepening into the woods, the hero loses little by little his snobbery, vigor and self-confidence, starts lagging behind, and loses his nerve. “No matter that he is a great master, and even an engineer! This is all for nothing here in the taiga! He’d better sit at home in Harbin and drink coffee with liquor in a good company”. That is the way the character is judged by another character [9, 55]. Smartness and assertiveness fly off the engineer like discarded husks. At the end of the story, we see a distraught, miserable man with shattered nerves. Having recovered from the adventures, K. judges himself accurately and comes to the conclusion that fully determines his position as a stranger: “Now I know what the taiga is! This is a wild, primitive beauty that does not like jokes and can destroy anyone who fails to please “her”! I’m not a fan of hers at all ...” [9, 56]. The hero of the story “Animal Night” captain Alexander Pyanovsky, hearing the roar of a tiger in the taiga, is so mesmerized by this “forest symphony” that he begins to imitate the roar of the king of the taiga and then sings Aria of Susanin with such enthusiasm that makes the narrator overexcited. The voices of tigers and singing of the hero “merged into one inimitable majestic hymn to the wild eternal nature” [9, 53]. This is the moment of

the highest tension in Pyanovsky's life, the moment of the hero's self-actualization, during which he experiences revelation and "merges" with the universe. Therefore, five years later, in Galicia, dying of a wound, he recalls only two things in a feverish delirium—his native Caucasus and that night in Manchuria.

Baikov's essays and stories show that the writer, in accordance with the mythopoetic tradition and Chinese aesthetics, seeks to give symbolic content to the landscape and to synchronize the rhythms of nature with the rhythms of human life. If in essays seasonal landscapes reproduce the climatic features of Manchuria, then in fiction seasonal landscapes, as a rule, have a metaphorical meaning. For example, the metaphorical meaning of the seasonal landscape in the story "Russian Trappers" is obvious. This story is structured as a "triptych"; there are three independent pictures that add up to a whole. Each part corresponds to a particular time of year: In the first part, the action takes place in winter, in the second—in autumn, in the third part the events unfold in spring. Based on mythopoetic ideas, the author correlates the events and characters with natural seasons. Winter is Barabash's death and the possible death of Veselovsky, who is in the active army ("Russian Trappers"); autumn is Tun-Li's wisdom and maturity ("The Great Van"); spring is Doroshin's life and vibrant energy ("Russian Trappers"). It is interesting that in the Chinese tradition the seasons have an ethical interpretation, which is associated with the above-mentioned characters: Spring is humanity (Doroshin is a "man for people", he has not made anything for himself); autumn is justice (Tung-Li's actions comply with "unshakable" laws of being); winter is wisdom (Veselovsky discovers the truth for himself).

In the novel "The Great Van", the landscape is depicted as the movement of an annual circle within one and the same plot. According to K. Rekho, "the oriental flavor was already evident at the very beginning of the story. As in 'seasonal poetry', the narration begins with the image of the four seasons" [10, 44]. The first chapters are a landscape overture depicting the nature's cycle, which determines the rhythm of the forest and its inhabitants. The movement of landscape images correlates with the plot and reflects the main idea of the novel—the death of the taiga and its ruler Wang.

In his descriptions of the taiga, N.A. Baikov constantly emphasizes that Manchuria is a special world, dramatically different from the European one—strange, unusual, alien. That is reflected in the author's double system of oppositions: "Europe vs. Asia", "civilization vs. barbarism", "Self vs. Other". The "otherness" of this world is embodied in various artistically mediated forms, which are revealed through the analysis of central motifs (the motif of food, smell, eye contact), characters' beliefs, etc.

Shu-Hai is a pagan harmony, where nature acts as a god. The fundamental principle of the universe is established through interaction and alternation of yin and yang, darkness and light, cold and heat, rest and movement. A new space gives rise to new ideas about the fundamental questions of life alien to European mentality. In Buddhism, the "Self" is a manifestation of the "All"; therefore, the "Self" is eminently indestructible. The author promotes this philosophy to the Russian reader. One of N.A. Baikov's ideal characters, Russian in origin, having settled in Manchuria, does not imagine his life without nature, and therefore, he sees nature as the principle of the

existence of things, which unites everything. For Tun-Li (“Russian Trappers”), life and death are equally easy to accept and equally beautiful, because their succession is the law of nature.

Initially, the world of taiga is seen by the author as “different” and special because he looks at it through “Russian (European) eyes”: “This extraordinary scenery in the midst of a *alien, wild* (hereinafter, emphasis added—E. N.), but beautiful and majestic nature evoked wonderful dreams and carried me away into the world of memories, images and pictures of the past. I saw the banks of my native Dnieper; the quiet, peaceful villages, and farms of the friendly Ukraine; the battlements of the ancient Moscow Kremlin; the cities and villages of Orthodox Russia; the picturesque steep banks of the Vilia and the gray ruins of the castle of Lithuanian princes; the beautiful Neva, encased in granite, reflecting huge bridges and buildings in its waters; harsh rocks and snowy peaks of the Caucasus; blooming valleys of beautiful Georgia—all these visions and pictures pass one by one before my spiritual eyes...” [11, 138]. Thus, proceeding from an alien world, the narrator is transferred to the scenes of his home world. There is a perception of the Manchu region from its center—the author-narrator is still a stranger to this world, and therefore, he constantly notes its distinctiveness.

However, the author’s characteristic perception of Manchuria as “his” world, as part of the great Russian empire, whose vast space is being settled, mastered, and conquered by newcomers, is also outlined here. This cultural assimilation and appropriation of initially foreign space originate in the inner space, the space of the narrator’s soul: “When looking at this dark sky of the Far East, you can’t help but wonder what is happening in faraway Russia at this moment? You are mentally transported for tens of hundreds of miles and try to penetrate through the veil of vast space. Despite the distance separating us, one can feel the close connection between the motherland and the distant periphery. The heart beats far away in Russia, but its pulse is felt here, on the shores of the Great ocean [ibid.]”. The boundaries between the “Self” and the “Other” are gradually blurred. Manchuria is not just a foreign, wild, and dangerous space; but at the same time, it is the part of the homeland, a special borderline area, an outpost of the Russian empire in the East. The exploration of a new space and its cultural development result in narrator’s self-discovery and self-determination not only geographically but culturally. He tries to find out if he is a man of the West or the East, Russia (Europe), or Asia.

The process of the narrator’s exploration of a new space unfolds both at the figurative and plot levels in the system of the above-mentioned oppositions. The collision of Europe (civilization) and Asia (primitiveness) invariably reveals the qualitative incompatibility of two types of culture: On the one hand, civilization destroys nature [11, 12]); on the other hand, this primitive world destroys European axiology and logic.

Thus, the “Self vs. Other” opposition, on the one hand, expresses the peculiarity and uniqueness of Manchuria and, on the other hand, describes the author’s search for self-identification. The author recognizes the difference of this new world but at the same time he is unable to identify himself with it. He is a “newcomer” who feels the harmony of the taiga world and gradually gets used to it, but he cannot assimilate

into this world and remains a stranger. Hence, in our view, in his works the writer just touches this unique and different world but does not become the part of it. N.A. Baikov remains a “son of the Russian culture”, a scientist, a naturalist. Having great respect for this world, he recognizes its right to independence.

The space in which the narrator is found disrupts all European notions. The taiga’s nature is chaotic: various trees and herbs, tropical and northern ones, grow here with no consistency whatsoever, grapevines are braiding the age-old cedars’ mighty trunks; the leaves here serve as flowers. (“The taiga has dressed in its exuberant and colorful attire, not flowers but leaves were sparkling like gem stones. The sharp-carved maple leaves as well as simple foliage of birch and linden trees stood out against the general dark-green background with their saffron yellow color, the lacelike grape leaves and crimson spots of vines and actinidia were burning purple” [13, 26].)

From the viewpoint of a European mindset, the “social” life in the taiga is hectic and disordered: as the “animal nights” set in, every living thing in the taiga trepidates, humans included—“trappers, hunters, and other forest dwellers avoid leaving their fanzas in the nighttime and sit still in their wretched huts, trembling with fear, listening to the rampant roaring of fearful animals”; the tigers that normally do not attack people or approach their houses, as the old taiga dwellers believe, “break into fanzas and kill everyone who lives there” during those “animal nights”. [13, 53]. Therefore, from a European logical viewpoint the world of the Manchurian taiga is a world that is fundamentally opposite to orderliness, consistency, or any regulatory actions. However, this characteristic of space does not imply a negative formula of civilized consciousness that views chaos as disorder, but a positive characteristic that presupposes nature’s self-empowerment. (Obviously, this detail already proves that the narrator takes a special position: he is a newcomer, sincerely striving to understand a foreign world, a different culture.)

Moreover, the author continuously emphasizes the primevalness and savagery of the taiga area. Shu-Khai is a primal harmony of sounds, colors, and elements. This spatial characteristic also unfolds within the “East–West” opposition, contrasting the two types of thinking: the Asian, Eastern one, and the European one. The Shu-Khai harmony continues until newcomers, foreigners—the bearers of European consciousness (people from the concession and factory, border guard soldiers) invade it. So, the two dimensions are clearly contraposed: the primal space of Shu-Khai and the historical space of contemporary civilization. The topographical elements of those dimensions—the trappers’ fanzas and the fishermen’s huts, the concession and the border guard’s barracks—become some kind of a metonymy for a certain lifestyle. And, considering the fact that the Shu-Khai space is being idealized, the corresponding time period and the taiga dwellers’ lifestyle are therefore being idealized as well.

Now, the most important elements of space forming the worldview in V. Pereleshin’s (“who belongs to the first succession of Russian poets of the second half of the twentieth century”, according to the Berkeley University professor Simon Karlinsky (also native of Kharbin), lyric poetry will be described [14, 38].

The lyrical hero in Pereleshin’s early works strived, almost in a declarative manner, to reach harmony within himself and with the world around. Hence, the poet has

written a lot of poems the titles of which reference abstract notions (“Vocation”, “Contemplation”, “Premonitions”, “Immortality”, etc.). Addressing the “Russia–China” issue (and the wider one “West–East”), in his art Pereleshin tried, first and foremost, to contemplate these ideas from a philosophical viewpoint (hence—“transcendence” and “abstraction”). Apparently, Pereleshin also perceived the “Chinese poetic tradition” organically. Later, in the introduction to the corpus of classical Chinese poetry “Poems on a Fan” he notes: “Unlike ancient and European poetry, in the Chinese poetry, not the theme of love takes central place, but the theme of nostalgia, separation from a friend, frailty of existence” [7, 15].

To their full extent, the “Eastern motifs” start to appear later, in the fourth poetry book titled “The Victim” (1944). For instance, in the poem “Zhonghai”, the poet uses parallelism, which is characteristic of Chinese classic poetry, when the first two lines, painting a picture of nature, correlate with the lyrical hero’s mood or their philosophical reasoning: «Все лето будут лотосы цветсти/ И озеро притихнет, зеленея, / И все отдам я странные пути / За твой изгиб, прибрежная аллея» [16, 38].

Isn’t this the expected result of the early poems’ lyrical hero searching for their “way”, overcoming the “book wisdom”? “The Star Over the Sea” (V. Pereleshin’s third poetry book) not only becomes an element of a picturesque landscape, but also an object of “contemplating”, which makes one reflect on the “Eastern wisdom”. In the poem, “The Last Lotus”, written in 1943 in Beijing, addressing the “last lotus”, “uplifted like a flag” among the “dead stems” and “withered flowers”, the poet urges it: «Стой. И не бойся ран./ Стой гордый и отвесный, / Как древний великан, / Держащий круг небесный!» (emphasis added - O. B.) [3, 4, 10]

The cited lines from the fifth poetry book “The Southern House”, associated with the “Chinese” period of Pereleshin’s work, very accurately define his poetic creed and simultaneously depict the image of China which appears in its lyrical content. This mythologized image of a great country stands among epic literature of ancient Rome, Greece, etc.

Then, in the poem “Huxinting” the reader is presented with a description of a magic land, where ancient fables are alive and any wonder is possible: «Глядит в озерную равнину / Равнина большая вверху. / Мы подплываем к Хусиньтину, / Где сердце озера Сиху. / <...> /Сюда, приветливо взирая, / Вся золоченая, Гуаньинь / Сошла для нас от кущей рая / И строгой мудрости пустынь.» [3, 32].

Therefore, the poet not only mythologizes, but also aestheticizes China, he creates an image of a dreamlike country. It is interesting that such a perception of a “second home” was typical for many representatives of Russian artistic upper-class immigrants.

It should be mentioned that the themes of “two motherlands”—Russia and China and of “poet and poetry” determine the problematic and thematic originality of this collection to a great extent. This book by Pereleshin, which is, in our opinion, one of his best works, is rich in philosophical contemplations regarding life, death, the meaning of human existence, happiness, freedom (“Of One Heart”, “The Last Lotus”, “The Sonnet”, “To the Tired Ones”, “To a Friend”, “From Afar”), the nature of

fine arts (“The Poet”, “The Seeker”, “Spring”), love (“The Southern Wind”, “The Unavoidable”), and friendship (“To a friend”, dedicated to Lu-Tian-Sheng).

The Eastern theme takes a special place in the book “Southern House”. Notable is the “infatuation” of the poet with the Chinese culture, poetry, nature of the Far East, the “musicality” of Chinese names and denotations (toponyms and anthroponyms): «Вечерняя заря / Горит в садах Бэйхая.» (“Последний лотос” [3, 4]); «Поверг Цюй Юань в речную быструну. / Седой Ли Бо нашел на дне колодца / Похмельную и низкую луну...» (“Ночь на Сиху”, [3, 26]); «Сюда пришел еще безвестным/ Чжи Хуа, художник и монах:/ Картины языком чудесным / Поют победно на стенах...» (“Хусиньтин” [3, 32]).

In the poem, “Xiantancheng” the toponym, aside having a semantic load, also works as recitative: «В Сянтаньчэн рано – на рассвете – / Отдыхать ходят облака. / В Сянтаньчэн улетает ветер, / В Сянтаньчэн тянется река. / <...> / В Сянтаньчэн просятся улыбки, / В Сянтаньчэн сходятся мечты. / Про него всхлипывают скрипки, / На него молятся цветы...» [3, 36].

In conjunction with color-related epithets and other denotations of color toponyms and anthroponyms add an exotic flair to the poems and serve to create a special atmosphere of dreamlike Chinese landscapes: « “Красные листья под инеем” – странное имя:/ Сколько в Китае затейных и умных имен! / Часто бывал я пленен и обрадован ими, / В странное имя сегодня я снова влюблен. / < ... > / Да, но и осенью в полдень сильней пригревает/ Бледное солнце и светит в кленовом саду. / Будет минута: неласковый иней растает, / Красные листья и губы под ним я найду!» (“Красные листья под инеем”, [3, 28]).

The poem “Heard Before” with a subtitle “The Lu Xin Poem” was included in the collection, and it is a perfect example of reception of a foreign poetry piece: «Фонарики цветные освещают/ Распахнутую дверь в банкетный зал./ Красивая, нарядная служанка / Подносит гостю яшмовый бокал.», [3, 37]. In line with the spirit of Eastern Poetry, Pereleshin is addressing the contemplation of nature, overlooking its state during different seasons and times of the day, he is painting traditional Chinese landscapes with words: «Шестнадцатого – каждый месяц лунный – / Как говорят, “окно полно луной”. / Луна везде! И я, отныне юный, / Впадаю в мир уже почти родной. / Печаль, с которой сердце не сживается, / Поверг Цюй Юань в речную быструну./ Седой Ли Бо нашел на дне колодца / Похмельную и низкую луну...» (“Ночь на Сиху”, [3, 26]).

One of the first researchers of Pereleshin’s poetry has noted that “China has deflected not only in the poet’s style but in his perception of the world as well: one could notice Taoist character of some of Pereleshin’s philosophical poems [17, 237]. Seamlessly combining the Christian faith in immortality of the soul and the Buddhist idea of reincarnation, Pereleshin only views them as ways of apprehending Eternity, Transcendence. The “mysterious” and “wise” East penetrated the poet’s worldview gradually, as he became more familiar with the monuments of Chinese literature and philosophy. His appeal to translating is also not coincidental. The poet’s borderline existence between two cultures, Eastern and Western, gave rise to some particular eclecticism, which was likely unworthy of his monastic dignity, but quite permissible for a poet, a “lost argonaut”, who wrote once: «Я широк, как морское лоно:/ Все

объемля и все любя, / Все заветы и все знамена, / Целый мир вбираю в себя.» (“Заблудившийся аргонавт”).

The poet could rightfully call his “second motherland”—“my China”: «Где мы часто прощались до завтра, Навеки прощай,/Невозвратное счастье! Я знаю спокойно и просто: /В день, когда я умру, непременно вернусь в Китай.» (“Издалека”, [3, 38–39]).

51.3 Conclusion

It is obvious that such different writers both in terms of artistic methods (ethnographer and naturalist, an heir to the traditions of romanticism and acmeism) and forms (prose and poetry) are brought together by their borderline existence between two cultures, Eastern and Western, which resulted in eclecticism of worldview perception that is clearly expressed in their works. Both authors organically combine the Christian faith with Eastern philosophical ideas, mythologize space and create the world of unshakable harmony and ancient culture. However, N. Baikov’s works depict to a great extent the image of real Manchuria and space has a distinctive axiological character: the characters of the essays and stories “stand the test of space”, which contributes to the formation or change of their worldview attitudes, determines behavioral models, realizes internal potential, leads to evolution or, on the contrary, to degradation. While in V. Pereleshin’s lyrics, China is depicted in a romantic light as an ancient fairy-tale country, magical, and amazingly beautiful and is aestheticized by the author in the spirit of the Silver Age poetry traditions.

Thus, the Far-Eastern Russian émigré literature did not only preserve its national features, but also creatively interpreted the traditions of Eastern culture, which largely determined its artistic originality.

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Chapter 52

Impact of State Support Measures on the Socio-economic Situation of Families with Children



S. Kostina, G. Bannykh, and E. Zaitseva

Abstract Inequality in the incomes of various groups of the population and the implementation of government support measures continues to be an urgent problem in foreign and domestic scientific research. One of its important aspects is the study of the income of families with children, who make up a significant part of poor households in the Russian Federation. In accordance with this, reducing the poverty of families with children is one of the most important directions of state policy. The purpose of this article is to analyze the impact of government support measures on the socio-economic situation of families with children in the Russian Federation. The study uses such methods as document analysis, statistical data analysis, mass survey of families with children. The results of the study indicate that the measures of state support for families with children existing on a regional scale do not have a significant impact on the socio-economic situation of families. The main reasons may be the following: the inability to obtain existing support measures for many categories of families with children, the small, insignificant amount of monetary forms of support and the determination of the right to benefits. The families with children who took part in the study are mostly dissatisfied with the existing and provided measures of state support.

52.1 Introduction

The discourse of population poverty has reappeared in the media and scientific publications in recent years in the Russian Federation. The impetus for this was the Decree of the President of the Russian Federation of 05/07/2018 No. 204,¹ his repeated speeches during this period with the verbalization of the state's plans to reduce poverty as a socio-economic phenomenon, in order to reduce its level at least twice.

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¹Decree of the President of the Russian Federation of 07.05.2018 No. 204 “On national goals and strategic objectives of the development of the Russian Federation for the period up to 2024”.

A family with children cannot fully live and form human capital if they spend about 60–70% of their budget on food. Households with children, in addition to spending on meals at home and outside the home (school, kindergarten), have other, low-elastic needs, such as the purchase of housing, clothing, travel expenses, sections, and circles. Maleva and Grishina point out that households with children have high risks of poverty, because of all poor households, they account for 70% [1].

The main hypothesis of the study was the following: the variety and number of measures to support families with children existing in the Russian Federation and regions have an impact on their socio-economic situation in general, but the level of influence differs depending on the type and category of family.

The purpose of this article is to analyze the impact of government support measures on the socio-economic situation of families with children in the Russian Federation. Research questions:

- what are the concepts of studying the impact of government support measures;
- what types of families with children are supported by the state;
- how is the poverty of families connected with support measures;
- how the measures to support families with children in the Sverdlovsk region are evaluated.

52.2 Theoretical and Methodological Foundations of the Study of the Socio-economic Situation of Families with Children

Studies of the impact of government support measures on the economic situation of families with children and the reduction of their poverty are based on several concepts—absolute, relative, and subjective poverty [2]. In studies based on the concept of relative poverty, the poverty line is usually taken as the share of the median equivalent disposable income (40, 50, 60% of the median), in the concept of absolute poverty—the normatively established level of a person's monetary income (e.g., in the Russian Federation, this is the subsistence minimum), subjective poverty—people's assessment of their own situation.

Molnar studied relative poverty and its impact on the socio-economic situation of families with children [3]. The main conclusions of her research (based on materials from Romania) are that the poverty level is higher in households with children compared to childless households. In 2007, in Romania, 68% of the poor (almost 2.7 million people) live in households with children. The most dramatic is the situation of households with two adults and three or more children, while at the opposite pole are households with two adults and one child.

For Mitchell, the key issues are the types of families that are supported by national governments and specific measures to support different family models in the nation states of Europe [4]. For example, comparing the Czech Republic and Slovakia in terms of an indicator that measures the difference in the cost of all child-related

benefits as opposed to benefits paid to families without children, the author assigned them to a unique group of countries within the European Union [5].

In the studies of Duncan and Brooks-Gunn in the early 2000s, it was shown that the absolute poverty of families with children and measures of state support for families are interrelated: imposing temporary or quantitative restrictions on support measures leads to serious economic deprivation and intergenerational poverty [6].

The relative poverty of families with children, according to Seccomb, can be overcome in the context of the introduction of preventive measures (through a reasonable policy of redistributing the economy), rather than focusing government efforts on individual support measures or highlighting special types of families [7].

Attention to the problems of the socio-economic situation of families from the standpoint of absolute poverty arises, among other things, among researchers dealing with the functioning of families with disabled children, that is, the category of families in particular need of state support. A group of researchers from the University of Kansas concluded that absolute poverty affects five main aspects of the functioning of families with children with disabilities: health, physical environment, emotional well-being, productivity, and family interaction [8].

Researchers from Ohio University came to interesting conclusions about the interdependence of the complexity of family structure and the economic resilience of the family. The positive relationship between family complexity and government assistance is more pronounced for children in families with two married biological parents. Family complexity was independently associated with economic disadvantage, namely a lower income-to-need ratio and a higher likelihood of receiving government assistance [9].

The theory of social exclusion is also quite common in relation to poverty, in which state support measures for families with children should, first of all, be aimed at eliminating the causes of poverty (individual behavior of households and the socio-economic structural conditions of their life) [10]. Social exclusion implies that the poor are “people, families and groups of individuals whose resources (material, cultural and social) are so limited that they exclude them from the minimum acceptable way of life in the Member States in which they live” [11]. Only monetary support does not solve the issues of the economic situation of families with children, and the approach to poverty of families from the standpoint of only absolute or only relative poverty, according to Houston, is limited, since it does not provide an answer to the question of chronic or temporary poverty during the life cycle of the family.

Kolosnitsyna and Filippova, based on the concepts of absolute, relative, and subjective poverty, analyzed the impact of child allowances up to and from one and a half years on the probability of poverty in families with children [12]. In the study, they used various econometric models based on data from the Russian Monitoring of the Economic Situation and Health of the Population for 2003–2015 [12]. They conclude that both of these child allowances generally reduce the risk of both absolute and relative poverty. However, the results of the study indicate the low effectiveness of child benefits in Russia.

One of the main methods for analyzing the impact of social support measures on the economic situation of families with children in domestic science is the model family method. It has been used in a number of Russian studies.

Interesting results were obtained in a study by the Higher School of Economics. Using the method of model families, a team of authors evaluated the volume of the package of transfers to large families in the regional context [13]. According to the results obtained, the median average monthly package of a model family with three children with incomes below 1 living wage in aggregate can provide from 100 to 150% of the child's subsistence minimum. However, the authors cite a number of restrictions—firstly, this applies only to families with a child under 1.5 years old (this dramatically increases the volume of regular monetary support); second, there is a high level of regional differentiation (from 59 to 18% of the child's living wage) for families where all children are over three years old; and thirdly, existing support measures do not solve the problem of poverty of poor families. As a result, they come to the conclusion that the current system of social support as a whole makes a significant contribution to reducing the overall level of absolute poverty in the country, as well as to reducing the depth of poverty for families with children. At the same time, the leading role in this process is played by the monthly allowance for caring for a child up to one and a half years.

Grishina and Tsatsura conducted an analysis of the impact of the payment of benefits at the birth of the first and second child² on poverty and the distribution of incomes of families with children on the basis of model calculations based on data from a sample survey of Federal Statistical Service VNDN-2017 [14]. Their calculations showed that the provision of benefits for the first and second child reduces the level of poverty among households eligible for these payments by 1.8 times and significantly reduces the level of extreme poverty (when cash income is less than 0.5 living wage). However, this has practically no effect on the overall poverty level of families with children, because the share of households eligible to receive payments for the first and second child in the total number of households with children is less than 4% (families with an average per capita income not exceeding the statutory limit—1.5 living wage are eligible for this benefit in the region in 2018–2019 and 2 living wages in 2020).

According to Rosstat data, the share of children under the age of 16 (18) living in households with an average per capita income below the subsistence level is constantly growing: in 2011 it amounted to 19.9% and in 2017—already 26%,³ the level their poverty is twice as high as in the general population. The phenomenon of poverty in families with children is determined by a number of factors, such as the dependency burden on parents[15], belonging to the group of absolute poverty

²Federal Law of December 28, 2017 No. 418-FZ “On monthly payments to families with children”.

³The share of children under 16 (18) years of age living in households with average per capita money incomes below the subsistence level (as a percentage of the total number of children under 16 (18) years old). Family, motherhood and childhood. Federal State Statistics Service <https://rosstat.gov.ru/folder/13807?print=1>.

[16], female unemployment, especially of mothers with children [17], regional characteristics of the labor market and living standards, the size of the municipality [18], the impoverishment of the middle stratum of society, the so-called White collar workers—scientific and creative intelligentsia [19], the problem of targeting social support for families with children based on the concept of absolute monetary poverty (correlating the average per capita income of families with abstract minimum expenses—the subsistence minimum) [20].

The system of measures of social support for families in the Russian Federation is rather complex. Support measures can be divided according to various parameters: by targeting—to those addressed directly to families with children, or families with children are one of the target groups of recipients of the measure; by coverage—categorical or means-tested; by appointment—support for the consumption of families with children, stimulation of priority processes for the state, incentive measures; by area of representation—measures in the area of social security; education; health protection; provision of housing; by the form of provision—monetary and non-monetary, etc. In addition, social support measures are focused on certain categories of recipients that are most susceptible to exclusion—families with children under the age of three (seven), large families, families with disabled children and children with socially significant diseases, families with a single parent (in including children who have lost their breadwinner), families with disabled or unemployed parents, foster families, families of military personnel and government officials, etc. The complexity of this system is also associated with the existence of two levels of provision of support measures—federal and subjects of the Russian Federation.

52.3 Research Results

The total number of support measures addressed to families with children in the regions varies in a wide range: from 11 to 17 in some republics of the North Caucasian, Southern and Siberian federal districts to 50–60 in the Lipetsk region, the cities of Moscow and St. Petersburg, Nenets Autonomous Okrug [13, p. 62]. The amount of these benefits also varies: for example, the amount of the child benefit ranges from 90 rubles (Altai Republic) to 10,000 rubles (Moscow), for a child of a single mother—from 180 rubles (Altai Republic) to 15,000 rubles (Moscow) [13, p. 63].

As can be seen from the data in Table 52.1, the number of recipients of various regular benefits has been declining in recent years. According to official statistics, the number of children under the age of 18 from certain categories of families eligible for social support measures at the expense of the regional budget increased from 3,074,681 in 2011 to 5,095,252 in 2018.⁴ At the same time, the number of children under 16 years old who received a monthly allowance decreased from 2011 to

⁴Dynamics of main indicators of household income in 2011-2017 Federal State Statistics Service. [https://www.gks.ru/storage/mediabank/sbornik2011-2017\(3\).pdf](https://www.gks.ru/storage/mediabank/sbornik2011-2017(3).pdf).

Table 52.1 Results of state support for families with children, thousand people

Indicators/years	2016	2017	2018
Number of recipients of child support	4400	4040	3720
Number of low-income families with children who received regular cash payments	–	3954.4	3552.3
Number of low-income families with children who received a lump sum payment	–	133.3	164.8
The number of families that received subsidies for housing and utilities, mln	3340	3190	3040

Table 52.2 Average payments, rub

Indicators/years	2016	2017	2018
Average size of regular cash payments to poor families with children per month per family	–	904	971
Average size of a lump sum payment to low-income families with children, rubles	–	3667	4159
Average monthly family subsidy, rubles	1372	1456	1483
Average size of one-time cash payment under a social contract, thousand rubles	36,800	38,200	37,800

2019 both in absolute terms (from 9675 to 6997 thousand), so the share of children receiving this allowance decreased (from 38.7 to 23%).

Measures to support families are significantly differentiated by the number of their recipients: for example, in 2018, the payment of the allowance for the summer holidays for children was made to 788 recipients, and the child allowance—to 3.72 million recipients.⁵

At the same time, the real coverage of families with children with social support measures remains unclear, as well as the amount of transfers received on average per family. This is due to several points. Firstly, one family can simultaneously fall into several categories of recipients of support measures. Our research has shown that a fifth of families can apply for support measures for at least two, and some—for three or more categories of recipients. Secondly, even families belonging to the same category do not always receive the same amount of support measures. In particular, the number of real recipients of individual support measures may be less than the number of those who have the right to use them. Accordingly, it is difficult to assess the volume of transfers received by individual families with children, to assess their impact on the socio-economic situation of the family.

Another problem is the rather low amount of basic benefits (see Table 52.2), which generally cannot have a significant impact on the economic situation of families with children. For example, the amount of a one-time allowance for women registered in

⁵ State report on the situation of children and families with children in the Russian Federation 2018 Ministry of Labor and Social Relations of the Russian Federation. <https://mintrud.gov.ru/docs/1361>.

Table 52.3 Social benefits, compensations, and other payments to households with children under the age of 18—total (average per household member, per month, rubles)

Indicators/years	2011	2013	2014	2015	2016	2017	Growth, %
Households with children under the age of 18—total	813.9	1245	1222	1148.7	1418.8	1328.3	61.27
Households with one child	616.1	748.7	725.4	641.7	867.5	771.9	78.81
Households with two children	1001.6	1703	1569	1553.3	1779.9	1634.4	61.28
Households with three or more children	1273.4	2229	2287	1966.0	2385.4	2393.0	53.21
With children under 3 years old	1508.7	2084	2302	2142.2	2537.3	2504.4	60.24

medical institutions in the early stages of pregnancy is 675.15 rubles in 2020, the minimum amount of the childcare allowance is 3375 rubles.

According to a sample survey of Federal Statistical Service VNDN 2019, the average amount of benefits and compensation received for children per month was 469.4 rubles per household and 185.9 rubles per family member. For households with children, per family member per month, the total amount of benefits and compensation payments for children is just over 1,500 rubles (1646.5 for a married couple with children under the age of 18), which is about a third of all benefits received by such a household social transfers, which include other benefits, pensions, scholarships, etc.

At the same time, according to the GNPI data for 2011–2018, the average size of all benefits and payments for households with children under the age of 18, per one household member, increased by almost 60% (see Table 52.3). The size of social transfers for families with one child increased to a greater extent (78.8%).

To assess the impact of various social support measures on the socio-economic situation of families with children, in April 2020, the authors conducted a study using the online survey method, in which 412 families with children living in the Sverdlovsk region took part. Families of various categories who receive government support measures: a young family, a family with children under 18, disabled children, large families, the poor, etc., were interviewed. In most cases, the respondents identified themselves as several categories of recipients of support at the same time: the most common categories—a young family and a family with incomes below the subsistence level, a large family and a family with incomes below the subsistence level. At the same time, only 24% of respondents indicated that income per family member is less than 10 thousand rubles per month, the main part (41.3%) determines their average per capita income in the range from 10 to 20 thousand rubles. per month. Almost all of the respondents indicated that they receive at least one measure of state support.

In the course of the study, the total amount in monetary terms of the received support measures was estimated. Firstly, this is the volume of received cash transfers, and secondly, it is an estimate in monetary terms of the amount of non-monetary support measures received. About a third of respondents were able to estimate the

receipts received—35.6% of respondents indicated the amount of monetary measures received, and 32.6% of non-monetary measures (the rest partially indicated that they did not receive or did not know the amount of received support measures, or did not answer the question).

The research question was as follows—how government support measures affect the economic situation of families. For this, correlations between the amount of received support measures and the amount of income for each family member per month were built. It should be noted that no significant relationship was found between these parameters. Among those families, whose average income per person was up to 10 thousand rubles a month (in fact, they can be attributed to the poor), the largest group (48.9% of the respondents) receives monetary support measures on average from 1 thousand to four thousand rubles, 13.3%—up to 10 thousand, 22.2%—up to 20 thousand rubles, 8.9%—over 20 thousand rubles, 6.7% up to one thousand rubles. per month.

Among families with incomes per person from 10 to 20 thousand rubles per month (which were the majority among the respondents), the share of those families who receives monetary support measures up to 20 thousand per month is growing (this is almost comparable to the average monthly income per family member)—their 31.5% of respondents, almost a third (30.1%) indicated that support measures ranged from 1 to 4 thousand rubles, 13.3% from 4 to 10 thousand rubles.

Sufficiently economically prosperous families with average per capita incomes from 20 to 35 thousand rubles also indicated that they receive monetary support measures: 17.4%—up to 1 thousand, 34.8%—up to 4 thousand, 13%—up to 10 thousand, 26.1%—up to 20 thousand and 8.7%—over 20 thousand rubles a month.

During the study, respondents were also asked to rate how non-monetary support measures (free meals, benefits, etc.) affect their family income. Only one-fifth of the respondents answered yes to this question. Almost half of them (49.4%) estimated income (or savings) from non-monetary measures from one thousand to four thousand rubles a month, a third—up to 1 thousand a month, every tenth—from 4 to 10 thousand rubles.

The study also examined the satisfaction of families with children with measures of state support and the impact on it of the size of this support and the general economic well-being of the family.

First of all, it should be noted that the respondents practically did not mark the answer option “completely satisfied, support measures have solved the main problems of the family”. The choice of the respondents was divided mainly between partial satisfaction and complete dissatisfaction with the received support measures. Satisfaction is expected to correlate with the amount of measures received—it is believed that support measures at least partially solve family problems 40% of those who receive up to 1,000 rubles, 45.6%—up to 4 thousand, 57.1%—up to 10 thousand rubles, 64.3%—up to 20 thousand and 95%—over 20 thousand rubles.

The correlation of the level of satisfaction with average per capita income is not so clear: families with an average per capita income of 10 to 20 thousand rubles are satisfied to a greater extent (44.7% are partially satisfied), the most dissatisfied are families with incomes of less than 10 thousand rubles. (36.4% are not satisfied).

Oddly enough, in families with high incomes (over 20 thousand), dissatisfaction begins to grow—for example, in families with incomes of 35–45 thousand rubles. 33.3% are not satisfied with the received support measures.

52.4 Conclusion

In scientific studies on the interplay of poverty and government support measures for families with children, poverty is usually determined by the current family income compared with an absolute standard designed to represent the amount required for a minimum adequate standard of living (absolute poverty) or for the average income of people in the same country (relative poverty). While income poverty is linked to material hardships (e.g., malnutrition, inadequate housing, lack of access to health care), it is not the only indicator of such problems for families with children.

The low impact of the existing system of social support measures on poverty reduction for families with children is explained in the studies for various reasons. Among them, one can note, firstly, the barriers associated with the right to benefits—this is the value of the neediness threshold, depending on the GPA, and the procedure for determining family income, which involves taking into account income for the previous 12 months, which limits the possibility of receiving benefits for families, financial situation which significantly deteriorated due to various reasons, including the loss of a job or the mother's taking parental leave [14]. The flip side of this barrier is the payment of benefits without regard to need, to families with a sufficiently high level of income (not poor).

Secondly, one can note the low size of a number of benefits. Third, a significant proportion of poor families with children is not covered by social support [1].

According to the results of the study, the implemented support measures do not solve the problems of families with children and generally do not have a significant impact on their economic situation—for almost half of the respondents, the total income from support measures does not exceed 4 thousand per family. Accordingly, there is a rather low level of satisfaction with support measures among families with children, regardless of their income level.

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Chapter 53

Model of Interactions Between Supply and Demand on the Labor Market



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Abstract The article assesses the relationship between labor demand and labor supply in Russia. Labor demand and labor supply are described by two sets (vectors) of indicators that drive their formation. The study model also includes labor migration, informal employment, and the labor force participation of the elderly as supply factors to fill the labor shortage and ensure the equilibrium of the labor market. The study is based on the statistics provided by Rosstat for 2006–2018 by Russian regions. The study found that, since 2014, there was a trend towards stronger relationship between labor supply and labor demand, which can be explained by a policy aimed at retaining skilled workers amid the lower labor cost, expectations of increased economic activity, and labor shortage due to demographic factors and migrant outflow. Russian labor market is adapting to the difficult macroeconomic environment by expanding its labor relations practices (such as underemployment) rather than by laying off workers. Inclusion of indicators in the model allowed to assess their impact on the interactions between labor demand and labor supply. Employment of the population aged 60–72 years old proved to be the most significant factor among all the indicators of supply and demand in the labor market, which points out to its high potential in ensuring a balanced labor market.

53.1 Introduction

Russian economy continues to face the challenge of imbalance between labor demand and labor supply, which can be seen both in quantitative and qualitative disequilibrium

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on the labor market [1, 2]. In the future, this problem will be aggravated by the population ageing [3]. According to Korovkin [2], labor shortages may emerge even amid the low economic growth rates with stagnating aggregate labor demand.

The quantitative and qualitative disequilibrium between labor demand and labor supply results in severe economic losses, therefore, it would be important to look for new and improve the existing tools for realizing the potential of labor force as the main factor of production. It is believed [4] that the implementation of an active longevity strategy provides an effective tool for addressing current and future challenges associated with population ageing. The studies [5] show that, in Russia, a certain share of older age cohorts retain their resource potential, including health, high level of education, and considerable intelligence. Moreover, active labor force participation of the pensioners is not a new phenomenon in Russia. However, many experts express their concern that older workers may face difficulties in the labor market both in finding a new job and retaining their current one [6]. Analysis of age discrimination [7] revealed that, at the age of 29, the employment chances are 1.8–2.5 times higher than for those who are 48. Therefore, in Russia, shifting employability limits pose new challenges to the labor market related to this labor force and the need of the labor market in it. The study of interactions between labor demand and labor supply factors will allow to assess possible future trends on the labor market, which is especially relevant at the time when the population aging puts a significant constraint on employment.

53.2 Approach

As a result of objectively poor provision of macroeconomic statistics on the studied issue [8], researchers face a challenge in assessing and formalizing the concepts of labor demand and labor supply. As a rule, the analysis of labor demand uses the number of employed and the number of available vacancies and, for the labor supply, it uses the number of labor force and unemployed. Comparing these figures allows to assess the mismatch between labor supply and labor demand [9–11]. Such an approach underpins the model of harmonization between labor demand and labor supply proposed by Korovkin [12]. This model describes interactions between the number of potential workers (the difference between the working-age population and those employed in the economy) and available job vacancies by taking into account demographic processes and the movement of workers and jobs. Similar approaches are widely used in assessing the equilibrium between labor supply and labor demand, but they have a drawback related to the statistical accounting methodology. For example, depending on the data source, there may be some fairly strong discrepancies in estimating the number of employed [11]. At the same time, as rightly noted by Gimpelson [13], the stated need in workers expressed in the form of available vacancies is far from being identical to the effective labor demand and job creation. In this context, this study described the labor demand and labor supply using two sets

(vectors) of indicators that drive the formation of demand and supply on the labor market.

In the scientific literature, the set of factors shaping the labor demand and labor supply is not a matter for discussion. Various studies used a similar list [14–16], as the labor demand is influenced by macroeconomic factors, including the level of economic development, production factors, and the unemployment rate. Labor supply reflects the willingness of workers to sell their labor for remuneration offered on the market and, therefore, depends on the availability of labor, its level of education, and qualifications. For the purposes of this study, labor migration, informal employment, and the labor force participation of the elderly are also viewed as supply factors to fill the labor shortage and ensure the equilibrium of the labor market. Inclusion of these factors in the model will allow to assess their impact on the interactions between labor demand and labor supply.

53.3 Study Data

The study is based on the statistics provided by Rosstat for 2006–2018 by Russian regions. Anomalous regions have been removed from the review. The lack of data for at least one year or more than/less than two-fold deviation from the year average served as the grounds for such removal. As a result, we had a sample of 68 Russian regions. The indicators of labor supply and labor demand are presented in Table 53.1.

53.4 Model

The employment rate of the population aged 60–72 is one of the indicators describing supply on the labor market. However, the labor market is a combination of two sets (vectors) of indicators describing supply and demand. In this case, there is no output variable. Therefore, it would be difficult to use regression analysis. In such case, a possible tool could be the coefficient for the strength of relationship between random vectors, as introduced by one of the authors in an earlier study [17].

In a special case where the vectors $\mathbf{X} = (X_1, \dots, X_m)$ and $\mathbf{Y} = (Y_1, \dots, Y_l)$ have joint normal distributions, the coefficient for the strength of relationship between random vectors “ \mathbf{X} ” and “ \mathbf{Y} ” can be determined using the following formula:

$$D_e(\mathbf{X}, \mathbf{Y}) = 1 - \frac{|\mathbf{R}_{X \cup Y}|}{|\mathbf{R}_X| \cdot |\mathbf{R}_Y|}, \quad (53.1)$$

where $|\mathbf{R}_X|$, $|\mathbf{R}_Y|$, $|\mathbf{R}_{X \cup Y}|$ —are the determinants for correlation matrices of random vectors “ X ”, “ Y ”, $\mathbf{Z} = \mathbf{X} \cup \mathbf{Y} = (X_1, \dots, X_m, Y_1, \dots, Y_l)$, $0 \leq D_e(\mathbf{X}, \mathbf{Y}) \leq 1$.

Table 53.1 Indicators of supply and demand on the labor market

Symbol	Indicator
<i>Indicators of Supply</i>	
X1	Wear of fixed assets across full range of organizations, %
X2	Indices of physical volume of investments in fixed assets, in comparable prices, as a percentage of the previous year
X3	Unemployment rate of population aged 15–72 years old, %
X4	Labor productivity index, as a percentage of the previous year
X5	Index of physical volume of gross regional product, in constant prices, as a percentage of the previous year
X6	Index of labor market strains, unit
<i>Indicators of Demand</i>	
Y1	Employed in informal sector, as a percentage of the total employed population
Y2	Labor force participation rate of population aged 15–72 years old, %
Y3	Share of people with higher and secondary vocational education in the structure of economically active population, %
Y4	Number of employed commuting to the region for work, as a percentage of employed population in the relevant region
Y5	Employment of population aged 60–72 years old, %

In this case, we have the vectors for indicators of demand $\mathbf{X} = (X_1, \dots, X_6)$ and supply $\mathbf{Y} = (Y_1, \dots, Y_5)$. The analysis showed that vector data can be described by multidimensional normal distribution laws.

Along with (53.1), we will also introduce an assessment of the contribution made by individual components of vectors “ \mathbf{X} ” and “ \mathbf{Y} ” to the joint relationship.

$$\begin{aligned}\Delta D_e(X/X_i, Y) &= D_e(\mathbf{X}, \mathbf{Y}) - D_e(\mathbf{X}/X_i, \mathbf{Y}), \quad i = 1, 2, \dots, 6, \\ \Delta D_e(\mathbf{X}, Y/Y_j) &= D_e(\mathbf{X}, \mathbf{Y}) - D_e(\mathbf{X}, \mathbf{Y}/Y_j), \quad j = 1, 2, \dots, 5.\end{aligned}$$

53.5 Findings and Discussion

Figure 53.1 presents the dynamics in the coefficient for the strength of relationship between the indicators of supply and demand on the labor market $D_e(\mathbf{X}, \mathbf{Y})$ in 2006–2018. Since the labor demand substantially varies over time [1, 18], as we expected, the values of the coefficient for the strength of relationship between the indicators of labor demand and labor supply changed significantly during the period under review, which saw the financial and economic crisis, downturn in the economy, imposition of sanctions against Russia, and introduction of counter-sanctions.

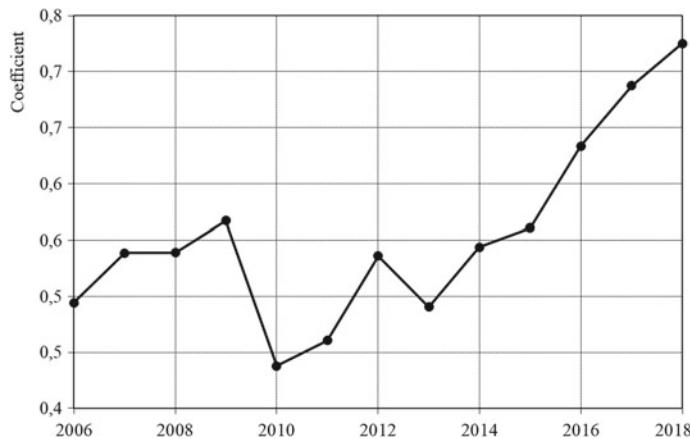


Fig. 53.1 Dynamics in the coefficient for the strength of relationship between the indicators of supply and demand on the labor market

Thus, the strength of relationship declined substantially in 2010 when, following the implementation of such anti-crisis measures as the public works and creation of temporary jobs, there was a negative balance of job movement (in 2009–2010, the economy lost 2.4 million jobs). On the one hand, the adopted measures stabilized the labor market during the crisis, but, on the other hand, they did not contribute to the improvement of employment efficiency and overall economic development in the post-crisis period.

The chart shows that, since 2014, there was an upward trend in the relationship between the indicators of labor demand and labor supply. Izryadnova [19] explains such response of the labor market to difficult macroeconomic environment by the policy aimed at preserving the qualified personnel amid the real cheapening of labor, expectations of stronger economic activity, and shortage of labor supply caused by demographic factors and outflow of migrants. The labor market is adapting by expanding its labor relations practices rather than by laying off workers. In the periods of economic instability, the number of underemployed workers is increasing [20]. According to Rosstat, in 2012–2018, the share of such workers rose from 5.2 to 11.0% and continues to grow, with the largest increase observed in construction where, following the investment downturn, the share of underemployed workers soared from 5.6 to 17.6%. Such high underemployment and part-time employment constrain the growth of unemployment but, at the same time, preserve inefficient employment in the labor market.

Table 53.2 presents the estimates of average contribution made by each of the studied demand and supply factors to their joint relationship over the period of 2006–2018. Since the contributions of such factors as unemployment rate, share of people with higher and secondary vocational education in the structure of economically active population and the employment of the population aged 60–72 years old are

Table 53.2 Average contribution to the joint relationship of individual supply and demand indicators over the period of 2006–2018

Factor	X1	X2	X3	X4	X5	X6	Y1	Y2	Y3	Y4	Y5
Average contribution	0.074	0.030	0.085	0.052	0.065	0.062	0.061	0.070	0.080	0.043	0.096

quite substantial and stable over time, it could be concluded that they really affect the operation of the labor market.

The highest average contribution to the joint relationship between the demand and supply indicators on the labor market was made by the employment of the population aged 60–72 years old, which points out to the high potential of this group for meeting the labor demand.

For each region of the Ural Federal District, the analysis revealed a very strong relationship between the indicators of supply and demand on the labor market. The coefficient $D_e(X, Y)$ was no less than 0.998.

53.6 Conclusion

To sum up, the following conclusions can be drawn:

1. The use of coefficient $D_e(X, Y)$ allowed to simultaneously consider all indicators of supply and demand on the labor market and make quantitative estimates.
2. The proposed indicators of supply and demand describe the labor market in a sufficiently adequate way and can be used to study the employment based on the coefficient $D_e(X, Y)$.
3. The employment of the population aged 60–72 years old proved to be the most significant among all indicators of supply and demand on the labor market. This indicates that there is a substantial relationship between employment level and demand and supply factors in the labor market.

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Chapter 54

Models of Digital Services Development During an Economic Crisis



M. P. Loginov, N. V. Usova, and A. A. Drevalev

Abstract The authors justify the timeliness of studies focusing digital services and their importance in the present context. Literature review showed the lack of consideration of the digital services development issues in theoretical studies. The authors carried out a retrospective analysis of the national economy development and highlighted a number of facts that illustrate the impact of a recession on the development of the digital services. It should be noted that the latest economic crisis that was caused by non-economic factors led to significant transformation of the services market and an increase in the degree of its digitalization. The outcomes of the study include the following results achieved by the authors. First, the drivers of digital services development are identified. Second, the authors propose aim-dependent models of digital services that allow shaping the development directions depending on the model of a digital service and the demand it enjoys in the current context. Third, short-term trends of digital services development are specified based on the current economic situation and the changes in consumer behavior which are attributed to a number of mandatory measures imposed in order to overcome destabilizing non-economic factors.

54.1 Introduction

54.1.1 Context of the Study

Digitalization has only recently become a priority of the national economy development in Russia.

The rapid spread of digital technologies has been transforming various aspects of human economic and social activities. Service industry is one of the sectors that

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experience this impact. The service sector contributes significantly to emerging trends of the national economic development. At the same time, the changes in the national economy are driven by the global trends and major shocks in the economic and social interactions in the society.

The following drivers can be considered as the most important ones for the service industry development: globalization and integration of the economic processes; digital transformation attributed to the transition to the new wave of innovation, or technological and economic paradigm; signs of a crisis in the economy caused by various factors.

It should be noted that the service industries and retail trade in particular have become the main sectors of the national economy to experience a major downturn in the face of the economic crisis of 2020.

54.1.2 Relevance of the Study and Literature Review

The services linked to digital technologies have gone through several stages of development in Russia. The services themselves, their quality and their form have changed. In the modern context, the Internet and social media have become a meeting point for market participants and a place for their active interaction. In this regard, the digital services development is getting particular importance as a strategic pathway for increasing the national economy competitiveness [1].

The digital transformation of the national economy is a current trend and a relevant area of the research. Among others, we can pay attention to studies by such scientists as Grishin I.Yu., Khalameeva K.Yu., Kolmykova T.S., Nesenyuk E.S., Osmanova Z.O., Timirgaleeva R.R. and others.

The paper by Timirgaleeva and Grishin reflects certain issues of digital transformation. In particular, the authors state that “the study of the issue has shown that the digital component in the Russian economy is most clearly observed in such industries as microelectronics, e-commerce, finance services, retail, telecoms and cloud-based services. The state programs of digitalization deserve special attention. Those include electronic public services that are being actively developed. With good reason, experts state the fact that Russia’s results in these areas correspond to the level of the national economy development” [2].

Kolmykova, Nesenyuk and Khalameeva [3] assessed the level of the national economy digitalization in Russia in comparison with such countries as China, the USA, Japan and others. Digital economy development is considered from the perspective of the innovation wave, or the change in technological and economic paradigm.

Osmanova [4] carries out comparative analysis of the level of digital transformation of the national economy in Russia and in a number of foreign countries.

The digital services have been emerging since the early 1990s, but it is only recently that the term “digital service” has been introduced into scientific discourse. There is a certain degree of controversy and there are multiple points of view on

the differentiation of such categories as “electronic service,” “information service” and “digital service.” Some authors consider them synonymous. However, in our opinion, it is not exactly correct. There is no doubt that all these services are similar in the way they are provided with the use of computer equipment and technology, but the main difference lies in the process of delivering the service.

It should be noted that the issues of the digital services development have not been considered thoroughly in academic papers yet, although the introduction of the category into scientific discourse has become timely and relevant. We can mention only several publications that focus on digital services development issues [1, 5–9].

54.1.3 *Objective of the Study*

The digital economy is currently at the initial stage of emerging, and the key trends and the directions of its development are shaping. At this stage, it is necessary not only to elaborate models of digital services, but also to propose measures aimed at the further development of the digital services sector in the context of a crisis caused by non-economic factors.

54.2 Theoretical Part: Models of Digital Services Development

When considering digital services, we should note that in general, the driving forces of the digital economy include digital data and digital platforms. We have discussed the dynamics of the digital data growth above. The situation regarding digital platforms is the following.

In order to be successful in the market, companies need to transform their business models. In particular, service sector enterprises are transferring their services to the Internet. This transfer can be partial or complete depending on the specific features of a particular service.

As far as the model of the digital service development is concerned, it should be noted that digital platforms act as a mechanism of the digital services sector the shaping and development. The platforms can either aim at allowing and ensuring the process of interaction between market participants, or provide innovative services in the market. For example, Uber, Alibaba and Facebook belong to the first type of platforms. Innovative platforms, on the other hand, include the ones that provide services or products that do not have a material form. In particular, this group includes operating systems, applications and technological standards.

The authors propose to distinguish several models of digital services depending on the aiming (Fig. 54.1).

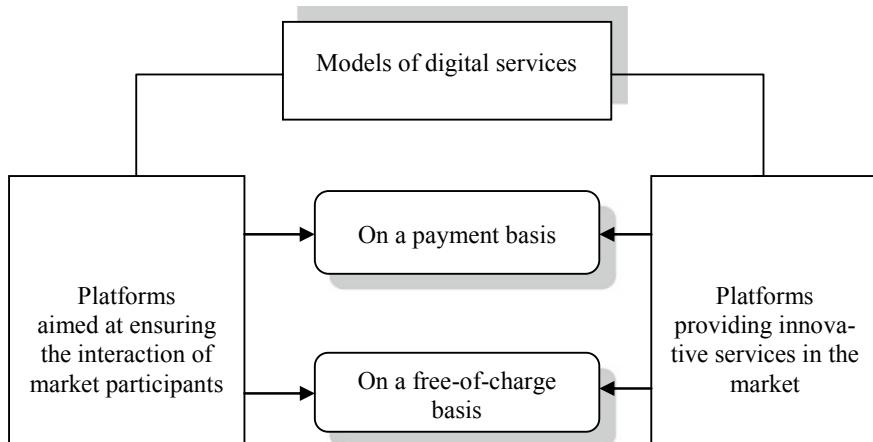


Fig. 54.1 Models of digital services (Authors' own elaboration)

As depicted in Fig. 54.1, there are four models of digital services. The main criterion is the aiming of the platform as a basic element in the mechanism providing a digital service.

Platforms aimed at allowing and ensuring the process of interaction between market participants cannot be considered innovative and having no tangible manifestation or output. In particular, platforms can have financial manifestation due to the fact that services are provided on a payment basis. In that case, a user pays the price of a specific service to receive it and feel the benefit from it directly in the future. As far as online stores are concerned, they have material manifestation as well, because in the end, customers receive goods offline. In the case of a taxi, we can feel the result of the service and evaluate its quality.

When considering platforms aimed at ensuring the process of interaction between market participants on a free-of-charge basis, we can think of various social media. Such platforms become a place of interaction, but there is no financial aspect for the customer who only needs the Internet connection and a means of communication (mobile phone, laptop, tablet, etc.) to gain access to a social network.

The other two models are associated with solutions that provide innovative services in the market. If we consider the payment-based form of interaction, we should mention the services that have no material form, for instance, purchasing antivirus software or other products and services that cannot be represented by objects of the material world. Considering the innovative services provided on a free-of-charge basis, we can think of an example of Gosuslugi ("State Services") or other applications that allow tracking user specifications including health and physical activity trackers.

Considering everything mentioned above, when creating a digital service model, it is necessary to take into account not only the factor of cost, but also the innovativeness of the service.

54.3 Retrospective Analysis of the Macroeconomic Indicators

54.3.1 Major Trends in Digital Services Development

Having identified the models of digital services, we can carry out the retrospective analysis of macroeconomic indicators and analyze the trends in the service sector development.

The UNCTAD data that characterizes the global trend in the digital economy development has significant importance. In the Digital Economy Report [10], UNCTAD experts provide characteristics of changes in global data traffic based on the Internet Protocol (IP). In the 25 years from 1992 to 2017, the traffic had increased from about 100 GB per day to more than 45,000 GB per second. The indicator is forecasted to grow to 150,700 GB per second by 2022.

Russia has certain peculiarities of the Internet development that are identified by the experts [11]. The Internet is a necessary infrastructure element needed to provide digital services. The Russian Association for Electronic Communications provides the following data characterizing the development of the Internet in Russia in February 2020 [12].

First, most of the Russian population (79%) use Internet at least once a month. 90% of the Internet users go online every day.

Second, a mobile phone is becoming more popular as a tool used for the Internet access (70.5% of the country's population comprise the audience of the mobile web in Russia).

Third, “the Russians change their consumer preferences faster than others and switch to digital technologies more easily. For example, 85% of the respondents in Russia admitted that they began using banking applications more often (the global figure is 69%), and 90% began buying more on the Internet (76% globally)” [12].

The data discussed above proves the fact that digital services emerge as one of the segments of the services sector.

The development of digital services in general is influenced by the availability of mobile networks. It is the percentage of population that have access to different types of mobile networks that is one of the major indicators of the digital economy development level and the availability of digital services.

The period from 2007 to 2019 (see Fig. 54.2) shows an increase in the global population and the number of Internet users. It should be noted that the growth rate of the number of Internet users is higher than that of the population, which signifies the potential for the development of both the digital economy and the digital services.

The development of the e-commerce, or retail Internet trade, can be considered as a trend in the service sector development, because in this case, there is no new product, but retailers only provide the service of selling existing products online.

According to the Federal State Statistic Service of Russia for the period from 2014 to 2019, there is a constant increase in the share of Internet sales in the total retail trade turnover in the Russian Federation (Fig. 54.3).

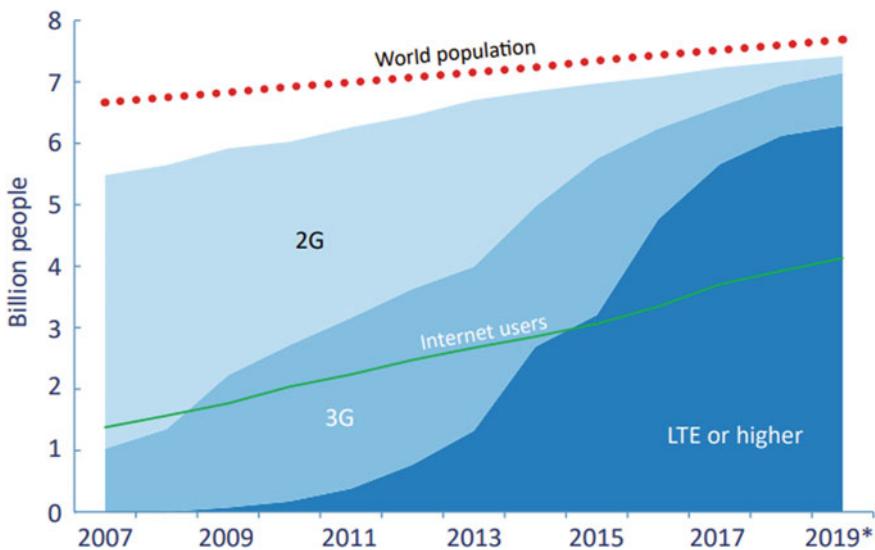


Fig. 54.2 Access of the population to mobile networks by its type, 2007–2019 [13]

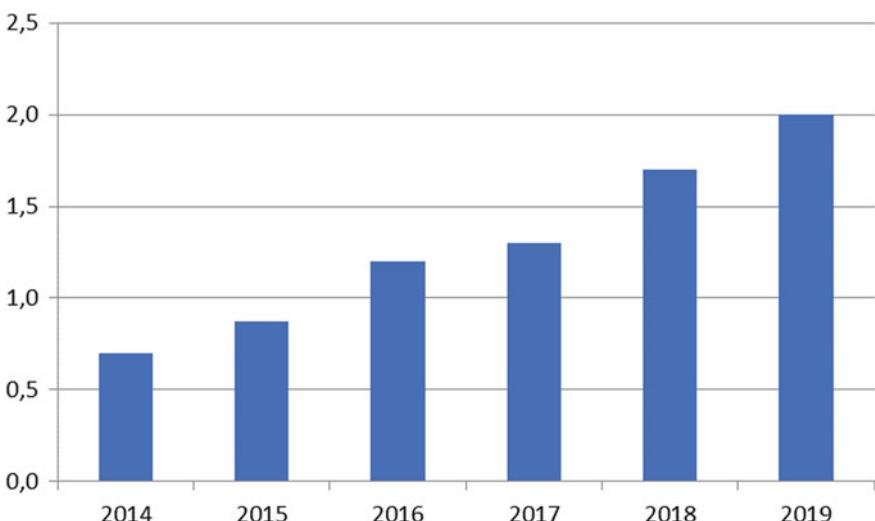


Fig. 54.3 Share of Internet sales in total retail trade turnover in the Russian Federation, % (Percentage of turnover in current prices. Authors' own elaboration based on [14])

The Russian Association for Electronic Communications, in its turn, provides the following data. The e-commerce turnover in 2019 reached 4172.8 billion rubles which was comprised of online retail trade of 1295 billion rubles (+26% compared to 2018), online travel services—730.3 billion rubles (+9% compared to 2018), the

Internet services market—808.7 billion rubles (+19% compared to 2018), the electronic payment services market—1338.8 billion rubles (+19% compared to 2018) [12].

In the present context, the digital economy in general and the digital services sector in particular are developing at an increasing pace. The reason for that can be attributed to both the state priorities reflected in strategic documents and the current crisis situation.

At the same time, a number of factors can be identified that prevent the digital services from developing more actively. In particular, the following difficulties are associated with the e-commerce services.

First, the customer cannot touch and try on the product. This drawback is one of the most important aspects for a number of potential consumers.

Second, there is a room for doubts about the quality of the goods purchased online.

Third, a potential client of an online store can have certain fears regarding the lack of awareness of the procedures and contacts in case of issues and difficulties that can arise when buying or returning the goods.

However, the share of the e-commerce segment continues to grow steadily. Moreover, according to experts, if there may be a downturn in the retail trade in general in 2020, the online market will demonstrate the opposite trend. The share of e-commerce may reach 10% of retail trade turnover by the end of 2020 due to an increase in online sales of traditional retail stores and segments [15].

When identifying the same negative factors for digital services, the following ones should be mentioned: the fear of fraud, lack of confidence in the quality of the service and certain degree of conservatism resulting in preference toward offline services.

54.3.2 *The Impact of the Crisis*

In order to determine the current trends in the digital services development, we should consider the main macroeconomic indicators.

Tables 54.1 and 54.2 show that the economic situation is very difficult. There is a significant decrease in the volume of paid services to the population and in the retail trade turnover. Due to the difficult epidemiological situation, a number of enterprises had to cease operation and some companies either left the market or laid off and reduced their staff. In particular, there is an increase in the number of unemployed, and there is also an increase in wage arrears during the first half of 2020 (Table 54.3).

As shown in Table 54.3, the increase in wage arrears is attributed to the lack of own funds of the enterprises.

Table 54.1 Main economic indicators of May 2020 compared to previous periods

Indicator	May 2020	Compared to May 2019, %	Compared to Apr 2020, %	Jan–May 2020 to Jan–May 2019, %
Retail trade turnover, bln RUB	2257.3	80.8	106.7	93.9
Paid services to population, bln RUB	518.1	60.5	99.1	83.4
Total number of unemployed citizens (age 15 and above), mln	4.5	132.7	105.3	107.8
Unemployed citizens registered (Rostrud statistics), mln	2.1	2.8 times	163.5	142.3
Average monthly wage of employees: nominal, RUB	49,306	101	96.7	106.7
real, RUB	–	98	95.7	104

Authors' own elaboration based on [16]

Table 54.2 Main economic indicators of May 2019 compared previous periods

Indicator	May 2019 to May 2018, %	May 2019 to Apr 2018, %	Jan–May 2019 to Jan–May 2018, %
Retail trade turnover, bln RUB	101.9	101.5	102.2
Paid services to population, bln RUB	99	98.1	99.4
Total number of unemployed citizens (age 15 and above), mln	94.3	95.7	94.4
Unemployed citizens registered (statistics of Rostrud), mln people	106.3	95	102.4
Average monthly wage of employees: nominal, RUB	108.4	103.5	107
real, RUB	103.1	103.2	101.7

Authors' own elaboration based on [16]

Table 54.3 Dynamics of the overdue wage arrears in 2020, at the beginning of each month

Month	Wage arrears (million rubles)			Number of employees with overdue wage arrears (thousand people)
	Total	Including debt due to not receiving state funding in time	Including debt due to the lack of own funds	
January	2114	14	2100	34
February	2251	16	2235	34
March	2207	4	2203	34
April	2153	7	2146	34
May	2209	3	2206	36
June	2416	7	2409	39

Authors' own elaboration based on [16]

In addition to that, the decline in wages was registered mainly in the segments of the service sector that were most affected by the COVID-19 pandemic including the following ones [17]:

- air transport services, airport operation and road transportation;
- culture, leisure management and entertainment;
- sports and recreational physical activities;
- operations of travel agencies and other companies providing touristic services;
- hotel business;
- catering and food services;
- supplementary education, NGOs and other institutions involved in education;
- conferences and exhibitions hosting;
- household services (laundry, dry cleaning, hairdressing and wellness centers, mechanical maintenance, etc.).

The tourism sector was the first to suffer from the pandemic [18] when the borders of the countries and even regions were closed and it became impossible to provide travel services.

Air transport services and airport operations, as well as the catering sector, had to cease their activities.

Many industries used the period of the imposed self-isolation as an opportunity to review their activities and find new ways to develop. Many businesses have found an opportunity to move their services to the Internet. In particular, such segments as sports and recreational physical activities, catering, education, culture, leisure, entertainment, exhibitions and conferences have adapted to providing and/or marketing the service online [19].

For example, the Mariinsky Theater, the Bolshoi Theater and others offered to watch their best shows and plays online during the period of self-isolation. A lot of museums including the Russian Museum invited visitors to virtual exhibitions.

Fitness clubs introduced online training, which allowed businesses not only to keep a certain part of customers but also to build brand awareness and shape a positive image among potential customers. Such promotion can lead to an increase in the number of real customers in the future.

As far as the catering is concerned, many companies benefit greatly from official social media presence, as well as having a good official website. These were the main channels used by customers to order food delivery or a to-go service. Apart from that, the enterprises involved in catering had an option to cooperate with food delivery aggregators.

Educational institutions have completely switched to e-learning in the Internet, regardless of the level of education. Online meetings could range from everyday classes to defense of the final graduation works and theses. Digital readiness level of most educational institutions allowed not only to keep the teaching standards but also to improve the educational process when needed.

Retail trade also belongs to the service sector and may be considered a notable case of the digital technologies implementation. Offline stores have moved to the Internet or focused on developing their existing online channels in order to retain their customers.

According to the Central Bank of the Russian Federation, compared to retail trade, the decrease was even more significant in the volume of paid services: -37.9% in April and -39.5% in May. Operational indicators of consumer activity indicate that the partial opening of stores, cafes and service enterprises in June 2020 resulted in the better dynamics: the pace of the decline in consumer activity significantly slowed down on a year-to-year basis [20].

In this regard, the main question that an entrepreneur or a head of an organization faces is how digital technologies can be introduced into the business processes. When considering the matters of digitalization in the service sector, it should be noted that there is a risk of treating informatization and digitalization as synonymous concepts by mistake, although they are in fact different.

The issues of informatization come down to computer equipment and Internet access. Digitalization, in its turn, concerns establishing and managing business processes, creating new business models.

Official website or a social media account do not necessarily lead to a synergistic effect in company's activities. The main drivers of the digital services market development remain relevant both in the context of a crisis and after it will be over. These drivers include opportunities and incentives for companies to tailor targeted advertising, reduce the costs, etc., and as a result, bring down the price of the services for the target audience, as well to independently create a model of service or a services package.

Because of the imposed restrictions, limited mobility and negative consequences of the crisis, the population had to learn to use and master digital technologies, including to choose, order and pay for services without leaving the home. Most likely, many customers will never return to pre-pandemic consumer patterns as they have become used to choosing services at any time and with the use of any device with Internet access.

54.4 Conclusion

According to the authors, the following trends will be the major drivers of the digital services development in the near future.

- The business model in the service sector changes. Companies switch from traditional ways of providing a service to the digital one due to its convenience and the target audience readiness to adapt consumer behavior to the online practices.
- Pricing and promotion policies are reconsidered in connection with the intensifying competition on the Internet.
- The existing market structure is undergoing transformation, because a number of companies have to leave the national market due to the financial difficulties they have faced and the lack of competitiveness.
- Digital services are becoming more individualized which results from the emerging possibility of adjusting the existing service to the needs and requirements of a particular consumer.

The demand for digital services will only grow in the context of a crisis. Alongside with that, it can be assumed that the free-of-charge models of digital services will enjoy greater demand than the models relying on a payment basis, regardless of the platform aiming. Provided that the national economy will have stabilized and will be following the upwards trend, and the demand for digital services on a payment basis will grow in the future in the framework of the model associated with the innovative services.

In this regard, companies should be active in developing and expanding their presence on the Internet, updating the information flow constantly reflecting the current situation.

Apart from that, cobranding products and campaigns remain relevant and timely as they help to attract more consumers and increase the brand and company awareness in the market.

Further development of digital services will allow gaining a number of positive effects.

First, the innovation and investment activity in the national economy will increase.

Second, standardization and automation of digital services will take place influencing the way digital services are provided; it will allow market participants to intensify regional geographical expansion which in turn will lead to improvement of the quality of life of the population as a whole.

Third, a common digital space will bring together the producer and the consumer of the service in real time and allow coordinating the activities of all the market participants.

Fourth, there will be an improvement in the process of using various promotion tools that take into account individual peculiarities of a particular consumer.

In the fifth place, the market development will be reflected not only in the quantitative growth but also in the qualitative change in the structure of its participants.

Not only big national and international companies will be present and compete in the market, but also small and middle-scale enterprises will find their place.

Finally, we can forecast that the costs of providing and receiving services will decrease, as well as administrative barriers—which will contribute to increasing the transparency of the processes associated with providing the services.

All in all, the crisis has served as a catalyst for the digital services development and the changes in consumer behavior in the current context. All the conclusions drawn from this stage should be taken into account by all the stakeholder including companies and state authorities involved in elaborating strategic and tactical plans regarding the digital services sector development at a nationwide scale.

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Chapter 55

“Canada”, “New Zealand” and “Australia” Stereotypes Modeling Using Associative Experiment Data



K. V. Borovikova , Yu. V. Krasnoperova , and V. V. Tarasenko

Abstract The article describes the results of the research of the content and the structure of the stereotypes “Canada”, “Australia” and “New Zealand” using the associative experiment data. The respondents were 76 people. The analysis of the experimental data was carried out at three stages: at the first one, the associative fields were built; at the second stage, the semantic groups were singled out to reveal the features of the stereotypes; and at the third stage, the reactions of the two age groups were compared. The semantic analysis of the reactions and their quantitative processing has helped single out the nuclear features of the stereotypes under study. According to the associative experiment data, the most frequent reactions to the word “Canada” were *hockey, maple syrup, maple leaf*, to the word “Australia”—*kangaroo, spiders*, to the word “New Zealand”—*green*. These images are included into the nucleus of the stereotypes under question. The semantic analysis of the reactions shows that the nucleus of the stereotype “Canada” contains such features as “symbols”, “nature”, “food” and “sport”. The nucleus of the stereotype “Australia” has “animals”. The nucleus of “New Zealand” consists of “nature”, “films” and “the positive emotions and evaluating”.

55.1 Introduction

The importance of stereotypes in the modern world cannot be underestimated. They are formed during people's joint activities by focusing their mind on properties and qualities of the phenomena of the world which are well known, visible or understandable to at least a large number of people. Ethno-cultural (national) stereotype is one of the types of social stereotype.

In this study, we adhere to the following definition by N.V. Sorokina: “national stereotype is a stable, schematized, emotionally evaluative image of a nation that is widely spread in a certain ethno-cultural environment” [1]. Thus, ethno-cultural

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stereotypes are characterized by stability, emotional intensity, subjectivity and generality.

Currently, numerous studies of ethnic stereotypes are being conducted both abroad [2–6], where they are carried out mainly within the framework of psychology and in our country. In Russia, both scientific articles [7, 8] and entire dissertations are devoted to the results of studying ethnic stereotypes [9–12]. Both auto- and heterostereotypes are being investigated [13, 14].

Ethnic stereotypes are divided into auto-stereotypes (opinions, judgments, assessments of representatives of any ethnic group about the most characteristic features and qualities of their own people) and heterostereotypes (a set of evaluative judgments about any nations by representatives of other nations) [15, p. 249].

A stereotypical image of a particular country (including one's own) consists of the image of the country itself and the image of the people who inhabit it. The image of the country is made up of ideas about foreign and domestic policy of the state, economy and culture. The image of the nation consists of ideas about the national character and national preferences [16, p. 246], the appearance of the representatives of a particular nation and the peculiarities of the lifestyle. Revealing such perception features is of great interest.

One of the important psycholinguistic methods of studying stereotypes is the associative experiment. It has a number of advantages over other techniques. According to Adamova, it reveals, on the one hand, the way social reality is represented in the content of stereotypes, and, on the other hand, the subjective system of connections between components of a stereotype [17, p. 88]. The analysis of the associative experiment data allows us to study the national and cultural specifics of linguistic consciousness, since it helps to build a certain fragment of the worldview reflected in the linguistic consciousness, to talk about the corresponding stereotypes in the ordinary/common linguistic consciousness and trace the dynamics of their development [18, p. 8]. At present, the associative experiment is actively used to study various ethnic stereotypes [19, 20].

55.2 Methods

This article presents the results of the research of heterostereotypes in Russian linguistic consciousness using the associative experiment data. Test subjects were asked to write reactions to the words stimuli: Canada, New Zealand and Australia. The respondents were 76 people—35 students of the Institute of Philology and Intercultural Communication of the Amur State University of Humanities and Pedagogy and 41 foreign language school teachers from the city of Komsomolsk-on-Amur. The age of the test subjects ranged from 18 to 61. The majority (73 people) are women. The choice of respondents will reveal the main features of the stereotypes in the linguistic consciousness of native Russian speakers who are fluent in English and have extensive knowledge of the target language countries. The comparison of

the reactions of the two age groups will highlight the differences in the way these countries are interpreted by young people and their more mature colleagues.

55.3 Results

The analysis of the experimental data was carried out at three stages: at the first stage, the associative fields were built; at the second stage, the semantic groups were singled out to reveal the features of the stereotypes, and at the third stage, the reactions of the two age groups were compared.

As a result of analyzing the reactions to the stimulus word “Canada,” the following associative field has been built: *hockey (15), maple syrup (9), maple leaf (6), maple (5), cold (5), leaf (3), flag (3), French (3), migration, the same climate as in Russia (2), lakes (2), refusal (2), Niagara Falls, mountains, high standard of living, old trees, Toronto, Sonya Esman, courage, life, benevolence, forests, autumn, TV series, clover, convenience, big houses, a famous singer, a country next to the USA, studies, parks, a good country to live in, language practice, a British colony, waterfalls, snow, fresh water, children.*

The biggest number of reactions “hockey” was predictable (20% of informants). However, the absence of reactions connected with Canada being the second largest country in the world is surprising. There are only reactions to Canada’s past history (*a British colony*) and a particular reference to its geographical position (*a country next to the USA*).

The primary reactions were those connected with the country’s symbols: its flag and the maple leaf depicted on it: *maple leaf (6), maple (5), leaf (3), flag (3)*. However, the number of reactions *maple syrup* exceeded the aforementioned ones.

According to the semantic analysis of the reactions, the following groups representing the “Canada” stereotype have been outlined:

Sports: *hockey (15)*;

Country symbols: *maple leaf (6), maple (5), flag (3); leaf (3)*;

Nature: *maple leaf (6), maple (5), Niagara Falls, mountains, lakes (2), forests, clover, old trees, waterfall, fresh water, parks;*

Food: *maple syrup (9)*.

People: *Sonya Esman, famous singer*;

Climate: *cold (5), the same climate as in Russia (2), snow*;

Location: *Toronto*;

Attractions: *Niagara Falls*;

Emotions and ratings:

Positive: *a good country to live in; benevolence, high standard of living, courage, life, convenience*;

Negative: –.

To reveal the peculiarities of the country’s image due to the informants’ age, two groups of test subjects have been established. The first group numbers are 35 people, and its members are students aged 18–23 (Group 1). The second group was made up

Table 55.1 Reactions of Russian-speaking test subjects to the stimulus word “Canada”

Reactions	All test subjects		Group 1		Group 2	
	Number of reactions	%	Number of reactions	%	Number of reactions	%
Hockey	15	20	9	26	6	15
Maple syrup	9	12	7	20	2	5
Maple leaf	6	8	1	3	5	12
Maple	5	6.5	—	—	5	12
Cold	5	6.5	—	—	5	12
Leaf	3	4	—	—	3	7
Flag	3	4	1	3	2	5
French	3	4	3	9	—	—
Migration	3	4	3	9	—	—
The same climate as in Russia	2	2.6	—	—	2	5
Lakes	2	2.6	—	—	2	5
Refusal	2	2.6	—	—	2	5

of teachers aged 25–61 (Group 2). For easier perception, the results of quantitative data processing are presented in Table 55.1.

Let us compare the obtained data. For a quarter of the Group 1 respondents, Canada is associated with hockey and maple syrup (26% and 20% compared to 15 and 5% in Group 2). The reactions describing Canada’s climate mainly belong to the second group. Two representatives of Group 2 have not provided any reactions to the stimulus word “Canada.”

The analysis of the reactions to the stimulus word “Australia” resulted in the following associative field: *kangaroo* (44), *spiders* (6) + *cute little spiders*, *Sydney* (4), *ocean* (3), *koala* (2), *kiwi*, *a separate island*, *Hugh Jackman*, *Melbourne*, *Opera on the water*, *ozone holes*, *cats*, *platypus*, *Adelaide*, *dingo*, *water*, *Cate Blanchett*, *warm*, *giraffe*, *flora and fauna*, *refusal*, *continent*, *animals*, *surfing*, *the Lord of the Rings*, *penguins*, *language school*, *upside down*, *dream of visiting*, *crocodiles*, *Aborigines*, *the movie “Point Break,” exotic*.

The most frequent reactions to the stimulus word “Australia” were *kangaroo* (60%), *spiders + cute little spiders* (10%), *Sydney* (5%), *ocean* (4%), *koala* (3%). It should be noted that some reactions (*kiwi and the Lord of the Rings*) may have been used mistakenly, as they are connected with New Zealand rather than Australia.

At the second stage of the experimental data analysis, the semantic groups reflecting features included in the “Australia” stereotype have been outlined:

Nature: *ocean* (3), *separate island*, *water*;

Climate: *warm*,

People: *Hugh Jackman*, *Cate Blanchett*, *Aborigines*;

Location: *Sydney* (4), *Melbourne*, *Adelaide*;

Table 55.2 Reactions of Russian-speaking test subjects to the stimulus word “Australia”

Reactions	All test subjects		Group 1		Group 2	
	Number of reactions	%	Number of reactions	%	Number of reactions	%
Kangaroo	44	60	18	51	26	68
Spiders	7	10	7	20	—	—
Sydney	4	5	3	9	1	3
Ocean	3	4	1	3	2	5
Koala	2	3	—	—	2	5

Animals: *kangaroo* (44), *koala* (2), *dingo, cats, platypus, penguins, crocodiles, flora and fauna, giraffe, animals, kiwi*;

Attractions: *Opera on the water*;

Sports: *surfing*;

Films: *the movie “Point Break,” The Lord of the Rings*;

The group “emotions and ratings,” which is typically present in the informants’ reactions, is in this particular case absent.

In Table 55.2, the reactions of Russian-speaking informants to the stimulus word “Australia” are presented in quantitative and percentage ratio.

It should be noted that Australia is associated with kangaroos in the specialists’ mind to a bigger extent than in the students’ mind.

Here is presented the associative field to the stimulus word “New Zealand”: *refusal* (8), *green* (7), *the Lord of the Rings* (5), *kiwi* (5), *Hobbit* (4), *greenery* (3), *far* (2), *nature* (2), *landscape* (2), *green fields* (2) + *green hills*, *relaxing* (2), *wind* (2), *clean area/ unpolluted area*, *flowers*, *a lifelong dream*, *country*, *small*, *scenery*, *summer*, *spaciousness*, *studies*, *cheese*, *Wellington*, *heaven*, *comfort*, *islands*, *green leaf*, *interesting*, *fields*, *beauty*, *ocean*, *sea*, *green meadow*, *language practice*, *dairy products*, *the other side of the world*, *warm*, *summer language school*, *Aborigines*, *traveling*, *apples*.

Quite a large percentage of refusals is notable (11% of respondents have not provided any reactions).

The nucleus of “New Zealand” was comprised of the following reactions: *green* (10%), *the Lord of the Rings* (7%), *kiwi* (7%), *The Hobbit* (5%), *greenery* (4%).

The semantic analysis of the reactions to the stimulus word “New Zealand” has allowed to distinguish the following groups:

Nature: *greenery* (3), *nature* (2), *landscape* (2), *green fields* (2) + *green hills*, *wind* (2), *flowers*, *space*, *landscape*, *islands*, *green leaf*, *fields*, *ocean*, *sea*, *green meadow*.

Movies: *The Lord of the Rings* (5), *The Hobbit* (4).

People: *Aborigines*;

Location: *Wellington*;

Emotions and ratings:

Positive: *rest* (2), *comfort*, *paradise*, *a lifelong dream*, *clean area*, *interesting*, *beauty*;

Table 55.3 Reactions of Russian-speaking test subjects to the stimulus word “New Zealand”

Reactions	All test subjects		Group 1		Group 2	
	Number of reactions	%	Number of reactions	%	Number of reactions	%
Refusal	8	11	4	11	4	10
Green	7	10	4	11	3	8
The Lord of the Rings	5	7	4	11	1	3
Kiwi	5	7	—	—	5	18
The Hobbit	4	5	4	11	—	—
Greenery	3	4	—	—	3	8
Far	2	3	2	6	—	—
Nature	2	3	1	3	1	3
Landscape	2	3	—	—	2	5
Green meadows	2	3	—	—	2	5
Rest	2	3	—	—	2	5
Wind	2	3	2	6	—	—

Negative: —;

Food: *cheese, apples, dairy products*.

Let us note the reactions referring to the remoteness of the country: *far* (2), *the other side of the world*.

The percentage and quantitative ratio of the reactions to the stimulus word “New Zealand” are presented in Table 55.3.

It appears that young adults tend to connect New Zealand more with the movies that were filmed there. The representatives of Group 2 had almost no such reactions. For them, the country is mostly associated with kiwi (18%) and greenery (*green*—8%, *greenery*—8%, *green fields*—5%).

Let us compare the semantic analysis data of the reactions to the stimulus words “Canada,” “Australia” and “New Zealand.” To distinguish the nuclear features of the examined stereotypes, the representativity of each group in regard to the total number of reactions (there were 85 of them to the stimulus word “Canada,” 88 to “Australia,” 74 to “New Zealand”) has been evaluated. The results are presented in Table 55.4.

First, we will analyze the groups that did not match in the presented stereotypes. In the stereotype “Canada,” a group of reactions reflecting the symbols of the country is presented. There is no such data in the stereotypes of New Zealand and Australia. A somewhat positive rating has been given by the respondents for Canada and New Zealand, however, not Australia. The absence of negative reactions regarding all examined countries is remarkable.

Table 55.4 Content of the stereotypes “Canada,” “Australia” and “New Zealand”

Semantic group	Canada		Australia		New Zealand	
	Number of reactions	%	Number of reactions	%	Number of reactions	%
Country symbols	17	20	—	—	—	—
Nature	21	25	5	6	21	28
Animals	—	—	55	63	—	—
People	2	2	3	3	1	1
Cities	1	1	6	7	1	1
Attractions	1	1	1	1	—	—
Positive emotions and ratings	6	7	—	—	8	11
Negative emotions and ratings	—	—	—	—	—	—
Food	9	11	—	—	3	4
Climate	8	9	1	1	—	—
Sports	15	18	1	1	—	—
Movies	—	—	2	2	9	12
Refusal	2	2	1	1	8	10

As it turns out, Canada and New Zealand are associated with “nature” (25 and 28% accordingly) more than Australia. However, most of the reactions to the stimulus word “Australia” are referring to animals.

The groups most frequently presented were the following: in the stereotype “Canada” “the symbols of the country” (20%) and “nature” (25%), “sport”—18% and “food” (11%), in the stereotype “Australia”—“animals” (63%), in the stereotype “New Zealand”—“nature” (28%), “movies” (12%) and “positive emotions and ratings” (11%).

It is interesting that the group “cities” is more frequently represented in the stereotype “Australia”; however, the capital city is not found among the reactions, but there are such cities as Sydney, Melbourne, Adelaide, which apparently have brighter images in the minds of Russian-speaking people.

It is obvious that the respondents have no fixed associations with people in researched stereotypes. The names of two actors were only given in the group “people” of the “Australia” stereotype, the other ones included Aboriginals; in the “Canada” stereotype, the name of a blogger and a famous singer were mentioned.

55.4 Conclusion

Thus, the conducted research allows us to draw several conclusions.

According to the associative experiment data, the most frequent reactions to the word “Canada” were *hockey, maple syrup, maple leaf*, to the word “Australia”—*kangaroo, spiders*, to the word “New Zealand”—*green*. These images are included into the nucleus of the stereotypes under question.

The semantic analysis of the reactions shows that the nucleus of the stereotype “Canada” contains such features as “symbols”, “nature”, “food” and “sport”. The nucleus of the stereotype “Australia” has “animals”. The nucleus of “New Zealand” consists of “nature”, “films” and “the positive emotions and evaluating”.

Ethno-cultural stereotypes are characterized by emotional intensity. The images of Canada and New Zealand are positively portrayed in the consciousness of Russian-speaking respondents. Comparing the results of this research with the data obtained earlier [21], it should be noted that in the autostereotype “Russia” and stereotype “the USA,” negative emotions and evaluations are prevailing; at the same time, the stereotypes of Great Britain, Canada and New Zealand are positive.

Comparing the distribution of semantic groups in the examined stereotypes with the data obtained earlier, we reach the conclusion that nature is part of the content of all stereotypes except for the USA.

The comparison of the reactions of the two age groups has not shown any significant differences. However, some reactions, as *studies, language school, or summer language school*, reflect the respondents’ belonging to a group professionally engaged in learning foreign languages.

The prospect for further research is to increase the number of test subjects in order to verify the data obtained, as well as to conduct an associative experiment with Russian speakers not related to the study of a foreign language professionally.

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Chapter 56

The Role of Motivation in the Formation of Personally Significant Qualities of Future Teachers



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Abstract The work raises the question of the relationship of professional motivation and professionally important qualities of the personality, which are not always realized by university teachers, who believe that high education provides the formation of professional competencies and qualities of the future professional. This view reflects only the external picture, omitting what is happening in the system of motives that generates new motives and building their hierarchy. The relationship of the prevailing motivation with professionally important qualities of teachers is the target of this study. As the research methods, there was used author's comprehensive questionnaire including questions relating to the motives that attract to the teaching profession and to the representation of professional qualities of the respondents. The revealed relationship of the dominant motives with professional qualities of the students and the future teachers was numerous and poorly differentiated. This indicates on the equal opportunity of motives to act as a foundation for the development of any professional quality. The study suggests that the role of dominant motives in the formation of the structure of professional qualities of the teacher is different. Emerging in the university dominant motives, developing begin to determine the formation of different qualities that are the basis of competencies.

56.1 Introduction

The transformations taking place in modern society permanently update the requirements for the training of professionals, which is fixed in the state documents, developed concepts and models of their training, sets of professionally important qualities and competencies that a specialist should have [13, 14].

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Moreover, the introduction of the term of “competence” did not change the situation, since now the concept of professional qualities was simply equated to the concept of competence, which was clearly reflected in the publications of representatives of various disciplines. So, Donina and Sukhova [4] offer to consider the professional qualities of a foreign language teacher as a professional-information competence. Other authors in the context of their disciplines introduce the concept of informational-communicative competence [19], music-pedagogical competence [8] and professional-gaming competence [20]. Shishlyannikova [17] proposes to consider professional competence as an integrative quality of the teacher. It is also necessary to note the opposite trend, when instead of professional competencies certain professional qualities are considered. For example, Vasev [21] analyzes communicative-ethical speech qualities as an indicator of professional competence of the teacher.

The considered works allow us to conclude that the basis of all competencies and their core is the personal component. Knowledge itself does not change a person, and it must find for him a value-personal meaning. And according to Dyachenko [5], due to the complexity of diagnostics of the level of achievements in the development of competencies, it is possible to assess the indicators of their formation by such qualities as the ability to empathy, socioreflexia, self-organization and general culture.

At the same time, the majority of high school teachers remain confident that the educational process, covering both classroom work and classes outside the classroom, and fully ensure the formation of professionally important qualities of the future professional personality. The basis of this assumption is the approach to the developing personality of the student, as some receptacle containing a certain set of knowledge, skills, competencies, qualities, etc. It is emphasized that some components of this set correspond to future activities and will be able to develop in a professional environment [3]. Shadrikov indicates that starting to master any activity a person has at his disposal certain qualities, some of which are professionally important [15, 16].

What are the features of the process of formation of professionally important qualities, from what moment you can call a person competent in his field, until when after graduation and employment, a person remains “new,” “green” and “incompetent” [6]. All these problems constantly arise in the practice of higher education.

Such views of high school employees are explained by the fact that the content of professional education is directly connected with the formation of a stable system of professionally significant qualities of the personality, that is, we are talking about the process and the result of professionalization. At the same time, there is often a desire to form an algorithm for future activities and the need to develop the personality of the future specialist, ensuring his more complete self-realization is forgotten. This approach reflects mainly the external, visible to the teacher picture, often omitting what is happening in the inner world of the future professional and, above all, in the system of his motives. But it is the motive, directing and regulating activity, determines the identity of the personality, generating new motives, building their hierarchy.

These problems are amplified by the fact that the number of studies aimed at analyzing changes in the internal sphere of the learning subject can hardly be considered sufficient, and it is often repeated prevailing motives that gradually become familiar, characteristic for the subject, and, in the end, transform into the features of his personality. This was pointed out by Leontiev, presenting the dominant motivation as one of the main characteristics of the personality, reflected in the features of other personal traits [9]. Sudakov understands the dominant motivation as a kind of “filter” of external motivation, which determines the direction of the leading vector of the subject’s behavior [18]. Accordingly, the educational process at the university should set such motives and goals that will allow the future professional to acquire theoretical knowledge quickly and effectively, to work on the formation of appropriate skills, as well as to develop with the greatest share of student’s conscious participation professional and personal qualities necessary in the future for the successful solution of various professional tasks.

On the other hand, already conducted studies often reveal dominant motives far from professional activity of both students and working professionals. Thus, a research carried out by Rean [12] recorded that the main motive for choosing a profession among the students of six faculties of St. Petersburg State University was the high profitability of future activity. On the basis of experimentally obtained data, Mysin and Uvarova [11] concluded that senior students of Moscow State Regional University are attracted by the possibility of stable earnings and social benefits received as remuneration for work in their future profession. Although, it should be noted that the students were also focused on diversity, fun, creative nature of the work, the opportunity to express themselves and engage in self-improvement.

The question arises how the set of professionally important qualities and competences necessary for a graduate is formed from various dominant motives, whether these motives are universal, ensuring the formation of the whole set of professional competences or each motive ensures the formation of “its own” set of professional competences, and in this case, graduates have different potential which must be taken into account by the employer [7, 10]. But, in any case, the fact of dominance of the student’s unprofessional, for example, selfish motive, naturally raises the question what structure of personality he will have and what competencies he will have at the output. Whether in this case there will happen something from what Druzhilov has warned [2], noting that the person can get professional qualities “in the result of special training and long experience, and cannot get, but only “be registered” as the professional.”

Chizhikova [1] considers this question in another professional field—the study of the relationships between motives of the choice of the medical profession with professionally important qualities. The author proved that the dominant motives for choosing the profession of a doctor among first-year students are also weakly interrelated with their ideas about the importance of individual professionally important qualities of medical workers.

The considered provisions make us take the next logical step—to move in the structure of the study of dominant motives to consideration of their relationships with developing on their basis professionally important qualities of the personality.

56.2 Methods

The aim of the research was to study the relationship of professional motives with professionally important qualities of the personality.

As research methods, there was used author's comprehensive questionnaire including questions relating to the motives attracting to the teaching profession and the representation of professionally important qualities of the respondents. The degree of expression of the dominant professional motives of the participants and their professionally important qualities was evaluated on a five-digit scale.

56.3 Results

As it turned out, the relationship of professional motives with professionally important qualities of the students and future teachers, is numerous and poorly differentiated. This fact may indicate the possibility of each motive to become the basis for the development of any professional quality.

Thus, it can be concluded that the majority of students of pedagogical professions do not have rigid links between the dominant motives of activity and professionally important qualities, and there is a possibility of developing of various professional qualities from these motives.

Similar pattern of diversity of relationships after graduation of working representatives of the teaching profession demanded a survey with a help of the same complex questionnaire of working teachers.

After processing the results of the survey, there was obtained reliable relationship of dominant professional motives with professionally important qualities. Thus, the motive "love for children" was associated with such professional qualities as "desire for development" ($r = 0.34^*$) and "empathy" ($r = 0.31^*$).

It is interesting that the motive "love for children" has a feedback with reflexive qualities ($r = -0.42^*$), which can be interpreted as contrast to the focus of professional pedagogical consciousness of the subject "on children" or "on themselves."

Creative motives are associated with creative abilities ($r = 0.59^{**}$), as well as with empathy ($r = 0.47^*$) and reflection ($r = 0.39^*$). It is obvious that the revealed interrelations confirm traditional views on the creative nature of the pedagogical profession, testifying to the developed habit of teachers to look at children and at themselves each time in a new way, "with other eyes."

The desire for self-reliance has demonstrated a close relationship with empathy ($r = 0.67^{**}$) and creativity ($r = 0.69^{**}$), as well as a moderate relationship with communicability ($r = 0.45^*$) and pedagogical artistry ($r = 0.45^*$). The importance of the desire for independence of the teacher is due, first of all, to the fact that, in this case, he is able to demonstrate his independence, ability to overcome difficulties, personality, i.e., to become an example for students, to lead them.

The motive for success in the profession is associated with such professionally important qualities as pedagogical tact ($r = 0.52^{**}$), empathy ($r = 0.46^*$), the desire for development ($r = 0.43^*$), and creative orientation ($r = 0.39^*$). At the same time, the connection with reflection has a reverse relationship ($r = -0.52^*$), which suggests the existence of some teachers' negative attitude to reflection with a focus on the success, considered by them as a factor hindering success. This may mean that success in the profession is seen more as an external achievement, not related to internal development.

It is interesting that career motive ($r = -0.40^*$) also has a reverse connection with reflection, which emphasizes the negative attitude to self-understanding in conditions when it is necessary to "move forward quickly." The career motive is also correlated with organizational qualities ($r = 0.65^{**}$), empathy ($r = 0.67^{**}$), creativity ($r = 0.55^{**}$) and pedagogical tact ($r = 0.45^*$). The revealed relationships give an outline of the subject, decided to make a career in the teaching profession.

Probably, therefore, the motive of self-realization is associated with another set of professionally important qualities: the desire for self-development ($r = 0.56^{**}$), pedagogical tact ($r = 0.50^*$), leadership qualities ($r = 0.46^*$), pedagogical artistry ($r = 0.36^*$), communicability ($r = 0.33^*$) and self-control ($r = 0.33^*$).

Motivation to benefit society is associated with such professionally important qualities as empathy ($r = 0.67^{**}$), pedagogical artistry ($r = 0.63^{**}$) and communicability ($r = 0.53^*$).

The teacher's focus on getting pleasure from mutual understanding with colleagues in this study was continued in the relationships with the following professional parameters of personality: empathy ($r = 0.61^{**}$), creative orientation ($r = 0.59^{**}$), communicability ($r = 0.51^{**}$), reflection ($r = 0.46^*$) and the desire for self-development ($r = 0.39^*$).

Particular attention in the research was paid to the manifestations of selfish motives, often causing fierce debate in society. According to the obtained data, this type of dominant motivation is closely related to organizational qualities ($r = 0.71^{**}$) but has a negative relationship with leadership qualities ($r = -0.33^*$). It is possible to assume that persons implementing this motive in the teaching profession seek their mercenary goals and achieve what they want without manifesting themselves, but organizing and pushing others, acting as "with someone else's hands."

56.4 Conclusion

The study allows us to conclude that, despite the presence of all the above mentioned motives in the professional activity of any teacher, the role and share of each of them in the formation of the structure of professional personality is different. The structure of professionally important qualities of the teacher is caused by the dominating motive defining representation and expressiveness of these qualities. Teachers with different dominant professional motives, for example, the motive "achieving success in the profession" or the motive "love for children" can be well-established professionals,

but they will come to this level in different ways with different sets of professionally important qualities.

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Chapter 57

Impact of Digitalization on Hotel Industry Development



E. V. Shumakova

Abstract This article considers the pressing issues associated with the impact of digitalization on the hotel industry development. The main focus is on the development factors and prospects of digital economics, as well as the fact that the hospitality industry is among the leaders in digital innovation and technology integration and use rate. The study of international experience and practices allowed the authors to identify the trends in the introduction of digital technologies into the hotel business and the changes in the hoteliers' mindset about the lack of their use options. The authors outline in detail the prospects and the functional features of the groundbreaking innovations that can be used by hotels in order to improve their business efficiency. The paper analyzes the impact of digitalization on the hotel industry development through the examples of mobile, cloud, and virtual data security technologies. Further, the authors discover that the increased client requirements for mobility and comfort force hotels try out and use brand-new technologies in their everyday operations. The authors present a list of the most promising and relevant digital innovations along with the horizons they open. The results obtained made the authors draw the conclusion that digital technologies provide hotels with the possibility to improve their customer loyalty, reduce costs, especially for facilities and electricity, improve their business processes, operational efficiency, management and maintain the security of their business and clients in cyberspace.

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57.1 Introduction

57.1.1 Research Relevance

A today's global trend in the world economy is the active development of complex social structures and relations that are increasingly based on modern digital technologies [1]. These transformations in turn increase the data flows and raise the problem of the formation of digital economics. The significance of these trends led to the emergence of today's pressing problems: the formation of a new type of economic systems, digitalization of social relations and economic complexes in general, in which the production, processing, storage, transmission and use of increasing volumes of information is of primary importance.

According to forecasting reports by The Boston Consulting Group (BCG) experts, about 32% of the global economy shall be introducing digitalization technologies in 2022, which will allow the government, business, and society to function more efficiently. Developed countries completed industrialization and they are successfully digitalizing their economies through the rapid development rates for innovative technologies dominated by artificial intelligence, automation, and digital platforms [2].

As a result, today it is clear that digital technologies are at the same time a large market and an industry in itself and a basis for efficiency and competitiveness of all other sectors and industries.

The hotel business is one of the sectors that widely use digital technologies. It is also one of the fastest developing fields nowadays. It has a high capacity and a lot of opportunities to use various cutting edge products of information and communications industry that help achieve financial and other benefits from the synergistic effect and integration processes from the development of specialized software to automate a hotels' operation to the use of global computer networks.

The active use of digital technologies in the hotel business is made evident by the annual increase in budgets allocated to deploy and expand digital services, attract extra staff, and the increase in customers' demand for digital services, etc. (see Fig. 57.1).

Note that contemporary information technologies may automate the process of attracting and servicing customers, as well as the decision making for managers and hotel services rendering. Today the development of services by hotels stipulates for the use of global distribution systems (GDS) that facilitate a faster and more convenient booking for transport tickets and hotel rooms, the acquisition of information concerning the availability of some trips and routes, the tourist attractions in countries and cities, car rentals, foreign exchange, and ordering tickets for entertainment and sports programs, etc. [4].

Fast emerging technological novelties glut the market, and the hospitality industry is always on the lookout for new methods of attracting tourists because it is hard to impress clients nowadays. That is why digital technologies have become innovations that create exclusive comfort for hotel guests [5]. Due to the advances in modern

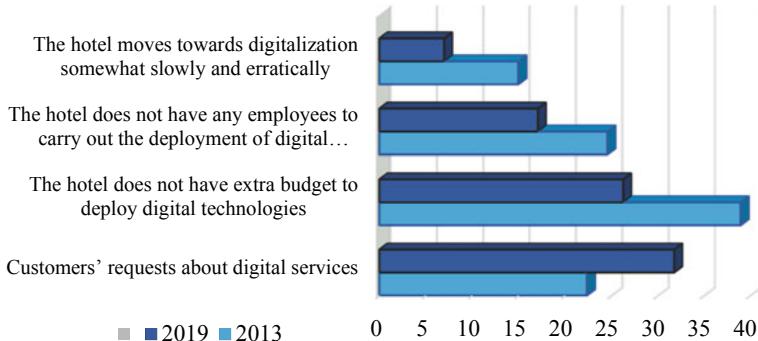


Fig. 57.1 Data from the annual survey by Hospitality Technology [3]

technology, hoteliers can organize the conditions that would be way better than those available in hotels in the twentieth century.

Taking into consideration the aforementioned, one can assume that the importance of studying the impact of digitalization on the development of today's hotel business predicates the increased interest in this topic. At the same time, it is necessary to point to the fact that the specifics of using digital technologies in various segments of the hotel industry remains insufficiently studied. Identifying the advantages of aggregated consumption and digital marketing economy requires additional investigation concerning their application possibilities in all the components of hotel work to increase their competitiveness via a more accurate ranking of consumer groups and targeted services. In addition, there are not enough valid data about market development rates, its growth capacities, and consumer behavior in the digitalized hotel business. It is also necessary to conduct a more detailed study of the factors restraining hoteliers in the use of digital services to eliminate them later.

Thus, these factors preconditioned the selection of the article topic. They also confirm its relevance, as well as theoretical and practical significance.

57.1.2 *Review of Publications*

The problems of digital economy establishment and its impact on the competitiveness increase in the tourism sector have been studied by Russian and foreign researchers including I. Ansoff, R. Ackoff, S. Veretyuk, S. Voitko, A. Glushenkova, A. Gudz, P. Doyle, P. Drucker, I. Zelisko, S. Kolyadenko, A. Thompson, E. Toffler, K. Schwab, et al.

The features of hospitality industry digitalization were described in detail in the research of G. Bouman, Mark de Reuver, A. Osterwalder, M. Rachinger, V. Vorraber, K. Linz, G. Muller-Stephens, A. Zimmerman, etc.

The problems of identifying the main drivers of digitalization in the hotel business and their significance for the development of this industry as a whole are investigated in academic works by famous foreign researchers including B. van Ark, D. Engelbart, J. Licklider, R. Lipsey, J. Stiglitz, etc.

Today many papers consider the prospects of using PR technologies and information networks in the hotel business. Among the researchers working on these issues, one can distinguish L. A. Ivanov, V. A. Lukyanov, A. F. Morgun, G. B. Munin, Yu. A. Karyagin, K. N. Prokhorenko, Kh. I. Roglev, S. I. Rudenko, S. V. Skibinskiy, K. S. Fedosova, etc.

Current trend monitoring and future sector requirement forecasting in the context of deploying break-through technological innovations were the subject matter of papers by M. Bizhakova, M. Malskaya, V. Khudo, Zavadinskaya, A. Terensio, etc. These researchers studied the bases of organizing hotel operation using innovative digital technologies.

With that, the multiaspect nature and argumentativeness of some of the digitalization problems call for further research on the impact of information and communication (digital) technologies on the development of the hotel business. The impact of society digitalization on social and economic relations in the hospitality industry needs detailed study, as well as the identification of prospects and justification of actions to develop brand-new models of hotel management based on contemporary digital technologies.

57.2 Research Purpose

The purpose of this article is to study the specifics of using digital technologies in the hotel industry and analyzing the impact of digitalization on the development prospects of the area.

57.3 Theory

The hotel industry is one of the most attractive sectors for today businesses. The global hotel business comprises about 560 thousand comfortable hotels that can accommodate over 38 million people. The overall number of rooms within the last 15 years continues to grow, and it increases by an average of 4–6% a year, which confirms the stable growth in lodging facilities [6].

As it has been mentioned before, digital technologies are actively introduced into the tourist infrastructure and hotel business. Price water house Coopers studied large hotels' preparedness for the deployment of future technologies through the assessment of the development level of their infrastructure and the depth of digitalization in the cities where they are located. The leaders in this preparedness rating for the

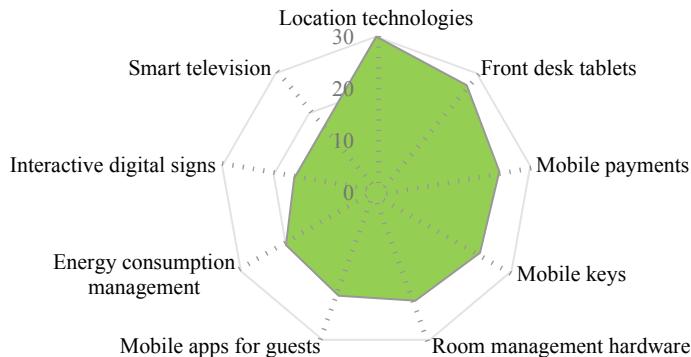


Fig. 57.2 Most popular digital technologies used by hotels, % [9]

world's largest hotels associated with the introduction of innovative digital technologies are the hotels in Singapore (62% ready), London (59%), Shanghai (55%), Moscow and New York (53% both) [7]. The level of digitalization for the hospitality industry was rated by the presence of multifunctional kiosks and smart stops in the streets, mobile apps for tourists, and the intensity of use of innovative technologies in hotels. The top places, in this case, were taken by Barcelona, Singapore, Shanghai, and Moscow.

Today, hotels use a large number of brand-new computer technologies to solve various problems and improve the quality of service. One example is the global computerized booking systems, integrated communications networks, multimedia systems, smart cards, management information systems, etc., that are aimed at the development of the hotel services market and tourist infrastructure [8]. Moreover, it is hard to imagine the promotion of hotel services today without information technologies.

Figure 57.2 presents a list of the most frequently used digital technologies in the hotel business.

The main driver for the hotel active use of digital technologies is the client requirements and requests. In response to this increasing trend, Intercontinental Hotels Group presented its research of the market trends for hotel services in 2020–2022 entitled Uncompromising Consumer: Paradoxes of Increasing Personalization Era at the World Economic Forum (WEF) in Davos. Its focus is on the high requirements of today's clients that expect hotel brands to satisfy a wide range of quite controversial requests and do not want to accept compromises [10].

57.4 Research Findings

As a result of using personified digital technologies, hotels increase their customer loyalty and subsequently their profits. For example, technological innovations led to

the development of specialized portals (between 9 and 5, Dayuse-hotels) where one can book a room or arrange a temporary office in the daytime even at luxury class hotels (the price depends on the times, days of the week, and hotel occupancy).

Technological innovations simplify booking, check-in, and staying for hotel guests and create a synergetic effect increasing the competitiveness of the hotel on the market. The analysis of the international experience helped identify the following digital trends in hotel business:

1. Check-in easier. QR codes, electronic tickets, and specialized mobile apps that can significantly hasten and simplify the checking-in process. For example, Hyatt Regency Chicago offers a check-in option in the lobby. Clients are to use their iPads and get an RFID key. Radisson hotels experiment with kiosks in four pilot locations (La Crosse, Phoenix, Salt Lake City, and Seattle). Guests can check-in online 24 h a day. They get a confirmation barcode via e-mail and scan it in the hall to check-in [11].
2. Connect and charge your gadgets. The use of gadgets and multifunction adaptors for charging and communicating, for example, if guests have devices with USB, mini-USB, HDMI, VGA, RCA, and S-Video interfaces, they can display the image from their computer, camera, or any other gadget on a TV in their room.
3. Remotely control everything in your room. Guest gadgets are integrated into the electronic hotel management system. Using mobile apps or the Internet of things, guests can remotely control their room [12].
4. Be your own concierge. This technology allows ordering a wide range of hotel services using a TV, a phone, or any device in the room that is connected to the hotel network.
5. Have peace of mind. An innovative security system that can determine the degree of threats for guests and personnel on its own.
6. Stay online everywhere on property. The hotel personnel is available online 24 h a day, 7 days a week, 365 days a year.
7. Find your way. Sensor cards for guest convenience. For example, Hyatt Regency Chicago uses sensor plasma screens for the interactions with Google Maps online service [13].
8. Borrow spare gadgets. One can rent modern devices at hotels. “Business bars” with brand-new gadgets for guests who left their own at home.
9. Do your business in style. An unconventional approach to marketing elements. The Marriott hotel network conduct experiments using the “beacon technology” to attract clients [14].
10. Simple but useful. Smart system for lighting, air conditioning, communications, smart keys, etc. Starwood’s (USA) tests the use of mobile phones as room keys via the NFC technology [15].

The use of digital technologies significantly reduces the costs of modern hotels, especially the electricity costs.

The research carried out by Hospitality Technology showed that among the major IT deployments planned for 2020, 20% of the hotels are planning to focus on energy

consumption management [16]. For the majority of the hotel, power is one of the top three expenditures. Therefore, energy-saving technologies are attractive in terms of financial savings. Smart technologies help hotels control and monitor energy consumption.

At the end of 2015, Hilton Worldwide became the first hotel company that was awarded the Superior Energy Performance certificate from the Department of Energy for energy consumption management in three of its buildings. Hilton deployed its own metering platform of Light Stay in more than 4500 hotels. Through collecting data from its global portfolio, the company can audit how hotels manage their energy consumption and optimize it [17].

Besides, today's hotels focus on the capacities of cloud technologies and calculations that help them improve their business processes.

Cloud calculations and SaaS are among the most discussed current trends in digital technology because they can become a break-through innovation for the hotel industry. Cloud technologies continue to spread throughout corporate apps of many hotels because their owners are attracted by the high deployment rates of such systems, low initial costs, easy handling, and significantly reduced efforts necessary to support their operability, which provides for system modifications as the needs change.

Cloud technologies let hotels all over the world strengthen their business from increasing operational efficiency to reducing management costs. Cloud calculations help reduce energy, equipment, and operational expenditures. As a result, hotels' hardware requirements reduce which, in its turn, helps reduce energy costs. Cloud calculations in the hospitality industry may also reduce the time necessary to deploy projects, which leads to financial resource-saving and performance increase [18].

The additional advantage of cloud calculations is that they free hotel employees from the obligation to spend all the time at the stationary terminals and allow them to work remotely and, in some cases, more efficiently.

The use of cloud services by hotels has a number of advantages for clients as well. These include, among others, smartphone or tablet check-ins as an alternative to front desk check-ins. The benefits of employing cloud technologies also include better access to products and services for clients, i.e., the smooth operation of the hotel.

A special focus should be placed on the fact that digital technologies provide better cyberspace security for both the hotels and their clients. The attitude of the hospitality industry toward cybersecurity is changing due to the increase in the complexity of DDoS attacks and the numbers of crypto extortionists. Security becomes increasingly relevant as payments get more mobile and new non-banking payment instruments emerge. Providing for the better payment and data security is the main goal behind investments in technologies for hotels. While in 2013, hotels allocated 12% of their aggregate budget on information security, the same value for 2020 increased up to 25% [19].

The confidentiality of guest data, in general, is an aggravating problem for the hospitality industry because of the growth of mobile and social channels and the

sophistication of data piracy, which leads to the increase in investments in intrusion detection and prevention tools [20].

57.5 Conclusions

Over the last years, the hotel industry experienced significant changes associated with the development and introduction of new information systems and technologies, digital innovations, and brand-new technical solutions. Today, the successful operation of a hotel is virtually impossible without using contemporary technologies. In addition, digital technologies are a compulsory attribute of quality assurance for the customer services rendered because end users set quite high requirements for the information support of services they receive. In particular, they want continuous and reliable access to the Internet, various mobile apps, etc.

The results of the research show that digital technologies provide hotels with the opportunity to improve their customer loyalty, reduce costs, improve their business processes, operational efficiency, management and maintain the security of their business and clients in cyberspace.

The authors deem the following to be the promising directions of digital technology development for the hotel industry: supporting mobile compatibility of various technologies and client gadgets with hotel services; the integration of guest data via cloud technologies; the improvement of room management systems; the security improvement and using digital screens.

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Chapter 58

Applying the Risk Management System in Exchange Control



M. Yakovleva

Abstract The author has analyzed the experience of theoretical studying issues related to risk management in the financial sector and customs control. The paper systematizes and visualizes the goals of the risk management system and outlines its elements applicable in the exchange control. The author's proposals on the development of criteria for determining the level of risk of violating currency legislation associated with the repatriation of funds and illegal disinvestment are given.

58.1 Introduction

To ensure the promptness and efficiency of state control (regardless of the sphere of public life) in the modern dynamically changing world, the idea of a risk-oriented approach to choosing the control objects, which supposes not comprehensive and total control of public relations but selective, maximally reasonable, and result-oriented control is becoming increasingly relevant.

The system of currency relations, which is the subject of exchange control, is no exception in this case. The number of forex transactions performed daily by residents and non-residents cannot objectively be covered in full by detailed control in a mode close to real-time one. Preliminary thorough exchange control of each forex transaction performed (including checking the content of the payer's documents for their reliability) would lead to an imbalance in settlement relations.

Currently, both preliminary and follow-up exchange control are implemented. At the stage of preliminary control, a format-logical control of filling in payment documents and accounting and reporting forms on forex transactions is performed, and at the stage of follow-up control, the validity and legality of the transaction can be checked, while, unfortunately, it is not possible to promptly suspend it or return funds.

However, the follow-up exchange control no less needs a system that allows identifying unconscientious persons and transactions aimed at the illegal disinvestment

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among numerous foreign trade participants performing the intense and conscientious economic activity. The size of the state apparatus is incomparable with the number of foreign trade transactions, which explains the selectivity of control; therefore, it is important to choose the right control object and not distract conscientious foreign trade participants from the current economic activity.

58.1.1 Theoretical Study of the Risk Management System

In the academic circles, the risk management issue and the specifics of functioning the system as a whole are widely discussed.

A.F. Andreev defines the risk management system from the standpoint of the system research methodology as a unity (interconnection) of customs personnel, software and hardware, and methods, which is aimed at protecting from the risk of violating customs regulations in the foreign economic activity [1].

According to Anisimov, ‘the risk management system is a complex of interconnected bodies and management tools ensuring analysis, identification, assessment, and minimization of risks during customs control’ [2].

Arabian and Popova define the risk management system as ‘a set of specific elements united into a single structure to achieve a common goal and used to improve the efficiency and promptness of decision-making in performing customs operations and, as a consequence, ensuring the identification and minimization of customs risks’ [3].

Nemirova and Savelieva believe that the risk management system is a complex of selective control methods and tools used by customs officials to achieve efficiency and promptness and reduce the resource costs of the customs authority and non-production costs of foreign trade participants and aimed at improving the quality of customs services [4].

The risk management system is applied at all the main customs control stages and covers all main areas of activity, including control over compliance with prohibitions and restrictions, the correctness of classification according to the EAEU CN of FEA, calculating customs duties, determining customs values, observance of intellectual property rights, control over the country of origin and the legality of declaring tariff preferences, etc.

Based on the foregoing, A.F. Andreeva, V.G. Anisimova, E.G. Anisimova, G.I. Nemirova, T.I. Savelieva, and E.M. Bogoeva have considered the risk management system from the customs control point of view and represented as a tool that allows ensuring the customs control efficiency in terms of reducing damage to the state budget and arrears on customs payments, i.e., in general, a tool ensuring compliance with customs legislation.

Ryaskova has considered enterprises from the standpoint of the financial risks and characterized the risk management system as a complex of methods, techniques, and measures that allow, to a certain extent, forecasting the onset of risk events and taking measures to prevent or reduce the negative consequences of such events [6].

In a complex, the approaches described allow outlining the main risk management system elements, the use of which in the exchange control is advisable, i.e.:

- a set of selective control methods and tools, which would improve the efficiency and performance of exchange control audits,
- the possibility of forecasting the onset of adverse consequences, which would ensure the prevention of violating currency legislation and illegal disinvestment.

58.2 Applying the Risk Management System in Exchange Control by the Customs Authorities

According to the Concept of Risk Management in the Customs Authorities of the Russian Federation approved by the decision of the board of the FCS of Russia dated May 29, 2014, the risk management system is a set of elements linked by common goals and structure, used to improve the efficiency and promptness of decision making in performing customs operations and ensuring the identification and minimization of customs risks [7].

The strategy and tactics of applying the risk management system, the procedure for collecting and processing data, analyzing and assessing risks, developing and implementing risk management measures have been developed to establish uniform approaches to management, implementation, and further improvement of the risk management system in the customs authorities of the Russian Federation [8].

The author has systematized the goals, the achievement of which is facilitated by the risk management system (hereinafter—RMS). These goals are schematically shown in Fig. 58.1.

These goals may be called common for any state control body, and exchange control authorities are no exception in this regard.

According to the author, achieving these goals will be facilitated by such RMS applying tactics, which ensures implementing the risk management process at all

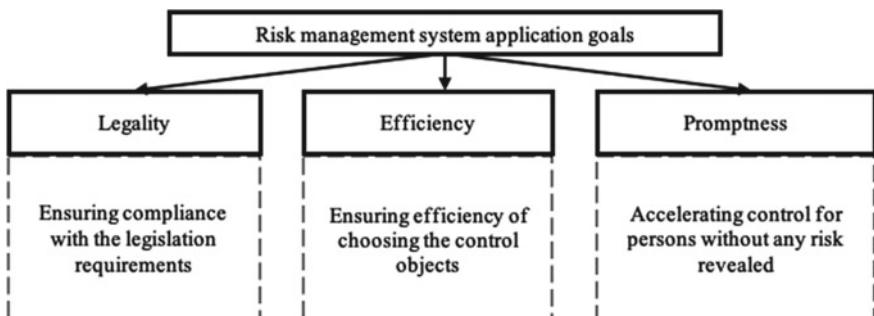


Fig. 58.1 RMS application goals

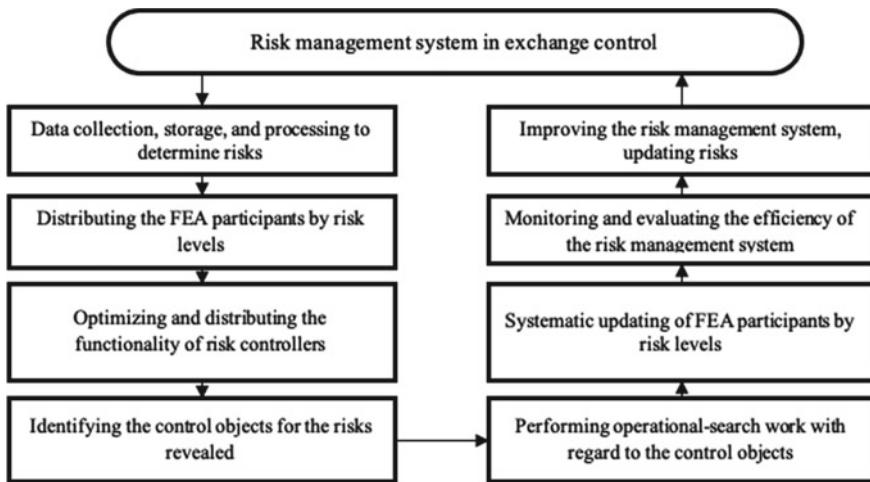


Fig. 58.2 RMS in exchange control

the exchange control levels (the author's scheme of RMS application in exchange control is shown in Fig. 58.2).

The main risk management system's tool is the risk profile, which is developed by the exchange control officials of the customs authorities to identify the control object based on risk indicators and apply measures to this object to minimize risks.

Identifying the control objects is a stage of control measures preceding the audit, which should be performed based on the analysis and estimation of data obtained at the previous system operation stages.

The risk management system is an ongoing process not limited by a rigid list of criteria for choosing the control objects. Each newly developed risk profile complements and develops the system, makes it more flexible and adapted to a dynamically changing environment.

But to ensure the systemic work based on a risk-based approach, it should be sufficiently regulated and detailed. Any system is efficient only if its constituent elements are available and interconnected. Therefore, the exchange control risk management system is not limited to only the development of risk profiles that 'work' exclusively in combination with the customs control modes.

58.3 Author's Proposals on Creating a Risk Management System in Exchange Control

As practice shows, violations of the currency legislation associated with the advance payments under import contracts are considered widespread. Under these conditions,

the exchange control authority's control and influence over the fulfillment of the monetary contractual obligations are virtually impossible.

The effect on the forex violation risks should be differentiated depending on the level of conscientiousness of the exchange control object. According to the author, the legal forex relation participants can be differentiated through risk-categorizing the foreign economic activity (hereinafter—FEA) participants.

Risk-categorizing the FEA participants assumes identifying the exchange control objects with signs of risks in the course of monitoring and analysis of forex transactions and the fulfillment of foreign trade contracts, as well as using data on the FEA participant risk level.

However, it should be considered that, depending on the entity exercising exchange control and the level of its competence and power, the FEA participants should be categorized by risk levels in different ways.

It seems that authorized banks being the exchange control agents should categorize their clients—forex transaction participants using techniques of electronic screening based on a list of information resources, addressing which allows and is required to form an objective data bank. The essence of electronic screening as an exchange control technique is described in more detail by the ‘Diversifying Exchange Control Methods in the Digital Economy’ paper’s author [9].

It is important to understand not only ‘where to look’ but also ‘what to look’, i.e., which factors should be considered to most objectively assess the activity of an FEA participant and assign a certain level of forex violation risk to it. Assigning the appropriate risk level to a participant of currency relations will determine the settlement operator’s actions: at a low risk level, the transaction is performed immediately without any restrictions; at an average risk level, the transaction is performed with providing the supervisory authority with relevant information and subsequent continuous monitoring of further transactions of this person, and at a high risk level, the operator refuses to perform currency transactions, thereby preventing illegal disinvestment.

In the above-mentioned paper, the author has identified a fairly detailed list of criteria for electronic screening performed by authorized banks. Herewith, by virtue of their competence, the customs authorities have a slightly different spectrum of data concerning the total scope of an economic entity’s foreign trade activity than a bank. Therefore, for the exchange control authority, the author has identified general and specific criteria that allow determining the risk of violation of currency legislation by an FEA participant (mainly associated with repatriation or illegal disinvestment). The categorization criteria and the calculated risk-level value have been systematized and represented in Table 58.1.

The calculated risk-level values are required to determine the priority of the appointment of an audit of a specific FEA participant. The order and priorities of including objects in the audit schedule are given in Table 58.2.

All the analysis and audit results should be systematized and be the basis for updating the categorization of the foreign economic activity participants.

Table 58.1 Criteria for determining the risk level of an FEA participant

Criterion No.	Criteria for determining the risk level	Low	Criterion value	Average	Criterion value	High	Criterion value
<i>General criteria</i>							
1	The time between the legal entity (individual entrepreneur) registration date and the transaction date	More than 3 years	1	1–3 years	5	Less than 1 year	10
2	Actual entity's location at the place of registration	Yes	1	Yes	1	No	10
3	Founder (director)	No signs of unconsciousness	1	Change of director/founder immediately before a large-scale transaction	20	Existence of facts of attraction to administrative/criminal liability; signs of notional appointment, mass registration	50
4	Number of employees	≥100 employees	1	≥3–100 employees	10	<3 employees	20
5	Ownership of fixed assets (intangible assets)	Yes	0	No	5	No	5
6	Branches and representative offices	Yes	0	No	5	No	5

(continued)

Table 58.1 (continued)

Criterion No.	Criteria for determining the risk level	Low	Criterion value	Average	Criterion value	High	Criterion value
7	Enforcement proceedings performed against the entity by the Court Bailiffs Service	No	0	Yes	10	Yes	10
<i>Specific criteria</i>							
8	Number of foreign trade contracts concluded subject to registration with authorized banks (with UNC)	> 15 contracts	1	> 5 to < 15 contracts	5	≤ 5 contracts	10
9	Frequency and amounts of forex transactions under a single contract	Payments and adequate supplies within a calendar period	1	Temporary gaps between payments and supplies are allowed	10	Multiple advance transfers in large amounts within a month without adequate fulfillment of obligations by a non-resident	50
10	Overdue contractual obligations non-fulfilled by non-resident counterparties	No more than 10% of contracts	5	> 10% of contracts	5	Under all contracts	10

(continued)

Table 58.1 (continued)

Criterion No.	Criteria for determining the risk level	Low	Criterion value	Average	Criterion value	High	Criterion value
<i>Specifies of product declarations issued</i>							
11	With UNC	≥90% of declarations	1	<90% of declarations	5	NA	10
12	Without UNC	One-time cases	1	No more than 50%	5	Prevail	10
13	Facts of deregistration of contracts with an authorized bank before the expiration date provided that they have not been registered with another bank	No	0	One-time cases	25	Systematic	50
14	Facts of repeated deregistration of contracts with an authorized bank due to the assignment of claims (assignment agreement)	No	0	One-time cases	25	Yes	50
15	Existence of contracts under which funds are transferred offshore and the goods are supplied from the EAEU countries	No	0	One-time cases	25	Yes	50

Table 58.2 Calculation of the order of including objects in the audit schedule by the risk level

General			Specific			Order of inclusion in the audit schedule		
K	Min	Max	K	Min	Max	I	II	III
K 1	1	10	K 8	1	10	$\Sigma 200-350$	$\Sigma 110-199$	$\Sigma < 110$
K 2	1	10	K 9	1	50	PRIORITY		
K 3	1	50	K 10	5	10	K3 max	K13 max	K15 max
K 4	1	20	K 11	1	10	K9 max	K14 max	
K 4	0	5	K 12	1	10			
K 6	0	5	K 13	0	50			
K 7	0	10	K 14	0	50			
Σ	4	110	K 15	0	50			
			Σ	9	240			

58.4 Conclusions

In conclusion, it should be noted that in the paper, based on theoretical research and practical experience, the author argues in favor of using a risk management system in exchange control, details criteria for determining the level of the risk of violation of currency legislation by the FEA participants associated with illegal disinvestments.

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Chapter 59

Trends and Prospects

for the Development of the Digital Economy of Modern Society



Zh. Yu. Bakaeva, A. N. Protchenko, and V. P. Romanov

Abstract The article deals with the problem of digitalization of the economy of modern society, which is determined by the institutionalization of its structure. The modern digital economy is based on international achievements that are required for the conduct of any national economy, its specialization and level of industrialization, and the full use of geographical and social features of development. Digitalization of the economy is not complete without management procedures in this area. First, it is related to the concept of digitalization of all areas of knowledge. Secondly, this is related to issues of simultaneous regulation of international and economic relations in these areas. The guarantors of digitalization are various types of methodology and economic unions that ensure the implementation of digitalization and informatization of economic phenomena and processes. Thus, economic factors aim to create, maintain and develop the quality of life, as well as to form the corresponding social strata and classes of subjects. The main tasks of economic activity in modern reality are united by the need for major changes in the entire structure of municipal bodies. The result of economic activity is considered to be a systematic, reasoned aspect of digitalization, the creation of databases of abstract models of economic reality.

59.1 Introduction

The traditional requirements of the international labor market for economic and technical knowledge define a new stage in the development of economic processes in modern society. Knowledge of foreign languages, competent oral and written speech, the ability to use basic software, sales skills, presentations, analysis define

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new requirements for the ability to use neural networks, artificial intelligence, virtual reality, digital platforms in the economic sphere.

The actuality of this topic is determined by various approaches and schools of thought, which follow from the following principles: the range and method of analyzing economic reality. The variety of methods used to evaluate economic processes encourages us to specify a certain number of research approaches in terms of their essence and significance in economic theory.

59.2 Problem Statement

To characterize certain aspects of the economy in terms of how economic processes are represented in the process of digitalization. There are three points of view on the digitalization of reality: institutional, Austrian and neoclassical—all of them are crucial to the presentation of the most important issues in the theory of the digital economy. It is obvious that the presented assessment of the importance of these approaches is selective and focuses exclusively on certain issues. Nevertheless, it seems interesting both for the tools used and for its theoretical value. The research analyzes economic processes in a digital economy that meets modern global trends in its development.

It is necessary to address the following issues: identifying the main trends in the development of the digital economy in the world and assessing the position of countries in the rating on the global communications index; analyzing the legal framework and practice of state regulation of the digital economy; [20] clarifying the tools and functions of the state in the field of the digital economy; specifying the strategic development goals of key indicators of its assessment in the concept of the state program for the development of the digital economy; definition of tasks, principles and perspective directions of improvement of the economy system in the conditions of digital informatization [19].

The novelty of the research lies in the problem of reforming economic processes, in particular, the use of digital platforms, changes in technologies and methods of economic training, and the formation of a new ideology of the digital economy.

Practical significance.

The main issues of digitalization analyzed by institutional research include various institutions that form the appropriate behavior of subjects and the impact that they have on economic processes. In the tradition of the digital economy, models have been created (including more formalized ones) that reflect institutional changes in various processes of digitalization of society. However, it is necessary to realize that the construction of a universal model reflects the influence of institutional factors on the digital economy. Despite certain difficulties in quantifying the qualitative factors that affect the indicators of the digital economy, institutional analysis allows us to identify institutional indicators of development that are characteristic of economies at different stages of development [3].

Institutionalists try to identify the consequences of specific constructions of institutional systems in digitalization. They understand that there are no universal systems for digitalizing the economy, because each of them develops in an individual way. Among them, one can find similarities in the institutional systems of digital economies of countries, which are the result of their belonging to the same cultural circle with similar historical experience or level of development. Such research focuses mainly on two types of questions: There is a dependency on the path and structural obstacles to economic growth (especially those that hinder the development of countries during their transformation periods). The institutional system of the economy is multidimensional and multi-faceted, consisting of both formal and informal rules created by the digital society. Through institutions, subjects form perceptions of the world and attitudes toward others. So, digital institutions create patterns of activity and codes of conduct that are considered correct in a given society. Subjects tend to adopt predictable behavior that helps expand the areas of interaction and prospects in the development of the digital economy [4]. The sphere of information technologies and telecommunications is inferior to the share of vacancies in sales. According to surveys, companies working in the field of information technology have minimally reduced the cost of maintaining staff by reducing the number of employees, reducing the social package, reducing wages, etc. [5]. At the same time, there was a significant reduction of staff in the automotive business, the production and processing of natural resources, and retail trade.

59.3 Practical Significance

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Chapter 60

Scenarios of the Eurasian Economic Union Development: Analysis and Recommendations



N. Ovchinnikova and T. Kokuytseva

Abstract The today's crisis caused by various limitations entailing industrial production shutdowns and supply chains failures stresses the crucial importance of the national economies revival policies. Stressing the importance of the Eurasian Economic Union (EAEU) development, it is crucial to work out several short-term EAEU development scenarios to come up with the economic growth stimulation and EAEU member-states' economies revival policy relevant for the current situation. This is the aim of the study. The pandemic and the economic crisis require constant monitoring of the situation along with making the necessary changes in the action plan, which makes the development of long-term scenarios seem unreasonable. To achieve the maximum positive effect, all of the EAEU member-states should be involved in the crisis-mitigation activities. The authors developed and described three EAEU development scenarios, i.e., an optimistic, a moderately optimistic, and a pessimistic one, depending on the duration of the coronavirus spread and the existence of the associated restrictions in the states. Each scenario describes the advantages, prospects, and challenges, associated with their implementation for the member-states and the EAEU on the whole. The conducted analysis allowed providing certain recommendations, which, if followed by the countries, shall allow mitigating the consequences of the pandemic.

60.1 Introduction

Today the world economy faces serious challenges. The global shock of the pandemic has seriously changed the national development strategies along with the economic,

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social, and political situations across the countries. The governmental issues, hunger, economic stagnation are all parts of the gravest post-pandemic scenarios.

However, even the less dramatic forecasts mention the fall-down of the global political alliances, slow economic recovery, which fails to quickly quench the high-rate unemployment undermining the national wealth.

Clearly, the existing economic situations stem from the long-developing complications in the sphere, which have only been enhanced by the virus. The emerging USA versus China conflicts around the emergence and the development of COVID-19 threatens the trade deal, which could help the global economy to recover. The countries are engaged in a coronavirus vaccine rivalry, which also stimulates the isolation of the national governments. The hopes that the countries could be able to set all the differences aside and take a united effort in their struggle against the virus have vanished. On the contrary, this struggle has become another vector of competition between the world leaders.

The radical position the USA stands on in respect to the international institutions like, for instance, the United Nations Organization, the World Health Organization, and the World Trade Organization, has only grown stronger over the pandemic outbreak [1].

The economic damage caused by COVID-19 can cause new migration crises, and the European Union can suffer from them. The countries relying heavily on oil, for instance, Algeria, have announced the twofold budget reduction due to the radical drop in oil prices during the pandemic. Some experts suggest that the new migration wave shall spin from the shores of the Mediterranean to the European countries, posing a new challenge for the EU economy.

The UN forecasts a USD 8.5 trillion decrease in the global production volume due to the pandemic, which can be caused by the extreme poverty of 130 mn people. As of now, more than 100 countries have already applied to the International Monetary Fund for help, as COVID-19 continues to rapidly annihilate other income-generating spheres, like tourism. On May 14, the UN increased the sum it plans to gather to fight the coronavirus and its consequences to equal USD 6.7 bn, which is three times the total announced six weeks before. This decision was made due to the forecast increase in the number of people below the poverty line [2].

All the mentioned factors argue for the necessity to implement modern measures and redefining the strategic goals of the countries. The multiaspect global integration can help reverse the consequences of the pandemic.

60.1.1 EAEU as the Alliance of the Future

Currently several major alliances are at a loss in the face of the world crisis. The European Union showed that the survival of an EU member-state is the direct responsibility of the country itself [3]. Financial challenges, migration pressing, and the total growth in the unemployment rates make the EU vulnerable [4].

In this situation, the EAEU is the youngest and the most promising alliance, which can help achieve the most beneficial goals in the short term. The main aim of the Eurasian Economic Union setup was the economic growth and development of the former USSR member-states.

In 1991 several former USSR member-states formed the Commonwealth of Independent States (CIS). Primarily it included three member-states, i.e., Belarus, Russia, and Ukraine. However, the alliance had no restrictions for the new members, and later the commonwealth grew to include 11 states. Over the period of its existence the CIS failed to meet the expectations providing the grounds to question the efficiency of this alliance functioning. The unsuccessful attempt to create a functional interstate partnership instrument made the countries to execute local agreements and alliances.

In 2003, a decision to create the Eurasian Economic Union (EAEU) was made based on the existing experience in the field. The major aim was to regulate and settle the trade and economic interaction.

Currently the EAEU includes five member-states, i.e., Russia, Belarus, Kazakhstan, Armenia, and Kyrgyzstan. The executed free trade agreements are the basis for cooperation with Vietnam, Iran, China, Cuba. Moldova is the observer country [5]. On April 29, 2020, Uzbekistan announced the launch of the procedure to join the EAEU as an observer country [6].

Today the EAEU is one of the most promising international alliances, which can strengthen its stand over the post-pandemic period and avoid a major economic crisis.

60.1.2 EAEU and the World Crisis

‘It seems, that the current new coronavirus pandemic-associated problems shall cause the shocks of a magnitude larger than the 2008–2009 financial crisis, while the trade wars and sanctions are aggravating the recession,’ stated the President of Russia, Vladimir Putin at the G20 summit [7].

According to OECD in 2020 the world economy growth rate will drop from 2.9 to 2.4%, while the scenario of a drop to 1.5% is also possible [8]. According to the World Trade Organization, the world trade shall face a 15–35% decrease in volume in 2020 [9]. Low budget income and high expenditure shall cause a severe and lengthy economic crisis in many countries [10]. Nearly 50% of the world population (about 3.9 bn people) have been affected by quarantines and self-isolation. The monthly cost of maintaining strict social distancing rules is 2% GDP [11].

This crisis is forecast to be one of the biggest since the Great Depression. It shall be associated with technological and institutional changes topped with armed and political conflicts. This can cause changing the world leaders and generate a new world order. The economic centers are already noticeably moving to South-East Asia and Eurasia. The economic order being formed in this region features a combination of state planning and market competition, as well as the growing share of public–private partnerships. The countries’ prosperity shall rest on the increasing joint investment assets of sovereign states.

According to the experts, the COVID-19 pandemic deteriorating effects shall include the 1.5-time decrease in the exports from the EAEU, along with the faster capital exports and weakening the national currencies [12]. All of these shall have a negative impact on the balance of payments of the EAEU member-states.

The situation is further aggravated by the increasing economic confrontation, which began long before the emergence of the crisis. The trade conflict between the USA and China, which the authors have already mentioned, have not been resolved since the beginning of 2018. The sanctions limiting the cooperation of the USA, Canada, the EU member-states, and several other countries with Russia influence the general economic situation in the EAEU [13].

China being one of the forecast key EAEU partners and the world economic powerhouse demonstrates a nearly 5% decrease in the growth rate over the last ten years. The world economy is on the brink of stagnation. Serious public frustration with the actions the governments take to tackle the social and economic issues is being generated in Chile, Bolivia, and Lebanon.

The COVID-19 pandemic has seriously affected the economic activity of the states. The losses caused by the shutdowns in tourism are born by the airlines (USD 252 bn in the USA), HORECA, etc. [14]. The real economy has been especially affected by the pandemic. For instance, the industrial output in January–February 2020 in China dropped by 13.5% year on year [15].

The lower business and economic activity causes the labor market squeeze, growing unemployment and increased budget load. All of these require immediate action from the governments to reverse the consequences with minimum losses.

60.1.3 The Post-Pandemic Economy Development Scenarios

In the uncertain conditions, one has to develop several short-term EAEU development scenarios. The pandemic and the economic crisis require constant situational monitoring and corrective actions, thus developing a long-term scenario seems unreasonable.

To achieve the biggest positive effect all the EAEU member-states should work to implement the crisis-mitigation actions [16]. Three scenarios are currently possible to develop, depending on the duration and extent of the coronavirus spread and the period of validity of the associated restrictions in the countries:

Scenario 1—Radical. This is the most depressing version of the world economy development. It is suggested that this course of events can be caused by the quarantine being in place for over 6–9 months and the public emergency regime in place. The USA will be primarily affected by the scenario, which shall become a turning point for the country [17]. The budget deficit forecast for the end of March is about –18%, which is much worse than that of the 1930 (–15%), and twice the level of 2008 (–9%), reaching the levels of the end of the WWII [18]. The decision on increasing the Federal Reserve System by two times has not been made until today and the

consequences can only be forecast negatively. A quick switch to hyperinflation is possible in this case [19]. World economic history has already seen similar situations. Germany faced the hyperinflation in the early 1920s, while Russia experienced a similar period in 1992.

Scenario 2—Moderate. This scenario can develop if the quarantine is in place for up to 6 months, while the global information and financial infrastructures are preserved. The experts forecast the possible recovery of the economy after this to take 2 or 3 years. Despite being softer in its form, this scenario features serious consequences for the financial system, health care, social and utilities sector.

The moderate scenario shall irreversibly affect the countries with the leading commodity market. The economies of such countries are forecast to bounce back only in the long term. There exist hyperinflation concerns (though not financial, as previously seen, but the commodity one) as the commodity prices fall, which shall cause the inability to act as a full-fledged global economy participant.

Scenario 3—Conservative. The most optimal scenario, which shall allow the national economies to tackle the crisis with minimum losses. The quarantine in this case should not last more than 3 months. The expected economy bounce-back is forecast to follow a V-curve. Unfortunately, even the most optimistic scenario entails the recession and defaults of corporations engaged in the globalized sectors (tourism, transport, entertainment, etc.).

60.1.4 The EAEU Development Scenario

Based on the economic development scenarios listed hereinabove, one can draw the most possible EAEU further development scenarios.

Optimistic (increase in the number of the EAEU members and strengthening the economic connections).

The current period features permanent conflicts between the EAEU member-states. Contentious relations with Ukraine destabilize the alliance making it vulnerable. Lately one can note that in the course of the pandemic all the EAEU member-states are interested in providing for the joint dynamic development [20]. The most efficient conflict and dispute resolution strategy shall be the eagerness to reach an agreement demonstrated by all the parties involved. Any negotiation on resolving political, economic, and other conflicts should not be affected by any other alliances or states. Making any settlements and minimizing conflicts can move the Western states to call off the sanctions, and thus make the national currency more stable, having positive impact on the economic growth.

This scenario shall allow for stabilizing the economic situation inside the EAEU, and provide the opportunities to extend the global economic cooperation, thus boosting the number of members. This situation shall empower the member-states to develop the relationship inside the union built on trust, which can later be evolved into something much more profound than a simple union [21].

Attracting multiple ex-USSR members shall, on the one hand, allow for the more extensive trade and economic opportunities available for the countries, and, on the other, facilitate the development of a union, matching the European Union. Attracting strong players, growing the international economic network shall improve the stand of the EAEU on the world economic arena and allow creating a strong alliance. However, there is a danger that as the number of members increases, certain agreements will become harder to achieve, which could become a weakness of the alliance.

Scenario 2—moderately—optimistic (do less, but better). The pandemic has changed the lives in all of the countries. The streamline shift from globalization to regionalization facilitates the reviewal of the key partnership actions. The value perception of the quantitative KPIs should be the matter of particular attention. In the current conditions switching to better-quality actions, solving the important task is more reasonable [22].

The EAEU member-states continue sustaining losses over their fight against the coronavirus. In a period like this setting goals and selecting the means to achieve them should be treated with utmost attention. With falsifications and achieving KPIs for the sake of reporting, the countries risk falling back in a serious recession for many years.

Cutting down the number of actions and working closely on the existing ones shall allow for a more precise cooperation and development of the EAEU. In this case, the number of the member-states shall not increase, as this policy requires a very detailed and precise work.

However, there is an essential challenge the EAEU might face while implementing this scenario. Weaker members of the alliance will try to get the most possible benefit from the stronger players (Russia, in this case) [23]. Russia, in its turn, is under much economic pressure (sanctions, state coronavirus mitigation expenses, etc.). Additional economic load might trigger the development of a crisis in the country, which will have a negative impact on the alliance on the whole.

Joining effort is a crucial task at this stage, and if failed in endangers the development of the alliance.

Scenario 3—Pessimistic (the EAEU dissolution). As stated hereinabove, the forecast for the world trade is disquieting. The 15–35% decrease expected in 2020 shall have an essential impact on the EAEU member-states' well-being. Maintaining the coronavirus mitigation measures costs the countries about 2% GDP on average. The development on new measures in macroeconomic and monetary policies becomes more and more urgent, i.e., stabilizing the exchange rates of the national currencies, neutralizing speculations, and providing for the safety and stability of the EAEU currency and financial system. Despite all of these measures, this might not be enough. Many countries are losing a lot of money and are gradually plunging into a prolonged recession [24].

A promising way out of the situation might be a wider economic cooperation with Shanghai Cooperation Organization. The One Belt, One Road SCO project can help the alliance member-states tackle the recession is the projects and ideas are actively coordinated. However, there is the most dangerous situation hidden here.

China has long been observing the economic integration in Eurasia and has certain plans for the Central Asian states. Over the past years China has managed to become the main trade and investment partner in the Central Asia. The invitation to cooperate as part of the Silk Road project allows for a closer integration relation with the countries China is interested in (for instance, Kazakhstan, Kyrgyzstan, and Russia). The SCO is already actively developing the economic cooperation and integration between the alliance members.

In this situation, many countries can accept the invitation to the SCO or the idea of the SCO and the EAEU merger if the economic situation inside the EAEU countries degenerates or there are no development prospects. This has obvious pros, as India, Iran, and Mongolia (observers) are members of the SCO, as they form promising markets. This integration shall allow the trade and economic cooperation zone and, consequently, can become a serious competitor for the EU in the short term.

60.1.5 Recommendations for the EAEU Member-States

Despite the selected development strategy, the EAEU countries should pay special attention to the following points, which will help cut the losses associated with the pandemic consequences:

- The EAEU member-states should develop refinancing mechanisms, which would cover the trade inside the union and the joint investment [13].
- One of the ways to stabilize the economic situation can be the development of joint development institutions: the Eurasian Development Bank, the Eurasian Stabilization and Development Fund, the International Investment Bank and the Asian Infrastructure Investment Bank.
- Forming a stable EAEU monetary system, aimed at the development and widening the real sector credit provision.
- Developing the ecosystem required to build a stable financial system in the EAEU.
- With the world economic crisis and the growing competition there is a need for boosting the competitiveness of the enterprises and companies due to the new technology implementation [21].
- Creating the safe work environment to minimize the new coronavirus wave, as well as regarding the distance employment as a new main business model [23].
- Taking on hand measures to support the monetary policy during the economic crisis. According to the Russia—OECD Center, the EAEU countries have already started the gradual implementation of the economy stabilizing polity (Table 60.1) [20].
- Cooperation should be the main current goal. The EAEU countries should agree on the best possible trade policies conditions and follow the minimum trade contradictions strategy.

Table 60.1 Extending the access to liquidity in the EAEU countries

Country	Type of rate	Current CB (NB) rate (%)	P actual CB (NB) rate (%)	Latest changes	Changes implemented on
Armenia	Refinancing rate	5.25	5.78	-0.25%	March 2020
Belarus	Refinancing rate	8.75	4.17	-0.25%	February 2020
Kazakhstan	Basic rate	12	5.66	+2.75%	March 2020
Kyrgyzstan	Accounting rate	5	1.83	+0.75%	February 2020
Russia	Key rate	6	3.62	No change	March 200

- Fiscal policy should be a matter of special concern. It should be made more innovative and inclusive: lower consumer taxes, transfers to households, priority of health care and social sphere [20].

60.2 Conclusion

Over the last 25 years, Eurasia has witnessed multiple experiments in creating a united and efficient economic space. As of today, the EAEU is the only alliance with a full-fledged economic union with the common language and currency. However, the pandemic requires some adjustment.

Even though Russia is one of the strongest EAEU members, it faces serious economic problems. The experts forecast that Russia shall face a lengthy recession, the sanctions will only become more sever, the economic situation will continue to worsen. As Russia is the strongest EAEU member, the complex economic situation can become a factor of vulnerability for the whole alliance.

The paper has reviewed the possible post-pandemic economic development scenarios and made forecasts for the EAEU economic development. The choice of the scenario shall depend on the steps the EAEU countries shall take.

The authors have drawn the recommendations fitting any scenario and allowing for the post-pandemic development of the EAEU countries' economies. It is worth mentioning, that the current situation is unstable to the extent that precise prognoses seem impossible.

Summarizing the ideas and conclusions set forth herein, the authors would like to stress that a scenario should be selected with consideration of the actual situation in the countries and be the most beneficial for the EAEU member-countries. The key goal of the governments today is stabilizing the national economies. Taking actions to achieve this goal might have long-term consequences capable of defining the fate of the EAEU.

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Chapter 61

The Practice of Applying the Social Contract: Topical Issues



T. Korobeinikova

Abstract The problem of poverty has remained one of the most pressing and urgent for several decades. The Russian Federation, like many foreign countries, is taking various measures to provide state support to citizens who find themselves in difficult life situations. One of the instruments of social policy to support citizens in need is a social contract, which makes it possible to increase the efficiency of the state social assistance system. A social contract is concluded with citizens in need or low-income families whose total income is below the subsistence level. The provisions on the conditions for material assistance prescribe the obligations and responsibilities of the parties. Through a social contract, the state supports people who are stronger and more motivated to get out of poverty, thereby activating the potential of low-income people. The article examines the practice of using a social contract in Russia and abroad, including a detailed analysis of the results of the implementation of a social contract in the Khabarovsk Territory. In addition, the author points out the reasons for the disinterest of the needy layers of the population in this kind of state support.

61.1 Introduction

According to the majority of experts, the consciousness of citizens regarding their own efforts and opportunities in solving their own problems is currently changing. Unlike other measures of state support, a social contract does not contribute to the growth of dependency among citizens but on the contrary stimulates the initiative of citizens in a difficult life situation. Over several decades of its use in the world, the technology of the social contract has shown its effectiveness in solving the problems of targeting when providing social protection measures.

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The basic principles of the social contract are voluntary participation, the targeted nature of assistance, the obligation to fulfill the terms of the contract, an individual approach in determining the conditions of the social adaptation program.

At the moment, the possibility of granting state social assistance on the basis of the social contract is provided by No.178-FZ Federal Law of 17.07.1999 “On state social assistance” (Art. 8.1.) [1].

The law defines the categories of persons who are provided with state social assistance, lists mandatory measures for implementation, indicates the authorities to facilitate the implementation of these measures, etc.

To implement the provisions of the law, No. 506n Order of the Ministry of Labor and Social Development of the Russian Federation, No. 389 of Rosstat dated September 30, 2013, was issued, which defines the methodology for assessing the effectiveness of state aid provision on the basis of a social contract [2]. No. 297 order of Rosstat dated July 30, 2013, contains standard forms of federal statistical observation and indicates a methodology for filling them out, and collecting and processing the necessary data [3].

Besides, the constituent entities of the Russian Federation have adopted laws and by-laws regulating state social assistance on the basis of a social contract. For example, there are No. 403-OZ Law of the Jewish Autonomous Region of 24.12.2004 “On state social assistance to low-income families and low-income lonely citizens in the territory of the Jewish Autonomous Region” [4], No. 370-pr Resolution of the Government of the Khabarovsk Territory “On providing targeted social assistance and state social assistance on the basis of a social contract” [5] and others.

61.1.1 Goalsetting

To consider the issue of the effectiveness of the implementation of social support measures using a social contract in the Russian Federation, it is necessary to analyze the international experience in this area, the practice of applying the social contract in Russia, and determine the directions for the development of this support measure.

The methodological basis of the research was formed by the following methods: the method of economic and statistical analysis, system analysis of the implementation of the social contract in the Khabarovsk Territory, and structural and functional analysis.

61.1.2 Urgency

One of the most pressing social problems today is the problem of poverty, which affects tens of millions of Russian citizens. According to the Federal State Statistics Service, in 2019, there were 18.1 million unemployed people or 12.3% of the total population [6]. To date, 1,917,000 people are registered as unemployed in the Russian

Federation. The total number of unemployed citizens in April 2020 amounted to 4.3 million people or 5.8% of the working population [7].

According to the World Bank, 736 million people (10% of the world's population) live in extreme poverty (with an income below \$1.9 per day), while 3.4 billion people have a daily income of less than \$5.5.

The UN estimates the number of people living in extreme poverty in 2020 may increase to 71 million. This is stated in the published UN report on the impact of the coronavirus pandemic on the achievement of the 2030 Sustainable Development Goals, which include poverty eradication [8]. Loss of income, lack of social protection, and rising prices will lead to the fact that even those whose economic situation was stable may be at risk of poverty and hunger. The UN report notes that the income of some 1.6 billion workers who were already in vulnerable conditions fell by 60% in the first month of the crisis.

Besides, the head of the World Bank, David Malpass, said that the collapse of the global economy will lead to the fact that about 60 million people worldwide may find themselves in a state of extreme poverty [9].

The fact that the pandemic and the associated crisis will lead to a worsening living standards of the population is also recognized in the Russian Federation. The Chairman of the Government of the Russian Federation M. Mishustin said that the achievements in the fight against poverty, accumulated over the decades, were under threat because of the coronavirus [10].

At the end of the twentieth century, socioeconomic changes taking place in various countries of the world began to attract the attention of scientists to the social contract as an opportunity for an “ideal” social structure. In the monograph “Social contracts in modern Belarus,” the authors note that one of the reasons for the stability of society is the practical application of the social contract as a modern interpretation of the concept of a public agreement in a market economy [11].

A special issue of the Analytical Bulletin of the Federation Council of the Federal Assembly of the Russian Federation in 2010 was devoted to the issues of regulatory legal support for the implementation of the social contract system, to the experience of the pilot use of the social contract system in certain regions of Russia [12].

The prospects for introducing a social contract into the system of social protection of Russian society were considered in the work of Prokofieva [13]. According to Kravchenko, the establishment of specific criteria for the need for various social benefits is implemented within the framework of the system of social contracts [14].

She believes that the need for the transition in the provision of social services to the use of the contract system is associated with the rapid growth of expenses for social goals and the inability of the state to solve all the obligations for the implementation of various social programs. Keller believes that the social contract is effective, as a rule, in small towns and rural areas [15]. According to some authors, the most effective mechanism for optimizing state social assistance is vocational training and retraining [12].

In general, modern authors assess the effectiveness of the social contract as a tool for poverty reduction, determine the prospects for its further development in Russian

society, and characterize the sociological portrait of the recipient of the social contract and the degree of its prevalence and attitude toward it in Russian regions [16–18].

Meanwhile, at present, there is lack of special research devoted to identifying the role and place of the social contract in the system of social protection of the population in the context of reforming this system.

61.2 Theoretical Part

61.2.1 *International Legislation and Practice of Using the Social Contract as a Measure of Social Support*

Programs that stimulate employment and save budget funds are being implemented in one or another form in the USA, Australia, Great Britain, most of Europe, and some countries in Asia and Latin America. The possibility of providing social support is interconnected with the conclusion of a social contract, by virtue of which the recipient is actively involved in the search for ways out of a difficult life situation.

According to Kravchenko, the contractual system for providing social assistance in foreign countries was introduced in connection with the need to implement state targeted social programs that take into account the specific needs of the population in dire need on the basis of joint funding from the state and regions [14].

For the first time, social contracts began to be used in the USA during the Great Depression, when, by order of the President of the USA F. Roosevelt, people built roads, government agencies, receiving money and food packages for this. Thus, government support has been provided to millions of households.

In 1996, the reform of the social assistance system in the USA consolidated the basic principle of providing social assistance—“who is able to work must find a job” [19].

Adopted in 1997 Law on Personal Responsibility and Employment Opportunities provided for a year-year limit for receiving social welfare. At the same time, the family loses the right to receive social assistance if the head of the family is not employed within two years from the date of the first payment.

The search for work by able-bodied persons, potential recipients of social welfare, in accordance with the plan to achieve independence in financial support of the family is one of the main conditions of the program. Expenditure on this program in 2015 totaled \$31.7 billion; the amount of social welfare is about \$400 [20]. At the same time, social assistance is provided both in monetary and in-kind.

The effectiveness of this program is confirmed by the number of employed people. In 1992, 6.6% were employed, and already in 2014—22.6% of the total number of citizens participating in this program. Moreover, during the implementation of this program, the number of people receiving assistance has decreased. Thus, the number of needy families decreased from 2215 people in 2000 to 1203 people in 2016, the

number of beneficiaries decreased from 5778 people in 2000 to 2757 people in 2016 [21, p. 79].

A specific feature of the provision of social assistance in the USA is the differentiation of responsibilities and powers of all levels of government. As a consequence, each state has its own requirements for the employment of recipients of social benefits under the temporary assistance program for needy families.

In addition, the USA is creating employment and self-sufficiency opportunities for people in need, for example, through the implementation of professional education and retraining programs.

The peculiarity of the application of the social contract technology in France is that not only the unemployed in need, but also the poor working citizens, whose need level is determined by the active solidarity income indicator (RSA), can participate in this program [22].

The legislation establishes the rules and procedure for concluding a social contract, the purpose of which is to maintain an acceptable standard of living for citizens who find themselves in a difficult financial situation, as well as to actively stimulate them to work. These norms are implemented at the regional level and funded jointly by the state and regions.

Active solidarity income (RSA) can be assigned to any applicant who is legally residing in France over the age of 25 who has no means; persons from 18 to 24 years old who have one or more dependent children (or are expecting the birth of a child); persons who have been employed for at least two years in the three years preceding their RSA application.

Support to citizens is provided in two stages:

- (1) the person who applied for help chooses one of the three areas of support for the social adaptation program (orientation phase);
- (2) a social contract is being developed and its implementation is carried out (support phase) [23, p. 85].

In case the conditions of the social contract are not fulfilled, that is the recipient is inactive, then he is excluded from the system of active solidarity income, and payments of welfare are terminated.

In Great Britain, the main element of the system for social adaptation of the unemployed population is the New Deal program, which is a combination of various measures to stimulate this category of the population to work. The structure of social payments under this program provides incentives for program participants to work, which is a guaranteed method against poverty. Social support agencies can suspend the payment of welfare to citizens who have refused the proposed “acceptable” employment.

Each program participant is assigned a person who provides direct assistance in finding a suitable job. If a citizen has not been able to find a job within four months, then he is offered a choice of one of the following employment options with the retention of unemployment welfare: subsidized job in the private sector; a workplace in the non-profit sector; full-time education or vocational training up to 13 months; work in the operational group on environmental protection.

If a person has refused the proposed employment options, the payment of unemployment welfare is terminated [12].

According to the UK Government, the implementation of the New Deal social programs is quite effective: over ten years of their operation (2000–2010), about 3 million citizens were employed and almost 1.8 million jobs were created, which increased the employment level to 75% and the number of applications for unemployment welfare decreased [12].

A feature of programs based on a social contract is the establishment of key performance indicators (KPI) for social services. As a result, the number of employed should increase, and the number of people receiving welfare should decrease. Social workers generally receive payments for each person they employ. In addition, if an employee does not fulfill the established requirements, then he can be fired. In order to encourage competition, the service is outsourced to non-governmental non-profit organizations.

As a consequence, being within strict limits, social service workers assess applicants' employment opportunities subjectively. And accordingly, people with addictions, high or uncertain requirements for employment, and representatives of some ethnic groups may be excluded from the circle of applicants for social support.

If the recipient of social assistance does not fulfill the terms of the contract, the social support service also has negative consequences, since it loses part of the funding due to the negative result of the work done. Thus, there is an interest in the positive result of the execution of the social contract by both parties [24].

It can be noted that the policy of European countries in the social sphere is adapting to the existing economic crises, taking into account also the "working poor." At the same time, measures are being taken to actively stimulate persons who are not employed in labor activity. In general, programs to catalyze employment action are performing well in most countries. In some states, the results of the implementation of this program are also taken into account when assessing the heads of municipalities.

However, a few independent studies have shown that efficiency is mostly formal and poverty has not decreased. As a rule, most found low-paying jobs, which did not improve the situation for their families. And, of course, those who were excluded from the program remained poor.

61.2.2 The Practice of Applying the Social Contract in Russia

The practice of using social contracts as a new form of state social assistance in the Russian Federation dates back to 2010. The regions provided this service on their own at their own expense.

According to information from the Ministry of Labor of the Russian Federation, in 2019, 89.3 thousand social contracts were concluded in Russia with a total coverage of 321.5 thousand people. According to statistics, most of the social contracts are for families with children under 16. As a rule, these are single-parent families and families with many children, in which there are able-bodied persons who do not have

a permanent source of income or who have income near or beyond the subsistence level.

In 2019, the most demanded measures were to overcome a difficult life situation and maintain personal subsidiary plots, which were implemented by 125.6 thousand people (39%) and 98.8 thousand people (31%), respectively.

Measures to overcome a difficult life situation and maintain personal subsidiary plots became the most demanded in 2019, which were implemented by 125.6 thousand people (39%) and 98.8 thousand people (31%), respectively.

Over the period from 2013 to 2019, the number of contracts concluded increased to 2.4 times, and the number of citizens covered by a social contract—to 3.4 times [25].

In the annual message to the Federal Assembly on January 15, 2020, the President of the Russian Federation V. V. Putin noted the need to expand the practice of the social contract, which “is designed to become a kind of individual program to increase income and quality of life for every needy family.” At the same time, according to the President of the Russian Federation, the indicator of the effectiveness of the work of the subjects heads should not be the number of social contracts concluded, but the real reduction in poverty in the region [26].

In 2020, the state plans to spend 7 billion rubles on social contracts. It is planned to conclude 68 thousand social contracts with these funds in 2020, covering more than 300 thousand people.

These funds are distributed in accordance with No. 1559 Decree of the Government of the Russian Federation of November 30, 2019, “On Amending ‘Social Support for Citizens’ the State Program of the Russian Federation and Invalidating some acts of the Government of the Russian Federation” [27].

The funds received can be used only in the following areas: assistance in employment (including training, job search, and payment of a scholarship during the internship), opening your own business and material support for citizens who find themselves in difficult life situations, for treatment.

Twenty-one constituent entities of the Russian Federation received federal funding in 2020. The provision of co-financing is associated with the work carried out in these regions on in-depth analysis of the structure of poverty and the presence of an appropriate regulatory legal framework. The key indicator for the implementation of this program is the reduction of the poverty level by 50%.

In 2021–2022, federal subsidies will be granted in the amount of 29.2 billion rubles per year [28].

61.2.3 The Practice of Applying the Social Contract in the Khabarovsk Territory

The practice of applying the social contract in the Khabarovsk Territory began a little later, in 2012. So, for eight years in the Khabarovsk Territory, more than 22

Table 61.1 Data on social contracts concluded in the Khabarovsk Territory [29]

	2014	2015	2016	2017	2018	2019
Number of social contracts	3 040	4 167	4769	3 687	3 792	4 140
incl. on the development of subsidiary farming	815	1 237	1 213	871	759	869
incl. for individual activity	229	213	155	—	61	36
incl. for the repair of living quarters and outbuildings	650	842	813	761	761	759
incl. to prepare for the autumn–winter heating season	301	254	341			
incl. for an active job search, vocational training, and career guidance	74	195	72	—	64	44
incl. to ensure that children attend educational institutions	631	813	1262	1 909	2 192	2432
incl. for other activities aimed at social adaptation of low-income families	340	613	855	—	48	—
Total amount provided under the social contract (mln rubles)	45.5	60.01	56.78	51.9	51.6	58.1
Average volume of social contracts (thousand rubles)	14.9	14.4	11.9	14.1	13.1	14.03

thousand social contracts have been issued. Wherein, the largest number of contracts is concluded with large and single-parent families (Table 61.1).

In the Khabarovsk Territory, recipients direct targeted assistance within the framework of a social contract mainly to the development of personal subsidiary plots, repair of living quarters, preparation for the heating season, and to ensure that children attend educational institutions (preparing children for school). They also invest money in starting their own business, in vocational education and job search.

The largest number of contracts was concluded by residents of Amursky and Lazo districts—760 and 754 respectively. Also, the support measure is most in demand in Khabarovsk, Komsomolsk-on-Amur, Vyazemsky, and Khabarovsk regions.

According to the Ministry of Social Protection of the Khabarovsk Territory, in 2019, 1773 people came to an independent source of income as a result of the active measures taken to overcome poverty. Half of addressed people—2159—increased in-kind income from their personal subsidiary plots, and 245 people found work. This fact confirms the importance of this stream of social policy of the state and its effectiveness.

In 2020, in the Khabarovsk Territory, 78.5 million rubles are provided for this support measure [30].

61.2.4 Reasons Preventing the Spread of the Social Contract

In March 2020, the Public Chamber of the Russian Federation and the Russian State Social University conducted a sociological study on the attitude of the Russian population to the social contract as a form of interaction between the state and low-income families [31]. 865 people from 43 regions of the country took part in the survey.

Most of the respondents are aware of the social contract. Only a small part of them (6%) do not know anything about it or (8%) have heard something, but cannot say exactly what it is. The rest either very well (58%) or in general terms (29%) know what a social contract is. Moreover, more than half of the respondents (52%) have an income below the subsistence level, which is the basis for concluding a social contract. Among low-income families, the share of those who are very well aware of social contract is higher than among families whose income is above the subsistence level (59 vs. 32%).

When asked why they do not conclude a social contract, 28.6% answered that they need to submit too many documents; 33% believe that assistance should be provided by the state without obligations on their part; 14.3% indicated that it is difficult to fulfill the obligations imposed on them; 9.5% stated that the allocated funds are small, and the responsibility for non-fulfillment is large; 22% indicated that there is little information about who can conclude a social contract; 2.3% explained that the social security agency unreasonably refused to allocate funds to them.

Meanwhile, 86% of respondents believe that the state should stimulate the recipients of social assistance to strive for an independent way out of a difficult life situation.

About 14% of respondents know that their contract provides for liability for non-fulfillment of contractual conditions, but they do not know what kind of liability.

So far, social contracts are more in demand by the population striving to develop their personal subsidiary plots. Only 20% of those surveyed said they were ready to go into business.

The respondents also expressed their opinion about the disadvantages of the social contract as a form of interaction between low-income families and the state:

- the amounts allocated by the state are insignificant, since this money is not enough to fulfill the obligations under the contract (29%);
- a limited list of problems for the solution of which it is proposed to conclude a contract (24%);
- impossibility to use the allocated money at its own discretion (15%);
- the contract has a short validity period; in this regard, it is difficult to fulfill its conditions (5%);
- it is difficult to understand the provisions of the contract without outside help, since they are incomprehensible and confusing (3%);
- the social security authorities unreasonably refuse to conclude a social contract (2%).
- little information about who can enter into social contact (2%).

61.2.5 The Practical Significance, Suggestions

The social contract in comparison with other types of state social assistance in the form of cash payments has a distinctive feature—there are counter obligations for the person with whom the social contract is concluded (the obligation to implement social adaptation measures).

The most common areas of social adaptation measures are maintaining subsidiary farming and ensuring that children attend educational institutions.

The practice of using state social assistance on the basis of a social contract has a positive trend and has potential—the number of social contracts is increasing every year.

To attract low-income families to the conclusion of social contracts, it is necessary to increase the amount of money, remove restrictions on the use of allocated funds; provide support for self-employed citizens; inform the population as widely as possible about the possibilities of a social contract; and constantly use feedback from program participants.

The contract must indicate an understandable procedure for the parties to act and define more clearly the obligations of the recipient of funds, which ultimately will allow achieving the maximum result and the most effective use of the allocated funds.

To assess the effectiveness of the implementation of a social contract, it is necessary after a certain period of time (e.g., 1.5–2 years) to assess the situation for each family or citizen, concluding whether they were able to get out of poverty.

Besides organizational measures, it is required to form a regulatory legal framework that ensures the implementation of the changed approach to the social contract.

61.3 Conclusion

Foreign experience testifies to the importance and significance of providing state support to socially unprotected categories of citizens by concluding a social contract.

In a relatively short period of time, the social contract in Russia has become an important tool of social support adapting to regional needs. The existing obligations of the recipient of funds under the social contract stimulate him to independent active actions aimed at getting out of a difficult life situation. Meanwhile, as noted earlier, efficiency indicators do not provide a complete picture of what is happening. The real impact of the contract on poverty is difficult to understand without additional independent research and assessments.

Russian regions are working to improve the efficiency of state social assistance on the basis of a social contract with the provision of subsidies from the federal budget. The use of the social contract technology by individual regions to provide targeted social assistance makes it possible to extend this practice to other regions, choosing the most successful methods and procedures for working with the poor.

The support of citizens within the framework of the social contract will allow to more fully realize the labor potential of the recipients of such assistance and increase their well-being by providing assistance in finding work and support in the implementation of entrepreneurial activity.

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Chapter 62

On the Need to Switch to Reliable Measurement of Financial Instruments in the Context of IFRS 9 to Improve the Reliability of Financial Statements



O. G. Zhitlukhina and O. N. Kochetova

Abstract The article defines ways to overcome gaps in the classification and evaluation of financial instruments to ensure the reliability and credibility of financial reporting under national and international standards. Differentiated methods for evaluating financial assets and liabilities in the context of recommended IFRS 9 business models. The indicators of assets and liabilities on the balance sheet are identified that reflect financial instruments and related changes in terms of their differentiated valuation, depending on the way their changes are reflected as a result of revaluation for reporting purposes. Tables are proposed that reflect the results of revaluation of financial instruments in the context of implementing business models. Based on the reporting data of six operating companies, estimated coefficients were calculated before and after applying the effective interest rate used in a conservative business model.

62.1 Introduction

Today when financial market is a dominating force, the role of financial instruments (FI) in the financial and economic activities of each company is significantly increasing. The economic nature of financial instruments as objects of accounting, their classification characteristics, and methods of valuation has not been sufficiently covered in both scientific and regulatory sources. Risks associated with financial instruments are not described that require regular clarification of their value, determination of the order of reporting, and, in some cases, the creation of provisions for impairment.

These circumstances negatively affect the reliability and credibility of financial reporting indicators as an information base for analyzing financial condition of an organization, since the vast majority of valuation coefficients contain indicators that cover financial instruments. The need to identify reliable valuation methods is

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becoming an urgent need for financial services. Despite this, the national accounting regulation is currently limited to the formation of only two types of value: initial and current market values, which is contrary to international standards (IFRS).

62.2 Gaps in the Definition of Financial Instruments Contained in National and International Regulation

Classification of financial instruments by their economic nature shows that despite their individual specific features, all of them are directly related to future cash flows, and therefore, control and responsibility for payments are assigned to their owners. The latter need to properly organize their assessment both for accounting purposes and for financial statements considering the current time factor.

Before considering cost characteristics of financial instruments and the impact of their valuation on the reliability and credibility of financial statements, it is necessary to define a number of fundamental terms that are interpreted differently by Russian accounting standards (RAS) and International Financial Reporting Standards (IFRS) and that will be used in this material.

Thus, RAS are limited only to regulating the accounting procedure for financial investments (FI), as part of financial assets (FA), which in IFRS also includes trade receivables [1], whereas IFRS consider financial instruments as a system with interrelated elements that include financial assets (including financial investments), financial liabilities, and equity instruments. This is evident from the definition in IAS 32 that defines financial instruments as any contract that simultaneously results in one entity having a financial asset and another having a financial liability or equity instrument [2]. As you can see, this definition does not include such a concept as “financial investments.” This category is not used in IFRS; although, in our opinion, financial investments, as an integral part of financial assets, should have its own specific term, since they have a distinctive purpose, namely to obtain economic benefits.

Also, Russian standards do not use such terms as “financial instruments,” “financial assets,” “financial liabilities,” “equity instrument.”

A significant gap between RAS and IFRS comes down to a different approach to the classification of financial instruments depending on their valuation category, negatively affecting the creation of a reliable methodology for the valuation of financial statements.

The RSA mostly uses “the original (historical) cost” for the purpose of accounting and reporting. The exceptions are listed equity securities and gratuitously received assets, and for them, the term “current market value” is recommended. The orientation of national standards toward the constant cost of accounting items indicates that the “time factor” is ignored, which considers the current assessment of the organization’s assets and liabilities and has a direct impact on the reliability of financial reporting indicators that consider financial instruments at the date of its drafting [3]. Currently, according to the national accounting practice, the balance sheet shows such elements

of financial instruments as long-term and short-term loans granted and received, accounts receivable and accounts payable, and most of the financial investments that are not traded in active markets. Their “initial cost” consists of the contractual value of the transaction plus, in some cases, the cost of their acquisition.

From the above, we can conclude that, despite the introduction of the concept of “current market value” in RAS, the aim of the cost concept of accounting has remained the same and actually not oriented towards, as in IFRS, the preferential use of “fair value” for the purpose of evaluating its accounting objects and, above all, financial instruments.

“Fair value,” as well as “current market value,” is based on the “current time factor,” but its functional role in the accounting system for the purposes of generating accounting and reporting indicators is quite different [4]. The difference is manifested primarily through the relationship of the transaction participants to the creation of fair value. This is evident from IAS 13, which defines fair value as the amount of cash that an asset can be exchanged for or that is sufficient to meet an obligation in a transaction between knowledgeable and independent parties [5]. This allows it to be characterized as an “average market value” that is close to an objective assessment of the accounting object. The current market value is created based on the supply and demand of specific economic parties that have their own specific features and participate in a particular transaction. In this case, there is an interdependence between economic parties, which leads to a deviation from the objective average market price [6]. This shows that the accounting data based on fair value are calculated in nature and are not directly related to the justification of the real transaction price [7].

The existing differences in the valuation category of financial instruments used in accounting do not exclude the existence of a relationship between them. Thus, the initial cost, which is created at the time of recognition of the FA in accounting, is based on the contractual value, which is nothing more than the “current market value,” determined based on the supply and demand of participants in a particular transaction. In this case, the initial cost of the FA is equal to the contractual current market value, possibly plus the amount of costs incurred. But this ends the application of the current market value, and then in subsequent reporting dates, it will reflect the original cost without change.

62.3 The Fair Value and the Amortized Cost as Modern Methods of Valuation of Financial Instruments Based on the “Factor of the Current Time”

From the above, it is clear that “fair value” is the average estimated market price that is not related to a specific transaction. At the same time, it is important that in regards to financial statements, its reliability depends on its sources of information.

Depending on it, IFRS establishes three levels of information sources for determining the classification characteristic of the fair value of FI.

At the first level, the fair value calculation uses data from open markets where liquid assets are traded, including the organized securities market that has official stock quotes. In this case, the fair value becomes equivalent to the current market value. In view of the fact, an active market excludes the possibility of the parties to transactions influencing their prices and interdependence, which can characterize such a current market price as an objective estimated market value or as a fair value.

The second level also involves the use of market information, but it is assumed that market data for identical products can be used.

The third level of formation (the least reliable under IFRS) is based on professional judgments of the company's management about possible market transaction conditions for the asset or liability being evaluated [5]. This level is characterized by the subjectivity of its assessment when creating a fair value. Since professional judgment of a particular "measurer" plays an active role at this level, evaluation in the context of the market turns into a "human process that includes (individual) foresight" [8].

Unfortunately, this category is completely absent in national accounting regulations, and the concept of current market value, as shown above, which is covered there and is the result of a specific economic situation, does not solve the problem of generating reliable information. Therefore, in order to change the target setting of the cost accounting concept of RAS, which regulates the procedure for preparing financial statements, it is necessary to disclose the mechanisms for an objective cost assessment of the facts of economic life, primarily that of financial instruments. The updating of the national accounting cost concept should be based on valuation methods based on the "current time factor" regardless of specific business situations; i.e., there is a need to switch to the preferential application of fair value.

In addition to fair value, as a mechanism for an objective valuation of FI, for accounting and reporting purposes, IFRS recommends using amortized cost, though this concept is also absent from the national standards. Amortized cost, as well as fair value, is created taking into account the "current time factor" and involves the recalculation of the original cost of the facts of economic life at the date of reporting, formed at the date of their recognition for accounting. Therefore, the amortized cost, in our opinion, can be characterized by analogy with the fair value, as the "average" "estimated" cost, determined independently of the participants in a particular business transaction. In terms of IFRS, amortized cost is the cost obtained by adjusting the original cost of financial assets and financial liabilities for the amount of accumulated depreciation calculated using the effective rate method [9].

The definition of "amortized cost" is based on the concept of "depreciation," which, in this situation, is understood as a gradual decrease in the value of financial instruments (or an increase in their value in the case of reverse depreciation), which occurs under the influence of the current time factor. In addition, the definition of IFRS shows that amortized cost is calculated using the effective interest method, which is the discounting of expected future cash payments to the current net book

value for the period before the due date or the next date of rate revision. This method is the basis for calculating the cost of money, considering the current time factor.

In our opinion, it is important to focus on the contradiction that occurs in RAS (ASP 19/02), which allows the use of the discount method to create indicators that reflect financial investments, and at the same time does not allow showing operations performed to change their valuation on accounting records. This means that the results of revaluation of financial instruments will not be included in other income and expenses, which will negatively affect the reliability of the organization's financial results report.

Thus, the use of methods based on the application of the “current time factor” allows for the formation of real data reflecting financial instruments at the reporting date for the purpose of a reliable assessment of the financial condition of the organization.

Therefore, the transition to fair and amortized cost as modern methods of valuation based on the “current time factor” of financial instruments should be provided in the target cost concept of financial accounting in the conditions of market economy development. At the same time, it is important to develop and describe such a classification feature of FI as “valuation category” in accordance with IFRS 9 ‘Financial instruments,’ which is absent in national regulatory and scientific-methodological accounting practices.

62.4 Changes in the Cost of Financial Instruments and Differentiation of Its Results in the Context of Business Models Recommended by IFRS 9 for the Purpose of Ensuring Reliable Measurement of Financial Statements

Comparing the historical cost of financial instruments at the time of recognition in reporting with the fair or amortized cost at the reporting date (as part of their “estimated” value) is a revaluation procedure. As a result of revaluation of FI, it becomes necessary to reflect the results of changes in their value, which are shown in the financial results and have a significant impact on the growth or decrease in equity. Revalued financial instruments change the result of assessing the financial condition of the organization, so to ensure its reliability, it is advisable to take into account the change in their value separately in analytical accounting and disclose them as part of other (“non-operating”) income and expenses, as income and expenses from other (financial) activities of the organization, and, in some cases, as part of equity.

The fair value, depending on the source of write-off of the results of revaluation of financial instruments, is classified in accordance with IFRS 9 for the purpose of accounting and reporting for the following types:

- fair value that shows the results of revaluation in profit or loss (FVTPL—fair value through profit or loss);
- fair value that shows the results of revaluation in other comprehensive income (FVOCI—fair value through other comprehensive income).

If fair value that reflects the results of revaluation through profit or loss is used for the measurement of financial instruments, the change in value at the reporting date is carried out at the expense of financial results and is reflected in the statement of financial results (FRR) as part of other income and expenses. However, if fair value is applied that reflects the results of revaluation through other comprehensive income, the change in value at the reporting date is disclosed in the statement of other comprehensive income, or if this report is not compiled (as in Russian accounting practice), it is reflected in the balance sheet as part of equity.

As for the amortized cost, the revaluation results of these financial instruments are disclosed in the FRR as part of other income and expenses (AC Income/Expenses), i.e., they are identical to the source of write-off used in the fair value measurement.

International accounting practice shows that methods for evaluating financial instruments based on the “current time factor” are differentiated not only depending on the source of write-off of the results of changes in the value of financial instruments, but they also provide the basis for business models that manage financial assets and are directly related to contractual cash flows.

Thus, the use of business models for managing financial assets implies their classification in the accounting system depending on the valuation category. The presence of regulated business models in the international standards for financial assets management (IFRS 9) and financial liabilities (IFRS 39) explained a significant dependence on them to generate cash flows in the organization.

The study of economic sources showed that the issues of classification of financial instruments depending on the valuation category and their relationship to the business models that manage them were not sufficiently addressed. They mainly contain excerpts from IFRS 9, which defines three types of business models for managing financial assets: “hold to collect; hold to collect and sell, and other.” Some names have already been assigned to these business models in a number of reference sources [10]. In our opinion, based on the purpose of the business model and the cost on which they are based, we can distinguish the following types of business models, which we have arranged in accordance with the types recommended by IFRS: a *conservative business model*, a *mixed business model* that includes a *business model with investment type of operations*, and a *speculative business model*.

Consider the target settings of the above business models in accordance with IFRS 9.

The “conservative business model” (BM as I/E) forms a category of financial instruments measured at amortized cost and requires the results of their revaluation to be reflected in profit or loss, as well as their disclosure in the FRR. This target business model refers to a type of business model such as “withholding FI to receive (or pay) contractual cash flows (principal and interest).” In order to assign FI to this business model, testing must be performed to ensure that their recognition in accounting

meets the sole payments of principal and interest (SPPI) criterion, i.e., that there is an exclusive receipt or payment of principal and interest. However, the contract for the acquisition of an asset cannot be changed [11]. To form an organization's accounting policy, it is important to know that this classification group of FI managed by a "conservative business model" includes only debt financial assets, such as purchased bonds, purchased financial promissory notes of other organizations, loans granted, certificates of deposit, and trade receivables.

In our opinion, financial liabilities related to debt instruments such as loans and borrowings received from other organizations, issued bonds, and promissory notes, as well as trade payables should be classified by analogy with financial assets belonging to this classification assessment category. All of them can be checked for compliance of their recognition in accounting with the SPPI criterion, which reflects the existence of an exceptional receipt or payment of principal and interest.

Under the "conservative business model," the method of discounting cash flows based on the application of the effective interest rate should be used to calculate the amortized cost and identify the result of revaluation of debt instruments managed by this model, which should be reflected in the accounting policy of the organization. The result obtained from the revaluation of FI directly affects the analysis of profit and profitability, and, consequently, the assessment of the financial condition of the organization.

The "mixed business model" (BM FV OCI) forms a category of financial instruments measured at fair value and requires the results of their revaluation to be reflected in other comprehensive income (OCI), as well as their separate disclosure in the OCI statement or in the balance sheet as part of equity. This target-based business model is one of the types of business models recommended by IFRS 9, such as "hold to collect and sell." The peculiarity of the "mixed business model" can be attributed to the lack of certainty in subsequent actions to perform operations with purchased financial instruments (equity securities). The purpose of purchasing FI, in this case, is either to receive cash flows stipulated in the contract (principal and interest) or to sell them later.

To form an organization's accounting policy, it is important to keep in mind that this classification group of FI managed by a "mixed business model" mainly includes debt financial assets that reflect financial investments in purchased bonds. For financial liabilities, the application of this business model is not recommended.

Similar in terms of the method of applied value (fair value through other comprehensive income) and the order in which the revaluation result is reported (in the OCI statement or in the balance sheet) are purchased shares that are not held for sale. However, in our opinion, they should belong to a different valuation category, since shares, as an equity instrument, do not generate "interest income" ("discount") and they are not subject to repayment. Unlike bonds, shares show the ownership relationship, not the loan relationship, and therefore, in our opinion, they should be managed by a separate business model, which, in a number of sources, is called the "business model with an investment type of operations" (BM FV OCI) [10]. The goal of this business model is to acquire or hold financial assets in order to form and increase the number of shares in the invested company in order to influence its activities, that

is, for investment. In accordance with IFRS 9, in this case, shares assigned to the selected asset management business model cannot be later reclassified to the “fair value through profit or loss” valuation category.

Of the “mixed business model” and “business model with investment type of operations” are used to calculate the “fair value through other comprehensive income” and identify the result of revaluation of financial assets managed by this model, expert methods are used, that is, for similar assets, and their value is also based on the “income approach” and “market approach.” When accounting policies are developed, these business models can include financial assets, both listed and not listed on the formal market for securities.

The “speculative business model” (BM FV I/E) forms a category of financial instruments measured at fair value through profit or loss, and it requires disclosure of the results of their revaluation in the FRR. This business model is classified under IFRS 9 as “other business models.” Its purpose is the entity’s intention to resell a financial instrument in the future in order to profit from changes in its market value (or to realize beneficial changes in fair value that arise from its sale at a higher price). In order to develop an organization’s accounting policy, all financial assets held for trading should be included in the classification group of financial instruments under consideration, which is managed by the “speculative business model.” Financial investments in stocks and bonds listed on an active securities market should fall under the management of this business model.

In our opinion, similar to financial assets that are traded on the formal market for securities, it is appropriate to include such financial liabilities as those:

- arising in connection with the issue of bonds quoted on the active market of the Central Bank;
- accepted for accounting for the purpose of repurchasing them in the near future;
- arising when operations are performed for the purpose of obtaining short-term profit.

Under the “speculative business model,” fair value through profit or loss is determined based on active market quotations at the date of recognition and at the reporting date.

Analysis of the above classification of business models shows that they determine the estimated categories of FA for the formation of the organization’s cash flows. And they are managed precisely at the level of FA classification groups and not at the level of individual financial instruments [11].

For practical application of the business models considered by us, it is important to determine the indicators of financial statements, in particular, the balance sheet for the disclosure of financial instruments in the aspect of specific business models. Namely, to assign to each type of financial instruments, the appropriate business model allows the most accurate assessment of reporting indicators. Tables 62.1 and 62.2 schematically present sections of the balance sheet that reflect the structure of the asset and liability of the balance sheet, respectively, providing for an estimated category in the aspect of business models under IFRS.

Table 62.1 Structure of the balance sheet asset, which provides an estimated category of financial assets in the aspect of business models under IFRS

Business model code	The name of the business model	Balance sheet indicators that reflect financial assets
I. Non-current assets (page 1100)		
<i>Financial investments (page 1170)</i>		
BM FV OCI	Business model with investment type	FI in shares for investment purposes
BM AC I/E	Conservative	FI in long-term held to maturity bonds
BM FV OCI	Mixed	FI in long-term bonds held to maturity and for sale
BM AC I/E	Conservative	FI to long-term financial promissory notes received, held to maturity
BM AC I/E	Conservative	FI in loans granted (long-term)
II. Current assets (page 1200)		
<i>Accounts receivable (page 1230)</i>		
BM AC I/E	Conservative	Long-term and short-term TDZ
BM FV I/E	Speculative	FI in the promotion for sale
BM FV I/E	Speculative	FI in bonds for sale for sale
BM AC I/E	Conservative	FI in bonds for holding to maturity
BM FV OCI	Mixed	FI in bonds for holding to maturity or sale
BM AC I/E	Conservative	FI in short-term financial promissory notes received for holding to maturity
BM AC I/E	Conservative	FI in short-term loans granted

From the presented tables, it can be seen that in the relationship constructions between balance sheet indicators that reflect financial instruments and estimated business models, indicators managed by a conservative business model occupies the better part (more than 76%).

The structural construction of balance sheet indicators in the context of business models for determining how to evaluate financial instruments is shown in Table 62.3. According to international standards, the conservative business model corresponds to the method of discounting cash flows, the speculative one to quotes of market assets at the reporting date, and mixed and other models correspond to expert method.

Due to the fact that a significant proportion of financial instruments in operating companies is managed by a conservative business model and, accordingly, is subject to amortized cost, we recalculated the financial stability and solvency coefficients in the conditions of applying this business model using the effective interest rate. Table 62.4 shows the coefficients of financial stability and solvency before and after

Table 62.2 Structure of the balance sheet liability, which provides an estimated category of financial liabilities in the aspect of business models under IFRS

Business model code	The name of the business model	Balance sheet indicators that reflect financial assets
IV. Long-term liabilities (p. 1400)		
<i>Borrowed funds (page 1410)</i>		
BM AC I/E	Conservative	Long-term bank loans and borrowings
BM AC I/E	Conservative	Long-term bond loans issued
BM AC I/E	Conservative	Long-term financial promissory notes issued
V. Current liability		
<i>Borrowed funds (page 1510)</i>		
BM AC I/E	Conservative	Short-term loans and borrowings
BM FV I/E	Speculative	Short-term issued bond loans for the purpose of repurchase
BM FV OCI	Business model with investment type	Short-term issued bond loans for the purpose of repurchase while maintaining its own credit risk
BM AC I/E	Conservative	Short-term issued bond loans to maturity
BM AC I/E	Conservative	Short-term financial promissory notes issued
<i>Accounts payable (page 1520)</i>		
BM AC I/E	Conservative	Short-term trade payables (TKZ)
BM AC I/E	Conservative	Long-term trade payables (TKZ)
BM AC I/E	Conservative	Short-term commercial promissory notes issued, held to maturity
BM AC I/E	Conservative	Long-term commercial promissory notes issued

Table 62.3 Methods of assessment of financial instruments in the context of business models recommended by IFRS

Type of business model	Method for evaluating financial instruments
Conservative	Cash flow discounting method
Speculative	Quotes of market assets at the reporting date
Mixed	Expert method (for similar assets), in other words “income approach” or “market approach”

Table 62.4 Indicators for assessing the reliability of financial instruments

Coefficient	Calculation formula	Value
<i>The coefficients of financial stability</i>		
The coefficient of autonomy	Own capital/balance currency	Shows dependence on borrowed funding sources
Permanent asset index	Non-current assets/own capital	Shows the share of own sources that is used to cover non-current assets
<i>Solvency coefficients</i>		
Liquidity ratio	Current asset/credit liabilities	Reflects the company's ability to repay current (short-term) liabilities from current assets only
Interim liquidity ratio	(page 1240 Form 1 + page 1250 Form 1 + page 1260 Form 1)/(page 1500 Form 1-page 1530 Form 1-page 1540 Form 1)	Shows the ability of an organization to repay its short-term liabilities by selling liquid assets

the recalculation of the balance sheet indicators, which include financial instruments that are subject to adjustment.

After analyzing the reports of six companies with different activities, we concluded that the most common financial instruments used in financial statements are “loans issued,” “trade receivables,” “trade payables,” “short-term loans received.” Therefore, these indicators were recalculated at the effective interest rate (EIR).

The comparative characteristics of the analysis of the financial condition of organizations based on indicators formed by traditional methods (based on their initial cost) and using amortized cost calculated using EIR made it possible to more reliably assess its indicators. The results of recalculating balance sheet items of enterprises of various types of activity in the Primorsky territory that cover financial instruments confirmed our hypothesis. The recalculated indicators of financial stability and solvency on average were higher by 7% and 5.54%, respectively.

The growth of the recalculated coefficients indicates an increase in the attractiveness of companies from external investors and creditors, demonstrating the potential ability to quickly repay short-term liabilities due to the sale of current assets. Due to the fact that liquidity ratios traditionally characterize the solvency of an enterprise, in general, the growth of the presented coefficients indicates an increase in the reliability of the enterprise as a partner for external users.

Thus, we can conclude that the modification of the classification and valuation of financial instruments in accordance with IFRS influence the validity and reliability of indicators for assessing the financial condition of the organization in connection with required reporting of the results of their revaluation. Therefore, to reflect the most accurate information that forms the indicators in terms of financial instruments, see our interpretation in Tables 62.5 and 62.6.

Table 62.5 Interpretation table (explanations to the balance sheet), reflecting the results of revaluation under the mixed business model

Indicators by business model as of the reporting date	Amount, in thousand rubles
<i>Mixed business model (FV OCI—FVOCI)</i>	
Revaluation of non-current assets, including revaluation (markdown)	
• Financial investments in bonds held to maturity	
• Financial investments in shares purchased for investment purposes	
Total results of revaluation of FI, using a mixed business model	

Table 62.6 Interpretation Table (explanations to the report on financial results), reflecting the results of revaluation under the conservative and speculative business model

Indicators by business model as of the reporting date	Amount, in thousand rubles
<i>Conservative business model (AMC)</i>	
Other income (expenses) including additional valuation (markdown)	
• Long-term and short-term financial investments in bonds held to maturity	
• Long-term and short-term financial investments in promissory notes received	
• Long-term and short-term financial investments in loans provided	
• Long-term and short-term financial investments in trade receivables	
Total results of revaluation of FI, using a conservative business model	
<i>Speculative business model (S/P)</i>	
Other income (expenses) including additional valuation (markdown)	
• Short-term financial investments in shares purchased for sale	
• Short-term financial investments in bonds purchased for sale	
Total results of revaluation of FI, using a speculative business model	

They will allow you to reflect the results of revaluation in the context of the implementation of a mixed business model in the notes to the balance sheet, as well as conservative and speculative ones in the notes to the FRR.

The specific feature of the reporting items that reflect the results of revaluation and markdown of financial instruments is that they are not provided with cash flow and arise based on the current accounting rules, according to which they affect the

financial result, having a negative impact on the reliability and credibility of the “net profit (loss)” indicator in the financial statements.

62.5 The Research Conclusions

The areas for improvement of classification and valuation of financial instruments proposed in this paper and the developed recommendation tables for the balance sheet and the report on financial results will make it possible to more reliably assess the financial condition of organizations in the context of evaluating the accounting of financial instruments, and, accordingly, to generate more reliable information for both external and internal users of reports.

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Chapter 63

Well-Being of Workers and Career Strategies in the Conditions of Industry 4.0



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Abstract The purpose of the research is to analyze employee perceptions and identify career strategies that contribute to maintaining a high level of well-being in the context of Industry 4.0. The analysis of scientific literature shows that the flexibility and adaptability of employees' career strategies will allow employees to quickly adapt to changed working conditions and minimize possible risks. The use of outdated career strategies in the context of the fourth industrial revolution will slow down the adaptation processes of employees and threaten their socio-psychological well-being. The method of written narrative interview was used as the main method of empirical research. The study was carried out on the territory of the Russian Federation in 2020. The research involved 205 employees of various organizations. The results show that respondents are flexible in their perception of threats and career opportunities. The results show that full awareness of the consequences of the fourth industrial revolution is important for choosing a career strategy. Sufficient awareness of respondents allows adhering to active career development strategies. A reasonable assessment of the threats and opportunities of the future allows for timely correction of career strategies of employees.

63.1 Industry 4.0: Well-Being of Workers and Changing Career Strategies

The fourth industrial revolution (Industry 4.0) will inevitably lead to a qualitative change in all spheres of human life, including the labor sphere [1–3]. New possibilities are emerging for combinations of mental, physical and mechanical work. The fourth industrial revolution will increasingly affect the world of work, changing the types of jobs offered [4]. The development of technologies has already led to the

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rapid growth of teleworking [5]. This form of work, on the one hand, provides new opportunities for career development, in particular for women. On the other hand, teleworking can negatively impact the health and well-being of workers [6].

Technologies will soon appear that can work without human intervention. Experts predict technological breakthroughs in the widest range of areas: the emergence of artificial intelligence, ubiquitous robotization, the Internet of things, nanotechnology, biotechnology, and quantum computing. The world of work is undergoing fundamental changes. The relevance of the research topic lies in the fact that when robotization is introduced into production, difficulties arise in maintaining the required level of social and psychological well-being of workers. In the modern world, digital technologies are rapidly developing; more and more work operations can be performed by robots. Robots do not need to be taught new skills, nor do they need to be motivated and stimulated to fulfill the production plan. Robots do not need to pay sick leave or vacation fees, they are more efficient and accurate when performing certain tasks, even when compared with qualified personnel. Today robots are mainly used in industry. In the near future, there will be intelligent machines that can learn independently, be flexible, and evaluate the environment [7]. An intelligent robot will be able to perceive, act, reason. The need for human resources will decrease, which may affect both psychological and physical aspects of well-being [8]. Loss of work and reduced income, precarization of employment, lack of skills necessary for working in the new conditions, reduce the level of well-being of employees [9, 10]. The risk of technological unemployment is usually associated with the reduction of low-skilled employees, but some experts believe that layoffs will also affect other categories of employees [11, 12]. Scientists focus on career problems that employees are already facing due to the rapid development of new technologies and artificial intelligence [13]. As a rule, traditional linear models of career development are based on the idea of permanent employment for one employer [14]. However, at the present time, there are more and more non-standard employees in the world. New work stressors are emerging. Employees of various organizations are increasingly in a state of professional crisis and need the support of career counselors [15]. A person in the new realities must constantly provide himself with work, find new meanings in the working role [16–18]. Career self-management becomes the main factor for achieving career well-being [19]. The employee must be able to quickly adapt to new realities [20] and have career adaptability [21]. An important condition is the readiness of employees themselves to change, based on the perception of technological innovations [1].

The purpose of the research is to analyze employee perceptions and identify career strategies that contribute to maintaining a high level of well-being in the context of Industry 4.0.

63.2 Assessment of Employees' Perceptions of Career Strategies in the Context of Industry 4.0

The research was conducted by method of written narrative interview. The narrative impulse consisted in getting to know the essence of Industry 4.0 and receiving feedback from respondents in the form of an essay on the topic: "Describe your work, as well as your thoughts, feelings and possible actions regarding your professional future in the context of the fourth industrial revolution. How does this affect/not affect your work (professional activity) right now? In the near future? After 10 years?"

The characteristics of respondents are as follows:

1. The total number of respondents is 205.
2. 75.6%—women, 24.4%—men.
3. The age of respondents from 18 to 40 years is important when identifying career strategies, since there must be sufficient "reserve" to build a professional future.
4. Broad professional affiliation of respondents (employees of all types of work).
5. Among the respondents are representatives of various forms of employment and the unemployed.

Analysis of the received narratives has shown that it is possible to specify several types of professional behavior strategies:

1. "Ignoring" strategy—the respondent notes that Industry 4.0 will not affect their professional activities in any course of events. Even the assumption of possible development options in the context of digitalization is avoided. The narratives of the respondents say: "as I have worked, I will continue to work"; "Will not affect me"; "The relevance of my profession will not change"; "I don't really believe that everything can be automated".
2. "Confrontation" strategy—the respondent recognizes and understands that there are and will be changes in the work, but considers himself a more competitive professional compared to smart machines. In the narratives, the respondents noted: "in working with people prefer human communication"; "the machine will not be able to follow the perfect accuracy of detail, in any case will need a man"; "I find myself anyway, to replace the human factor completely impossible"; "the man dictates the rules of digitalization, so it will always be a priority"; "there will always be a need for a person who will set a task for artificial intelligence and monitor its implementation. And I am this person!".
3. "Adaptation" strategy—the subject notes that there are no changes yet and plans to adapt to them only when they appear. The narratives state: "I will adapt as the time comes"; "I will transfer my activities to an online platform if necessary"; "I will focus on the fact"; "I will adapt to circumstances if it is unavoidable"; "little depends on us, the question of big money"; "we need to act based on the situation, not on assumptions".
4. "Understanding" strategy—a person is ready for changes and will meet them if his employer or the state creates conditions for the adoption of a new one. Narratives contain the statement: "to cooperate and to come to a common with

the leader”; “if necessary, we will have a meeting to go to”; “if necessary—ready to adapt”; “if the organization provides conditions for advanced training, technical equipment, etc., as an employee, I welcome the changes”; “I always meet them halfway if they come to meet me”.

5. “Synergy” strategy—a person is aware of the changes that are taking place and prepares for them in advance. Respondents say: “this world is moving somewhere, and I’m trying to keep up with it”; “I need to keep up with the times”; “I’m learning right now”; “I’m constantly learning new skills that I quickly incorporate into my work”; “I need to prepare myself for the transition now, follow trends and take various training courses within the framework of digitalization of processes”; “I try to learn about new trends related to digitalization in my field of activity”; “it is important to be always in the trend, constantly developing yourself”; “we need to support what simplifies our work and at the same time develops new abilities and skills”. The distribution of respondents by planned strategies of professional behavior in the context of Industry 4.0 is shown in Fig. 63.1.

Thus, the majority of respondents adhere to active career development strategies: synergy; understanding; confrontation. Table 63.1 shows the gender distribution of respondents by identified career strategies and perceptions of opportunities and threats of the fourth industrial revolution.

The data obtained indicate a mostly positive perception of the respondents’ professional future. At the same time, women are more actively considering opportunities, and men are more focused on threats. Real experience of changing work functions has a significant impact on career strategies. The analysis of narratives revealed:

- 68.5% of respondents have experience of changing work functions;
- 7% of respondents said that they have a negative attitude to the impact of digitalization on labor functions;
- 44.5% are women with a positive experience of the impact of digitalization, of which 57% adhere to the “synergy” strategy, 17.9% support “understanding” and 16.8% have managed to cope with changes through flexibility and “adaptation”.

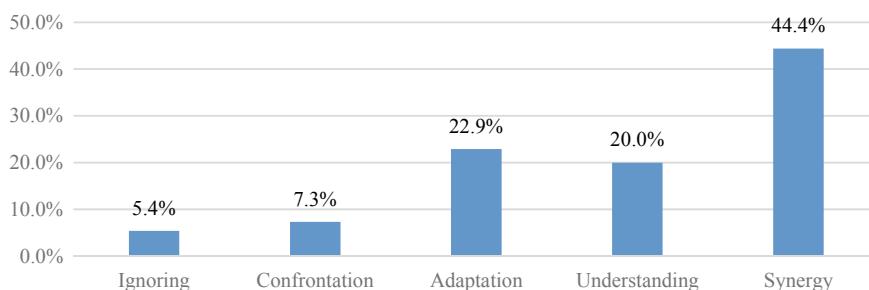


Fig. 63.1 Planned strategies for professional behavior of respondents in the context of Industry 4.0

Table 63.1 Distribution of respondent groups by career strategies of the total number of respondents, %

The group of respondents/career strategy	Synergy	Understanding	Adaptation	Confrontation	Ignoring
Women	33.5	16.5	18.5	4	3.5
Men	12	4	2.5	3.5	2
Perception of the opportunities of Industry 4.0, men	11	15	2.5	2.5	1
Perception of the opportunities of Industry 4.0, women	30.5	15	16	2.5	3
Perception of threats to Industry 4.0, men	5	1.5	1	1	—
Perception of threats to Industry 4.0, women	19	7.5	13	3	1.5
Perception of threats and opportunities in Industry 4.0, men	4	6.5	1	05	1
Perception of threats and opportunities in Industry 4.0, women	17	6.5	11.5	2.5	1

17.5% of the total number of respondents are men with a positive impact of digitalization on their professional activities, of which 54.3% adhere to the strategy of “synergy” and 17.2%—“understanding” and “confrontation”.

63.3 Conclusion

When summarizing the general conclusions of the research, we can focus on a number of important aspects. Earlier identification and maintenance of specific career strategy can help to minimize threats to Industry 4.0. Flexibility respondents perceive both the threats and opportunities of Industry 4.0. However, a more meaningful choice of career strategy is possible only under conditions of sufficiently complete information about the essence and directions of development, as well as the consequences of the fourth industrial revolution. Respondents with more extensive professional experience and interaction with digitalization show a more active position in relation to their professional future. The passive attitude of respondents can be explained by lack of awareness, lack of confidence in the professional future, lack of self-confidence, and probably insufficient level of well-being. Past negative experience reduces the possibility of professional adaptation to changing conditions.

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Chapter 64

Labor Relations at the University in the Context of Global Uncertainty



Z. Dvorakova , A. Fedorova , and I. Polents

Abstract The society perceives the universities for centuries as centers of knowledge and education. These days, teachers increasingly become under the press to satisfy their stakeholders' requirements—students, employers, and public institutions. The paper aims to analyze labor relations at university stemming from the globalized education market accelerated by uncertainty. It illustrates teachers' labor relations on examples from the Czech University and defines areas for improvement. Research methodology uses a triangular analysis. Based on in-depth desk analysis in secondary sources, focusing on the Web of Science database, it collects primary data by two unstructured interviews, a focus group, and long-term personal observations. The subject is personnel/human resource management applied for managing teachers' labor relations at one Czech University. Findings show that public and university regulations determine employment contracts and labor relations. The growing pressure of the external factors means that individual labor relations are closer to the characteristics of the private sector and create uncertainty. Employment is fixed term for most teachers, pay depends on individual performance, and career progression depends on visibility in the international scientific community. The retention and work motivation of teachers must use best practices, which have proven themselves in human resource management in high-tech business.

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64.1 Introduction

The society perceives the universities for centuries as centers of knowledge and education. They provide knowledge, create innovations, and contribute to improving the quality of life [1]. The respected university ratings are becoming the matrix in the states of the former Eastern bloc. Their criteria transfer to the evaluation of the university performance applied in some modified form to the distribution of funds and teachers' evaluations. As a result, teachers were increasingly becoming under the press and stressed as universities operate to succeed in the global education market and satisfy their stakeholders—students, employers, and public institutions.

Working conditions and labor relations at universities are on the edge of research in Central and Eastern countries. Their environment expects that social prestige, rooted in the times of the Austria-Hungary monarchy, and the identity of the professor with the university serves as a strong motive that supports the recruitment of young teachers and researchers, helps maintain staff and achieves their performance as the high-quality teaching, publishing, research, and development of the field.

The changes in the society and the economy caused by COVID-19 have opened a Pandora's box, and the public is experiencing conditions for work and life that it has never been able to imagine. The COVID-19 has globally halted traditional education processes at all levels of the education system. The universities were able to adapt very quickly and switched to distance learning. However, for the coming years, they can expect that public education will be underfunded, distance education will emphasize, and teaching practices will monitor more than before if they effectively achieve their results.

The paper aims to analyze work conditions and labor relations at universities stemming from globalized education and trends in online teaching accelerated by uncertainty due to the COVID-19. It will illustrate teachers' labor relations on examples from the Russian and Czech universities and define areas in their improvement.

64.2 Research Methods

The methodology insists on several methods that enable a triangular analysis. The research combines state-of-the-art knowledge identified by in-depth analysis in secondary sources, focusing on the Web of Science database, and evaluating primary data dealing with university personnel/human resource management (HRM) used for teachers. Information concerning university practices in labor relations was collected by two unstructured interviews, a focus group, and personal observations at a Czech University. Both interviews and the focus group held in June 2020. The additional information gives authors' long-term experience as employees at universities where they developed their academic careers in the frame of public and university regulations.

The reasoning methods are first that university staff are the agent of the change and may use their experience in pedagogy for transforming face-to-face lecturing to distance education. Secondly, based on bibliometric analysis, it can become evident a need to get an overview of labor relations at universities as a base for developing concepts and best practices in managing teachers and researchers in a different environment and discuss perspectives of the influence of digital education on their quality of work life. Comparing practices in labor relations and personnel/HR management can serve as a benchmark applicable in another cultural environment. Therefore, research collects and analyses data from an interpretative group of methods that reveal the potentials for recruitment, motivation, and retention of teachers in the context of uncertainty.

Research questions reflect the state of the art in secondary sources, gaps in knowledge about labor relations at universities in general, and the case of Russia and the Czech environments. The paper intends to find answers to the following:

What employment conditions and labor relations exist at universities?

Which personnel/HR practices can use for managing teachers and researchers at universities?

What changes must do in labor relations in universities in the time of uncertainty?

64.3 Literature Overview

64.3.1 *The Bibliographic Analysis*

We retrieved 74 474 bibliographic records that matched the query in database search in the period 1990–2020: records from the Web of Science databases count for 27 035 and Scopus 47 439. The structure of bibliographic records shows Table 64.1.

Table 64.1 Bibliographic records by the query in web of science and Scopus database 1990–2020^a

Query	Web of Science	Scopus
Labor relations	17 714	30 978
Labor relations and university	789	2 925
University jobs and uncertainty	118	332
Work-life balance	3 858	5 423
Work-life balance and university	316	633
Well-being and employment	3 620	5 631
Well-being and academic career	227	280
COVID-19 and university	393	1 237
Total	27 035	47 439

^aCalculated by the authors. Accessed 2020/07/27

The enormous amount of literature of various sciences does not allow conducting a complete analysis of all of them. In this paper, the analysis limits the most significant works, considering the citation index related to labor relations and university, university jobs and uncertainty, work-life balance, university, and finally, well-being and academic career. The studies in the Web of Science database outline the development of promising directions in several areas, mostly in education and educational research, management, economics, and social sciences interdisciplinary.

Labor relations and university belong to the most studied topics in the analyzed period 1990–2020 in Spain (115 publications in the Web of Science), the USA (81), England (71), Russia (56), Romania (31), but in the CR 20 ones. Articles dealt with the theme as mentioned above cover according to categories topics from education and educational research (256 publications, i.e., 32%), management (65 publications), obstetrics–gynecology (60), economics (52), and social sciences interdisciplinary (48), and others.

In the case of university jobs and uncertainty, the order of the number of publications characterizes the following: the USA (26), Germany (12), Spain (11), Canada, and England (both 6). Russia records four and the CR one. Papers belong to topics from categories: education and educational research (27 publications), economics (11), management (9), scientific education disciplines (8), and business (7).

Publications about work-life balance and university mainly print in the USA (110), England (34), Australia (30), Canada and Germany (both 16), and in the same period in Russia 2, and the CR 3. They focus predominantly on education and educational research (78 publications), scientific education disciplines (42), medicine—general and internal (23), management, and public environmental and occupational health (both 21).

Well-being and academic career mostly become a subject of publications in the USA (113), Australia (21), England (17), Canada (12), Spain, and Portugal (both 9), but in Russia as the CR only two. They belong to education and educational research (58), applied psychology (38), scientific education disciplines (23), psychology multidisciplinary (22), health care, and science services (10).

The number of literature deals with the most analyzed topics increases during the last twenty years, as shown in Table 64.2. It demonstrates that organizations see in labor relations at universities a potential for improvement in personnel/human resource management. The query “COVID-19” and “university” was for the first time in the Web of Science in 2020, and the number count on 27 July 393 papers.

Table 64.2 Bibliographic records by queries in the Web of Science 2000–2020^a

Heading level	2000	2010	2015	2018	2019	2020
Labor relations and university	7	29	55	106	88	28
University jobs and uncertainty	3	4	5	13	17	7
Work-life balance and university	2	11	20	59	46	29
Well-being and academic career	–	10	13	31	49	16
Total	12	54	93	209	200	80

^aCalculated by the authors. Accessed 2020/07/27

64.3.2 A Theoretical Background of the Labor Relations at Universities

The University 4.0 concept assumes that it will provide a platform for deploying research, projects, and development of new practices. The university, as a collective creator of intelligence, will offer opportunities for communication and navigation to individual and institutional stakeholders and “technologize” (1) thinking and communication of people; (2) creation of artificial intelligence and hybrid kinds of intelligence combining human and machine intelligence [2]. The “always-on-culture” will enhance the work-life balance due to flexibility in time and location. However, being “always-on” causes severe implications for the health and employee performance due to over-working and a lack of time for recuperation [3], leads to social and professional isolation, and perceived threats in professional advancement [4].

Giesenbauer and Muller-Christ [5] argue that transdisciplinary research and research-based learning can tackle social issues and universities should individually address different organizational subsystems. It can deduce that universities must cope with local tasks and global challenges to meet the expectations of higher education stakeholders. Their transformation must include university management systems, including: human resource management, active involvement of companies in education processes, and change of thinking of teachers. The traditional teacher’s way of thinking occupies the responsibility to fulfill a schedule and carry out the tasks connected. At the same time, teachers must commit to ethical standards, among which ideas of freedom and autonomy play in building professors’ identity [6].

Research on industrial relations at universities focuses on teachers because their performance creates incomes for these institutions and shows their mission. Research on the precarization of labor relations in academia happens uniquely. To illustrate

that the topic remains relevant, two studies from Russia and Finland demonstrate teachers' stances in education system reforms. Burtseva et al. [7] discuss the implications of professional education reform from the standpoint of changes in the position of teachers in Russian universities and colleges. They monitored an increase in working hours due to the implementation of teaching and administrative activities. Teachers' salaries increased thanks to getting academic degrees, work experience in an educational organization, and working hours. The compensation package represented an essential motive for growing satisfaction with jobs at universities. However, no reforms solved the problem of staffing regardless of the long-term trend that the demographics in academia has been worsening, which is evident in older teachers' case, their limited knowledge of foreign languages, and informational technologies. During the transformation of universities in Finland, three groups of teachers crystallized based on their attitudes to change. One group shows a reluctance to change, perceives them as a loss, overloaded with administrative work, and experiences job insecurity. The second one welcomes the changes and sees them as a potential for success and mobility; the third is among them, welcomes the work-life balance at the University, but takes a neutral position to changes [8].

In general, the beginnings of an academic career associate with job insecurity. Ortlieb and Weiss [9] analyze individual factories that help start a career in academia on the example of a large Austrian university. They find that the willingness to be geographically mobile, devote a large share of working time to research and networking, build on the results achieved, and have personal ambitions climbing in the ladder plays a significant effect. Postdoctoral researchers (postdocs) represent the critical human capital for university development, but they often have no prospects for career building and integration into these organizations. They work in uncertainty about their future, causing the decrease of their job satisfaction, especially in the area of social sciences and humanities [10]. Career adaptability reduces job insecurity and stems from individual internal and external marketability [11].

The teachers work under ever-increasing demands to build reputation and visibility in the international scientific environment [12]. It covers research and publications in prestigious journals, or at least, in conference proceedings indexed in the Web of Science. Unlike past and traditions, universities no longer provide stable employment and use temporary employment contracts or part-time employment. Carpiñero and Gonzalez Ramos [13] perform an extensive analysis that confirms that precarious working conditions and job insecurity have affected academics' lives and careers. Their results focused on Spanish universities and research centers, highlight psychosocial risks for both men and women academics because of accelerated work organizations, intensified by uncertainty and hyper-competition due to lack of positions. Their study mainly focuses on gender aspects of academic employment, arguing that academia represents the hegemonic male work model, especially damaging women's well-being and careers, and discouraging them from pursuing gender equality. Similar results about gender discrimination at universities achieved Edmunds et al. [14] when they analyze 52 studies published between 1985 and 2015. They find consistent evidence that women in academia are interested in teaching more than in research; women lack adequate mentors and role models, and

women experience gender discrimination and bias. The so-called glass ceilings in universities still exist, and women perceive many impediments and barriers to career advancement [15].

University 4.0 will increase job insecurity for teachers. So far, they cannot imagine how and what they will learn when students work with artificial intelligence, which will be at the same level of intelligence of students and teachers [16]. They ask questions and no answers. For example, what place they will get in the educational processes, which will be mass and distance, how they can teach online courses with students from all over the world with negative impacts on their health and professional development, or how to proceed in evaluating students' homework teams downloaded from Internet search engines. When offering distance education, universities will use marketing communication to build a brand and shape their stakeholders. Digital marketing trends and strategies, as applied by the current FinTech together with internet development, are evolving rapidly, and their tools quickly adapt to the specifics of others [17], e.g., after COVID-19 aimed at selling online courses.

According to the Bologna Process, the University's evaluation is based, among other criteria, on how successful its graduates are in the labor market. These days, it is not clear how employers will evaluate massive open online courses (MOOCs) and university degrees defended in the digital environment when recruiting new employees, or plan employee training and development. The first reactions exist. For example, Rosendale [18] identifies that hiring managers have a clear preference for traditionally educated/degree-conferred forms of higher education when searching for job applicants. According to Hamori [19], small employers are more likely to provide support for MOOCs than their larger counterparts as they lack formal training, and some organizations allow their employees to enroll in MOOCs that have job-relevant content but are not critical to existing performance. Research has shown that employers have no analysis for comparing the strengths and weaknesses of traditional education over distance education, although MOOCs are a less costly solution and can quickly address gaps between employee knowledge and job requirements.

The uncertainty associated with the University 4.0 applies to students, from the beginning of the studies to the successful completion. When they start studying, they choose a field, but it is not always clear whether it has a perspective and which changes can emerge [20]. During the study, political development, economic conditions, pandemics arise, and legislative changes. After graduation, they find that the profile of companies' requirements for graduates is hurrying, new jobs build, and employers innovate practices for career development and succession planning.

Based on secondary sources, distance education and e-teachers will become a mass affair. The COVID-19 measures cause worldwide that universities transfer in a short time the face-to-face courses to distance education. Teachers mastered the change equipped only with a laptop having minimum knowledge of an ergonomically correct workstation. As a result, their home offices potentially face suboptimal working conditions. If distance education continues a large scale, teachers need to understand the ramifications of the poor workstation [21].

We believe that distance education and e-working deepen differences among universities from the quality of services provided to students and the labor conditions provided to staff. E-teachers will depend more on information and communication technology (ICT), work under the constant pressure to be flexible, accountable for self-management, and personal health. In the Central Eastern European countries, the concept of University 4.0 must also include personnel/HR management innovations at universities, as its level characterizes administrative management with the priority to comply with the labor law. Teachers represent the human capital of universities, but currently, the quality of their labor relations determine to a large scale the ambitions and personality traits of university and faculty management.

64.4 Results

The focus group included five senior lecturers with Ph.D., one associate professor, and one professor: all work at Masaryk Institute of Advanced Studies (MIAS), Czech Technical University in Prague (CTU). The interview was semi-structured in June and lasted two hours. Questions covered the following topics:

- How are employment relations with the employer regulated?
- How is the salary paid?
- What changes in the personnel policy of the university have occurred in the last year?
- Has the employer violated the agreements? If so, to which ones?
- What is the cause of job dissatisfaction in the current job?
- What threats to the future exist at work?
- What requirements must do to keep the job?
- How does employment affect occupational health?

Based on their discussion, it can do a summary. The employment contract is written, senior lecturers have the contracts on a definite period, associate professors, and professors on an indefinite one. Each gets a salary transferred to a bank account. In the last two years, new staff has generally been recruited either part-time or by an employment agreement. There was no breach of contractual obligations by the employer. The salary consists of a tariff wage and merit pay. In addition to the salary, based on pedagogical performance and publications, it can be a reward for solving a research project.

In December 2019, dozens of teachers got a job offer from another technical university with a higher QS rating than the current employer. Those who applied for the selection were accepted. They will join a new employer from 1 September 2020. In the current job, the leading causes of job dissatisfaction contain lack or poor cooperation with the school management, no possibility to advance in the academic career to positions of associate professors and professors, setting unrealistic requirements to increase the H-index for teachers in economics and management and a precondition for the institute transformation as a school-wide department into a faculty in

a horizon of three years. The new employer will stress the quality of publications that means to publish in high-rated journals. However, the content of the teacher's work and the open environment for creative activity and honest interpersonal relationships in the workplace represent a strong motive for job satisfaction. It seems that such labor conditions can influence the willingness to boost performance with the new employer. A positive influence on teachers occurs the friendly communication from the management of the new employer, defining a clear perspective of the career growth of individuals and the entire office. In the following winter term, one problem exists—missing a building with workplaces. The new one is under the reconstruction offering open spaces for teachers, which is unusual for academia, emphasizing a calm environment and privacy. Due to the situation with COVID-19, it can expect that face-to-face teaching will supplement online courses, and distance education will apply blended learning.

The narrative case applied an unstructured interview with Radovan and held in June. He is a co-owner of two companies, one operates in the ITC sector, and the second one provides consultancy in economics and management. Clients usually come from the EU countries, mostly from Central Eastern Europe. Each company belongs to the small category of enterprises. So, the quality of services depends on the human capital and staff's willingness to develop themselves in core knowledge and personal competencies.

Radovan delegates all critical decisions in HRM to the managing partner responsible for essential HR practices, e.g., recruitment, selection, performance management, and compensation. The compensation strategy states that wages must exceed the local wage level as an essential stimulus for attracting and retaining employees. However, no companies provide any financial benefits with the only exception—to use flexible working schemes, online working, and mentoring. In both companies, he expects employees to search for learning opportunities and is keen on climbing the ladder. He acts as a model for employees, so he lectures at universities sharing his long-term experience with students, is a member of a professional HR group at the university for seven years, and gives consultancy/advice to education for business needs.

He criticizes the lagging of the Czech school system behind reality, numerous reforms that have a short life associated with the person of the Minister of Education, Youth, and Sports. From the establishment of the Czech Republic on January 1, 1993, to the present, 19 people have taken up the top position in the Ministry, i.e., 17 ministers and two as commissions in 27 years. The weakness of initiating a perspective change to link education with practice is the underfunding of Czech education, little or no experience of teachers in the business, teaching methods that emphasize memorization and traditional ways of verifying students' knowledge and skills (tick tests). On the other hand, he admits that the Czech business insufficiently involves in teaching at universities, offering few opportunities to link teaching with practice, such as listing projects for processing by a team of students and their defense before a committee of experts from practice. He is skeptical in accepting distance education by Czech business due to the quality of Internet networks in the CR and the lengthy transition to the 5G network, staffing of universities in the category

of associate professors and professors, and the level of digital literacy of teachers, especially in social sciences and humanities.

64.5 Discussion and Conclusion

Based on research questions, we can define working conditions and relations at universities and describe specifics in Russian and Czech University environments. Labor law and university regulations determine employment contracts and labor relations. The growing pressure of the external factors means that individual labor relations are getting closer to the characteristics of the private sector. Employment is fixed-term for most teachers, pay depends on individual performance, and career progression depends on visibility in the international scientific community. The specificity of working at a university lies in the fact that teachers represent a highly qualified workforce that requires fair dealing, clear rules of personnel/HR management, a favorable climate for professional growth, and cooperation across cultures. HR strategies and practices focused on teachers depend on university leaders, but HRM remains at the level of personnel administration without any long-term analysis of teachers' job satisfaction and labor relations.

The university employment means uncertainty for teachers. Requirements put on employees will grow thanks to the expectations of all stakeholders, the expansion of distance education, and the need to succeed in the global market with education and research. The retention and motivation of teachers must use best practices, which have proven themselves in HRM in high-tech business. It seems that teachers currently asking for the following:

- to create and develop systems for postdoctoral employees/young scientists' career development so that they can participate in multidisciplinary projects and build international networking as preconditions for climbing the academic ladder,
- to develop clear policies and guidelines regarding the psychosocial aspects of information and communication technology and provide support to teachers and students at the effective utilization of distance education in a healthy way [22],
- to increase the commitment of academics and employers for developing graduate employability by developing the participation of employers in internal institutional activities as advocated by policy-makers when they call for the recognition of employers as stakeholders in higher education [23],
- to build an organizational climate of trust and HR diversity management supporting equality among staff based on performance and individual competencies.

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Chapter 65

Monitoring Changes in Households Well-Being Under Conditions of Lockdown



A. Fedorova and I. Polents

Abstract The article highlights the results of the first stage of the monitoring study, which is an express-slice of the changes in the level of economic and psychosocial well-being of households that have occurred due to the introduction of restrictive measures in the region linked with the difficult epidemiological conditions. During ten weeks, a group of respondents assessed the change in the situation through the prism of their families using the scales proposed by the authors. The quantitative results of the scale assessments of the five express-slices are supplemented by a qualitative analysis of the respondents' narratives that allowing to obtain a detailed understanding of the feelings and experiences of overcoming the Covid-19 pandemic negative factors by people living together and running the household jointly. The quantitative and qualitative assessment is based on the individual perception of the situation by the respondents and reflects the dynamics of changes in the level of subjective economic and psychosocial well-being of households.

65.1 Introduction

The consequences of the Covid-19 pandemic are manifested in all spheres of human life and they have yet to be comprehended. The household and many aspects of its activities must be analysed as an important social institution, an integral part of the national economy. A United Nations report on the impact of the pandemic on the economy calls for all countries to start building new economy as the Covid-19 crisis plunges the global economy into recession and countries must join forces to support welfare and well-being in the future [1].

The economic well-being of a person is determined by many factors, such as the level and quality of life, the provision of the necessary life benefits, the wages and

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salaries that are consistent with the necessary and desired needs, and many others [2–6]. Nowadays, measuring economic well-being today is based on two approaches: objective and subjective. An objective approach implies that income (of the individual or household) in absolute terms is considered as an indicator of individual or family welfare. An important stage in the development of the methodology for measuring economic well-being was the recognition of the fact that subjective assessments are the best tool here [7]. Subjective assessments of the level of family income can be used as valid indicators of the economic well-being of households, which meets the purposes of the presented study. According to Khashchenko, subjective economic well-being is defined as an integral psychological indicator of a person's life, expressing a person's attitude to his current and future material well-being [7]. Thus, within the framework of the monitoring study, it is advisable to single out such evaluative parameters as the level of income, the level of subjective economic well-being and the level of subjective psychosocial well-being of the household.

The term “psychosocial well-being” indicates the close relationship between the psychological aspects of individual experience (interpersonal thoughts, emotions and behaviour) and broader social experiences (relationships, traditions and culture) [8]. Many psychosocial problems are rooted in stigmatization, lost hope, chronic poverty, inability to fulfil basic needs, and inability to perform social roles normally [9–15]. Overall, well-being is a condition for holistic health in all its dimensions: physical, cognitive, emotional, social and spiritual [16]. Monitoring changes in the level of subjective economic and psychosocial well-being of a household in a difficult epidemiological situation helps to understand the experience of family members, experiencing and adapting to new life conditions.

The object of research is the household (family), as a group of people living together and leading a single housekeeping. Taking into account the fact that the concepts of “household” and “family” are not synonymous [17], in this study the authors imply that most households are ordinary families consisting of two or more people.

65.2 Methods

In order to monitor changes in the level of subjective economic and psychosocial well-being of households (families), quantitative (survey) and qualitative (narrative analysis) assessment methods were used. The collection of empirical data was carried out within ten weeks from the beginning of the introduction of restrictive measures (so-called self-isolation) in the Sverdlovsk region (March 28, 2020). The respondents were full-time students of the Ural Federal University, who were temporarily transferred to the remote due to the complex epidemiological situation, who once in two weeks assessed the changes on the example of their families, answering three scale questions: (1) the level of household (family) income for the last two weeks (0–100%); (2) how can be assessed the level of economic well-being of the family at the moment (on a 10-point scale); (3) how can be assessed the level of psychosocial

well-being of the family at the moment (on a 10-point scale). In the last week of the study period, students were asked to describe the current trends and the reasons for fluctuations (if any present) in the values of the estimated parameters.

Thus, during the study period, five surveys (slices) were conducted. The number of respondents was 98 people with families of different characteristics: 56.7% of respondents have a family of 3 people, 21.1%—2 people, 18.9%—4 people, 2.2%—6 people and 1.1%—5 people. The number of working family members in respondents' families is 170 people, out of which 18.2% work in production, 17.1% are employed in trade, 17.1%—in service, 11.8%—in cultural and educational institutions, in the energy sector and in the state service (by 8.2%, respectively), building (7.1%), healthcare (4.7%), banking (3.5%), restaurant business (2.4%) and communications (1.8%). Most of the working family members are in the age group of 36–50 years old (70%), over 51 years old—17.6% and under 35 years old—12.4%.

Narrative analysis of the respondents' stories, supplementing the survey results, allows getting a detailed idea [18–20] of what kind of difficulties this or that family (household) faced in conditions of restrictive measures, and how these difficulties influenced its subjective economic and psychosocial well-being.

65.3 Results

Comparative analysis of the results of five surveys (slices) reflects dynamic changes in respondents' assessments of the level of economic and psychosocial well-being of the household over the period under study (Figs. 65.1, 65.2 and 65.3).

In general, a slight decrease in the level of income of the respondents' families during the study period should be noted. At the same time, the number of “absence of any changes” marks made by respondents here varies from 38% at the first to 56.5% at the fifth surveys. In the first survey, 14.8% of respondents indicated 20% decrease in family income and 13.9% of them indicated 10% decrease. After 10 weeks, this

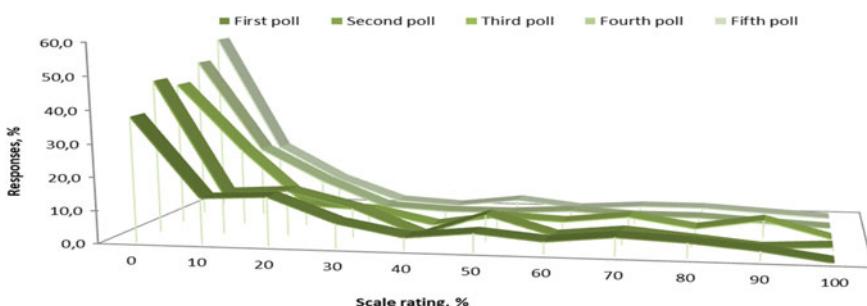


Fig. 65.1 Evaluation of negative changes in the level of income of the respondents' families under restrictive measures due to the Covid-19 pandemic, the beginning of April—the beginning of June 2020, %

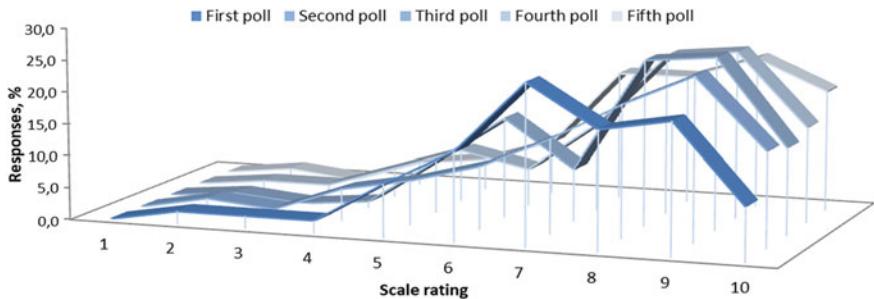


Fig. 65.2 Evaluation of changes in the level of economic well-being of the respondents' families under restrictive measures due to the Covid-19 pandemic, the beginning of April—the beginning of June 2020, %

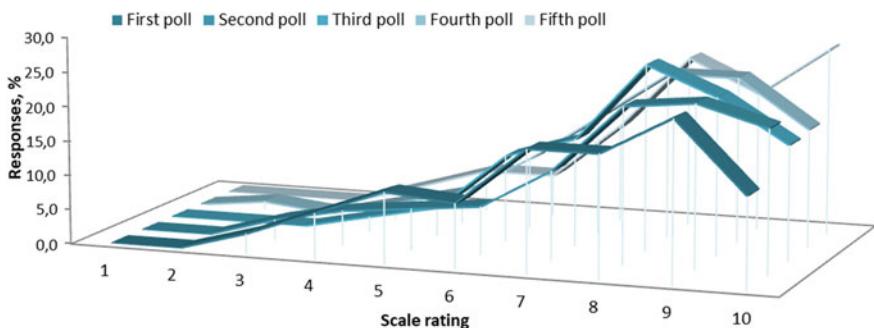


Fig. 65.3 Evaluation of changes in the level of psychosocial well-being of respondents' families under restrictive measures due to the Covid-19 pandemic, the beginning of April—the beginning of June 2020, %

ratio changed 9.4% and 20%, respectively. Reduction of income by 30% or more affected a smaller number of respondent families; number of marks here was also diminishing at each subsequent survey.

The distribution of respondents' answers regarding the level of economic well-being of the family shows a shift in common point estimation towards an increase in the fifth compared to the first surveys. So, unless in the first two weeks after the introduction of restrictive measures a quarter of respondents (25%) rated the level of economic well-being of the family at 7 points and after 10 weeks the largest share of respondents (23.5%) chose the option 9 points.

In accordance with the respondents' assessments, the change in the state of psychosocial well-being of their families also has a positive trend over the study period. For example, during the first survey, every tenth respondent assessed the level of psychosocial well-being of the family at 5 points (10.2%) and then by the fifth survey number of such answers decreased 1.7 times (5.9%). At the same time, at the beginning of the study period 13% of respondents chose an answer of 10 points, and after 10 weeks already 27.1% respondents answered that way.

Narrative analysis of the respondents' stories promotes a deeper understanding of the factors that influenced the well-being of households under restrictive measures (Table 65.1).

As noted above, over the ten-week period under study, there was a positive trend in respondents' assessments of changes in the level of economic and psychosocial well-being of their families. The respondents explain this trend for a number of reasons, including:

- (1) improvement of the epidemiological situation in the country in general ("... over time, mostly good news began to come about many people recovered, and they also stopped talking about the risk of infection and fines, so it brought a slight relief);
- (2) reduction of panic in society ("... later the panic decreased, the situation began to stabilize and slowly come to normal. The people adapted to the new conditions, and life returned to its usual course");
- (3) weakening of fear and disappearing of uncertainty ("... after about 2–3 weeks people started coming back to their senses, the fear of the unknown began to recede ... getting used to the situation, and after living with it for a little, we adapted to the new conditions");
- (4) completion of the process of adaptation to new conditions ("... there was no end in sight of the current situation, but now we are got used to it ...", "... first, the stunned condition, then the deterioration of the state due to the spread of the virus, and then the rise due to the fact that the family got used to the conditions and stopped reacting negatively");
- (5) appearing of new opportunities for earning ("... after a while the well-being of the family improves both psychologically and economically because the ways to somehow work and receive income were found ...").

65.4 Conclusion

The results of a short-term monitoring study are a quick snapshot of changes in the level of economic and psychosocial well-being of households that have occurred as a result of the introduction of restrictive measures in the region in complicated epidemiological conditions. Quantitative and qualitative evaluation of the subjective economic and psychosocial well-being of households is based on respondents' perception of the situation through the prism of their families. Despite the limitations related to a small number of respondents and a short observation period, the results of the study provide some insight into the experiences of overcoming the negative factors of the pandemic by people living together, leading a common housekeeping.

It should be noted that the high optimism of the estimates obtained in the course of the research in general can be explained by the special features of the respondents who are full-time university students and mostly non-working dependents. However, today it is believed that self-isolation is easier for middle-aged and older people than

Table 65.1 Analysis of narratives written by respondents, the beginning of June 2020

Examples of narratives	Semantic interpretations
<p><i>Level of income</i></p> <p>(1) “The level of family income did not change throughout the entire quarantine. Parents worked and continue to work without changes in salaries and reductions of the working day”</p> <p>(2) “The level of family income has not changed in any way, since work is carried out remotely and salaries are preserved”</p> <p>(3) “The level of family income did not change in the context of the pandemic, as one of the family members was transferred to remote work with the same salary, and the other one works in an industry that was not affected by the pandemic”</p> <p>(4) “The level of family income in the first two weeks of self-isolation decreased by 30% (there was no additional income), but in May income stabilized due to easing of self-isolation measures and the implementation of remote work”</p> <p>(5) “... in the first week the income level dropped sharply ... The father had little work, and the mother was paid 2/3 of the salary”</p> <p>(6) “There is a clear decrease in income ... since wages were calculated according to the minimum wage, and not for the work done”</p> <p>(7) “One of the parents lost his job during the pandemic ... , the level of the family income decreased by 20% during the entire period, and there was no job to raise the family's income”</p> <p>(8) “Father did not go to work on every shift ... On some shifts he and other workers were “turned back” without maintenance”</p> <p>(9) “Against the background of general panic orders were few, and, accordingly, parental income was also reducing”</p> <p>(10) “My family's sole income business suffered. My parents are both involved in tourism, air travel”</p> <p>(11) “The level of income reduced due to the lack of people in clinics. Later, income rose by 10%, as medical workers began to get extra pay for work in difficult epidemiological conditions”</p>	<ul style="list-style-type: none"> • no changes in employment and working conditions • stable remote work • transition to remote work • a sharp cut in salaries in the first weeks • decreasing income due to job loss • decreasing income due to business contraction • reductions in income due to forced absenteeism without maintenance • maintaining income levels due to government payments

(continued)

Table 65.1 (continued)

Examples of narratives	Semantic interpretations
<p><i>Economic well-being</i></p> <p>(1) “The level of family economic well-being, I would say, it decreased, since every year at this time our income was twice bigger”</p> <p>(2) “The level of family economic well-being remained unchanged. The family has assets that saved us from panic in a crisis situation”</p> <p>(3) “The family’s income quickly dropped to absolute zero. But my parents, as very prudent people, have been saving money for years for the so-called “airbag” in case of an emergency”</p> <p>(4) “The reason for the changes … is in sending one of the family members on unpaid leave and transition of the other one to remote work”</p> <p>(5) “At the moment, we do not have the same income as we had before the quarantine, but we are trying to return to it. And everyone began to work harder to make it”</p> <p>(6) “The level of family economic well-being, on average, remained unchanged, since our family had savings “for a rainy day,” and my mother continued to receive a salary”</p> <p>(7) “Parents’ salaries in the beginning of the quarantine drastically reduced and parents were unsettled but in the following weeks our family adjusted to new rhythm of life. We became more economical, and the cuts became less noticeable.”</p> <p>(8) “Economic prosperity deteriorated at the beginning, but then we began to spend money more economically.”</p> <p>(9) “At first, the family experienced a little panic due to the pandemic and lower incomes, although in general there were no big economic difficulties. A little later, the panic went away, we realized how to properly distribute current income.”</p> <p>(10) “The lack of funds was not particularly felt. Mother received state maintenance for an under three years old child and unemployment payments. That was an additional family income.”</p>	<ul style="list-style-type: none"> • lowering the total level compared to the previous period • decreasing level due to forced unpaid leave • decline in level due to transition to remote work • level remained the same due to additional financial assets • level remains the same due to savings (“airbag,” savings “for a rainy day”) • maintaining of the level by reducing costs and streamlining current income • maintaining of the level due to state support
<p><i>Psychosocial well-being</i></p>	(continued)

Table 65.1 (continued)

Examples of narratives	Semantic interpretations
(1) “The fact that you have to be at home almost all the time and you cannot go to parks, theatres, cinema, etc. exerts psychological pressure”	• decrease in level due to restrictions on free movements
(2) “The difficulty was that the family is large. It is difficult to do your usual things in that kind of environment... there were a slight fear and anxiety”	• reduction of social contacts • panic in society
(3) “When the virus began to spread, most people start panicking. All the media kept repeating how dangerous it was and that you have to stay at home”	• constantly be with family • living in uncertainty
(4) “At first it was pretty much fun for us to spend a lot of time together but then we clearly became “an eyesore” to each other”	• facing previously unknown situation • worries about health of relatives and friends
(5) “...in the early days of quarantine, everyone was interested in staying at home. Family conversations over tea ... But then it got bored”	• increasing of the burden of housekeeping and childcare
(6) “Psychological discomfort, “tiredness” of being at home all the time, impossibility of meeting friends or colleagues, lack of walks”	• rise of the level due to the opportunity to spend more time with the family, to overcome difficulties together and to increase the coherence of family members
(7) “In the middle of the quarantine, the level of well-being decreased, as it was not clear when the quarantine would end at all, and how to keep yourself busy at home in conditions of self-isolation”	
(8) “The level of social and psychological well-being decreases, as diseases occur near by our family”	
(9) “A small child was getting a lot of homework. It was taking a lot of time, and it was needed to explain the material that the teacher should explain. There is not enough movement in life. I want it all to end as soon as possible, and life would return to the rhythm familiar to everyone”	
(10) “Parents take sedatives in order to bring their [psychological] state just closer to normal, since each of them is very worried about what will happen in the near future and about the fact that they need to provide for three children and at the same time help elderly relatives in conditions of pandemic”	
(11) “Difficult to work and study remotely, to be constantly together, worrying about the health of the family and loved ones”	
(12) “My family faced a lack of money in the past so psychologically it is little dependent on the income component and is in high spirits”	

for young people. In addition, the reliability of the research results is ensured by quasi-quantitative approach.

It should also be pointed out that the period under study falls on the so-called first wave of morbidity in the region. The onset of the second wave is predicted in the autumn months, which determines the timing of the next stage of the monitoring study.

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Chapter 66

Research of Motivation to Professional Activity of Students of Technical and Pedagogical Universities Using the Method of Repertory Grids



T. A. Bulavkina, G. A. Neklyudova, and E. S. Evtukh

Abstract Constructs that students get from their life experience are revealed with the method of repertory grids. This helps finding traces that are shaped by all formative impacts and to understand what became a part of a student's personality.

66.1 Introduction

66.1.1 About Forming Student Personality as a Professional

Higher technical education is not just one of the most powerful systems of personal cultural development, it is also necessary for technical, economical, political and humanitarian potential development of modern society. Unfortunately, modern universities do not seek to teach their students professional culture, because such educational goals are not specific enough. Our days professional culture training is replaced by more specific educational tasks, like doing calculation works, term papers, graduation works etc. However, learning of professional culture by modern students is impossible only with textbooks, toolkits, Internet, distance education and practical tasks. It is necessary for students to learn new information, concepts, meanings on deeper levels, to make them important for students, so that restructuring of personal meanings in relation to profession took place.

In order for new, “messages”, concepts, meanings, unfamiliar to a student, to turn into “internal speech” of a student and for restructuring of the system of personal

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meanings in relation to the profession, education is also necessary. Cognitive component dynamics of sociocultural experience of individual in context of technical universities younger students has been little studied yet. Personal meaningful concepts change with new experience gained, which is a personal cultural experience [1].

Creation of new constructs by a person indicates that new personally meaningful concepts are built and such concepts are beyond old worldview frames of individual. Refusal of new experience and ignoring of new reality do not lead to appearing of new constructs, and so expected professional culture or desire to master it are not formed. Students would rethink the system of personal attitude to various aspects of life, including their future profession and educational activities at the university.

66.2 Research Goals

Goal of the research is revealing dynamics of personal professional motivation of younger university students as a subjective cognitive model of their sociocultural experience.

66.2.1 *Research Methods*

The main methods of this study are repertory grids method and mathematical statistics method.

Repertory grids, devised by George Kelly, show how an individual builds their own attitude to the world and how personality develops in cultural environment. It is really important that constructs are not taken externally, they are created by people themselves and are defined individually [2–5]. Twenty repertory roles in a grid were gathered to define constructs, connected with educational and professional activities. Every student created 20 bipolar constructs.

“Construct” is the term taken from the repertory grid theory, showing any side of reality and personal understanding of it. Constructs are created from personal experience of individual and help understand traces that are shaped by all formative impacts and what became a part of a human’s personality. Both objective and subjective elements of professional activity have personal variability. System of constructs of every individual is stable enough. Representativeness, repeatability and validity of found constructs have been tested and confirmed by a number of scientific works [4, 5].

Individual constructs allow to define self-organization of personality and understand what place elements of professionalism take in this structure. 2005s year students of Bryansk State Engineering and Technological Academy and Bryansk State Technical University were examined with the repertory grids method. We got 4100 constructs. Most of them were gathered from technical universities students and

820 constructs were from 41 students of faculty of Physical Education (pedagogical university). All repertory grids underwent mathematical and statistical processing.

$n_t = 56$ students (1120 constructs in 2000 year)

$n_t = 33$ students (660 constructs in 2011)

$n_t = 57$ students (1140 constructs in 2013)

$n_t = 59$ students (1180 constructs in 2018)

$n_p = 41$ students (820 constructs in 2018)

“t” is for technical university “p” is for pedagogical.

We used the following exploratory analysis method for gathered data: simple correspondence analysis. Constructs of students were grouped into three categories: educational, professional and personal. Constructs were category indicators (measured by nominal scale). Credibility of differences in unrelated samples was calculated with chi-square. Trend lines were defined from the perspective of relative frequencies of student number that had various constructs.

66.2.2 Results of Research

The analysis of correspondences for created constructs (focused on educational, professional and personal characteristics) allowed us to identify similarities and differences in perception of both the system of educational and professional activities and personal characteristics. Frequency contingency table was processed with multidimensional statistical scaling (STATISTICA package). Correspondence analysis method looks like factor analysis method, therefore we could group categories of students and categories of their constructs. The vertical axis was described by such attributes as “educational and professional” and characterized the importance of relations to student life, higher education, student life, study, research activities, future professional activities, mental outlook, and specific subject interests. The horizontal axis was described by personal characteristics.

It was discovered that personal interests (intelligence, behavior, character, etc.) were more important for students of technical university than for students of pedagogical university. Students of both universities were equally interested in educational and professional sphere.

For second-year students, the concept of success, both material and career, in various fields of activity is significant, and they paid a lot of attention to gender identification.

It was found that, in general, for all students that took part in the research, semantic constructs related to personal characteristics are close to each other, and these categories differ from semantic constructs related to educational and professional activities.

In turn, frequency response of their semantic statements (constructs) in the three aforementioned areas showed that male students of technical university were much

Table 66.1 Percentage of students with educational and professional cognitive constructs by year

Content of cognitive constructs	1999–2000	2010–2011	2013–2014	2018–2019
Attitude to education	16	67.5	39	89.7
Value of higher education	7.5	25.6	23.4	27.6
Value of student life	33.6	95.6	68.8	20.7
Interest to learning	43	13.9	19.5	51.7
Value of intellect	61.2	25	29.9	69.0
To love your job	11.2	14	10.4	13.8
To have a job	35.5	18.6	36.4	44.8
Professionalism, availability of relevant knowledge and skills	20.6	83.7	39	55.2
To make success (material and career)	33.6	12.3	15.5	65.5

closer to male students of pedagogical university than to female students of technical university.

Table 66.1 shows ten most typical positive poles of created constructs and relative frequency with which they occur in students.

The analysis revealed that educational and professional constructs were completely absent in 3.7% of the 1st-year students, and 2.5% of 2nd-year students, who were subsequently expelled (during 3rd and 4th years) for underachievement. Indifference to study was shown in individual constructs of 9.3% of second-year students.

Value of higher education for modern students has significantly increased ($p \leq 0.05$, according to the chi-square criterion) compared to their peers in 2000. So, in 2000 constructs reflecting the value of higher education were found in 7.5% replies of students, in 2010–11 in 25.6%, in 2013–14 in 23.4%, in 2018–19 in 27.6%. Drawing a logarithmic trend line ($y = 6.848 \ln(X) + 7.5769$) $R^2 = 0.977$ suggests further increase of higher education importance for the students of technical universities. Individual content of constructs slightly changed: the construct “to have a higher education—not to have a higher education” was the most popular among students in 2000, in 2018 there were more constructs with a positive pole like “striving to be the best”, “studying at ... (any specific University)”, “getting technical education”, etc.

Students are a prestigious social group, and student life was attractive to 95.6% of young people in 2010–11. Nowadays this attractiveness of student life began to decline and remains attractive to 20.7% of all students (as of 2018–19).

Significance of student life has also undergone big change. Student life was important, it was reflected in personal constructs, for 33.6% of students in 2000, and in 2011, and this number increased to 95.6%. By 2014 this number fell to 68.8% and continued to decline to 20.7% by 2018.

The analysis of the polynomial trend line of student life value ($y = -0.9002 \times 2 + 16,213x + 18,794$) with the credibility value of the approximation $R^2 = 0.9619$ shows decrease in significance of this parameter after overcoming the economic crisis

of 2008 in our country. We can assume that the crisis caused by coronavirus will lead to increase of student life value among young people.

The aspiration towards higher education or student life, according to Rayevsky (1985), do not provide any psychological basis for the development of a full-fledged educational and professional activity in absence of deeper educational and professional interests.

Frequency characteristics obtained from the detected constructs indicated that in 2018, students significantly increased their interest in gaining knowledge compared to both 2011 and 2014 ($p \leq 0.05$, according to chi-square criterion). The resulting polynomial trend line ($y = 0.491 \times 2 - 8.8179x + 51.337$) with the approximation credibility value $R^2 = 0.9999$ indicated that during the period of the highest growth of importance of student life, interest in gaining knowledge was minimal, although this is a specific and most familiar activity for students. Conversely, when importance of student life was declining, interest in learning was growing. In 2018, 51.7% of students created their constructs with similar content.

Currently, the most significant interest for students is gaining knowledge, and not just interest to the process of studying. The exponential trend line shows an increase in the number of students who created constructs that indicate their serious attitude to study ($y = 15.492e^{0.0973x}$) with an approximation credibility value $R^2 = 0.8367$.

Unfortunately, constructs reflecting the attitude to scientific activity are quite rare among students of technical universities. In 2018 there were 2.1% of students with such constructs, in 2000 there were 1.9% of students with such constructs. In 2011 and 2014, there were no such constructs in repertory grids.

In general, the constructs of future professional activity in the structure of personality of second-year students are represented in a smaller volume than the educational ones. This is understandable, because the meaning of professional activity is considered potential, and the meaning of educational activity is real. Among the constructs assigned to this block, there were more common constructs of a general nature, such as "to be a qualified specialist—not to be a qualified specialist". Creation of such constructs reflects a real, rather vague, idea of students about their future profession. Specific constructs related to professional activity, for example, "to be a good construction worker—not to be a good construction worker", were found only in isolated cases, and, as a rule, they were created by students who had practical experience in their chosen field. There were no constructs that reflect prestige of engineering in one form or another. In 2018, professionalism was significant for 55.2% of students.

The correspondence analysis shows that constructs reflecting professionalism are associated with constructs that reflect the desire to achieve success and with constructs that reflect such personal characteristics as hard work and importance of intelligence. Minimum values for the number of students using "striving to succeed" construct relate to 2008 crisis period (the polynomial trend line $y = 0.611 \times 2 - 9.785x + 42.982$, with the approximation credibility value $R^2 = 0.9876$). There is a similar situation observed with such personal construct as "hard work": (the polynomial trend line $y = 0.3987 \times 2 - 4.8381x + 22.66$, with the approximation

confidence value $R^2 = 0.9835$). But the “love your job” construct is only found in about a tenth of students.

The significance of intelligence matters for 65% of students in 2018. During 2011 and 2014 crises, intelligence was significantly less important for students of technical universities.

66.3 Summary

Emerging economic and social crises leave their mark on the attitude of students to their study and profession. During the research period, we noted growth of higher education value, more positive attitude to educational process and stronger desire to become a professional, but the value of student life reduced. Constructs that reflect the value of the engineering profession were only created by one in six students. It is important to conduct educational work on forming the professional culture and motivation for chosen profession among students.

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Chapter 67

Metric Approach to Enterprise Personnel Management



O. V. Milekhina

Abstract Analysis of the functionality of modern HR management software shows that some modern systems have automated both individual management functions and entire areas of activity using artificial intelligence. At the same time, it was found that the results of system research can simplify the solution of personnel management problems. In this article, a mathematical model of the personnel structure based on the Pareto power distribution is proposed. This allowed us to introduce an objective characteristic of the management quality, namely an integral coefficient of the use of human resources at the enterprise. Its application allows to support the transition to modern payment systems, to develop professional and digital competencies of personnel management services and to ensure the successful operation of the enterprise in the long term.

67.1 Introduction

The successful operation of an enterprise depends on the basic principles of forming and on implementing the personnel management policy. To achieve the best results in this direction, a whole palette of programs was developed. Domestic and foreign developers offer:

- software for automating individual personnel management functions including 1C:Solutions [1], Boss-HR manager [2], Cadre system [3], E-Staff Recruiter [4], Oracle: HRMS [5], ALFA hrms [6], Galaxy Corporation: personnel management and HR policy [7], INEC Personnel [8, 9], Parus: Frames [10], HackerRank [11], Pymetrics [12], Self Management Group [13];
- software for automating certain types of activities, e.g., recruiting such as Greenhouse [14], SAP SuccessFactors [15], iCIMS [16], Jobvite [17], Lever [18], SmartRecruiters [19], Breezy HR [20], and Ideal [21], Textio [22], Zoom.ai [23], Bullhorn [24] which use artificial intelligence algorithms.

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Despite a diverse offer of software, the most common product on the software market in Russia is 1C: Salary and personnel management [25]. For example, 1C: ZUP version 8.0 allows to support all the basic processes of personnel management, including personnel accounting and calculating remuneration, for government and commercial organizations. At the same time, new software solutions that meet the customer's requirements are usually composed from standard design solutions and algorithms for solving a specific problem, which are available for the developer. System research achievements can improve the solution of personnel management tasks. Quantitative (metric) results allow to answer important questions that previously had no solution. For example, the qualitative property of complex systems "integrity" can be characterized by a single parameter, similar to the temperature of a living organism. If its numerical values of the parameter exceed the acceptable limits, the system's performance deteriorates dramatically. Quantitative regularity of this kind has been discovered in the last century in the economics and sociology of V. Pareto. Further study of complex systems of a different nature confirmed the fundamental character of his discovery. This regularity was found in a number of areas of science and technology and was called as Zipf's law [26–28] in linguistics and Bradford's law of scattering in computer science [29–34].

The company's team is the main system-forming factor. It ensures the stability of the work and development of the socioeconomic system as a whole. Therefore, monitoring system parameters should be one of the functions of HR management software.

The purpose of the article is to develop a mathematical model of employee compensation differentiation based on the Pareto distribution system metric of enterprise integrity.

67.2 Methodology

The statistical regularity established by V. Pareto in the study of income distribution can be obtained on the basis of a fairly simple mathematical model. Individual rewards cannot all be the same or all different. Obviously, there must be a division into groups, in each of which they are equal (within acceptable deviations) and are changing from group to group. Let n be the sample size and m_i be the quantitative composition of the group with the number (rank) i . Then,

$$n = \sum_{i=1}^r m_i, \text{ where } i = \overline{1, r}.$$

The possible number of options to divide the organization's employees into groups is equal to the number of combinations with repetitions:

$$C(m_1, m_2, \dots, m_r) = \frac{n!}{m_1! * m_2! * \dots * m_r!} = \frac{n!}{\prod_{i=1}^r m_i!} \quad (67.1)$$

To determine m_i , we use the maximum entropy principle. The uncertainty of choosing one option is:

$$\ln C(m_1, m_2, \dots, m_r) = \ln \frac{n!}{\prod_{i=1}^r m_i!} \quad (67.2)$$

(the choice of the base of logarithms in this case does not matter).

For a fixed n , the value $\ln C(m_1, m_2, \dots, m_r)$ reaches a maximum when the denominator (Eq. 67.2) is minimal. However, direct minimization $\prod_{i=1}^r m_i!$ would lead to a trivial result $m_1 = m_2 \dots = m_n = 1$. To solve this problem correctly, we must take into account that the function m_i either increases or decreases; i.e., it is strictly monotonous, with increasing i . Therefore, the inverse function $i_m = m_i^{(-1)}$ will be the same. Thus, the complete set of partition options is defined by the product:

$$\varphi = \prod_{i=1}^r m_i! \prod_{i_m=1}^r i_m!.$$

Let us replace φ with an equivalent expression

$$\ln \varphi = \sum_{i=1}^r \ln m_i! + \sum_{i_m=1}^r \ln i_m!,$$

which has an extremum at the same point as (Eq. 67.2). Applying the Stirling formula to the factorials:

$$\ln k! = k \ln k - k,$$

where k is an integer, we get an expression of the form:

$$\ln \varphi = \sum_{i=1}^r m_i \ln m_i - \sum_{i=1}^r m_i + \sum_{i_m=1}^r i_m \ln i_m - \sum_{i_m=1}^r i_m$$

provided that

$$n = \sum_{i=1}^r m_i.$$

To minimize $\ln \varphi$, we use the method of undefined Lagrange multipliers:

$$F = \sum_{i=1}^r m_i \ln m_i - \sum_{i=1}^r m_i + \sum_{i_m}^r i_m \ln i_m - \sum_{i_m=1}^r i_m - \left(\sum_{i=1}^r m_i - n \right),$$

where λ is to be determined.

The solution of the equation $F_{m_i} = 0$ gives

$$m_i = \frac{n}{i_m \sum_{i=1}^r \frac{1}{i}}, i = \overline{1, r} \quad (67.3)$$

Dividing both parts (Eq. 67.3) by n , we introduce the probability:

$$p_i = \frac{m_i}{n} = \frac{c}{i}, i = \overline{1, r}. \quad (67.4)$$

Here, $c = \sum_{i=1}^r \frac{1}{i}$ is the normalizing factor. The index m_i in i_{m_i} is omitted because of a one-to-one correspondence of the forward and reverse functions m_i and i_m . The probability distribution (Eq. 67.4) is Pareto's law (Pareto distribution).

It is known [35] that the mathematical expectation for the sum $n = \sum_{i=1}^r m_i$ is equal to:

$$M(n) = \bar{n} = r \sum_{i=1}^r \frac{1}{i}, \quad (67.5)$$

and its variance is equal to:

$$D(n) = \frac{\pi^2 r^2}{6} \quad (67.6)$$

A more general approach to the relations m_i and i_m leads to a more general result, namely a power-law Pareto distribution. As it was shown by Schroeder [36]:

$$p_i = \frac{c_i}{i^\alpha}, i = \overline{1, r}, \quad (67.7)$$

where $0 < \alpha \leq 1$. Therefore, the distribution (Eq. 67.4) is a special case of Eq. 67.7 when $\alpha = 1$. In this case, the mathematical expectation expression $n = \sum_{i=1}^r m_i$ similar to Eq. 67.5:

$$M_\alpha(n) = \bar{n} = r \sum_{i=1}^r \frac{1}{i^\alpha}. \quad (67.8)$$

V. Pareto has obtained a result based on large samples. As shown below, it remains true even for the number of medium-sized organizations. Expression (Eq. 67.5)

depends only on r and gives the smallest value of the complete set of representatives of all groups (qualifications), at which the distribution p_i is still valid.

For $r = 6$, according to Eq. 67.5 we get $n \approx 15$. For a much larger number of N , so that $\frac{N}{15} = l \gg 1$, the formulas (Eq. 67.5) and (Eq. 67.6) in accordance with the addition theorems of mathematical expectations and variances will take the form [37]:

$$M(N) = lr \sum_{i=1}^r \frac{1}{i} \text{ and } D(N) = \frac{\pi^2 r^2}{6l^2}, \quad (67.9)$$

and the formula (Eq. 67.8), respectively,

$$M_{(\alpha)}(N) = lr \sum_{i=1}^r \frac{1}{i^\alpha} \text{ and } D(N) = \frac{\pi^2 r^2}{6l^2}, \quad (67.10)$$

Therefore, the coefficient of variation $M(N)$ for $r = 6$ will be equal to:

$$\delta = \frac{\sqrt{D(N)}}{M(N)} = \frac{\pi}{\sqrt{6l} * \sum_{i=1}^6 \frac{1}{i}} = \frac{1.28}{\sqrt{6l}}.$$

Thus, the larger the number of employees in an organization, the lower the coefficient of variation. For $N = 1000$, for example, $l = \frac{1000}{15} = 66.7$, $\delta = 6\%$.

All the above given arguments about the distribution of groups by relative numbers can be applied for a similar distribution by their relative rewards. If s_i denotes the reward of the group (rank) of number i , and $S = \sum_{i=1}^r s_i$ the corresponding sum for the entire sample, then by analogy with Eq. 67.4 we get:

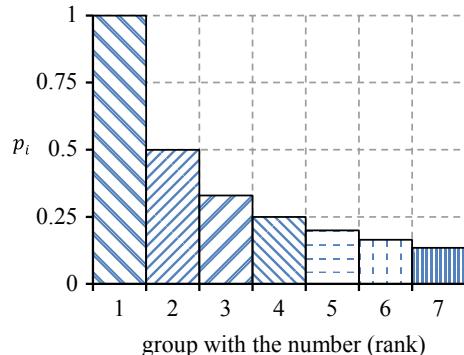
$$p'_i = \frac{s_i}{S} = \frac{c'}{r - i}$$

The graph $p_i = \frac{c}{i}$, which is called as the “hyperbolic ladder,” is shown in Fig. 67.1. Distinguishing between the values of p_i for $i > 6$ is visually difficult, so let us make a number of relations:

$$\frac{p_1}{p_2} = 2; \frac{p_2}{p_3} = 1.5; \frac{p_3}{p_4} = 1.32; \frac{p_4}{p_5} = 1.25; \frac{p_5}{p_6} = 1.17; \frac{p_6}{p_7} = 1.14; \frac{p_7}{p_8} = 1.13 \text{ etc.}$$

Add it with the difference $\Delta p_i = \frac{c}{i} - \frac{c}{i+1} \approx \frac{c}{i^2}$ for $i > 7$. From these relationships, it is clear why V. Pareto found only six groups (social strata) of the economically active population: At $i > 6$, their division by income practically disappears, and with the growing i , it decreases inversely with i^2 .

Of particular interest is the interpretation of the i —number (rank) of social strata, according to which they are formed. It is obvious that i does not depend on the profession (there are many hundreds of them), type of activity, etc. This indicator

Fig. 67.1 Hyperbolic ladder

allows for the only interpretation; i.e., it can be the ordinal number of the level of education in any field of science and technology, the ordinal number of the level of qualification (category) in working professions, etc. There are indeed six such levels, for example: (1) primary education; (2) incomplete secondary education; (3) secondary education; (4) higher education in any field of science and technology; (5) first academic degree (candidate of science); and (6) second academic degree (doctor of science). There may be variations in the names and plus or minus one or two in the number, but not in the principle of building the system. Similarly, the discharge grids of working professions, especially in metalworking and mechanical engineering, also have six levels.

A century ago, when V. Pareto carried out his research, the actual level of professionalism in one or another kind of activity was recorded in the same way as at present. This automatically follows from the property of rank distributions shown above in the mathematical model. Therefore, regarding the size of the steps of the “hyperbolic ladder,” this is a recognition of the objective nature of this approach to the stratification of professions and activities.

The Pareto distribution is called as equilibrium one, because it is evidence of public agreement about its social justice. In particular, the maximum excess of income in the social stratum of the first rank with respect to the income of the sixth rank $\frac{p_1}{p_6} = 6$ is recognized as normal by economists and sociologists.

Let us return to the consideration of expressions (Eq. 67.5) and (Eq. 67.8). Since $0 < \alpha \leq 1$, with the exception of $\alpha = 1$, the inequalities $\frac{1}{i} < \frac{1}{i^\alpha}$ and $\sum_{i=1}^r \frac{1}{i} < \sum_{i=1}^r \frac{1}{i^\alpha}$ must be fulfilled, and therefore, $M(n) < M(n_\alpha)$. The estimated number of personnel is minimal at $\alpha = 1$ and increases with decreasing this parameter. This circumstance gives grounds for the introduction of the coefficient of use of the enterprise’s human resources, which is defined as

$$K_{\text{use}} = \frac{M(n)}{M(n_\alpha)} = \frac{\sum_{i=1}^6 \frac{1}{i}}{\sum_{i=1}^6 \frac{1}{i^\alpha}} = \frac{2,45}{\sum_{i=1}^6 \frac{1}{i^\alpha}}. \quad (67.11)$$

The effect of α on this characteristic is shown in Table 67.1.

Table 67.1 Calculated coefficients of using the company's human resources

α	p_1	p_2	p_3	p_4	p_5	p_6	$\sum_{i=1}^6 \frac{1}{i^\alpha}$	K_{use}
1	0.408	0.20	0.13	0.10	0.08	0.068	2,450	1.00
0.8	0.353	0.20	0.15	0.12	0.11	0.080	2,625	0.86
0.6	0.300	0.20	0.15	0.13	0.11	0.100	3,330	0.74
0.4	0.250	0.19	0.16	0.14	0.13	0.122	3,980	0.62

For $\alpha = 1$, the ratio of the maximum remuneration to the minimal one is $\frac{p_1}{p_6} = \frac{0.408}{0.068} = 6$, and the human resource utilization coefficient is $K_{\text{use}} = 1$. For $\alpha = 0.4$, the corresponding ratio is $\frac{p_1}{p_6} = \frac{0.25}{0.122} = 2$, and $K_{\text{use}} = 0.62$. The continuation of that table for smaller values of α does not make sense.

The presented conclusions are made for the enterprise as a whole; i.e., the “hyperbolic ladder” refers to the personnel of the entire enterprise and not to individual structural divisions. Extremely high values of K_{use} can be violated by external economic reasons, natural staff turnover, etc. To restore the personnel proportions dictated by the requirements of equilibrium p_i , time and a purposeful policy in the field of personnel management are needed. Therefore, the average value K_{use} over a fairly long period of time will be less than one. The lack of statistics for this approach can be compensated by the known experience of other production systems. It is known, for example, that the average resource utilization rate does not exceed 0.62 (the so-called golden ratio). This is the value of K_{use} in our case for $\alpha = 0.4$. Therefore, we can assume that the minimum allowed value is $\alpha = 0.5$ and the corresponding value is $K_{\text{use}} = 0.68$.

67.3 Conclusion

The most important and distinctive feature of any team is its organic integrity. This intuitive, but formally almost undefined property can be characterized by one critical parameter, namely by the degree indicator α in the Pareto power distribution $p_i = \frac{c}{i^\alpha}$.

When $\alpha = 1$, this distribution has an extreme property which means that the estimated number of staff according to the staffing table is minimal. In particular, the ratio of the maximum and the minimum is $\frac{p_1}{p_6} = 6$. Reducing α , for example, to $\alpha = 0.4$ leads to the fact that this ratio becomes $\frac{p_1}{p_6} = 2$, and the number of staff increases by $\frac{1}{0.62} = 1.61$ times. A further drop in the value of this parameter can lead to complete degradation of the enterprise.

The calculation of the coefficient of use of human resources of the enterprise is performed using a formula similar to (Eq. 67.11). To do this, one should introduce the actual probability p_{fi} , which is obtained when registering a real “hyperbolic ladder” of the entire enterprise as a whole.

$$K_{\text{use}} = \frac{2,45}{\sum_{i=1}^6 \frac{1}{p_{f_i}}},$$

Practical monitoring of this indicator can be organized without significant costs on the basis of accumulated and stored enterprise data and standard software tools for statistical data analysis.

In conclusion, we note that the proposed mathematical model

- supports the introduction of modern remuneration systems, such as grading systems. The specifics of such remuneration systems allow creating a ranking system for the entire enterprise based on the value and importance of a particular workplace for the enterprise [38–41], increasing staff motivation and ensuring the survival and success of the enterprise in the long term;
- allows to develop professional and digital competencies of personnel management services employees;
- ensures the successful operation of the enterprise in the long term based on the implementation of an effective personnel management policy.

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Chapter 68

Method of Multi-criteria Evaluation of the Product Range



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Abstract The article presents a theoretical and methodological justification for the need to take into account a variety of criteria when evaluating the product range of an enterprise. Modern markets are characterized by an increase in the variety of products and brands, a shortened product life cycle, improved information access to consumers of goods, as well as increased influence of large retail operators in the supply chain and changing consumer behavior. An important aspect that requires a transformation of approaches to managing the product range is enterprises' worsening financial situation as a result of the economic crisis, including the one caused by the coronavirus pandemic. In addition, it is necessary to take into account the permanent restrictions on the activities of companies, including the industry specifics of their operation. Existing methods for evaluating the product range usually use one of the following criteria: contribution to turnover, sales variability, customer perception of value, and the growth rate of demand. At the same time, market realities are such that it is necessary to combine several evaluation criteria at once and take into account the priorities of both the manufacturer and the consumer of products. In the proposed methodology, each product name is subject to a comprehensive assessment in terms of its contribution to sales volume, sales variation, profitability, perceived uniqueness, and relative price. The rating method is used as the basic assessment tool. The method is universal and can be used by enterprises of different industries and fields of activity. If necessary, you can add additional evaluation criteria to it. Testing the proposed method in the confectionery industry and its comparison with the traditional ABC-XYZ analysis confirmed the possibility of obtaining more accurate conclusions based on it, allowing you to make more informed management decisions in terms of managing the product range.

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68.1 Introduction

With the development of technology, better consumer knowledge, and higher expenditures on innovation in the budget of buyers, providing an effective range is becoming increasingly difficult for enterprises. At the same time, the characteristic of the effectiveness of the product range is not limited only to ensuring coverage of economic costs and achieving profit indicators. It is more complex and depends on a number of factors that need to be taken into account when forming production programs at industrial enterprises and when managing sales in trade and services. The product range of a manufacturing enterprise must ensure full employment, financial stability and solvency, achieve the corporate and functional goals of the organization, as well as fulfill the tasks of fully meeting the needs of customers and maintaining and developing a competitive position.

68.2 Theoretical Justification of the Problem

68.2.1 *Relevance of the Development of the Methodological Apparatus for Evaluating the Product Range*

The relevance of the development of methodological provisions for evaluating the product range is due to changing business conditions. In particular, the following trends can be identified most clearly:

1. More products that are associated with intra-company product competition, and leads to the so-called commodity cannibalism.
2. Hyperfragmentation of markets, which is manifested in an increase in the variety of products, which leads to the need to find more and more segments and niches in the market. There is a tendency to individualize products and reduce the return on investment in further market segmentation.
3. More brands [1] against the background of an increase in the concentration of markets (respectively, a decrease in the number of competitors). In addition, there is an increase in the number of varieties within product categories, which is already close to the saturation point.
4. Higher concentration in distribution and marketing of consumer goods. According to the RBC News Agency, at the beginning of 2019, 700 of the largest FMCG retail chains in Russia formed more than 56% of the retail food trade turnover [2]. In this regard, the need to take into account the requirements of sales channels when forming the assortment increases and the importance of having distinctive properties that are advantageous from the point of view of ensuring competitiveness in goods increases.
5. Transformation of consumer behavior as a result of the coronavirus pandemic, which is manifested in changes in the usual shopping cart, an emerging

trend in domestic consumption and the developing “DIY” segment, new more sustainable shopping, and the revaluation of the perception of the value of the goods.

6. A shorter product life cycle due to less stability of consumer preferences, reducing production technological complexity of new products and a spreading strategic method of selecting market share from existing brands by introducing new brands to the market.
7. In the markets of durable goods, the cost of repairing products is close to the cost of replacing them: products do not last as long as before. If a device breaks down, it is usually easier to replace it with a newer model than to fix it.
8. The spread of digital technologies, which leads to the emergence of a range of new products, the transformation of simple products, and the increasing use of the principle of customization in the product policy of companies.

The reasons for the development of the range are considered to be the need to meet changing demand [3], the possibility of obtaining network effects [4]. This may also be due to the desire to bring product lines in line with the current challenges of the economy. For example, the knowledge economy affects the processes of updating the product range [5].

68.2.2 Argumentation of Product Range Evaluation Criteria

The aspects requiring consideration in the formation of range and assessing its viability in different studies are: cost and production cost [6], specific features of the organization of the supply chain [7], plans to change the technology of production [8], compliance with the performance standards [9], the effect of brand strength [10], the speed of commercialization of the introduced product line units [11], customer value, customer satisfaction and stage of the product life cycle [12], the objectives and strategy of the product line in general [13], the structure of the distribution channel, possible implementation strategies targeting potential of differentiation [14].

Argouslidis and Baltas noted that the decisions concerning changes in the range must be strictly formalized and take into account the overall strategy of the company, the length of the product line, the market challenges, the management's view of the changes, the regulatory context and the level of technological change [15]. Assortment decisions are usually about finding a compromise between growth and profitability. They should harmonize the company's strategic objectives [16].

An important aspect of the formation and evaluation of the product range at the enterprise is the restrictions imposed by industry characteristics and the level of business (local, national, global). So, in particular, for enterprises in the confectionery industry operating at the regional level, researchers [17–23] identify internal and external restrictions. Among the internal constraints there are:

- (1) resource constraints associated, first, with the need to maintain a constant number of highly qualified personnel due to the narrow special training and lack

of such personnel at the regional level. Secondly, production lines are designed to produce a sufficiently large volume of products, so the expansion of production volumes and the acquisition of new lines should be justified, both from the resource point of view and from the market point of view. Third, minimum batches of raw materials and components for the confectionery industry are usually designed for the production of relatively large trial batches, so there are restrictions associated with the release of new products. On the one hand, the market encourages confectionery enterprises to produce new assortment units, and on the other hand, their production requires a significant diversion of resources, including financial ones;

- (2) the nature of the supply. The quantitative and structural composition of the product range is formed considering the availability of resources for the production of products, so the supply model used (fixed size or fixed frequency), the growth rate of prices for raw materials play an important role in the formation of the product range;
- (3) the richness of the range of confectionery enterprises is associated with the desire to attract customers to products. The considerable breadth and depth of the assortment set the task for the confectionery industry enterprises to harmonize production programs not only in terms of technology, but also in terms of consumer aspects;
- (4) certification requirements should also be considered in product development in terms of additional time required for this procedure;
- (5) the material intensity of confectionery production affects the flexibility of enterprises in the market, their ability to reorient to new orders, since the purchase of raw materials for the production of unplanned products diverts additional workers and makes the order execution time longer;
- (6) different types of confectionery products have different profitability. In general, the profitability of sugar products in the confectionery industry is 1.5–2 times higher than the profitability of flour products. At the same time, the structure of flour confectionery products includes socially oriented products and more cost-effective options. Their number in the assortment portfolio should be sufficient to ensure the required profitability of the enterprise;
- (7) the availability of warehouse space is a significant factor in planning the volume and structure of production, since the confectionery industry often faces fluctuations in demand, and the ability to accumulate stocks of finished products and raw materials to ensure the stability of production and supply of products is extremely important.

External restrictions that apply to the formation of the product range for the confectionery industry include:

- (1) the level of competition in the sales market. Enterprises in the confectionery industry, as a rule, occupy a leading position in the local market. When entering markets in other regions, they must take into account the level of competition and calculate production volumes based on growth prospects, both in local and regional markets (by regional markets, we mean sales markets in regions

- other than the “parent” region). Prospects for sales development in the market depend on the activity of competitors, on how much their products are liked by local consumers, and so on;
- (2) customer preferences determine the ability of an enterprise to sell its products. In the confectionery market, consumer preferences are related to taste characteristics, motivation for healthy eating, and the desire to try new things. In addition, each direction of the confectionery industry has its own product structure of production, and the market has its own product structure of consumption. The closer the production orientation and customer preferences are, the more guaranteed the projected sales volumes are and, consequently, the less risky the production program is;
 - (3) buyers' evaluations of the company's products act as restrictions in situations where the quality of confectionery products does not meet the requirements of the market. Therefore, it is necessary to conduct a systematic consumer examination of goods and consider its results during the development of a product range,
 - (4) the competitive position of the enterprise determines how much the enterprise is able to overcome the entry barriers in the industry. In the confectionery industry, the main barriers are the need to buy expensive equipment to ensure high sales volumes of products of stable quality, financial opportunities (relatively high working capital), marketing capital created through the promotion of trademarks, opportunities for innovative growth, which determine the ability of a manufacturer to create product innovations of a higher order than those of competitors;
 - (5) the stage of the demand life cycle should be taken into account when developing the production program in terms of the growth rate and volume of market demand, the type of consumer groups in the final consumption market. In addition, it is important for the confectionery industry to assess the life of assortment units and monitor market saturation in a timely manner in order to have time to offer new versions of confectionery products before the decline in demand for old ones begins to negatively affect the financial performance of the enterprise;
 - (6) the seasonality of demand. The pronounced seasonality of demand makes it necessary to form an assortment that will smooth out the “peaks” and declines in production volumes. At the same time, in conditions of stable demand, the dependence of the product structure on demand factors decreases;
 - (7) the elasticity of demand determines the ratio of quantitative and cost indicators of the production program. In case of elastic demand, higher selling prices can lead to a significant decrease in sales and revenue of the manufacturer. At the same time, inelastic demand allows for a more flexible approach to pricing, but requires compliance with schedules and high reliability of supply.

68.2.3 Statement of the Research Problem

In the conditions of transformation of the global, national and local market environment, enterprises need to form a product range taking into account current trends and restrictions. Consequently, the methodological apparatus for forming and evaluating the product range needs to be improved.

At the moment, the most widely used methods for evaluating the product range are the following:

- (1) methods that emphasize consumer perception of products. These include the approach proposed by French authors [24], which uses price and quality parameters to determine the optimal portfolio composition. At the same time, the product portfolio is divided into three levels (bottom, middle, top);
- (2) methods that take into account the contribution of the product line to revenue. In this group, we can distinguish the methods of ABC and XYZ analysis that takes into account, respectively, the size and stability of sales of each product name;
- (3) bubble graphs, which are based on the assessment of internal and external factors of product development. The famous BCG matrix, a matrix of “Risk versus Reward” model ADL/LC (Arthur D. Little, Life-Cycle), matrix “General Electric—McKinsey”, matrix “Technical novelty—Market novelty”, matrix “Ease vs Attractiveness”, etc. [25].

We emphasize that in the practice of Russian enterprises, ABC analysis is most often used, which is not always supplemented by XYZ analysis. At the same time, we note that the optimal product range of an enterprise is formed taking into account a number of balance factors, including the compatibility of products in terms of completeness of market segments coverage; the degree of management control and the type of policy of interaction with suppliers and customers; the stage of the life cycle; financial flows; the competitiveness of goods (divisions); resources needed to ensure the stable position of the corporation and to implement strategies for individual product areas; the probability of commercial and technological success of products. An integrated methodology is also needed to evaluate the product range, which must consider the above-mentioned economic challenges and existing internal and external constraints.

68.3 Methodological Tools of the Research

The rating method is proposed as the basis of the assortment evaluation method. Rating is a comprehensive assessment of the state of the subject, which uses a set of many indicators that are not always formalized. In other words, the rating method allows you to integrate indicators that have different units of measurement.

In the author's methodology, two groups of criteria are distinguished: those that are significant for the manufacturer of goods and for buyers. Among the criteria that are important for the manufacturer of goods, we have included:

- (1) contribution to sales volume (K1). To calculate it, the sales volume of the product name must be correlated with the total sales volume of the enterprise. This indicator reflects the degree of significance of a unit of product nomenclature in terms of market demand and capacity utilization. In order to implement the methodology, it is assumed that the product range is ranked in descending order of the contribution to sales.
- (2) Sales variation (K2). To determine it, it is necessary to correlate the standard deviation of quarterly sales of a product name with the average quarterly value of sales of a product name. The less variable the sales of a product unit, the easier the forecasting process and the lower the cost of switching to the production of other product names. In order to implement the methodology, it is assumed that the product range is ranked by increasing variation in sales.
- (3) Profitability (K3). The profitability indicator, estimated on the basis of comparing the profit and cost of a product name unit, indicates that the product is in demand on the market and that the company has unique competencies for its production. In order to implement the methodology, it is assumed that the product range is ranked in descending order of profitability.

The criteria that are important for the buyer in the proposed methodology are

- (1) Perceived uniqueness (K4), calculated as a quotient of the sum of ratings and the number of respondents. This criterion is used to determine the degree of perceived novelty of product properties. Estimates are obtained as a result of a survey of customers to identify similarities or differences between the company's product and its closest counterpart. For this purpose, the Likert scale is used, the extreme values of which are 1 (completely different) and 7 (very similar). In order to implement the methodology, it is assumed that the assortment range is ranked in descending order of perceived uniqueness.
- (2) the relative price (K5), which is estimated based on the correlation of the price of the product name of the range under study and the price of the competitor's analog. The more profitable the price of a product is for the buyer, the more attractive it becomes in the conditions of the decreasing purchasing power of buyers. In order to implement the method, it is assumed that the product range is ranked by increasing relative price.

Significant areas of assessment are formed on the basis of the criteria identified by us at the stage of theoretical justification. In accordance with each criterion, product units are ranked and based on averaging ratings for each, the position of each product in the company's assortment is determined from the point of view of the manufacturer and from the point of view of the buyer.

The resulting average ratings allow you to divide the product range into groups:

- (1) in terms of decreasing interest for the manufacturer: S (strong), M (middle), W (weak);

- (2) in terms of decreasing extraordinariness for the buyer: P (particular), O (ordinary), E (extortional).

68.4 Research Result

The proposed method was tested at a Russian confectionery enterprise located in the Belgorod region that sells its product both in there and other regions of Russia (mainly to the Urals) and abroad.

The results of the analysis are shown in Table 68.1.

According to the results of an ABC-XYZ-analysis of assortment, 20 products have the highest market and production potential, and the results of POE-SMW-analysis show only 5 products.

The proposed method is clarifying in relation to the ABC-XYZ classification. According to the above-mentioned example of a multi-criteria analysis of the assortment, the number of leading confectionary brands that are significant from the point of view of a definite future investment and development is two times less than in the traditional assessment. The proposed POE-SMW analysis identified “Russian patterns”, “Belgorochka” with sugar, “Shapito”, “Gemma” with orange filling, “Jubilee”, “Miracles in a sieve”, “Sugar”, “Blues Dessert”, “Blues Dawn”, “Blues White night”, “Blues Evening”, “Toplenochka”, “Strawberry”, “Leningrad”, “Blues cocktail”, “Belgorod motifs”, “Allegro” with apricot filling, “Italian” with cherry filling, “Fifty-fifty” with filling, “Fairy tales of childhood”. While per the conclusions of the ABC-XYZ analysis, in addition to the given list of names as the leading product positions (included in the AX, AY, BX, BY groups) the company adds such names as: “Our brand”, “Camila” in glaze (white decor), “Pal’chiki oblizhesh” in glaze (white decor), “Camila” in glaze (dark decor), “Sweet witch” (dark glaze), “Pal’chiki oblizhesh” in glaze in dark glaze, “Sweet witch” (white glaze), “Aroma melted milk”, “Condensed milk”, “Sugar”, “Zoological”, “Cream”, “Smeshinki”, “Fiji” with cranberry filling, “Magic wand” (white glaze), “Tidbit” in white glaze. Meanwhile, many of them have a negative customer rating.

68.5 Conclusion

The use of a method that uses a multi-criteria approach to evaluating the assortment allows for more careful consideration of the parameters of the internal environment of an industrial enterprise and the opinions of customers. The traditional method of analysis based on the use of grouping by ABC and XYZ classification can lead to erroneous management decisions, since it does not take into account the perception of products by customers. The consumer assessment component provides a long-term view of the market position of individual product names and should be taken into account in strategic planning. At the same time, excess resources that are mistakenly

Table 68.1 Analysis of the product range of Belogorye Confectionery factory, JSC

Name of goods	The values of the criteria					Criteria ranks					Group	
	K1	K2	K3	K4	K5	K	K2	K3	K4	K5	ABC-XYZ	POE-SMW
“Nasha marka”	0.017	0.11	0.06	6.2	0.98	23	7	41	52	10	AX	EM
“Kamila” in glaze (white decor)	0.027	0.14	0.14	4.1	1.05	14	19	16	37	34	AX	ES
“Pal’chiki oblizhesh” in glaze (white decor)	0.046	0.13	0.19	3.8	1.09	5	18	5	29	47	AX	ES
“Kamila” in glaze (dark decor)	0.019	0.16	0.19	3.8	1.09	21	26	5	29	47	AX	ES
“Sladkaya koldun’ya” (dark glaze)	0.029	0.12	0.19	4.1	1.09	12	12	5	37	47	AX	ES
“Pal’chiki oblizhesh” (dark glaze)	0.046	0.17	0.21	3.9	1.11	4	29	3	34	50	AX	ES
“Sladkaya koldun’ya” (white glaze)	0.028	0.10	0.18	4.3	1.09	13	5	8	41	45	AX	ES
“Aromat “Toplenoe moloko”	0.044	0.10	0.15	6.3	1.06	6	4	13	53	39	AX	ES
“Skazki detstva”	0.039	0.14	0.07	4.8	0.98	9	20	34	46	14	AX	OM
“Blyuz Belyaya noch”	0.018	0.13	0.15	2.2	1.06	22	17	13	6	39	AX	OS
“Blyuz Vecher”	0.023	0.12	0.18	2.3	1.09	17	13	8	7	45	AX	OS
“Toplenochka”	0.040	0.13	0.07	4.6	0.98	7	16	34	43	14	AX	OS
“Zemlyanichnoe”	0.026	0.12	0.07	4.6	0.98	15	10	34	43	14	AX	OS
“Leningradskoe”	0.024	0.08	0.06	5.4	0.98	16	2	41	49	10	AX	OS
“Sgushchenochka”	0.021	0.15	0.02	4.7	0.94	20	23	52	45	1	AX	OW

(continued)

Table 68.1 (continued)

Name of goods	The values of the criteria					Criteria ranks					Group	
	K1	K2	K3	K4	K5	K	K2	K3	K4	K5	ABC-XYZ	POE-SMW
“Saharnoe”	0.030	0.12	0.04	2.6	0.96	11	9	49	11	3	AX	PM
“Russkie uzory”	0.069	0.08	0.09	1.8	1.00	2	3	26	1	25	AX	PS
“Belgorodchka” with sugar	0.036	0.12	0.08	2.5	0.99	10	11	30	10	21	AX	PS
“Shapiro”	0.040	0.11	0.14	1.8	1.05	8	6	16	1	34	AX	PS
“Dzhemma” with orange filling	0.051	0.11	0.09	2.9	1.00	3	8	26	15	25	AX	PS
“Yubilejnoe”	0.075	0.07	0.07	3.7	0.98	1	1	34	27	14	AX	PS
“Allegro” with apricot filling	0.022	0.26	0.11	3.4	1.02	18	36	23	22	29	AY	OM
“Postnoe”	0.021	0.55	0.07	4.9	0.98	19	46	34	47	14	AZ	EW
“Zoologicheskoe”	0.014	0.16	0.07	5.3	0.98	25	28	34	48	14	BX	EM
“Slivochki”	0.010	0.18	0.08	6.1	0.99	32	30	30	51	21	BX	EM
“Blyuz Kotek!”	0.008	0.14	0.16	1.9	1.07	35	21	11	3	42	BX	OM
“Belgorodskie motivy”	0.014	0.15	0.12	2.9	1.03	26	25	21	15	32	BX	OM
“Itai’yanka’s vishnevoj nachinkoj	0.014	0.19	0.15	2.8	1.06	27	33	13	14	39	BX	OM
“Fifti-fifti with filling	0.009	0.12	0.09	3.8	1.00	33	14	26	29	25	BX	OM
“Chudesa v reshetke”	0.016	0.16	0.06	1.9	0.98	24	27	41	3	10	BX	PM
“Blyuz Desert”	0.007	0.15	0.14	2.1	1.05	37	22	16	5	34	BX	PM
“Blyuz Rassvet”	0.011	0.15	0.14	2.3	1.05	29	24	16	7	34	BX	PM

(continued)

Table 68.1 (continued)

Name of goods	The values of the criteria	Criteria ranks							Group				
		K1	K2	K3	K4	K5	K	K2	K3	K4	K5	ABC-XYZ	POE-SMW
“Smeshinki”	0.011	0.13	0.04	3.9	0.96	30	15	49	34	3	BX	PW	
“Fidzhi” with lingonberry filling	0.008	0.25	0.08	3.1	0.99	34	35	30	17	21	BX	PW	
“Volshebnaya palochka” (white glaze)	0.010	0.32	0.17	3.6	1.08	31	39	10	25	44	BY	EM	
“Lakomyj kusochek” (white glaze)	0.013	0.38	0.21	3.8	1.11	28	42	3	29	50	BY	EM	
“Lakomyj kusochek” (dark glaze)	0.008	0.52	0.26	3.5	1.16	36	45	1	24	53	BZ	EM	
“Pal’chiki oblizhesh”	0.006	0.19	0.16	3.3	1.07	39	32	11	20	42	CX	EM	
“Slivochnyj zavitok” (dark glaze)	0.004	0.23	0.05	3.1	0.97	43	34	45	17	6	CX	PW	
“Magiya” stuffed in white glaze	0.002	0.18	0.05	3.3	0.97	51	31	45	20	6	CX	PW	
“Volshebnaya palochka” (dark glaze)	0.006	0.31	0.22	2.7	1.12	38	37	2	12	52	CY	EM	
“Sladkie chudes”	0.017	0.51	0.11	4.5	1.02	45	44	23	42	29	CY	EW	
“Magiya” stuffed in dark glaze	0.027	0.34	0.05	3.6	0.97	49	40	45	25	6	CY	PW	
“Fiorella” with walnut	0.046	0.42	0.04	3.8	0.96	50	43	49	29	3	CY	PW	
“Slivochnyj zavitok” (white glaze)	0.019	0.31	0.07	3.2	0.98	40	38	34	19	14	CY	PW	

(continued)

Table 68.1 (continued)

diverted to unpromising products can be used to develop product innovations that allow enterprises to maintain long-term competitiveness in the market.

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Chapter 69

Human Capital as a Tool of Ensuring Sustainable Development



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Abstract Human capital is an innovative economic category introduced into scientific circulation in the second half of the XX century in connection with the actualization of the productive forces of post-industrial society and the formation of the knowledge economy. At present, human capital has become the main productive force for economic development and improving the quality of life. Noospheric perception of the surrounding reality, together with uncontrolled anthropogenic impact on the environment and the growth of social contradictions, has led to the emergence of a global direction for complex solutions to economic, environmental and social problems based on the concept of Sustainable Development. Investment in human capital is reliable and pays off faster than investment in other types of capital. It takes at least 5–10 years to create a new human capital. Human capital has become the foundation of the modern knowledge economy, the foundation for the formation of a free civil society, the generator of a cultural environment, and the solution of various social and environmental problems. For the formation of modern human capital, it is necessary to modernize and create innovative educational technologies. IT is a product of the application of human capital and is used for its reproduction and more efficient use. As a result, human capital has become a factor shaping post-industrial society. Human capital is the main force for achieving the set of sustainable development goals that have been formulated at international forums under the auspices of the United Nations for the foreseeable future.

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69.1 Introduction

Sustainable development (SD) is generally recognized by the world community as a vector for the development of civilization in the near future. Main objective of SD is implementation of balanced economic development while preserving the natural heritage and solving complex social problems in the interests of current and future generations of the world's population [1, 2]. Seventeen main SD goals are set in the UN Declaration Transforming our world: the 2030 Agenda for Sustainable Development [3].

One of the most pressing issues in the implementation of the SD concept is the use of human capital as a force to solve various problems of achieving sustainability. In this aspect, human capital should be considered in two ways, since human capital is the result of achieving various SD goals (first of all, ensuring quality education and good health and well-being of people, their equality [3]), and serves as a tool for solving all SD tasks.

Therefore, the purpose of this article is to study human capital as a tool for effective sustainable development.

69.2 Human Capital and the Goals of Sustainable Development

Human capital (HC), like other types of capital, can change its value over time. The main factor in preserving and increasing HC is its reproduction. HC reproduction is achieved by achieving multiple SD goals. First of all, it is quality education N4,¹ ensuring health, well-being N3 and equality of opportunities for all people: gender equality N5, achieving general equality N10. Note that HC is used to achieve these two goals SD (self-reproduction of HC). In turn, HC serves as a factor in solving other tasks aimed at achieving all other SD goals [4, 5].

The impact of HC on the social sphere of public relations is aimed at achieving the following SD goals:

- elimination of poverty N1 and hunger N2 through the use of advanced agricultural technologies and humanization of society [6, 7];
- gender equality N5 and reducing inequality of people N10 [5];
- ensuring peace, justice and creating effective public institutions N16 as a result of increasing the education of people and the development of civil society institutions [8].

The goals of SD mainly environmental orientation are achieved through the acquisition of environmental knowledge by educated people, starting from the household level, up to the eco-economy [9]. Environmental goals include preventing climate

¹Here and further, the designation, for example, N6, indicates the ordinal number of the corresponding sustainable development goal according to [3].

change N13, providing affordable and clean energy N7 [10, 11], using clean water and observing sanitation rules [6], and preserving marine ecosystems N4 and terrestrial ecosystems N15.

The goals of economic orientation (decent work and economic growth N8, industrialization, innovation and infrastructure development N9, responsible consumption and production N12) are achieved by extending the educational potential to the production sphere, which leads to creating new jobs with high wages, economic development, improving the quality of manufactured goods and the quality of life of the population [4, 10, 12].

Sustainable development of cities and other localities N11 is aimed at solving a complex of economic, environmental, social, and urban development problems of modern cities, where more than half of humanity lives and which occupy less than 1% of the land area [13–15].

Partnership in solving SD problems at all levels of N17 allows us to eliminate contradictions between participants in the relationship, realize the synergetic potential of system solutions to development issues, and use benchmarking [15, 16].

69.3 Reproduction of Human Capital

Productive use of HC is possible from the time a person reaches working age (15–16 years) until their retirement (on average, about 63 years). Thus, the duration of a person's professional activity is about 39–35 years.

Human capital like other types of capital is depreciated over time. Professional development is required approximately every five years (about 6–7 times during the working career). Sometimes it is necessary to retrain specialists due to changes in the content of professional activities.

Taking into account the long service life of HC, when evaluating the effectiveness of its use, we consider the time—discounted flows of HC reproduction costs (they are assumed to be equal to the costs of education), and the income flows—the wages of HC carriers. The algebraic sum of these flows for the time period under consideration forms net present value-NPV [17].

To monitor HC reproduction, it is necessary to have statistical information about training costs, employment of graduates of educational institutions, and employee salaries. Currently, such a monitoring system is being created with the joint participation of the Federal Executive authorities of Russia. The results of the monitoring will be available on the Internet and will be used to compare international and different regions of Russia, study the dynamics of the flow of personnel from different professional groups between the regions of the country and form a rating of educational institutions. According to the portal of employment of graduates of educational institutions (www.graduate.edu.ru) the cost of higher education in Moscow was about 141 thousand rubles/year, and the initial salary of graduates was 494.5 thousand rubles/year. The return on investment in education takes about 4 years, and ensuring adequate wages for educated citizens remains relevant.

69.4 Human Capital as a Force for Sustainable Development

The only force for the implementation of SD is human capital, the carriers of which made all the discoveries, inventions and scientific developments that have transformed the reality around us. The main result of the use of human capital was the creation of the third world—the sphere of technology. Innovative technologies together serve as a means to achieve SD goals.

The limited volume of the article does not allow us to consider in detail all the technological innovations created by HC.

Therefore, we will focus on one of the global goals of SD—the preservation of the climate on the planet, for which it is necessary to increase the energy efficiency of anthropogenic activities. At the same time, the availability of various food and industrial products will be increased, and the quality of life will improve.

Indian researchers studied data from 73 countries on the relationship between human capital and energy consumption (1990–2014). The development of human capital directly affects the reduction of specific energy consumption. Improving education contributes to the development of the economy and achieving its sustainability by reducing the specific energy consumption [10]. Countries rich in hydrocarbon reserves will not be able to develop faster in the future. This is because oil wealth does not encourage investment in human capital, which is frivolously presented as a secondary resource [18].

Performed by Zafar et al. analysis of the relationships using the Granger causality test [19] has shown that there is a bidirectional causal relationship between energy consumption and environmental impact, as well as economic growth and environmental impact. A unidirectional causal relationship was found between (a) natural resources and environmental impact, and (b) human capital and natural resources [20].

The development of human capital has led to the fact that over the past hundred years, the energy intensity of a unit of GDP (intensity) has decreased by about four times due to the use of advanced technologies in production and an increase in the share of the service sector in the national wealth [8, 21].

The study of the sustainability of territories depending on the ecological footprint and the value of the Human Development Index (HDI) showed that a higher value of HDI contributes to increased energy efficiency and environmental well-being. Thus, the development of human capital determines the solution of the main environmental problems [22].

To achieve the SD goals, specialists must not only have the usual professional competencies, but also be able to solve environmental problems related to their professional activities. The training of such specialists is based on their mastery of multicultural knowledge, and the ability to implement an innovative eco-economic approach based on the style of sustainable thinking [23, 24].

69.5 Conclusion

Human capital is the main force for the sustainable development of post-industrial society and the most important component of the national wealth of developed countries. The means of sustainable development are created by the labor of carriers of human capital. Innovative solutions to global and regional economic, environmental, social and other problems are carried out by professionally trained employees.

Education in the modern world has become the main productive force that creates the knowledge economy. Eco-economy is also promoted by carriers of human capital.

Human capital and modern education form a new person as the basis for creating a civil society and provides an opportunity for a high quality of life for present and future generations.

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Chapter 70

Human Identity in the Coordinates of Historical Time



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Abstract The search for one's own identity is a necessary condition for the existence of a person and, as a rule, is conducted in the aspect of his national, religious, and social characteristics. The great importance in this process has historical self-determination, which only in the mutual superposition of the coordinates of the beginning and the end of history is possible. The problem is these parameters are traditionally considered autonomously in relation to each other, which a balanced assessment of the state of modern humanity and its future complicates. The aim of this paper is to apply methodological approach that will provide a correlation of historical retrospective and outlook for self-determination of modern man. Since the historical location of modern human is the point between prehuman and post-human, it can be argued that his essence is not quite defined. It is multifaceted, but without soul is impossible, so anthropogenesis is a soul-genesis, which in the physical appearance of man is expressed, in the creation of tools, art, religion, morality, in various forms of symbolic activity. A not fully formed person begins to dehumanize. This is a symptom of the approaching of the “end” of history. Organic and intellectual regression is accompanied by the integration of human with a machine, which assumes not only the functions of the body, but also intellect. The primacy of creation is replaced by the dominance of consumption. In man “symbolic animal” dies, but “virtual animal” awakes. Religious faith degenerates into “secular” faith, language degrades to the level of “digital” phenomenon, beauty transforms into a commercial and entertainment product-simulacrum. There is the occurrence of a new era—post-verbal, post-value, post-human. But historical pluralism points to the asynchronous of the “beginning” and the “end” of history. Ending in one point, it begins in another, thus preserving the hope for the preservation of man.

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70.1 Introduction

Today, historical science distances from the traditionally considered problems within the framework of the philosophy of history. Among historians it is widely believed that “science is itself philosophy”; that is, that historical science is self-sufficient in the realization of their educational potential. This is probably true, especially when it comes to specific problems of historiography. But the connection of the fragments of the “historical mosaic”, the inner unity and the meaning of historical events are subject only to the optics of philosophical reflection. That is why, despite the commitment of many historians to the positivist methodology, from time to time concepts are born, the authors of which rise above the empirical descriptions in order to discover the ultimate reason of historical existence, which is the subject of the philosophy of history.

The need for this kind of generalization is dictated by the desire to understand and explain the past, to recognize the future, and, ultimately, following the path of self-knowledge, to create an integral picture of social life. The experience of self-determination of an individual is possible only in a temporary perspective, when the view from the present, in one way or another degree of clarity, opens and the beginning of life, and its completion. So the search for humanity’s identity is possible only on the ways of pairing the “beginning” and the “end” of human history.

The relevance of this problem is due to the nature of the modern era. There is a violation of the continuity of times, the once strong foundations of culture demonstrate their fragility, and the integrity of personal and cultural identity is replaced by the priority of the relational. The search for identity is hampered by the reference to the “beginning” and the “end” of history as autonomous scientific and philosophical problems.

70.2 Main Text

Such Russian researchers as V. P. Alekseev, I. L. Andreev, P. I. Boriskovsky, B. F. Porshnev, Ya. Ya. Roginsky, Yu. I. Semenov, Yu. I. Efimov played an important role in the study of the problem of the “beginning” of history [see, e.g., 1, 2]. But they usually consider it on their own, little correlating with the subsequent historical process, and especially with its “end”, historians are interested in the future as far as. Also, in itself, is considered, usually, and the problem of the “end” of the history. Such foreign researchers as O. Spengler, F. Fukuyama played an important role in its study [3, 4].

But only the connection of these time limits of history in one study allows us to see something new in the implementation of laws and the mechanism of formation of self-identification, comprehension of historical self-determination of mankind. However, this is not so easy to do, since the concepts of the “beginning” and the “end” of the history are invested with different, incompatible contents. In this case,

their correlation is methodologically difficult. If the “beginning” of history is considered as the process of humanization of the prehuman, “gathering” of human, then the “end” of history (which logically should be considered as the process of dehumanization) is presented, more often, as the exhaustion of some main super-tasks of history: the achievement of freedom, the assertion of liberal–democratic values, the erasure of historical diversity... As a result of the deployment of these processes, the development of mankind is deprived of novelty; and history turns into “post-history” [5, p. 17].

There is a clear “substitution” of the object of research: The emphasis is transferred from the analysis of the formation and actualization of human nature, its essence, to the analysis of his motivations and goal-setting. Thus, the logic of building of a consistent line of the historical process is broken, interrupted.

The “beginning” of the history is logically compared with the “first human”, which is the result of the actualization of the main “puzzles” of human nature itself. The “end” of the history is correlated with the Nietzschean “Letzte mensch” (this image is also used by F. Fukuyama) [3], with posthistoric man of the crowd who believes in nothing and recognizes nothing but his comfort, and who has lost the ability to feel awe.

If the “first human” is born from the “prehuman”, then the “last human” dies in the “post-human”. The formation of man, according to a number of important parameters, is not complete (the idea of F. Nietzsche that man is even closer to the monkey than to the man himself; therefore, he is only a “bridge”, not a “goal”; the idea of J.-P. Sartre that the existence of human has not yet reached its essence; therefore, human is only a “project”).

The incompleteness of human is evidenced by the incompleteness of his essence. Virtually every definition of man can be challenged by a counterthesis. Human is a “rational being”, many obvious facts confirm this. But, too often man (mankind) behaves recklessly. Therefore, it is more correct to say that human is a reasonable–reckless (or, more precisely, reckless–reasonable) being. Man is a “social animal”. But sociality is not so deeply rooted in human nature that in “borderline situations” it does not slide as “light gilding”. Therefore, it is more correct to say that human is biosocial. Man is a “spiritual being”, but material needs play too important, often leading, role. Therefore, it is more correct to call human a material and spiritual being in one stage.

Perhaps the solution to this antinomic problem is to assert the dual nature of human nature; or even its multi-order nature. But, this time, this ontological “fuzziness” gives grounds to speak about “human without essence” [6, pp. 177–178].

The essence of any phenomenon is formed at the stage of its maturity. The uncertainty of expression, incompleteness of a form of human nature gives the basis to speak about what stage of maturity it is far not reached. The “eternal not completeness” of human definitions (no one can put the “final point” here) testifies to his “eternal incompleteness”. Man—the non-finito, not fully formed, and therefore is a lack of expression.

And this unfinished man (in substantially the prehuman) is already beginning to dehumanize. Not complete an embodiment to a human, man began to turn into a post-human. The historical location of man is between the prehuman and the post-human [7, pp. 79–80], or between the “first” and the “last” human. Man is an “eternal middle” (not always, “golden”) between the “beginning” and the “end”, between “beast and angel” (B. Pascal). Maybe this is the historical residence of man—“between” external and internal infinity, “between nothing and everything” (B. Pascal)?

Let us try, in this paper, to correlate the idea of the “beginning” of history with its “end”; thus, trying to build a consistent view of the line of human history, and its two “nodal points”: the initial and final.

The beginning of history is the beginning of human. The beginning of man is the beginning of properly human. Properly human, that human cannot be separated, without loss, that is, his essence. If the body of man, to a large extent, is similar to other living beings [8, pp. 96–98] (although there are quite serious differences: from the “hominid triad” to the structure and functioning of the brain); then, this is its main peculiarity—in the non-/overbody.

The most ancient and deeply studied in philosophy the concept to denote the non-/overbody is the “soul”. In the broadest sense, it is the inner non-material life of man, his entire inner world. It is in the soul that the essence of man, his fundamental difference from all other beings, lies; it is precisely this that is his main forming principle. Hence, so rightly today is a Socratic definition: “human is the soul” [9, p. 258]. The soul is not yet the whole of person; but when we investigate the soul, we investigate the main thing in human.

The soul—en over-bodied thinking-feeling substance—appears as a “human in human”, as a human nature. The appearance of man is an expression, not in the “pure” form, his inner appearance. The whole humanized world is the soul, “inside-out”. The soul is the inner (directly) and outer (indirectly) world of man; that is, the soul is THE WHOLE human. It is legitimate to define human not so much as Homo sapiens (he increasingly separates thought processes from himself, entrusting them to artificial intelligence), but as Homo animus (“man of the soul”). This is also valid for the reason that in the Western tradition “mind” is considered as the (highest) part of the soul.

Anthropogenesis, thus, unfolds in its being, in the soul life (i.e., it is a soul-genesis). The external (physical, material) side of genesis appears, in the end, the moment mediating the deployment of the internal (mental) side.

If we leave aside the religious-mystical understanding of the soul (e.g., as “the exhalation of God”), it is a “sum” of experiences. Aristotle, not coincidentally, defines it as the “cumulative ability of sense perception” (*aisthētērion*). These are religious, moral experiences, feelings of beauty and love. The mental “space” also includes ideas about the otherworldly life. In the Western tradition, its highest level is called “reason” (although, e.g., Augustine the Blessed considered such will, and V.S. Soloviev—shame), with their abilities to self-reflection, creativity (which led to the creation of “second nature”, including artificial tools, housing, clothing), allowed

to master the fire and verbal speech. Each of these pieces of “puzzles” individually distinguishes man from other living beings, and their composite combination, forming a new integral properties.

The appearance of man “builts” emerges gradually, partially, for a long time (to some extent, not ending to this day). Analyzing this process, we are forced to follow the logic of archaeological artifacts; although the sequence of “gathering” of man in anthropogenesis, in fact, could be different.

The appearance of man cannot be formed, in one way or another, by the soul (as a “sculptor”) in its own “image and likeness”. The humanization of the body is the expression of the humanization of the soul. Actually, human in the body is the product of his superbiological life, the expression of the actual human qualities of the soul. The first evidence of the life of the human soul is the superbiological signs of the body, the “hominid triad” (upright walking; liberation of the forelimbs; volume and shape of the skull). The most ancient skeletal remains of *Homo habilis* (with signs of “hominid triad”) are 2.5 million years old (Ethiopia, Afar region) [10, p. 126].

The structure of the body of the prehuman is fixed first in time, mediated manifestation of the “unusual” content and “structure” of his soul, in particular its mental-active ability. The latter, it is likely, developed at the level of pre-tool activity (gathering and hunting—corrals, traps, snares). *Homo habilis* had not yet carried out targeted processing of the stone, and only broke one stone and another, randomly selecting a broken-away lithic flakes suitable for certain actions.

The second time a reified manifestation of human life actually are “are tools made the tools” (purposefully double-sided artificially processed stones). They were used by *Homo erectus* 1.8 million years ago (Ethiopia, Kada-Gona region) [2, p. 34]. In addition, he has used the skins as clothing and used fire. Appeared 200–150 thousand years ago, *Homo sapiens* learned how to make fire and have mastered verbal speech.

130–100 thousand years ago, an ornament appeared—the first manifestation of a sense of beauty that has reached us. This is the earliest visible evidence of the life of the soul (not mediated as before, but direct). The prehuman need awakens for more perfect beauty than the beauty of the surrounding world (representing the expression of superbiological joy).

The first religious ideas appeared 100–50 thousand years ago [11, p. 96]. There was an initial idea of the “soul about the soul” (animism), asserting the universal animality of the world, the presence of invisible entities that control the human body, all phenomena and forces of nature. The first image of the world begins to form—“home” in which to live.

An attempt is also made to visualize the soul itself. It has been represented symbolically in the image of a fantastic bird-women (as highlighted by her soaring, the supra worldness, the immaterial, the origin of different metaphysical being). The female image appeared as “the beginning of the beginnings”, “the receptacle of souls”, penetrating into the body and leaving it like breathing. Thus, the deployment of mental self-reflection begins (awakens soul-seeing), which appears as direct evidence of the actualization of the actual human soul.

Along with the material mediator in the interaction of human with the world (instrument of labor, weapons), a not/supermaterial mediator arises: myth, symbol, metaphor, sign. Thus, man from “the animal that uses tools”, turning into “an animal that uses the symbols” (“symbolic animal”, by E. Cassirer).

The deployment of self-reflection is also carried out in the creation of “self-portraits” in the form of a print of the open hand (the cave of Pech-Merle, France) [12, p. 73]. Perhaps this is the first attempt to differentiate own “I” and hence self-identification. Since the hand was “perfect tool”, the open hand with five fingers can be considered the first “social self-portrait” of prehuman, who began organizing, making representations of himself. Prehuman seeks to the transformation of chaos into ordering the material and super-material level, processing, thus, in “anti-entropic system”.

About 70 thousand years ago in Africa, there were the most ancient ritual burials where the dead were laid in a crouched form (pose of the baby-embryo) [13, p. 55]. There were mounds, in the grave were placed necessary in the afterlife items: clothing, jewelry, incense, utensils, weapons, clay figurines, amulets. The first complex ideas about the otherworldly life are formed. Thinking about death as a separation from the world, from another person, from life, was an important motivation for further actualization of self-consciousness, self-identification. “Man begins with crying about the dead (mourning)” [14],—wrote M. Mamardashvili.

50–40 thousand years ago, there is a *Homo sapiens sapiens*, primitive herd turns into a tribal community, there is a transition from endogamy to exogamy. And, not by chance, at the same time, a taboo begins to form, expressing (by Z. Freud) the emergence of guilt, duty, conscience, that is, the actualization of moral experiences. Taboo was as precluding (prohibition of consanguinity in marriage, to the murder of the tribesmen, the prohibition to leave without the aid of the weak and the sick), and permissive (use of common property, distribution of food is not the principle of force, and justice) nature.

30 thousand years ago, there is a prosperous of cave painting (see: “Grazing deer”, cave Font-de-Gaume, France) [15, pp. 36–39]. The creation loses its connection with utilitarianism, becoming a supra worldness; there is “beauty for the sake of beauty” (beads, earrings, rings, buckles, bracelets). Man appears (including) when he has compassion (and not only in relation to another person, but also in relation to the beast) (see: “Wounded bison”, Altamira, Spain). Animals are able to sympathize only with their relatives, people—and other living beings, with nature as a whole.

There is a prosperous of plastics, which found expression in the creation of “Paleolithic Venus” (see: “Venus of Willendorf”, Austria). There is not any face in the images of man yet, the body “wakes up” before. But the body is able to express not only its own life, but also the life of the soul, sometimes “overlapping” the life of the body. 10 thousand years ago was created weightless, graceful, melodious, poetic image of “Girl collecting honey” (Araña Caves, near Valencia, Spain). So draw a girl could only fall in love with her. Perhaps we meet herewith the first in the world (preverbal) declaration of love (first love text—Sumerian “Epic of Gilgamesh”, which appeared 4–3 thousand years ago).

Anthropogenesis is soul-genesis. The soul is formed gradually (“from puzzle to puzzle”) and heterochronically: first, the mental-active principle is actualized (more necessary for self-preservation, survival of the body; that is, the first superbiological serves to the biological); then the human sensual (aesthetic) perception awakens (the superbiological begins to “serve”, including itself, that is immanent, there is “beauty for the sake of beauty”); then—the supersensible, religious (the superbiological begins to “serve” to the transcendent); next—the most complex, “high”—moral and love experiences (superbiological begins to “serve” to the building of “dialogue with the other”).

“Evolutionary impulse” is gradually moving from the development of the material (visible, external) world to the development of the spiritual (invisible, internal) world; from mental and physical activity to sensory-supersensible perception. The beginning of human history is not a “point”, not a “knot”, but a “thread”, a “bridge”, a process stretched over time for millions of years. The beginning of soul-genesis—2.5 million years ago (“the beginning” of prehistory), the completion—10 thousand years ago (“the end of” prehistory, “the beginning” of the history). Prehistory builds a “first man”, that he “will build” history. “First man” is “constructor” self-assembling “from puzzle to puzzle” 2.5 million years.

The result of the prehistory—“first human”—differs with anatomical structure (“hominid triad”), has a complex mental activity, manufactures and uses artificial tools, has faith (in spirits, the immortality of the soul), a sense of beauty (art), a sense of love, has an idea of the structure of the physical and spiritual world (worldview, myth, religion), has morals, capable of self-consciousness and self-development.

The formation of man is the formation of mankind. The whole person does not exist (the individual has not often all formulated human qualities; they are only in humanity as a whole). It is the humanity and is a holistic the actual “first” man. All the most important human qualities are only at the level of the generic universal essence. At the level of individual human existence, all of them, often, may not be. Generic human—holistic, individual human—partial. Individual existence is “poorer” than the universal generic essence.

The essence of the individual is not in man, but in humanity. “My” essence is outside of “me”, it is not in “me”, but in humanity. The species soul is whole and immortal. To the extent that the individual soul is part of the generic soul, it is whole and immortal. “I” is man, when “I” is humanity. “Gathering” (“disassembly, redesigning”) of man (humanity) continues throughout his life!

The purpose of the prehistory is “first man”. The “beginning” of the history is the end, basically, of collecting the “composition” called “man” (humanity) from about a dozen basic pieces of “puzzle”. The “beginning” of history is the beginning of man as his only subject. Actually man becomes humanity at the generic level. Man can remain at the individual level as a prehuman. The heterochrony of the generic and the individual passes through all human history.

To talk about the “end” of history in our time, it is necessary to show the “scattering” of this composition, the loss of certain of its links. The “end” of the history is the dehumanization of man, his transformation into a post-human. Let us project the revealed elements of “puzzle” to modern man,

which is the result, including the previous social evolution, human anatomy remains essentially unchanged over the past 50–40 thousand years. However, bodily evolution (not affecting the anatomical foundations, and becoming, because of this, almost “invisible”) continues: There is a further reduction of rudimentary organs and decreases the volume of the brain (150 g over the past 20 thousand years); due to hypodynamia, reduced muscle mass. The “physical end” of man is evidenced by the approach to the limit of physical abilities (in weight and track athletics world records are set less and less, often surpassing the previous result quite slightly; and the world record for long jumps has been held for 28 years).

More importantly, man approaches to the limit of the intellectual capabilities [16]. Mental activity in an age of increasing chaos can less and less be a “guiding thread” in the confusion of “intricacies” of human life. There is no rational “formula of chaos”. The postmodern era is a post-rational era. The intellect was thus reducing the faith of the chaos that was thus reducing intelligence. Man remains intellectually “disarmed” in the face of a frightening–hostile–chaotic incomprehensible world.

The human body continues to be important, but, increasingly, not the only carrier of his life. The main instrument of labor since the end of the eighteenth century, instead of the body (in particular, hands), more and more, becomes a machine. The machine appears as a continuation, addition, strengthening of the physical capabilities of the body. The body, more and more, “fuses” with the machine, gradually “flowing” into it. The emphasis is shifted to the “second”, “artificial” body (first, repeating, duplicating, continuing the “first body”, as a result of organ projection; then, creating a “third” body, displacing the “first”, up to autonomy from it). The human body is more and more outside of man, all the stronger is not a man. Through implantation of chips into the brain, the merging of human consciousness with artificial intelligence begins [17].

What is happening before our eyes “splicing”, “stitching” the human body and brain with the machine, at some point will lead to the appearance of a cyborg. The development of these trends promises a new future in which the fusion of modern science and advanced technologies will be a factor in the birth of a renewed person and society. To get rid of diseases, to ensure productive longevity, to multiply the abilities given to man by nature—what could be better?

These “majestic” pictures of the future, firstly, receive a rational justification and institutional design, and, secondly, find a sensual and visual embodiment in the products of the media and art. In these conceptualizations and visualizations, the people are represented, free from disease and suffering of the age of longevity, and, perhaps, and immortality. The source of this trend of modernity is transhumanism. Its representatives position themselves as follows: “Transhumanism is an intellectual and cultural movement that confirms the possibility and feasibility of fundamental improvement of human living conditions with the help of applied technologies, especially through the development and wide availability of technologies to eliminate aging and significantly improve the intellectual, physical and psychological capabilities of man” [Op. cit.: 18, p. 32]. Transhumanism should be seen not only as a system of views. Today it is a well-developed complex of doctrines and institutions. Its representatives have their own organization, an official website on the Internet, they participate in the

work of many public organizations, such as the club of Rome, and movements, in particular, “green”. There are groups of transhumanists in Russia who are united by the Russian transhumanist movement. And this movement seems to be working very effectively. Not by chance, “the youth sees otherwise transhumanist idea than the older generation that showed held in 2016 in the university cities of Russia empirical research” [19, p. 248].

But at the same time, the boundless spread of modern technology causes a sense of anxiety. Digital technology, making man’s life easier in something, they would form a dependence on social networking, virtual games, in general, renders social life. Moreover, the uncontrolled promotion of nanotechnology, biotechnology, information technology, and cognitive science, for which the English abbreviation NBIC is used, in the long term is fraught with the transformation of the person himself. And in some cases, it is only a fragmentary impact on individual organs and systems of the body, and in some cases—the transformation of human nature. It is quite possible to compare it with Pandora’s box, capable to bring down on people terrible disasters, to become the reason of social degradation. S. Lem says that “the technology is more aggressive than we usually believe. Her invasion in the psyche, the problems associated with synthesis and metamorphosis of personality will fill further progress. Then will disappear mass moral imperatives, viewed today as indestructible, but will appear new questions, new ethical problems” [20]. Technological transformations today inevitably lead to the reformatting of society, as well as the value bases of this society. This stage of evolution can be reasonably defined as post-human. This is a clear argument in favor of the statement about the “end” of history and the entry into post-history.

Modern man uses much more artificial tools. But, unlike his ancestor, he does not create them (in the vast majority), but only distributes, consumes. The emphasis is increasingly shifted from creation to the consumption of only those or other tools (devices). More often, they are not used for productive (industrial and agricultural) activities (unlike the “beginning” of history, it is actively involved which is not the majority), and for communication, entertainment. The shift from self-preservation, creation, expansion, protection, cognition and self-knowledge to (“naked”) “consumption for consumption” (“mass consumption society”), or consumption for pleasure (“age of hedonism”), self-affirmation, self-realization (dominant “to have over be”) can also be attributed to the “end” of history.

Man remains, in many ways, a religious being (80% of the world’s population call themselves believers) [21]; in this regard, it is not necessary to talk about the “end of history”. However, the depth and effectiveness of religious experiences (which determine the perception of the world and the way of life) are not what it used to be. Religious faith is superseded by “secular faith”: in oneself, fate, luck, love, friends, the future... faith in faith; it is superseded by benefit, profit, the desire for power and success. In interaction with nature, man ceases to be a “symbolic animal”, affecting it (without any unnecessary reflections, metaphors and symbols) directly technique (oil and gas wells, coal mines, plowing, logging, fishing). Interaction with the world and another person becomes “linear”, purely pragmatic, “naked”, frankly cynical. One loses the depth of its world, becoming the outer; surface of a human interacts

with the surface of the world (“the age of the triumphant surface”). If at the first stages prehistory–history moved from the external to the internal, now—from the internal to the external, which can be qualified as a movement to post-history.

Science, replacing the religious worldview, does not create instead of its worldview, capable of becoming for man “a universal house in which to live” (M. Buber). Man remains “homeless” and “naked”; one-on-one with “icy, thoroughly penetrating, hostile world”, which can be attributed to the “end” of history.

In interaction with each other and with the world, man is increasingly becoming a post-symbolic “virtual animal”. Moreover, virtual reality increasingly appears not as an intermediary in interaction with the world, but with this world itself. Man interacts with him not even as an object, but as an equal subject. Naked man tries to dress in the “virtual clothes”, more turns in the virtuality of its own. If “first man” appeared, to a large extent, as “real” (at the same time, being included, to a large extent, in symbolic relations with the world); modern man appears, to a large extent, as “virtual” (only to some extent included in the real relationship with the world) [see: 22].

The speech of modern man is increasingly becoming not immediate, live, and digital, formalized, “silent” (“civilization of the thumb”). Illiteracy remains high in the world, reaching about 1 billion adults (and this figure has not changed much in recent decades) [23]. Speech is poorer in meaning, emotional shades, and profundity, it does not need a large vocabulary. There are 300 words in the Facebook dictionary (so many words a child learns to 2–3 years), and it is the average (daily) “active vocabulary” of modern man [24].

There is reason to talk about joining the post-verbal “culture of comics and action”, where the action is not just “released” from the word, but exists autonomously (not feeling the need for the word, the need for “vestments” in “verbal clothing”), presenting self-sufficient, self-valuable. Words become superfluous, “bead game” appears as a waste of time, and the loss of time is equivalent to the loss of money. To paraphrase the aphorism of Jose Marti (“the best word is action”): the best action is action. The introduction to the post-verbal history can be quite attributed to its “end”.

Beauty remains one of the most important values of human life, losing, however, its depth, becoming a “painted surface” (interior design beauty-exterior), or “painted air” (virtual beauty), turning from “window in the metaphysical world”, from the “promise of happiness” (T. Hobbes) in commercial and entertainment product-simulacrum. “The purpose of beauty is to be beauty” (V. Hugo). But “beauty for beauty” exists less and less, being supplanted by “beauty for utility”.

Modern consumer-conformist man has self-reflection, but, more often, only at the household level. “New syncretism” recreates—the dissolution of individual consciousness in the “swarm consciousness” of the majority. Reduction of representations of man about himself occurs: He becomes aware of himself more as consuming the body, the soul comes to mind (losing the metaphysical component). Holistic reflective human can only have world view, modern partial man has it not (or it appears eclectic chaos).

Death is being forced out of the modern glossy culture, and its cultural value is being more and more minimized. The funeral service is reduced, and the time of

farewell of close people with the dead is reduced (his body is no longer brought home, no funeral service for three days). Cemeteries are far outside the city, rarely visited, have an abandoned character. Hedonistic man seeks in every possible way to “strike out” any reminder of death not to overshadow continuous “holiday of life”. In the cheerful culture, life is perceived as a continuous “beach”, endless “shopping”, incessant “banquet”, which nothing has the right to overshadow. The devaluation of death naturally leads to the devaluation of life.

The loss of the capacity for compassion leads to indifference, insensitivity, inner deadness. But, because your physical vision will not see it; and if something cannot be seen with physical eyesight, so it does not exist. A person who aspires to be “too alive” becomes “too dead”. On the Earth “there are more dead among the living” (G. Gurdjiev), “betraying their depths” (G. S. Pomerants), living a someone else’s, false life. In “too real” bodies are increasingly nesting “too dead” souls. Modern culture is too similar to the “madly merry dead man”, to the “brightly colored dead man”.

The maxims of this openness was formulated by V. S. Vysotsky (“I mourn all the sorrow of the world”) and F. M. Dostoevsky (“Everyone is to blame for everything”). But modern man is often closed to his problems (“my house is my fortress”), too often is closed to the perception of what is happening, especially the negative (“the less you know the better you sleep”). And the natural result: the revival of himself and the world (as the main line of evolution, history) is increasingly replaced by self-world death. If earlier reflection of death makes life (and death) “more lively”; this immobilization of life makes it “more dead” and death. The necrosis of life and death, quite naturally, fits into the “end” of the history.

Morality is “blurred”, the distinction between good and evil is “erased”. “Listening to good and evil indifferently” (A. S. Pushkin), people are increasingly focused on other values: benefit, success, power, wealth. The greater the desire for profit, the less the desire for justice (Confucius noticed). “Taboos”, which were the “clips” of the human in man, weaken. As a result, “soul demons are increasingly coming to the surface” (K. Jung). Approved by the aesthetics of evil (“Flowers of evil” Charles Baudelaire, “I love to watch as children die” V. V. Mayakovsky), satanism. Life is not understood as an absolute value, murder (Holocaust, mass casualties among civilians during the wars in Iraq, Syria) and suicide (“the right to euthanasia”, including children’s) have quite “reasonable” justification.

More tolerant is the attitude to incest (in Portugal, Spain, and Serbia, such relations are not considered a crime; in Russia, marriage between close relatives is prohibited, but sexual relations between them are not criminalized) [25]; the non-contradiction of incest is approved in modern literature and cinema (“Tender Is the Night” by S. Fitzgerald, the film “Blue lagoon” directed by D. R. Klayzer).

So dear to mankind the idea of equality is not able to reach across the chasm that separates the “Golden billion” and the rest of humanity. The main goal of human history—freedom—is becoming more and more illusory, with the deployment of total control over the behavior and consciousness of people through the use of modern digital technologies. Voluntary “escape from freedom” (E. Fromm) is becoming more and more typical. All this allows us to talk about the entry into the post-moral

(and even post-value) era, which is quite correlated with the concept of the “end” of history.

70.3 Conclusion

Thus, the correlation of the “beginning” of history with the modern state of man gives sufficient grounds to talk about the “end” of history. But, of course, all is not so simple. Such “ends” of history, throughout its many thousands of years, can be found quite a lot. And always it is not about the “end” of history in general, but about the “end” of one story, and the beginning of another. This statement fits well into modern ideas about historical pluralism (there has never been a single world history, and now it does not exist).

The history is multi-pole and multi-vector (even with regard to modern globalization). In addition, local histories are heterochronous: each of them unfolds at its own speed, passing its own special stages. Heterochrony also exists within local histories: the “end” in one respect does not mean the “end” in another (in some respect it is the “beginning”, in another—the “middle”, in the third—the “quarter”). That is, “beginning”, “end”, “middle”, etc., stories can coexist. So, it is impossible to evaluate the history unambiguously (either that or that). This is still impossible to do because the view of history is multipolar and changeable (depending on the changing realities and the interest in one or another interpretation of the past).

The view of history is also related to the ratio of phylogenesis and ontogenesis. The story begins with the birth of each person (Goethe: “When I was 18 years old, and the world was 18”); and ends with his death (Goethe: “Under each tombstone lies world history”). There are as many stories in this regard as there are people. Every born child is another chance given to people to overcome the “end”. Every dead is the despair of history, every born is its hope.

About the “end” of history can only be said by looking “from the opposite shore”: from outside or above. But we are within the historical process. The “end of history” can only be spoken of when it has already happened. But then (the “end” of history, in this sense, is synonymous with the “end” of the world) to state this, it is likely, can no one.

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Chapter 71

Perceptions of Professional Success Among Codependent Women Title



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Abstract Article devoted to the research topic. Features of perceptions of success in women in interdependent relationships. The author substantiates the relevance of the investigated problem, devoted to codependent relationships and the problem of achieving success. Currently, the relevance of the studied problem lies in the fact that the problem of codependence and codependent relations in Russian society is growing. The aim of the study was to study the characteristics of perceptions of success in women in codependent relationships. The article examines in detail the approaches to the study of the phenomenon of codependence in modern psychological science. Various approaches to understanding the concepts of success and successful activity are described. In the description of the empirical study, it is proved that there is a relationship between perceptions of success and the level of codependence in women, and also that there are features of representations in women in codependent relationships. When assessing relationships in the family, it was found that according to the indicators of success, women in codependent relationships and women without signs of codependence revealed significant differences that allow us to conclude that women without signs of codependence are more oriented toward success.

71.1 Introduction

The actuality of the topic is determined by the fact that the attitude to success, which includes a sense of satisfaction from achieving a set goal, the acquisition of status, and prestige has a significant impact on the elements of emotional self-regulation and self-attitude of a person. And this directly affects his psychological state, reflects on professional self-realization, and is a stimulus for development of the personality [14, 15].

However, people in codependent relationships usually have lack of necessary skills, which leads to the formation of dysfunctional relationships [5] and inefficient

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functioning. S. M. Yatsyshin, A. S. Kolenova proved that codependent relationships influence the value-semantic sphere of the codependent person, the content characteristics of the value-semantic sphere of the codependent man change [18]. In particular, the ideas about your own life and your future may change, the “I” image and the image of the world, the idea of success may change.

71.2 The Goal and Tasks of the Research

The goal of the research was to study the characteristics of ideas about success of women who are in codependent relationships.

71.3 Literature Review

As a phenomenon, the notion “Codependence” was distinguished in psychology quite recently. No one knows exactly where, when, or who first used this term. At first, this concept was understood as a joint life or close relationship with an alcoholic or drug addict person. Then, it also became associated with living together or having close relationships with any dysfunctional person [2].

A whole movement is developing in the world to overcome codependence. The definitions given by codependence researchers differ, at that certain aspects of codependence are emphasized in these definitions [17].

Wegsneider Cruz: “Codependence is a constant concentration of thought on someone or something and dependence (emotional, social, sometimes physical) on a person or object. From time to time, this dependence on another person becomes a pathological condition that affects all other relationships” [16, p. 150].

E. Young: “Codependence is poor health, violation of adaptation, and problems with behavior associated with joint life with an alcoholic” [19, p. 258].

A. V. Schaeff: “Codependence is a disease that has many forms and expressions and grows out of the main process, which I call the process of dependence developing” [11, p. 53].

V. Mendengol defines codependence: “as a stress-induced thought concentration on someone’s life, which leads to a violation of adaptation” [6, p. 32].

R. Subby believes that “Codependence is an emotional, psychological, and behavioral condition that has developed as a result of exposure to long stress and the use of a set of overwhelming rules—rules that do not allow you to express your feelings freely, as well as directly discuss personal and interpersonal problems” [7].

M. Pia explains codependence as follows: “A Codependent person is someone who is completely absorbed in regulating the behavior of another person and does not care at all about satisfying his own vital needs” [8, p. 36].

American scientists (M. Beatty, A. Myager, E. Smith) have come to the conclusion that first of all codependence affects people who had a so-called “difficult” childhood, people from abusive families, victims of violence, etc. [3].

Codependence is a painful condition that results from adapting to a family problem in the past. The codependent person divides his life experience into two incompatible parts—“everything is bad” and “everything is good”—dichotomous thinking. The partner may temporarily be idealized; but if he cannot fulfill all the desires of the codependent, he is rejected and devalued. A codependent person is not aware of his own feelings and is not able to be guided by them, hence the distrust to himself and others. One of the central problems of codependent relationships is the unconscious self-presentation of the codependent in the role of either a child or a parent with the rejection of the role of an adult [4].

Please note that the first paragraph of a section or subsection is not indented. The first paragraphs that follows a table, figure, equation, etc., does not have an indent, either. Subsequent paragraphs, however, are indented.

In people’s understanding, “success” is more an objective achievement in a specific activity and in life, and the concept of “success” reflects the subjective experience and conditions for achieving a success [9].

A large number of literature, both of foreign and domestic researchers, considered successfullness using the concept of success. From this, we can come to the following conclusion that scientists understand successfullness as a state that manifests itself in the final result or in the anticipation of success achievement [12].

In modern society, successfullness is not perceived as something acquired from nature. Significant emphasis is placed on the fact that it can be nurtured. The successfullness of any person depends on certain conditions, it may be the presence of a goal, the definition of his real vocation, adequate self-esteem, education, flexible mind, ability to interact with people, self-development, etc. [20].

When considering success, it is correlated with the achievement of a specific goal. In the pursuit of success, a person hopes for it, and at the same time, there is a fear of failure, and as a result, he avoids it. The result of failure leads to a decrease of social status and self-esteem, as well as contributes to negative emotions [13]. J. V. Atkinson considers the result of success as a positive image that should be sought for the sake of rewards, praise, positive emotions, improvement of social status, and self-esteem [10].

71.4 Empirical Research

We will consider the meanings of the symptoms of codependence in relationships of women. Using the codependence test (D. Fischer, L. Spann, adaptation of V. D. Moskalenko), we assessed the level of expression of codependence in respondents. Below we show the results that reflect the level of codependence among our respondents. Assessing the values of indicators, it can be noted that the most expressed is a moderate codependence of 42% of women. The respondents in this group tend

to evaluate their relationships inadequately in some situations, for example, during a state of love and sometimes experience a strong emotional dependence on their partner. 30% of the surveyed women have a normal level of codependence. They are able to assess adequately their relationships with other people, can prioritize the satisfaction of their own and others' needs, and build "healthy" relationships. The least presented in the general sample is expressed codependence, and it is observed in 28% of women. In the further research, 94 people took part, with the aim of even sample each subgroup included 47 people, and 2 research subgroups were formed: women with a normal level of codependence, women with an expressed codependence. As a result of the theoretical analysis of ideas about success, we identified a number of components that we studied further in the empirical study: models of successfullness, motivation for success, the manifestation of success, and ideas about the specifics of success achievement.

We conducted a comparative analysis of indicators of ideas about success of women with different levels of codependence using the method "Research of ideas about successfullness" (Klochkova O. Y.) [1].

We found that the compromise model of success achievement prevails in both subgroups of respondents. In both subgroups, material factors do not play a major role in building a career and choosing a professional activity, but they remain quite important due to changes in the socio-economic situation in Russia. In this case, success is understood as "private life," and the choice of profession is determined by the influence of relatives, the profession, and the path to success must be approved by the family and the closest environment.

Significant differences were revealed in the indicators of the American success model. Women with the norm (28.2%) are twice as often choose this model than women with a high level of codependence (10%). Thus, for women without signs of codependence, the achievement of success is represented as an individual trajectory, and the goal for them is material success, but it is achieved through hard work. Codependent women are ready to achieve success still focusing on their partner; more often for them, the "happiness" of the partner is more important.

Differences were also found in the indicators of the Soviet model of success achievement. Women with a high level of codependence (26.1%) achieve a success through mastering a socially useful profession, and it is important for them to be accepted by others, as they are not ready to accept themselves. Only 11.4% of women without signs of codependence have this model of success. 8% of women without signs of codependence have hedonistic model of success, and this model is not found in women with a high level of codependence, so codependent women are not focused on achieving life's pleasures.

It should be noted that the ascetic model of success achievement is insignificant in both groups, but this model is found in 6.3% of the respondents in the group of women with a high level of codependence. We believe this is due to the fact that they do not tend to think about their own pleasure and strive to achieve success itself, and success for them is a movement toward some ideal, highly spiritual goal. Women with the norm do not have such model.

We conducted a comparative analysis of the data obtained using the methodology “Motivation for success and fear of failure” by A. A. Rean. Approximately, an equal number of respondents were distributed between motivation for success and motivation for failure, but significant differences were found in all three indicators. Women with a high level of codependence tend to be focused on failure. When they achieve success, they are afraid of failure, so they do not expect benefits for themselves, but they fear condemnation and therefore strive for success. Codependent women prioritize not their desires, but their “fears.”

Women without signs of codependence are oriented on success. Initially, they do not think about failures, starting a business they are focused on positive result, and they are ready to face failures, but they are not afraid of unsucces. This may be due to the fact that women in this group are less focused on the relationship partner. The smallest number of respondents does not have a vividly expressed motivational pole, but a significantly larger number of women without signs of codependence are not fully aware of their motivation, perhaps this is connected with the fact that they are not fully aware of their own needs and the needs of others. Thus, we discovered that there are significant differences in all indicators.

A conducted comparative analysis of the results using the method “Self-assessment of manifestations of fear of success” (by G. V. Turetskaya) revealed some differences, and the obtained data allow us to analyze the differences between women with a high and normal levels of codependence.

As described above, after studying the main manifestations of fear of success in women, we found that the majority of respondents experience significant anxiety about the lack of time and attention given to family or relatives. Significant differences were found for this indicator among women with a high level of codependence (48%) and women without signs of codependence (26%). Codependent women find it difficult to allocate their own resources, so in the process of achieving success, building their own career, they have a fear of lack of time and a feeling that they are taking this time from their relatives. Often partners of codependent women tell them that they do not get sufficient attention, but this does not always reflect reality.

Women without signs of codependence are more likely to experience fear of being dissatisfied with their professional role (29%), in contrast to women with a high level of codependence (7%). Perhaps, women without signs of codependence are afraid not to realize themselves in the profession, as they are more focused on career success.

Women with a high level of codependence two times oftener underestimate their professional achievements than women without signs of codependence (21% and 9%, respectively). Their professional achievements for codependent women are not so important, especially if they are not evaluated by a partner. 19% of codependent women and only 9% of women without signs of codependence experience fear of saving a family and personal relationships. Perhaps it is connected with the fact that in families with codependent relationships, the identification of the “I” is weakly expressed, and women simply do not imagine themselves outside the family, that is why they feel fear. Significant differences were found in the indicator of fear “refusal from further advance in business,” and in codependent women, this fear is three times

more common (17% and 5%, respectively). Codependent women are ready to give up their position and any promotion.

Thus, it can be concluded that women with a high level of codependence are characterized by the fear of lack of time, underestimation of their professional achievements, fear of saving a family, as well as refusal from further promotion, and women without signs of codependence are more likely to feel dissatisfaction with their professional role.

71.5 Conclusions

Our research is an attempt to reveal the peculiarities of the ideas about success among women with different levels of codependence. The subject of the research is the study of the peculiarities of the ideas about success in women with different levels of codependence. Our comparative analysis of the data showed that there are significant differences in the indicators of ideas about success in women with high and normal levels of codependence. Based on our research, we can work out recommendations for codependent women in order to develop their success.

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Chapter 72

Mathematical Models of Expert Information Processing for Evaluation of Projects



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Abstract The paper presents mathematical models of multi-criteria evaluation of projects by expert methods. The traditional additive method is considered, which is widespread in assessing the attractiveness of projects. Given the advantages and disadvantages of the additive method, two alternative methods for evaluating projects are proposed. One of them is based on the theory of latent variables; the other is based on the theory of fuzzy sets. The technique of processing the results of evaluating projects obtained by different methods is presented, and their properties are analyzed. It is shown that the method based on the theory of latent variables has several advantages over the additive method: The linearity of the estimates obtained, their independence from many projects, and a set of criteria. Computational experiments were carried out, which showed that the method based on the theory of latent variables gives adequate, linear, and independent estimates of the attractiveness of projects. The method for assessing the attractiveness of projects based on the theory of fuzzy sets is used when it is impossible to evaluate projects according to criteria using natural scales. In the proposed approach, projects are evaluated according to the criteria based on some parameters characterizing the projects in terms of their attractiveness. Each project is considered for each criterion as a fuzzy set with a given membership function. The paper presents various types of membership functions that meet the criteria of different types. The conditions for applying membership functions for different criteria are described. The proposed methods will allow for more objective assessment and selection of projects based on multi-criteria assessments, allowing them to be implemented effectively.

72.1 Introduction

The management of enterprises and organizations through the effective implementation of projects is a modern management approach that allows modern enterprises

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to develop efficiently. At any enterprise, innovation is constantly needed: the launch of new products in production, the introduction of new technologies, both production, and management. All this requires the development and implementation of new projects in various areas of the enterprise. As a result of the project activities of the enterprise, one of the main stages is the evaluation and selection of the best projects from the available alternatives [1–3].

The aim of this work is to describe mathematical models and methods of their implementation to obtain integral estimates of the attractiveness of projects, namely the traditional method of evaluation and two alternatives, based on the mathematical apparatus of the theory of latent variables, and the theory of fuzzy sets. Also, the objective of this study is to analyze the estimates obtained and compare the results of project evaluations using different methods in order to justify their effectiveness.

For evaluating projects, a multi-criteria approach is usually used, when the quality of the project is determined by comparing the given project with the others according to the set of developed criteria.

The selection of criteria is determined by the activities of the enterprise and the type of project. The most typical project evaluation criteria are [4–6]

- novelty and relevance of the project;
- technical and practical significance;
- complexity of implementation;
- investment attractiveness;
- availability of qualified project implementers;
- project implementation time;
- level of commercialization;
- socio-economic significance of the project results;
- potential for import substitution and others.

Criteria can be either quantitative or qualitative. Project evaluations according to quantitative criteria are set in physical scales; according to qualitative criteria, evaluations are obtained on the basis of expert evaluation. For each criterion, an assessment of each project is carried out, and based on private assessments, an integral assessment of each project is formed.

Consider some methods for obtaining integrated assessments of the attractiveness of projects.

72.2 Additive Method for Evaluating Projects

Let us first consider the classical method of evaluating projects, which is considered traditional and is widely used at present [7].

Let there be n -projects $\text{Pr}_1, \text{Pr}_2, \dots, \text{Pr}_n$, which are evaluated according to m criteria K_1, K_2, \dots, K_m . We denote by X_{ij} a particular estimate of the i th project by the criterion with K_j . Also, in the case of different importance of the criteria for the final evaluation of projects, it is necessary to set the weight of the criteria w_j .

The scales for measuring projects according to the criteria can be of different types: dichotomous, polyatomic, continuous interval, and semi-interval. In addition, the criteria may have a different orientation in terms of the degree of attractiveness of projects: direct, when the larger the assessment by the criterion, the more attractive the project, and the opposite, when projects are more attractive with a lower assessment by the criterion. In order to adequately receive integrated project estimates, private estimates on different scales must be normalized to a single scale.

As a normalization procedure, one can use the reduction of particular estimates to a direct unit scale [8]. For criteria with a direct scale, normalized private estimates of projects by x_{ij} criteria can be obtained by the formula:

$$x_{ij} = \frac{X_{ij} - \min_i(X_{ij})}{\max_i(X_{ij}) - \min_i(X_{ij})}, \quad (72.1)$$

and for criteria with a reverse scale, according to the formula:

$$x_{ij} = \frac{\max_i(X_{ij}) - X_{ij}}{\max_i(X_{ij}) - \min_i(X_{ij})}. \quad (72.2)$$

In the traditional approach, the integral assessment of the project quality is carried out according to the additive method [7], when the integral estimate Ap_i of the project Π_i will be determined as the sum of the individual estimates multiplied by the weights:

$$Ap_i = \sum_{j=1}^m w_j x_{ij}. \quad (72.3)$$

The main advantage of the additive method is its simplicity in terms of computational procedures and its comprehensibility for practical use. However, it has a number of significant drawbacks, the main of which are the dependence of the obtained estimates on the types of projects under consideration and a set of criteria, as well as the nonlinear effect of the criteria-based assessment scales on the overall integral project assessment. Consider other models for evaluating projects that are devoid of these shortcomings.

72.3 Project Evaluation Method Based on Latent Variable Theory

This method is based on the mathematical apparatus of the Rush model for estimating latent variables [9–12].

To apply the method for project appraisal, let us assume that the integral appraisal AP_i of the project is some vector latent variable. The Rush model assumes the presence of another vector latent variable AK_j , which characterizes the evaluation criteria. The variables AK_j have the meaning of the feasibility or severity of the criterion K_j on the whole set of evaluated projects. The higher the AK_j score, the less all projects together satisfy the specified criterion.

In accordance with [13, 14], to obtain estimates of the latent variables AP_i and AK_j , it is necessary to solve an optimization problem of the form:

$$\sum_{i=1}^n \sum_{j=1}^m w_j \cdot \left(x_{ij} - \frac{e^{AP_i - AK_j}}{1 + e^{AP_i - AK_j}} \right)^2 \rightarrow \min, \quad (72.4)$$

which can be supplemented by the condition of non-negativity of latent variables:

$$AP_i \geq 0; \quad AK_j \geq 0; \quad i = 1, 2, \dots, n; \quad j = 1, 2, \dots, m. \quad (72.5)$$

The method based on latent variables has a number of advantages compared to the traditional additive method. We list the main advantages of this method [15, 16]:

Integrated project evaluations are their unique characteristics and do not depend on many projects and a set of criteria.

Integrated project estimates are measured on a linear dimensionless scale, which can be easily translated into any other, for example, probabilistic rating scale.

In addition to integrated project evaluations, it is possible to obtain estimates of the influence of the AK_j -criteria, which are also linear. These estimates allow the analysis of criteria for various groups of projects, highlighting the most important of them.

The main drawback of the estimation by the Rush model is the impossibility of an analytical solution to the nonlinear programming problem (72.4) and (72.5); however, this problem is successfully solved by numerical methods.

72.4 Fuzzy Set Project Evaluation Method

This method is based on a slightly different approach to multi-criteria project evaluation [17]. Here, many projects are seen as fuzzy in terms of attractiveness of projects for each criterion. It is assumed that each criterion corresponds to a certain indicator y , individual for each project. Each exponent of criterion K_j will have a fuzzy set with membership function $\mu_j(x)$. If for project Π_i , the value of this indicator is equal to y_i , then for private evaluations of projects according to the criteria, you can use the formula:

$$x_{ij} = \mu_j(y_i). \quad (72.6)$$

Then, to evaluate the integral attractiveness of the AP_i -project, you can use the formula:

$$AP_i = \sum_{j=1}^m w_j x_{ij} = \sum_{j=1}^m w_j \mu_j(y_i). \quad (72.7)$$

Consider the main types of membership functions that can be used in evaluating different types of exponent y . Let us try to consider the main types of such criteria and select the membership functions for them in general.

A *dichotomous indicator* is a representative of a clear set, when the project can either meet the criterion or not match. Then, the membership function is:

The membership function if the attribute corresponds to the value c is:

$$\mu(y) = \begin{cases} 1, & \text{if the project meets the criteria;} \\ 0, & \text{if the project doesn't meet the criteria.} \end{cases}$$

The *polyatomic indicator* differs from the dichotomous one in that the indicator y can contain several gradations from a single segment, and the criterion contains several attributes with different attractiveness.

An example of such a criterion is “Project Complexity” (1—low, 0.5—medium and 0—high).

A *uniformly distributed* indicator in a certain interval. The criterion is met if the exponent y falls in the interval from a to b . For example, if it is required that the project run time be at least a -days and not more than b -days. The membership function is:

$$\mu(y) = \begin{cases} 1, & \text{at } y \in [a; b]; \\ 0, & \text{at } y \notin [a; b]. \end{cases}$$

The indicator *linearly increasing* on an interval. It is used if the indicator y was ideally more than b , but not less than a , for example, the profitability of the project should be b -rubles or more, if less—worse, but not less than a -rubles. Membership function will be:

$$\mu(y) = \begin{cases} 0, & \text{at } y < a; \\ \frac{y-a}{b-a}, & \text{at } y \in [a; b]; \\ 1, & \text{at } y > b. \end{cases}$$

The indicator *linearly decreasing* in the interval. Similar to the previous one, but for inverse (minimizing) criteria with membership function of the form:

$$\mu(y) = \begin{cases} 1, & \text{at } y < a; \\ \frac{b-y}{b-a}, & \text{at } y \in [a; b]; \\ 0, & \text{at } y > b. \end{cases}$$

An exponentially increasing indicator is used when it is necessary that the value of y be as large as possible, not less than a . For example, the investment attractiveness of a project should be no less than a . Then, the membership function is:

$$\mu(y) = \begin{cases} 1 - \exp\left(-\frac{y-a}{a}\right), & \text{at } y > a; \\ 0, & \text{at } y \leq a. \end{cases}$$

The exponentially decreasing indicator is similar to the previous one and is used when it is necessary that the value of y be no more than b minimum, for example, project costs should not exceed b . Then, the membership function is:

$$\mu(y) = \begin{cases} 1 - \exp\left(\frac{y-b}{\sqrt{b}}\right), & \text{at } y \leq b; \\ 0, & \text{at } y > b. \end{cases}$$

A triangular measure is used when the value of y should be from the interval from a to b , but its best value is in the middle of the interval. Membership function is equal to:

$$\mu(y) = \begin{cases} 1 - 2 \frac{|(a+b)/2-y|}{b-a}, & \text{at } y \in [a; b]; \\ 0, & \text{at } y \notin [a; b]. \end{cases}$$

A normally distributed exponent is similar to the previous one, but is used when y is a random variable distributed by the Gauss law. Membership function will be:

$$\mu(y) = \exp\left[-8 \frac{(y - (a + b)/2)^2}{(b - a)^2}\right].$$

It should be noted that to calculate the integral indicators of project attractiveness, instead of the additive approach (72.7), one can use an approach based on the theory of latent variables (72.4) and (72.5), but with the initial data obtained from (72.6).

72.5 Conclusion

Thus, some methods of multi-criteria evaluation of projects were examined in terms of their attractiveness.

The additive method is traditional; its main advantage is simplicity in computational terms.

The method based on the Rasch model for estimating latent variables has several advantages over the additive one: Linearity of the estimates obtained their independence from many projects and a set of criteria. Its disadvantage is the impossibility of an analytical solution in the practical application of the method.

A method based on the theory of fuzzy sets is distinguished by the fact that many projects are considered fuzzy in terms of the attractiveness of projects for each criterion and are characterized by some membership function.

The authors conducted computational experiments based on simulation methods, which showed the adequacy of integrated project evaluations using methods based on the theory of latent variables and fuzzy sets. In addition, estimates by these methods showed higher accuracy and resistance to changes in the initial data than estimates obtained by the additive method.

It should also be noted that expert assessment based on the theory of latent variables according to the Rasch model has been tested in other areas of scientific and practical activity, in particular, in education [18], management [19] and in assessing the competence of personnel [20].

Which method should be used when evaluating projects depends on the specifics of the projects, as well as the type of criteria and type of rating scales.

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Chapter 73

Features of Professional Socialisation in the Context of Digitalisation



G. Bannykh and S. Kostina

Abstract The digital economy entails a change in the structure of employment, the emergence of new types of employment and types of professional activity, the need to change several types of professional activity during a career, high professional mobility, the emergence and growth of precariates. The competitive advantage of a professional is transfessionalism. The purpose of this article is to study the characteristics of professional socialisation of workers and the impact of these phenomena on changes in the labour market in the digital economy. Research methods that were used in the work—analysis of documents, analysis of statistical data, secondary data analysis. The results. The labour market (both world and in Russia) is the most sensitive indicator of digital changes. The consequence of digitalisation is the complexity of the organisation and functioning of the world of jobs and the change in the content of professions. The result of these challenges in the Russian labour market is an increase in the precarious work segment—up to 17 million people, which leads to the loss of professional identification. Professional socialisation today is possible without professional training: only a little more than 50% of graduates of vocational education organisations are employed according to the specialty they have received. Workers of pre-retirement age are actively changing the scope of professional work and are undergoing professional re-socialisation.

73.1 Introduction

In the context of digitalisation of social relations, the importance of human resources and their quality is growing. Digitalisation leads to a change in the content and technology of work of various professional groups, the emergence of new and reduction of obsolete types of professional work, which requires professionals not only to master new digital competencies (knowledge and skills) but often also new professions (both related and far from originally obtained in the course of education or practice),

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the acquisition of new professional experience. This is the content of professional socialisation and self-determination of an individual (employee, professional).

The purpose of this article is to study the characteristics of professional socialisation of workers in a digital economy. Important research questions include the following:

- how digitalisation has affected the employment sector and the labour market in the Russian Federation,
- how digitalisation affected the change in the working career of workers,
- how these changes affect the choice of a professional trajectory by an employee and the mastery of a new profession.

73.2 Professional Socialisation and Self-determination: Theoretical Approaches

Turning to the analysis of professional socialisation and self-determination, it is necessary to dwell on the definition of the central phenomenon—the profession. Despite the fact that the profession as a complex and controversial social phenomenon has many approaches to definition, one of the most common approaches can be considered institutional, in which the profession is a type of labour activity, occupation that requires some training and is usually a source of livelihood. No less common is the understanding of the profession as a social community, which is built naturally and is regulated, including by informal norms. In this case, the profession has its own “culture”, consisting of common meanings shared by all members, based on similar or jointly carried out activities, allowing professionals to resist the external environment, while maintaining internal unity. From this position, the most important process of familiarising oneself with the profession is professional socialisation.

In its most general form, professional socialisation is a process that continues throughout a person’s life while he is engaged in professional labour. The foundations of professional socialisation are laid back in school, its purposeful formation begins in a professional educational institution, and only then continues at the workplace. However, in the current conditions of instability, socio-economic transformations, the transition to a new technological structure and other things, professional socialisation takes on a more complex form—a person is forced to join several professions, and sometimes it happens almost simultaneously. Professional socialisation is a multi-factor and multi-level process of assimilation by an individual of a professional culture, its integration into a professional system by transferring professional values, traditions, and norms of professional behaviour.

In most studies, the problems of professional socialisation are revealed by the example of students in the vocational education system. The attention of scientists was drawn to various aspects of professional socialisation—both substantive and procedural. A study by M. Dinmohammadi, H. Peyrovi, and N. Mehrdad reveals common structural elements of the process of professional socialisation that help to

achieve a common level of success—learning, interaction, development, and adaptation [1]. J. T. Shuval, and I. Adler distinguished three models of socialisation in the profession in the process of the classical learning option: active identification, active rejection, and inactive orientation [2]. D. Toit believes that the process of converting a beginner to a professional is essentially a process of acculturation, during which the values, norms and symbols of the profession are acquired. This process can take place at the formal level (for example, at a university) and at the informal level (in the process of professional socialisation and communication with a group of peers, as well as informal sanctions) [3].

In studies that reveal the substantive aspects of professional socialisation, various factors affecting professional socialisation are studied. A. S. Hirschy and M. E. Wilson et al. Describe the influence of age, authority, and relationships on the formation of professional identity, which underlies professional socialisation [4]. S. M. Clark and M. Corcoran studied differences in the professional socialisation of men and women in the academic environment [5].

Professional self-determination is the primary stage of professional socialisation. According to L. B. Schneider, professional self-determination is a long-term process of an internal, subjective plan, meaningfully consisting of a person searching for “his” profession and “himself in the profession”; determination of their own professional positions, prospects and their achievement; gaining readiness for independent professional activity [6].

The effectiveness of self-determination in the profession can be determined by the degree of coordination of the psychological capabilities of a person with the content and requirements of professional activity, as well as by the personality’s ability to adapt to changing socio-economic conditions in connection with the arrangement of their labour careers.

Fossen F., Sorgner A. suggested that digitalisation has an ambiguous effect on the profession: it can lead to both productivity growth and the complete replacement of human resources with machines, it all depends on the presence and representation in the profession of the corresponding highly professional computer skills [7].

Thus, we can state the stable interest of researchers in the structure and content of the professional socialisation of the individual, as well as in the changes in this process that are caused by the digital transformation. The digital economy is changing the conditions of work, employment, and forcing graduates to choose professional activities, and workers with established professional competence to adapt to new conditions.

73.3 Features of the Labour Market in the Russian Federation in the Context of Digitalisation

As T. F. Safarov notes, until now, the Russian labour market has not practically changed under the influence of digital technologies, responding to economic crises

not so much with a reduction in jobs, but with a decrease in the general level of salaries [8]. With the further digital transformation of economic sectors, the introduction of automation and robotisation systems, increasing labour productivity and replacing physical service channels with digital ones, more and more jobs may be threatened with extinction.

According to experts, at the beginning of 2020, more than 20 million workers in Russia are at risk of automation, i.e. they will require upgrading or changing their qualifications, retraining or leaving the labour market, 45.5% of the average number of employees [9]. According to experts, the development of new technologies in the next few years will lead to a reduction of 7 million jobs, which will be compensated by only 2 million vacancies in new areas of economic activity [10]. Russian experts believe that up to 10% of currently existing professions may disappear in the next five years.

Such structural changes in the labour market can be considered as challenges in the context of digitalisation. The answer to such challenges is the individualisation of social and labour relations; development of non-standard forms of labour relations; blurring the boundaries between work and leisure and more.

Precarious work can manifest itself in various forms as partial, temporary, non-permanent, part-time, secondary employment, employment, over-employment, self-employment, activities for the provision of labour for employees (outsourcing, staff leasing), remote employment, informal employment, crowdsourcing, insourcing, project form of employment, etc. The scope of precarious work in the Russian labour market is significant and has a tendency to increase. According to the Federal State Statistics Service, the number of employed in the informal sector of the Russian Federation is currently more than 20% of the total employed in the economy [11]. According to the Federal Tax Service of the Russian Federation, in March 2020, officially registered about 500,000 self-employed [12]. According to a study by the Center for Socio-Political Monitoring in 2019, the share of self-employed in the total employed population was 22%, of which 10% for main work and 12% for additional work [13]. In numerical terms, this is about 16–17 million people. The consequences of the growth of precarious work, including an increase in the scale of precarisation of labour.

According to a study of social attitudes and dispositions of the population of Russia regarding new forms of employment conducted by the All-Russian Research Institute of Labour and St. Petersburg State University in 2017, 56% of respondents aged 18–29 chose work only for themselves as the most preferred type of activity for them (an entrepreneur, self-employed, freelancer). Such employment, in their opinion, provides an opportunity to independently choose the place of performance of work functions, to regulate working hours and the amount of work. In this age group, there was also the highest level of readiness for training and acquiring a new profession in comparison with respondents of other ages. Moreover, 41% of the respondents are ready to study, get a new profession at their own expense, which is the highest indicator among all age groups, and only 4% expressed the opinion that training is not required [14].

One of the significant risks of the Russian labour market in the digital economy is the imbalance of highly qualified intellectual specialists—in 2018, only 17% were involved in the profession, with 72% of managers experiencing a shortage of qualified personnel.

The result of digitalisation in the labour market and professions is a serious increase in precariates, non-standard forms of employment, and an imbalance in the employment of highly qualified specialists, which makes it difficult to adequately interact between the education sector and the world of work, influencing the change in the attitude of workers to the profession, professional work, and a stable professional career.

73.4 Changes in Professional Socialisation in the Context of Digitalisation

Instability in the labour market in the context of digitalisation creates various scenarios of a career and employee behaviour. Researchers note that the process of adapting a new employee is less and less accompanied by the practice of mentoring, transferring experience and other actions that form the professional identity of the employee [15]. On the one hand, these are the consequences of the individualisation of labour relations, on the other hand, it is the result of increased competition and concern for maintaining one's own intellectual capital. The behaviour of workers with regard to overtime work, called the “flexible” form of employment today, has changed, in fact, work takes more time and more work is done. Thus, according to the Fund of public opinion, which conducted a special interview with working Russians aged 18 and over, showed that 41% of respondents have to work overtime on weekends, and earn extra money or have extra income—31% [16]. Again, the reason is increased competition, and the result is the rapid deterioration of labour potential and the desire to change the scope of activity.

As for changes in the career, first of all, the professional path is becoming increasingly difficult to plan, and secondly, those who work directly in their specialty for a long time are becoming less and less. In this regard, the guarantee of employment no longer implies a certain specialty, a specific place of work or a specific employer. To a greater extent, it is the result of the ability, while remaining active, to adapt to changing requirements. The task of everyone is, therefore, to monitor their level of demand in the labour market throughout their lives. Then the demand will be a guarantee of employment.

According to E. F. Zeer, in the new world there are fewer professions and more situational labour functions, the concept of “transfession” is increasingly used, which refers to the type of work aimed at solving complex professional problems on the basis

of convergence of knowledge and competencies belonging to different areas of socio-professional activities. In modern society, the need arises for the development of pre-adaptation subjects of professional activities, i.e. preparedness for the uncertainty of the professional future [17].

The need for professional self-determination and entry into a new profession (professional socialisation) arises among various groups of workers.

Firstly, this is the most active part of the workforce. The change of profession is mainly resorted to by citizens aged 30–49 years—specialists and workers of various qualifications, regardless of educational level [18]. According to the data of the “Russian Monitoring of the Economic Situation and Health of the Population of the Higher School of Economics (RLMS-HSE)”, conducted in 1998–2016, conditionally “giving sectors” in the dynamics of years remain practically unchanged: unemployed and employed in the field of trade and consumer services. While the landscape of “host industries” over the past decade has expanded significantly and significantly changed. If in 2005 workers moved to industries such as trade, consumer services, food processing, construction, transportation, communications, agriculture, then in 2016 to the sectors of trade, consumer services, transportation, communications, and previously demanded by horizontal professional mobility the construction sector was supplemented by education and utilities [18].

Macro environment factors lead to the release of not only specialists of various qualifications, but also middle managers of large corporations, directors of small private enterprises. According to studies, the majority of those changing the profession is preparing for this systematically: preparing for dismissal took from six months to a year and included the formation of an economic airbag, exploring opportunities for retraining programs, considering similar experiences of friends and acquaintances [18].

However, problems of professional self-determination also arise in young professionals who have just received professional education. In particular, 91% of Russian employers believe that graduates lack practical skills, 83% determine the level of training at universities as medium or low [19]. According to a study by the All-Russian Center for the Study of Public Opinion, only 51% of Russians work according to their specialty, 47% work in a different professional field [20, 21]. At the same time, 70% of respondents received new professional training (37% on special courses, 33% on their own), and 29% of the respondents did not receive any professional skills for the new field of activity.

The issues of professional self-determination are mainly dealt with by organisations of general and vocational education in relation to youth. In relation to “adults”, such activities are carried out by public employment services in the framework of assistance to unemployed citizens.

A change of profession presupposes the beginning of the process of professional socialisation, which includes the mastery of the necessary knowledge and skills. In this regard, two groups of professional areas of employment can be distinguished. The first group includes areas in which work requires confirmation of their qualifications in the form of a document, most often of a state standard, on vocational education. This group can include, for example, the profession of a doctor or teacher. The second

group includes areas of employment where the presence of a vocational education of a certain orientation is not required. These areas include low-skilled labour, trade, a significant part of office workers, etc. Most of the labour mobility with a change of profession, in our opinion, falls on the second group of professions.

In recent years, they tried to compensate for the absence of a requirement for a document on a certain professional education in the Russian Federation by introducing a qualification confirmation system based on professional standards. Currently, more than a thousand professional standards have been approved in the Russian Federation, 343 qualification assessment centers, and 681 exam sites in 68 regions of the country operate. An independent assessment of qualifications allows you to recognise the results of non-formal learning, the inheritance of structural elements (units) of qualifications when an employee changes educational and career paths. However, this system is not binding.

To develop digital competencies for adults in Russia, a pilot project has been launched to provide personal digital certificates that allow you to get additional education and career counseling, which will close the gap between human potential, the educational system and the needs of employers. At the end of 2019, 5000 certificates were issued, and by 2020, another 30,000 certificates are planned to be issued.

73.5 Conclusion

The labour market (both world and in Russia) is the most sensitive indicator of changes in a market economy and is undergoing a very significant change under the influence of digitalisation. The result of digitalisation in the labour market and professions is a serious increase in precariat, non-standard forms of employment.

The answer to these challenges in the labour market in Russia is an increase in the share of people employed in non-standard forms of labour relations—up to 17 million people, up to 20% of the total number of employees, which leads to an increase in precarisation and loss of professional identification. Digitalisation also causes an imbalance in the employment of highly qualified specialists, which complicates the adequate interaction between the field of education and the world of work, influencing the change in the attitude of workers to the profession, professional work, and a stable professional career.

Professional socialisation today is possible without professional training: only a little more than 50% of graduates of vocational education organisations are employed according to the specialty they have received, and workers aged 30–49 years who have qualified specialists, lower and middle managers and are most susceptible to professional mobility, change of profession other things. Workers of pre-retirement age are actively changing the scope of professional work and are undergoing professional re-socialisation. Every fifth employee changed the professional sphere of work at least once. In these conditions, the task of the state becomes not only the creation

of conditions for mastering the new profession of released workers, but also new systems of qualification confirmation.

In the digital economy, the nature of the interactions between workers with different skill levels and digital technologies that influence the demand for labour, as well as the speed of digitalisation, leads to structural changes in the labour market, expands forms of employment (freelance, outstaffing, outsourcing, remote), forms the precariate and needs for flexible labour, professional mobility [22]. The traditional economy trained specialists to choose one profession for life; in the digital economy, the most important quality is the diversity of capital, professional subject skills, and professional flexibility.

The process of professional self-determination in modern socio-economic conditions becomes long and unattached to certain age periods (for example, graduation from school). The digital economy is changing the requirements for professional, especially digital competencies, and forcing workers with established professional competence to adapt to new conditions. An important skill of a modern employee is continuous self-education, ahead of retraining, obtaining a flexible list of competencies.

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Chapter 74

Opportunities of Electronic Learning Platforms for the Russian System of Higher Education



N. Savelyeva, E. Bozhko, E. Kalugina, S. Surovtseva, N. Pochitalkina, and R. Kusarbaev

Abstract The habitual training routine of today's students, who are the representatives of digital generation, is closely related to electronic educational programmes and courses, textbooks, assignments, and projects. The information support of the educational process is the prerequisite of obtaining the respective professional competencies, as well as of a successful professional career and its progression. The rapid development of online technologies has served as a catalyst for the emergence and spread of information educational technologies, particularly, of online education. The use of modern educational information and communication technologies gives the teacher many opportunities to simultaneously communicate the learning material to different groups of learners. The learners in such groups may have different levels of initial training, different perception speed, and sometimes even different attitudes towards the university education. These technologies dramatically reduce the number of slow learners, motivating them to educational activities and making the learning process more effective. Thus, the learning process rises to the proper level, and the university rankings rise accordingly. Although the World Wide Web as we know it is a relatively recent phenomenon, it is evident that the electronic distance learning has existed for a long time, and the level of its technological development was not always as high as it is now. The authors suggest that the standard structure and content of a media platform should be considered for a better understanding of the nature of modern digital learning technologies and the opportunities they offer.

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74.1 Introduction

The modern information society tends to erase the boundaries between traditional education and distance education due to the wide popularity of the Internet among the students, while they are studying various courses. Nowadays, the content of World Wide Web provides information on any topic of interest, and no doubt, this facilitates the search for information and reduces the time needed for academic research. E-learning, which provides for continuous training and retraining of specialists without any reference to geography and a specific time, is considered a manifestation of society virtualisation and is one of the most urgent government requirements to the education system. E-learning provides for continuous training and retraining of specialists without any reference to geography and a specific time [1–8].

Let us refer to the concept of “extramural learning”. Its classic version involves sending assignments in letters by mail. Since the late 1990s, some universities began experimenting with the implementation of online learning elements into extramural programmes, thus making the opportunities offered by e-learning and extramural learning, and the elements of face-to-face learning to successfully combine with each other. So, the implementation of digital technologies into the educational space of the modern information society becomes obligatory and necessary. This idea is relevant to all levels and types of education characterized by the contradiction between the digital literacy of today’s children and adolescents, who can handle personal computers virtually “from the cradle”, and the insufficient consideration and use of digital technologies in the educational process. Nowadays, the huge gap between the learning process and everyday routine of the learners is obvious, and this greatly reduces their motivation and interest in learning and, hence, the learning efficiency. It should also be noted that both the real world and the virtual world are of great importance for the younger generation of pupils and students. In this regard, once again we have to establish the fact that the Russian system of education, which is completely out of date, badly needs modernization. Although many educational institutions and some teachers are interested in the latest things and digital media technologies and do not hesitate to apply them, the vast majority of the representatives and institutions of Russian educational space still work in the same old way and refuse both to implement innovations and to develop them.

74.2 Methodology

We believe that the main goal of any e-learning platform is to provide people around the world with free and unlimited access to educational opportunities and services of the universities. Nowadays, e-learning is a perfect way of democratization of academic education of transferring the higher education system into a new format involving the combination of popular social networks (e.g. YouTube, Facebook,

Instagram, and VKontakte) and platforms (e.g. Webinar, Zoom, Google Meet, eTutorium) and conventional full-time and extramural forms of education. The digital teaching methods enable the division of learning material into clear-cut modules and provide for the availability of this material to everyone at any time, without fixed curriculums, financial investments or inaccessibility.

The overreaching goal of the modern higher education system is to create and to develop a single educational platform that would comply with all the learners' requirements and would not contradict the accepted academic standards. The necessary platform will be primarily useful for such potential users as people, who do not have an opportunity (be it financial or geographical) to obtain the higher education, people with disabilities, physically challenged people and people caring for unwell family members [9, 10].

E-learning platforms represent a significant potential for higher educational institutions, especially for small ones. The digitalization of the learning process provides the universities with the opportunity to attract foreign students, granting them the access to the available educational opportunities without them leaving their countries. This, in turn, will help increase the motivation and improve the level of efficiency and effectiveness of the vocational training process. In addition, the simultaneous involvement of highly skilled foreign and out-of-town experts from different areas of knowledge may also prove an important advantage of digital learning. Such experts will communicate their content to students through media platforms, and both students and researchers will benefit from it.

Using online platforms as a basis for learning implies certain criteria for forming academic groups, such as level of education, personal characteristics (geographical location, country of origin, etc.), and the desired level of education in the end. The intensive mentoring support provides a continuous supervision of the learners by people, who are not de facto or de jure members of the faculty staff. Senior and more experienced students can be appointed as mentors, and they become a kind of connecting link between students and teachers.

The expert teachers, who accompany the learning process with the thematic counselling, make the video introduction to the online learning process. Feedback is provided by the qualitative assessment of final qualifying papers of the students. The group of tutors is responsible for a smooth and even "entry" to the online course. They provide coverage of the thematic issues and assess final papers. Every tutor supervises five students. The tutor's task is to guide the process of collaboration among the group of learners, to monitor academic achievements of the group, to send academic credentials and to support the learners during examinations and formative and summative assessments.

Modern educational platforms also provide a regular academic exchange and feedback. The mentorship is actively supported with a transparent, public and moderated chat that provides for a comprehensive solution to any learning issues and problems that may arise, as well as for bilateral feedback and assessment. The students become involved in the traditions of academic discourse and independent peer review. The main aim here is to involve the individual experience of every participant of the educational process into the learning process, as well as his or her national and

cultural features, personal preferences and interests. It is also important not only to develop the students' confidence in the fact that there is always a way to solve any problem but also to open new perspectives and to establish a different vision of their future profession.

74.3 Results

It is noteworthy that the learners themselves distinguish a number of advantages of learning by means of media platforms as compared to the traditional learning. Such advantages include clear syllabus, efficient system of notifications and communications, clear deadlines, availability of the electronic board, convenient structure of the online platform, possibility of downloading home assignments and making peer reviews. All the said factors contribute to the learners' making significant progress in training at low costs and investments.

The learners also note that one of the main advantages of e-learning platforms is that they expand the range of opportunities offered by classical learning. The educational platforms are a kind of breakthrough, a revolution in the education system, which greatly facilitates the students' everyday learning routine and brings some diversity thereto. The undeniable advantages of e-learning are the following: learning material, always available for download, temporal and geographic flexibility and easy and convenient ways of interaction among all participants in the educational process.

However, despite the availability of educational material, it should be noted that there exists a risk of the students' cognitive decline and loss of academic research skills. Besides the great features offered by e-learning platforms, the students mention that such platforms are unable to function independently, without the elements of classical learning. The availability of emotions and immediate personal communication among all participants in the educational process is an integral part of the learning process. Based on this, we emphasize the need to combine online technologies and classroom (face-to-face) type of learning.

The next challenge necessary to be admitted is the availability or lack of certain technical conditions needed for adequate and effective use of all the possibilities offered by educational platforms. The process of online learning requires that each participant of it should have basic knowledge of IT, a personal computer or a gadget and stable Internet connection at maximum speed. If this is not the case, then the risk, that only the learners with more advantageous technical capabilities will be able to register and to participate in the planned online learning event, may increase.

The main difficulties in implementing e-learning may also include the possibility to organize it on the basis of several educational platforms within a single faculty, institute, department etc., which will put the students in a situation when it is necessary to constantly monitor several resources in order to obtain new information. Such a division may result in the loss of important information and, therefore, to the reduction of effectiveness and efficiency of the educational process.

74.4 Conclusions

Therefore, the use of educational platforms neither introduces something fundamentally new in the basics of pedagogy and methodology nor implements new didactic concepts. Unfortunately, many teachers are hardly familiar with the variety of features and tools offered by educational platforms. This often results in the fact that only a small part of the potential these resources have to offer—most commonly, the information storage—is used. When educational platforms are used as a basis for formative or summative assessment, the students are usually offered multiple-choice questions or online tests with no creative thinking processes involved.

Nowadays, e-learning may be considered as a way to establish greater equality and to achieve equal opportunities in higher education (by means of the so-called “Open Education”). Here, it is important to strike the right balance between e-learning and face-to-face classroom learning. E-learning may contribute to the democratization of academic education, which is characterized by the intensive interaction between the learners and the teachers, and the availability of such education for all groups of the population that had never before had the possibility of obtaining academic education.

We believe that different people may consider e-learning as a more attractive element of the career development system (as a principle of life-long learning). This brings to the fore the need to develop new appropriate didactics, which would be beyond all political trends and would take into account the interests and needs of all target groups.

Many educational institutions and their students currently create and develop their own online courses and programmes. Private firms and companies specializing in the development and sale of digital educational services are also not uncommon now. In either case, this process requires and inevitably entails considerable financial investments, and in order to reduce them, the universities often combine their efforts for the creation of digital educational products. Unfortunately, the most common misconception of the administration of many universities is that they implement educational online platforms as an opportunity to reduce costs, especially by means of reducing the teaching staff involved in the educational process.

Alongside with the above, it should be noted that the universities could more effectively use the funds allocated for the digitalization of the educational process in order to modernize the conventional techniques and methods of teaching. Besides, the energy costs for the development and maintenance of educational online courses should not be overlooked, as such courses require regular upgrades, updates and technical maintenance, whereas the universities nowadays have a limited amount of funds at their disposal and are not always able to rely on sponsorship.

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Chapter 75

Stress Resistance of Teachers as One of Factors of Effective Educational Activities



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Abstract This paper is devoted to the problem of stress resistance of pedagogues, while it is considered as one of the key personality traits ensuring the readiness of educators for educational activities. Teachers in their daily activities on an ongoing basis are faced with stress and stressful situations, and the successful opposition to them is one of the key factors in the success of their educational activities. The purpose of this paper is to analyze foreign and domestic literature on the research problem and an empirical experiment aimed at identifying the level of stress resistance and components of readiness for educational activities of students of a pedagogical university. The study was based on the Professional Pedagogical Institute of the South Ural Humanitarian Pedagogical University. The study involved 182 students in areas of undergraduate training among 120 girls and 62 boys. Such significant

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gender differences in the sample can be explained by the popularity of the pedagogical direction among girls and the decline in interest from young men. Analyzing the obtained diagnostic data, the authors came to the conclusion that stress resistance as a key factor ensuring the readiness of future teachers for educational activities are not fully formed. Therefore, the work which is planned to prepare future teachers for educational activities is relevant and necessary.

75.1 Introduction

In their daily activities, teachers are increasingly faced with tasks and requirements that generate stress associated with their professional activities, which leads to a decrease in their productivity. A study conducted in 2005 by the American psychologist S. Johnson showed that of the 26 professions involved in the study, the teaching profession was the second most stressful occupation after ambulance drivers [9].

Constant socioeconomic changes, a radical change in the ideological paradigm, meaning of life and value orientations of youth lead to an increase in the importance of the educational component of the educational system. At the same time, reforms in the education system caused a decrease in its educational and humanistic mission.

At the present stage, the educational work of teachers is accompanied by a huge number of difficulties, extreme and stressful situations, which can only be overcome with a high level of stress resistance. Therefore, we consider stress resistance as a personality quality that ensures that future teachers are ready for educational activities, which in turn is an important aspect of all his future work in secondary vocational education, which made this paper relevant.

The purpose of this paper is a theoretical analysis of foreign and domestic scientific literature on the problem of research and identifying the level of formation of certain aspects of readiness for educational activities of students of a pedagogical university.

75.2 Problem Statement

We turn to the analysis of foreign literature on the causes of stress in teaching and stress resistance of teachers.

The study conducted by S. Dlamini, C. Okeke, and K. Mammen showed that instability at work and the inability to influence the current situation related to employment are the main source of stress [2]. According to L. S. Pettigrew and G. E. Wolf, there are two types of stress: (1) stress based on tasks related to professional activities, with poor behavior of students, with job descriptions, with bad attitude of colleagues, (2) stress associated with the lack of career advancement, lack of necessary material resources for the implementation of the educational process at the appropriate level, dissatisfaction with their professional role [14].

According to I. O. Segun-Martins, stress in teaching is an adaptive response to a situation that is perceived as critical, threatening their well-being. Stress, according to the author, is a person's reaction to the situation, not the situation itself. Stress is considered as a non-specific response to inadequate and unacceptable requirements for the teacher, a reaction to disturbing events in the surrounding reality. Stress is the process by which a teacher perceives and copes with emerging threats and challenges [19].

D. W. Chan considers stress as emotional disorders and changes in the psyche caused by stressors. Stress in the workplace, according to the author, has a harmful effect on the health and well-being of teachers, as well as a negative impact on their productivity [1]. C. Kyriacou stress associated with learning, calls "teacher stress", defines as the experience of a teacher in getting unpleasant, negative emotions such as anger, anxiety, tension, frustration or depression caused by some aspect of their work as a teacher. The sources of teacher stress are diverse, among the most common are the need to adapt to sudden changes in the curriculum, the feeling of powerlessness and injustice [12].

C. Q. Haydee and B. G. Raymund in their study found that most educators believe stress is so common that it has become a normal state in their lives. Stress always has a harmful impact on the lives of teachers, worsens their health, causes a constant depressed mood, reduces their quality of life. Stress causes emotional, physiological, cognitive, and behavioral changes in the personal sphere of teachers [7]. According to Norwegian scientists E. Elstad, E. Lejonberg and K. A. Christophersen stress in the activities of teachers are associated with negative assessments of their activities on the part of students and administration, and the constant increase in requirements for the quality of their work [3].

Interesting for our work is the study of S. Dev, according to the author, the causes of stress in the activities of Indian teachers are procrastination, i.e., the tendency to constantly postpone important things. Procrastination is a behavior that occurs to a certain extent in most people. Procrastinators tend to put off performing professional tasks, which can negatively affect their professional activities and lead to stress. Psychological factors that affect the ability to overcome stress are self-motivation and emotional stability, which are the key components that provide stress resistance of teachers [2].

The opinion of Chinese scientists boils down to the fact that teachers, like any students, get used to stress during their studies at the University during examinations, which are considered a key predicate of stress. The negative impact of examination stress is not limited to individual psychological health, but extends to social relations in the team and the attitude to the government and society as a whole [23].

Summarizing the above studies, we note:

- (1) Most foreign authors consider the profession of teachers to be the most stressful and stressful.
- (2) The most common causes of stress are instability, inability to influence the current situation in the workplace, unfair attitude on the part of management, negative actions of students.

- (3) Stress has a harmful effect on the health and well-being of teachers, as well as a negative impact on their productivity.
- (4) For many teachers, stress becomes the norm, which reduces the quality of their lives.
- (5) The teacher in a state of stress transfers this state to the students and becomes the cause of their stress.

The further course of the research led us to the analysis of foreign studies devoted to the formation of stress resistance of teachers.

The term “stress resistance” refers to a person’s ability to withstand stress without serious impairment [20]. Stress resistance, according to D. W. Chan, is associated with effective coping strategies of behavior. It is the ability of a person to cope with emotionally charged situations and the ability to endure stress, tension without serious harm to mental and physical health [1]. S. R. Maddi is of the opinion that stress is inevitable in any work activity, and employees differ only in their ability to deal with stress [13].

Endurance to stress is a personal characteristic of the teacher, which determines his way to counter stress situations, sudden problems, affective states [1]. Components of stress resistance were first identified by S. C. Kobasa in 1979, the author considered stress resistance as a resource of resistance to stress situations. Stress resistance is considered S. C. Kobasa as three interrelated dispositions: (1) long-term, stable performance of labor functions; (2) control over their behavior and mental state; self-confidence and ability to face challenges [10].

Stress-resistant teachers tend to potentially stressful events as less threatening and do not seek to avoid them; they are more persistent, responsible, show efficiency in stressful situations and are able to perform complex professional tasks [20, 23].

Experience in dealing with stress depends on the personal experience of the teacher, the strategy of his behavior, the style of interaction with colleagues and students. Stress resistance allows teachers to be restrained, in extreme situations not to experience strong tension [1].

School leaders can help reduce teacher stress by creating working conditions that support teachers. The working conditions that provide the greatest job satisfaction include administrative and collegial support [8, 15].

Very important for the formation of stress resistance is the optimistic attitude of teachers, and scientists have found that optimists have better immune function after acute stress, while the pessimist did not show such an effect. In situations of constant stress, optimists did not show a tendency to depression, unlike pessimists. Stress can also lead to fatigue at work. This applies to the adverse effects of working conditions, when stressors seem inevitable, and the sources of job dissatisfaction cannot be corrected [15, 16].

N-A. A. Fadia studying the stress resistance of Israeli teachers, came to the following conclusions, women experience higher levels of stress, harder to endure the load, dependent on external social support. Also, the scientist found out that experienced teachers experience stress due to emotional burnout, less experienced tend to experience any minor experiences. Stress resistance allows teachers to perform

their professional duties more effectively, and it is easier to cope with difficulties and reduces the likelihood of emotional burnout and exhaustion [4].

According to M. H. Fisher, the formation of stress resistance is facilitated by a balanced diet, exercise, adequate sleep, as well as the ability to recognize overloads in work and stressful working situations. At the same time, the lack of mechanisms to combat stress leads to health problems, insomnia, anxiety, and depression [5].

Summing up the results of the analysis of studies on the problem of stress resistance, we note:

1. Stress resistance of the teacher is associated with the ability to overcome difficulties, determined by a set of personal qualities that allow a person to carry significant intellectual, volitional, and emotional stress due to the characteristics of professional activity, without any harmful consequences for the activities of others and their health.
2. The teacher should treat stress in his work as a given, overcoming stress is associated with an effective coping strategy of behavior.
3. Stress resistance largely depends on the style of interaction of the teacher with colleagues and students.
4. The formation of stress contributes to a balanced diet, exercise, adequate sleep.
5. Stress resistance is the most important structural component of professional stability of the teacher.

Let us turn to the characterization of the term readiness of teachers for educational activities.

M. Yu. Kulebyakina by the readiness of teachers for educational work refers to integrative personality education, implemented in the unity of motivational-needful, cognitive, active, and emotional-reflective components, which together ensure the successful implementation of educational functions in educational organizations [11].

According to A. N. Tkacheva, readiness for educational work is interpreted as a holistic personality education that combines value, cognitive, effective, regulatory, emotional, technological, and evaluative-prognostic components and is realized in the ability to axiological attitude to the world and needs in socially significant activities [21].

M. M. Yurkova identifies two approaches to the definition of “readiness for educational activities”: functional (state of psychological functions) and personal (functional readiness for educational activities) [24].

Based on the foregoing, we note that the readiness for educational activities, in most studies, is considered as an integrative quality of the personality of the future teacher, manifested in his creative needs, value attitude to educational activities and the pupil, as a set of competencies necessary for the holistic development of the personality of the pupil and educator in educational process.

75.3 Research Questions

After analyzing the work, devoted to the preparation of future teachers for educational activities, we found that in most of them there are the following components of the readiness of teachers for educational activities [11, 18, 21, 24]:

- motivational-value component: includes sustainable motivation to work with students, dominant motives of professional behavior, awareness of professional ideal, sense of duty, value attitude to the teaching profession, desire for self-development;
- cognitive component: systemic knowledge and skills necessary to ensure and develop a holistic personality of the student, knowledge of the conceptual and theoretical foundations, forms and methods of organizing educational work, orientation toward the educated person as the highest value, the need to create comfortable emotional atmosphere
- operational activity component: anthropological orientation, integrity and thoughtfulness of all components of the implemented educational system, stable moral guidelines, knowledge of innovative technologies of educational work, self-improvement and self-upbringing, stress tolerance, knowledge of self-regulation methods, emotional stability and intelligence, pedagogical imagination, observation;
- evaluative and reflective component: readiness to assess their potential and the potential of their pupils, rejection of negative phenomena in society, the ability to consciously control the results of educational work, as well as their own level of self-development, a high level of development of reflective and prognostic abilities.

The conducted empirical research is aimed at revealing the formation of the aspects of the operational activity component in students.

Summing up, we highlight the common features in the studies devoted to the readiness of teachers for educational activities:

1. In most studies, readiness for educational work is considered as an integrative personal education, ensuring the successful implementation of educational functions in professional educational organizations.
2. It implies a value attitude to the educational process and all subjects of the educational process.
3. Readiness for educational activities implies psychological (psychological stability and flexibility, stress resistance) and personal (functional) to it.
4. Educational activity is a leading aspect ensuring the effectiveness of the pedagogical process.

75.4 Purpose of the Study

Our empirical research will be aimed at identifying the stress resistance of students of pedagogical high school. In our opinion, it is possible to evaluate its formation even during the course of studying at a university, and they are the foundation for preparing future teachers for educational activities.

75.5 Research Methods

The base of the research was the Professional pedagogical Institute of the South Ural humanitarian pedagogical University. The study involved 182 student for bachelor courses: vocational training (on branches «Decorative arts and design»; «Economics and management»; «Transportation»; «Manufacture of food products»; «Law and enforcement»), including 120 girls and 62 boys. Such significant gender differences in the sample can be explained by the popularity of the pedagogical direction among girls and the decrease in interest from boys. To identify the level of stress resistance formation, we used the «emotional intelligence Traits questionnaire (TEIQue)» [22] and R. Lazarus «Coping test» [14], aimed at identifying positive and negative coping strategies.

75.6 Findings

Let us proceed to the characteristics of the results. Let us start with the evaluation of emotional intelligence of students, the indicators of its development depends on the ability of future teachers to understand the emotional state of other participants in the educational process, cause students a positive emotional state, the ability to manage their emotions and feelings, all of the above qualities have a positive impact on the stress resistance of teachers. The teacher with developed emotional intelligence is able to avoid conflict situations, feel confident in stressful and extreme situations.

Interpreting the data of Table 75.1, we can state that this important indicator for productive professional activity in extreme situations, as “control over emotions”, is much better formed in boys (51.61% revealed a high level) than in girls (only 21.67% revealed a high level). Girls are much easier to get out of emotional balance, and they tend to lose control of their emotional states in extreme situations, thereby provoking their instigators to more active and aggressive actions. At the same time, in terms of “impulse control” in young men, a low level prevails (58.06%); i.e., they are prone to aggressive reactions to stimuli, to hasty, ill-considered decisions and can themselves act as a factor in the emergence of emotionally tense situations. In terms of “stress resistance”, the results of young men were expected to be higher (43.55% of respondents with a high level), this fact means that they are better able to cope

Table 75.1 Comparative results of development of emotional intelligence “Questionnaire traits of emotional intelligence (TEIQue)” boys and girls

Gender of respondents	High level	Average level	Low level
<i>Control over emotions (in %)</i>			
Boys (62 man.)	51.61	32.26	16.13
Girls (120 man.)	21.67	54.17	24.16
<i>Pulse control (in %)</i>			
Boys (62 man.)	19.35	22.58	58.06
Girls (120 man.)	38.33	29.17	32.50
<i>Stress resistance (in %)</i>			
Boys (62 man.)	43.55	24.19	32.26
Girls (120 man.)	17.50	37.50	45.00
<i>Management of emotions (in %)</i>			
Boys (62 man.)	33.87	40.32	25.81
Girls (120 man.)	26.67	55.83	17.50
<i>Assertiveness (in %)</i>			
Boys (62 man.)	40.32	41.94	17.74
Girls (120 man.)	35.83	39.17	17.50
<i>Awareness of the social situation (in %)</i>			
Boys (62 man.)	25.81	51.61	22.58
Girls (120 man.)	37.50	40.83	21.67
<i>Adaptability (in %)</i>			
Boys (62 man.)	58.07	24.19	17.74
Girls (120 man.)	33.33	43.33	23.33
<i>Expression of emotions (in %)</i>			
Boys (62 man.)	19.35	41.93	38.71
Girls (120 man.)	44.17	38.33	17.50
<i>Perception of emotions (in %)</i>			
Boys (62 man.)	30.64	29.03	40.32
Girls (120 man.)	26.67	30.83	42.50

with external pressure and stress. Girls are under the pressure of external factors and tend to reduce the effectiveness of professional activities. Within the framework of the indicator “emotion management”, which is responsible for the ability to manage the emotional States of other people, the results are also higher in young men, they are more able to calm and motivate students in an emotionally tense situation, to instill the necessary emotions in other subjects of the educational process.

In terms of «assertiveness», the performance of young men is expected to be higher, although slightly, since they are more inclined to defend and challenge their point of view, which in turn may be one of the reasons causing tension in

Table 75.2 Predominant coping strategies «Coping test» R. Lazarus in boys and girls (in %)

No.	Coping strategy	Boys (62 man)	Girls (120 man)
1	The confrontation	66.13	20
2	Distance	15.00	61.67
3	Self-control	40.32	26.67
4	Search for social support	34.17	62.5
5	Acceptance of responsibility	56.45	34.17
6	Escape/avoidance	22.58	46.67
7	Solving planning problems	45.16	37.5
8	A positive assessment	61.29	70.83

the student group. The results of the indicator «awareness of the social situation» are higher among girls, and they are more likely to establish social relations, focused on working with people, enjoy interpersonal communication; this fact explains the great popularity of their teaching profession. The indicator of «adaptability» is higher in young men (58.07% of respondents with a high level), and they quickly adapt to life circumstances, including extreme situations in their professional activities [6, 17]. The indicator «expression of emotions» is much better formed in girls than in boys (44.17% and 19.35% of respondents with a high level, respectively), and they are more able to express their own emotions, find the right words and actions, the pillars clearly convey their feelings (Table 75.2).

The results of psycho-diagnosis conducted with the use of coping test showed that students are dominated by low-constructive strategies to overcome conflict situations “confrontation”, “distance”, “positive assessment”, which can be attributed to resource-destructive strategies.

Note that for young men is more characteristic of aggressive coping strategy, which leads to conflicts on the part of colleagues and students. Girls are more prone to stress and excessive neuro-mental stress, and they tend to distance themselves from conflicts 61.67%, search for social support—62.5%, flight-avoidance—37.5%. Reliance of the majority of respondents on the coping strategy “positive assessment” can be considered as a mechanism of pseudo-rational evaluation of protection from stress factors, which is fraught with avoiding problems, their resolution, latent experience of stress and conflict. Positive coping strategy “Planning to solve the problem” is characteristic of only a third of respondents.

75.7 Conclusion

The theoretical analysis of foreign literature on the problem of research allowed us to draw the following conclusions: (1) most foreign authors consider the profession of teachers to be the most stressful and stressful; the causes of stress are most often instability, inability to influence the current situation in the workplace, unfair attitude on the part of management, negative actions of students; stress has a harmful effect on the health and well-being of teachers, as a negative impact on their productivity; the teacher in a state of stress transfers this state to the students and becomes the cause of their stress; (2) stress resistance of the teacher is associated with the ability to overcome difficulties, determined by a set of personal qualities that allow a person to carry significant intellectual, volitional, and emotional stress due to the peculiarities of professional activity, without any harmful consequences for the activities of others and their health; (3) willingness to educational activities implies psychological (psychological stability and flexibility, stress resistance) and personal (functional) to it and is considered as an integrative personal education, ensuring the successful implementation of educational functions in professional educational organizations.

The empirical study led to the following conclusions: (1) the majority of indicators of emotional intelligence “control over emotions”, “stress”, “assertiveness”, “emotion management” is higher in boys; at the same time “awareness of the social situation” is higher in girls, they are more inclined to establish social relations, focused on working with people, this fact explains the great popularity of their teaching profession, in general, the level of emotional intelligence can be considered insufficient; (2) students are dominated by low-constructive strategies to overcome conflict situations “confrontation”, “distance”, “positive assessment”, which can be attributed to resource-destroying strategies. Girls are more prone to stress and excessive neuro-mental stress, and they tend to “distance themselves from conflicts”, seek social support, avoid/run away from conflicts.

Analyzing the obtained diagnostic data, we came to the conclusion that stress resistance as a quality of the personality of the future teacher providing readiness for educational activities are not fully formed, which may affect their future professional activities. Therefore, the work we plan to prepare future teachers for educational activities is relevant and necessary.

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Chapter 76

Using Big Data Techniques to Foster Professional Competencies in Engineering Students



E. V. Kuzmina, N. G. Pyankova, and A. V. Botsoeva

Abstract During the development of big data technologies, the requirements to the competencies of engineering graduates are changing. In connection with the transition of Russian higher school to FSES 3 ++, it is necessary to form indicators of the achievement of competencies taking into account innovative big data technologies. The work reflects the stages of the research, during which the areas, spheres, and tasks of the professional activity of construction engineer related to analysis and data warehouses have been identified. Currently, there is a demand for designing the infrastructure of a “smart home”. “Smart home” technologies are closely related to big data. Information from data warehouses is the basis for “smart infrastructure” solutions. The article presents a methodology developed by the authors for mastering the selected algorithms and methods for designing the “smart home” infrastructure with the use of big data for achieving indicators of professional competencies and also provides the results of a pedagogical experiment on the formation of the designated competencies. Such methods such as analysis, synthesis, formalization, methods of mathematical statistics (Mann–Whitney U-test), pedagogical experiment are presented as research resources.

76.1 Introduction

Information technologies penetrating into all spheres of life contribute to the improvement of comfortable living conditions and the solution of everyday issues. Engineering communications are increasingly dependent on automatic control and are beginning to use information from big data sources, from the management of urban infrastructure to the technology of “smart home”.

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Currently, the issues of using big data technology in the construction industry are being raised, but it is noted that the process is at the initial stage of development [1]. The authors raise the problems of the applicability of the big data concept at different stages of the life cycle of buildings and structures, and they divorce the concepts of big data and data analysis technologies in construction [2]. There are articles that outline approaches to the practical application of big data in the construction industry, in particular, at the stage of preparing tender documents, organizing projects and settlements with subcontractors. Data mining technologies are proposed to be used at the design stages to calculate material, financial and human resources [3, 4].

The articles consider the use of big data technology to select the most rational solutions to improve the reliability of the technological process of repair and construction works [5]. The solution of multicriteria problems in certain areas of the construction industry is beginning to be associated with the use of big data [6]. The use of big data in such areas of the construction industry as customer relationship and supply chain management is raised [7].

The higher school is faced with the task of training specialists focused on the use of big data technology in all industries [8], including construction, where the increasing demands of consumers are placing new demands not only on technology, but also on the labor market [9, 10]. In preparing specialists of construction specialties, it is necessary to form indicators of achievement of competencies that provide big data technologies, without which it is impossible to imagine the future [11, 12].

This type of activity should be carried out by the designers of the infrastructure of a smart home, whose main competencies are: design, installation and adjustment of intelligent water supply, energy saving, security, and household appliances [13, 14].

Indicators of professional competence achievement, formed by the Federal Educational and Methodological Association in the system of higher education on the enlarged group of specialties and areas of training 08.00.00 Construction techniques and technologies (08. FUMO) do not take into account the tendencies of big data technology integration into infrastructure projects [15].

The federal standard provides an opportunity to independently plan the results of training in disciplines (modules) and practices in accordance with planned indicators of achievement of necessary competences [16, 17].

At present, approaches to the use of big data technologies in the preparation of bachelors in various fields are beginning to be developed [18, 19]. In this regard, it is relevant to use big data technology in teaching engineering students. Currently, the construction industry in the Russian economy is recognized as a priority area. On this basis, it is necessary to make changes to the structure of the competencies of students of construction specialties so that graduates can work in the new realities associated with the formation of big data.

76.2 Statement of the Problem

To train qualified specialists potentially ready to work with big data in the field of construction, it is necessary to adjust the professional competence of higher education standards [20]. These competencies should include indicators to check the availability of knowledge, skills, and skills in using big data at different stages of construction activities.

To achieve this goal, it is necessary to solve the following tasks, which consist in: determining the directions of construction activities that are potentially related to the technology of big data analysis; determination of competences and indicators of their achievements, necessary for the development of modern technologies for data analysis; determination of the composition of knowledge and skills for the achievement of competence indicators; defining disciplines focused on the application of big data; development of a methodology for mastering algorithms and methods of technology for working with big data for bachelors—builders; conducting an experiment to achieve indicators of the formation of competencies.

76.3 Materials and Methods

The purpose of this study is to analyze the use of big data methodology for the formation of competence of bachelors in the field of information technology in the specialties “Construction”.

The study consisted of stages corresponding to the designated tasks.

The research consisted of several stages: identification of construction activities which are potentially related to the technology of big data analysis; identification of competencies and indicators of their achievements, which are necessary for the mastering of modern data analysis technologies; identification of the knowledge and skills composition for the achievement of competence indicators; definition of disciplines focused on the application of big data; development of a methodology for mastering algorithms and methods of technology for working with big data for bachelors—builders; conducting an experiment to achieve indicators of the formation of competencies.

Pedagogical experiment and methods of mathematical statistics were used as research methods. The pedagogical experiment was carried out on the basis of the Kuban State Agrarian University. The second year students of the direction “Construction” participated in the experiment.

At the first stage, the directions of construction activities related to big data have been defined: analysis of investments and decisions on capital investments in future construction projects; creation of models of interaction of objects of the “smart home” type with urban infrastructure; creation of digital data for the management of construction sites throughout the entire life cycle; observance and monitoring of

ecological construction standards for many participants within the limits of municipal formations.

Thus, big data allows to put forward hypotheses and implement them for the sustainable development of the construction industry [15, 16]. On this basis, for the general professional competence of the standard of the direction “Construction”—“Able to process, analyze and present information in professional activities using information and computer technologies”, two indicators of achievement of competence were developed:

- indicator 1—puts forward hypotheses based on big data analysis;
- indicator 2—applies knowledge extraction technologies (Knowledge Discovery in Database and Data Mining).

To achieve the first indicator, the student must acquire knowledge of the basic concepts of the theory of associative rules and methods of their implementation. The student should acquire the ability to detect associations between different events and quantitative description of mutual relations. Skills to achieve this indicator are the use of algorithms for the generation of associative relationships, the use of consistent templates for data search in the construction industry.

To achieve the second indicator, it is necessary to form knowledge about the tasks, goals, algorithms, clustering problems [21]. In Data Mining, the main task is classification and regression [22]. For the classification task, it is necessary to form the ability to build models that describe a previously defined set of classes or categories, including regression ones; the ability to formulate rules for attributing an object to a certain class of construction activity [23]. The skills to achieve the second indicator are building a classification and a regression model, assessing its compliance with real data, and interpreting the regression model [24].

Based on the knowledge, skills and abilities defined above, a methodology for analyzing big data was developed, containing the following stages: data selection, data cleansing, data transformation, Data Mining, interpretation of construction specific data. For each stage, tasks were developed to develop sustainable abilities and skills in working with big data.

At the final stage, for the formation of competencies in the application of technologies for analyzing big data, case studies were developed in accordance with the above areas of construction activities related to big data. The R-studio platform was chosen to implement the tasks [25–27].

Based on the analysis of the curriculum, a discipline was determined within which competencies for working with big data could be formed—“Information technology”.

The developed technique was tested within the discipline “Information technology”.

The plan of the comparative pedagogical experiment included the creation of equivalent groups: experimental and control; conducting an experiment; comparison of results between treated and non-treated groups.

The general aggregate of the pedagogical experiment was 61 people. These are students who are enrolled in the course of the 2nd course. There are two groups on

the stream, randomly formed. Students of these groups studied the same disciplines before participating in our experiment. Discipline Information technology, within which certain competencies were formed, is studied in the second and third semesters. In the second semester, students from different groups were given the same topics. The average score on the topics studied in the 1801SP group was 3.86, in the 1802SP group—3.94. The GPA is an indicator of sample homogeneity, that is, students have approximately the same level of knowledge before starting the experiment. The sampling strategy was to use real study groups. The first group became experimental (30 people), the second—control (31 people). This sample was determined by the requirements of the statistical processing method Mann–Whitney U-test. According to the requirements of the Mann–Whitney method, the minimum number of people in each sample should be more than three and less than sixty.

The study of big data technology was implemented as part of the second part of the “Information Technologies” discipline, which was held in the third semester.

Cases using big data technologies were the variable conditions of the experiment. Non-variable experimental conditions—the same lecture material.

76.4 Results

In the course of a comparative pedagogical experiment, students of the experimental group for the formation of the competence “Able to process, analyze, and present information in professional activity using information and computer technologies” performed business cases based on the author’s methodology. The control group students performed standard tasks.

The level of achievement of the indicators was checked using a one-hundred-score system in the categories: “knowledge”, “abilities”, “skills”. Figure 76.1 shows

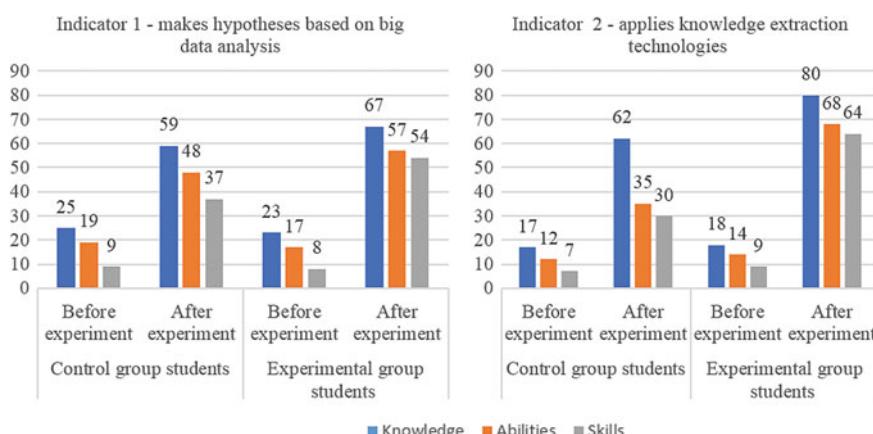


Fig. 76.1 Results of the pedagogical experiment

the results of the average scores obtained in the experimental and control groups before and after the pedagogical experiment, taking into account the achievement of indicators. Knowledge was tested with the help of test tasks; practical tasks were used to test skills and abilities.

The static significance of the experimental results was checked using the Mann–Whitney Q-criterion. For this purpose, the results were compared between the samples before and after the experiment in the categories of “knowledge”, “skills”, “abilities”. To test the absence of differences at the initial stage, hypotheses H_0 and H_1 were formulated.

H_0 : The level of scores obtained by students in the experimental group does not exceed the level of scores obtained by students in the control group for the category of “knowledge” (“abilities”, “skills”) before the pedagogical experiment.

H_1 : The level of scores obtained by the students in the experimental group exceeds the level of points among students in the control group in the category of “knowledge” (“abilities”, “skills”) after the pedagogical experiment.

The critical value $U_{kr} = 303$ for the statistical significance level $\rho = 0.01$ and $U_{kr} = 350$ for the statistical significance level $\rho = 0.05$. The empirical value $U_{emp} = 464$ corresponds to the category “knowledge”. This value is outside the zone of significance. A similar situation is observed for the categories “abilities” ($U_{emp} = 400$) and “skills” ($U_{emp} = 434$). Thus, the level of scores among students of the experimental and control groups before the experiment does not differ.

After the pedagogical experiment, the comparison of the scores among the students of the experimental and control groups for each category was carried out using the Mann–Whitney statistical method. Hypotheses were formulated.

H_0 : The scores obtained by the students in the experimental group does not exceed the scores obtained by the students in the control group in the category of “knowledge” (“abilities”, “skills”) after the pedagogical experiment.

H_1 : The scores obtained by the students in the experimental group exceeds the scores obtained by students in the control group in the category of “knowledge” (“abilities”, “skills”) after the pedagogical experiment.

The empirical values were recalculated. For the category “knowledge” $U_{emp} = 65$. This value is in the zone of statistical significance. Thus, hypothesis H_0 is rejected and hypothesis H_1 is accepted, i.e., the level of points among students of the experimental group is higher than the level of points received by students of the control group.

A similar situation is observed for the categories “abilities” ($U_{emp} = 50.5$) and “skills” ($U_{emp} = 26.5$). The empirical values for these categories are in the zone of statistical significance, i.e., the level of points in these categories among students of the experimental group is higher than among students of the control group.

76.5 Conclusion

The authors identified the development trends of the construction industry using big data technology. The priority areas in construction that are starting to use big data is

the design of buildings, structures, and the urban environment, taking into account intelligent technologies.

The standards of higher education in the direction of “Construction” were analyzed, and it was revealed that the standards reflect only typical competences of using information technology in professional activity. The educational standards of the new generation allow an educational institution to independently determine the structure and indicators of achieving professional competencies.

The authors developed two additional indicators for achieving competence in the use of information and computer technologies with the use of big data in construction: “puts forward hypotheses based on the analysis of big data”; “applies knowledge extraction technologies (Knowledge Discovery in Database and DataMining)”.

Based on the author’s methodology for using big data, taking into account the developed indicators, the structure and content of the “Information technologies” educational discipline was revised, theoretical sections on the study of big data were added, and business cases for analyzing big data and extracting knowledge based on big data were included.

The effectiveness of the method was tested experimentally. A pedagogical experiment was conducted with the selection of experimental and control groups. At the initial stage of the experiment, students in these groups had approximately the same knowledge, abilities, and skills in the field of big data. At the final stage, students demonstrated an increase in the level of knowledge, skills, and abilities assessed on a one-hundred-score system. The use of the author’s methodology in the experimental group showed an excess of the average knowledge score by 12.5%, abilities by 21%, and skills by 26% compared to the level of students in the control group.

The results of the experiment on the use of the author’s methodology in the preparation of bachelors in the direction of “Construction” confirmed its effectiveness in achieving the developed indicators of competence in the processing, analysis, and presentation of information in professional activities, taking into account the modern trends in the use of big data.

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Chapter 77

Increasing International Networks of Universities: Emerging New Forms of University Cooperation



Ani Oganesyan, Astkhik Nalbandyan, and Solomon Arulraj David

Abstract Growing global trends induced by globalisation and internationalisation have pushed universities to collaborate with others to ascertain their existence and competitiveness. Higher education institutions are increasingly expected to meet such global development as well as the local goals, depending on the needs. In this regard, new forms of interaction on national, regional, and international levels between higher education institutions are emerging. Such cooperation helps universities to share their resources for mutual benefits that would increase their efficiency. While such cooperation is not always easy and is posed with expected and unexpected challenges, which hinders such optimism. This study, therefore, aims to explore and account the nature, opportunities, and challenges of such new forms of university cooperation. The research relied on secondary data, mainly from the websites of the university networks, by exploring 33 international networks of universities, which includes 13 associations, 12 networks, and eight consortiums. The following criteria were used for analysis: the geographical and territorial distribution of network universities and types of interaction between partner universities and implemented projects. The findings indicate the existing problems in university cooperation, offer scope for the prospects of network universities, and define the measures for their future development. The study concludes that the availability of technological information, the communication platforms, and the adherence to the developed standards for the implementation of international projects are important for the effectiveness of these networks and their cooperation.

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77.1 Introduction

Universities across the world are facing multiple internal and external challenges that threaten their existence and competitiveness. Tetrevova and Vlckova [30] consider inter-university cooperation as a source of competitiveness in the knowledge society. For Ritzen [27], university cooperation helps in knowledge transfer among the partners. The external factors, including war, natural disaster, economic crisis, and unexpected situations such as the recent pandemic COVID-2019 pose challenges for existence to many universities, given the struggle to recruit students and mobilise resources. When universities are firefighting and struggling to survive, there may not be greater opportunities for cooperation. Yet, on a brighter side, cooperation might be a way out for many universities to ascertain their existence to bounce back. Hamdulahpur [15] argues that the international partnership and networking have disruptive impacts and future for research and teaching in universities.

Universities have had some forms of cooperation and networking for long time. For Salwak [28], university cooperation is not all new and has been there for long time in an informal manner. The new pattern for him in recent times is institutions striving largely for academic excellence. Globalisation and internationalisation trends have taken university collaboration to global scale for also reasons beyond academic excellence. Van der Wende [33] points out that higher education has been a key space for internationalisation policies and cooperation that brought countries together. It is argued that the modern socio-economic and sociocultural processes have a significant impact on the forms of interactions between universities and other institutions. It is important to observe, where universities are looking for their alliance, how language, culture, political ties, and other phenomenon influence the decision on the cooperation. For instance, Tierney [31] considers cultural and language differences as potential challenges for international cooperation, while he contends that the future holds great possibilities for those who are willing to go beyond these barriers.

Universities are increasingly expected to deal with both local and global challenges. According to Grau [14] universities that meet such challenges are named as “glocal” university (global + local = “glocal”). One of such global challenges is university’s compliance with the world rankings criteria. David and Motala [9] indicate that the global university ranking trends have pushed the rush for academic and university cooperation around the world. It is also interesting to observe that university cooperation is an important tool for regionalization policy as contested by Fischer-Appelt [13] that the emergence of university cooperation in Europe has played important role in regional integration or Europeanisation. University networks often act as the main regional cluster, create infrastructure for the development of the region, and increase the investment potential for the development of research and innovation projects.

The form of “network cooperation of universities” or a “new network model of universities management” has become one of the most rapidly developing forms of cooperation that support mutual benefits. Rensburg et al. [26] highlight that there are potential policy and economic implications of research collaboration among

emerging economies through formal and informal cooperation among individuals, institutions, and nations. The emergence of this new form is related with contradictions that have arisen, on the one hand, due to the decentralisation of management of the education system and the regionalization of universities, and on the other hand, the globalisation of the educational services market and the strengthening of international activity of universities. David [10] points out that many universities engage in networking and collaboration with other universities, industries, and other stakeholders as part of the third mission of universities.

In this regard, new forms of interaction on national, regional, and international levels between higher education institutions are emerging. Such cooperation helps universities to share their resources for mutual benefits that would increase their efficiency. While such cooperation is not always easy and is posed with expected and unexpected challenges, which hinders such optimism. This study, therefore, aims to explore and account the nature, opportunities, and challenges of such new forms of university cooperation, thus attempting to answer the research question; what is the nature of the new forms of university cooperation, how and why the new forms of university cooperation is different from others, and what are the opportunities and challenges of the new forms of university cooperation.

77.2 Methodology

The research at first explored relevant literature on network models and university cooperation and networks. Then, secondary data mainly from the websites of the university networks, annual reports, articles, agreements with partners, and other data by exploring 33 international networks of universities, which includes 13 associations, 12 networks, and eight consortiums. The research used the following criteria (for selection of the networks for analysis) that effective networks should meet: (1) the network has an international feature (with member universities from three or more countries), (2) the network has been functioning for more than two years, (3) there are clear cooperation agreements between the partners of the network regulating the activities of the partners, their rights and obligation, (4) the network has a functioning governing structure, defining goals, and tactical and strategic objectives, as well as planning the further development of the network. Comparative analysis of networks was carried using the following comparative criteria; the geographical and territorial distribution of network universities, and types of interaction between partner universities and implemented projects. Finally, based on results of the comparative analysis, we identified key challenges and opportunities of the university networks that may have implications on the effectiveness of the existing networks.

77.3 Conceptualising University Collaboration and Networking

Several experts have studied the theoretical aspects of the network models of organisations. Beerkins [4], Lewis et al. [18], Makoveeva [19], Johnson et al. [16], and Chow and Loo [8] define, university network as a set of educational institutions with common goals, resources for their achievement, and mechanisms of network interaction between them. A distinctive feature of the network is the diverse nature of the interaction of different forms and types of institutions, which include the educational institutions themselves and also, for example, vocational and secondary education institutions, research institutes, associations of higher education, etc. [16].

Therefore, the basic principles of the functioning of networks are common long-term goal that cannot be fully achieved outside the network interaction by each individual participant; volunteerism in providing flexibility and openness in the network structure; independence of partners who are able to realise their own goals and objectives, and who can have a certain benefit from the participation in network, but who are also responsible for achieving the ultimate goal of the network structure; plurality of leaders that allow ensuring the stability and elasticity of the network; and multiple levels of interaction, as each participant of the network structure can interact directly with any partner included in this network [8, 19].

One of the main conditions for successful university network is a partnership agreement, confirming the consistency of the goals and activities in the long term and reflecting the road map of interaction of its participants, priority areas of cooperation, as well as financial terms. Thus, university network is an association of educational, scientific, financial, and other resources of universities from different countries and regions to achieve common goals and objectives in the field of higher education. The network model has become especially popular among western universities in the early 2000s. European university networks date to the creation of the Coimbra group in 1985 [5]. The experts highlight the main advantages of using network structures such as: adaptability to changing conditions, rapid response to evolving market conjuncture; concentration of network participants' activities on their core competencies and unique processes; significant reduction of costs, their rational structure; elimination of duplication of some functions of the members of the network; involvement in joint activities in the implementation of projects within the network of competent partners with the necessary resource potential; efficient mechanism for information sharing among its participants and best practices deployment. Thomas [32] consider international university networking as an opportunity for all, in terms of global connections, diversity, collegiality, and human development. Students, academics, and researchers benefit largely from international university collaboration in terms of sharing ideas, resources, personals, and others [25].

There are several expected and unexpected challenges that are potential in university collaboration and networking. Akuni et al. [2] highlight that the level playing fields of the partners in terms of capacity, resources, and objectives often lead to difficulties in sustaining long-time university cooperation. Rensburg et al. [26] point

out that most of the collaborations are short lived and are not result oriented, yet they offer relevant experiences. Owens [24] indicates language as a barrier for potential collaboration with partners as it reduces smooth communication and understanding. For Adriana et al. [1], language, cultural difference, time zones, and educational backgrounds are identified as potential challenges for university collaboration. At the same time, some experts present realistic arguments as way forward. The use of the network approach allows to ensure both the efficient functioning of the entire socio-economic system and each of its elements separately [8], and the interaction of structures allows to obtain both, individual and cumulative, effects such as informative, resource, infrastructural, time, administrative, economic, social and, in general, the aggregate effects from their combination [17]. Owens [24] suggests that international university collaboration will continue to increase given the emergence of digital age. Altbach [3] points out that some of the new and young universities have developed different approaches to university governance and they might potentially be steering possible new forms of cooperation.

77.4 Analysis of Universities' Networking

Despite the fact that the first associations of universities were established about a hundred years ago, the form of network interaction of educational organisations aimed at strengthening the integration and implementation of joint projects has appeared relatively recently, 25–30 years ago (in the 1990s). It should be noted that today, there are not many studies on this form of cooperation of universities reporting the results and efficiency of networks of higher education institutions. The works of Beerkens (2004) dedicated to the consortium of higher education institutions in Europe and South-East Asia is one of such studies. In this research, he considers the creation of consortium and networks from the perspective of the resource theory of the firm and identifies two necessary conditions for the creation of successful strategic alliances and inter-organisational agreements—*compatibility* and *complementarity* of partners included in the network. This research considers the activity of the four most successfully functioning consortiums, such as: The Alma Network (4 universities), ASEAN University Network (17 universities from the member countries of ASEAN), Coimbra Group (38 universities from the European countries), ECIU (European Consortium of Innovative Universities—10 universities of Western Europe). Beerkens (2004) uses comparative situational analysis, questionnaires, interviews, analysis of statistics, reports, and other documents as research methods.

Another series of researches were done by a team in Monash University, Australia, in 2005, in order to examine the university as a form of network organisation, especially in the frame of introduction of new technologies and emergence of a “network society” [7]. The authors have conducted a three-year study on five Australians universities. The research reveals the main problems related to the transformation in the universities from the centralised management to the network management model.

Melikyan's [20] research on network form of cooperation between universities is worth exploring. The author reviewed 27 international university networks created in different years and comprising 1119 member organisations from 117 countries.

Our paper presents the results of the first attempt to systematise the available information on international university networks, with the expansion of the number of networks studied earlier and their types. Thus, we consider 33 international university networks (including 13 associations, 12 networks, and eight consortiums) that meet the following requirements: (i) the network has an international feature (it includes structure of three or more countries), (ii) the network has been functioning for more than two years, there are cooperation agreements between the partners of the network regulating the activities of the partners, their rights, and obligations, (iii) the network has a functioning governing structure, defining goals, tactical, and strategic objectives, as well as planning the further development of the network, (iv) the network consists of four or more universities (or other institutional structures). To collect the information, we used data from international university network websites, annual reports, articles, agreements with partners and other data. Currently, inter-university network cooperation is carried out through consortiums, associations, networks, clusters (higher education institution—organisations—research centres), and a branch network of universities abroad, as presented in Table 77.1.

The form of the consortium in the network universities is widespread due to its significant attractiveness. Its' members act based on bilateral intergovernmental agreements, their own national legislation, their statutes, and local rules applied in the process of educational, administrative, and other activities. The agreement within the consortium does not impose on its members any property and financial obligations and does not establish restrictions on their independence and autonomy at implementation of the authorised activity. This research as mentioned in Table 77.1 considered network structures that include a total of more than 2397 organisations from more than 210 countries. From the specialisation of structures within the networks, we can distinguish educational (implement various educational programmes), innovative, infrastructural, and integrational scientific-educational-industrial network structures [17]. According to the analysis, the network structures have predominantly broad specialisation (27 out of 33 reporting agencies), three innovative structures—UASNet, MNU, ECIU, three technology and engineering involved networks—CLUSTER, ISTA, and the Association of TIME. In most of the considered structures, the partner universities themselves are the main founders of cooperation in networks. They had already established long-term cooperation and created networks to strengthen existing links for the implementation of new larger-scale programmes with additional resources and funding (e.g. Erasmus+, Erasmus Mundus, and Tempus programmes). Non-educational institutional structures are initiators of the university networks created in 27% of all cases. Thus, the initiators of GUNI are the UN and the UNESCO, and the network includes all the structures where UNESCO chairs are presented.

Regional integration groups such as ASEAN, the countries of the Baltic and Black Sea regions, or ministries of education of countries (e.g. the SCO Network University initiated the foundation of ISTA) are other types of initiators of university networks.

Table 77.1 Types of international network universities, 2017

	Name of network university	Type	Foundation date	Number of members
1	Global University Network for Innovation (GUNI)	Network	1999	210 from 78 countries
2	Network of the Universities from the Capitals of Europe (UNICA)	Network	1990	46 from 35 countries
3	International Network of Universities (INU)	Consortium	1998	13 (5 continents)
4	Worldwide Universities Network (WUN)	Network	2000	21 (11 countries, 5 continents)
5	ASEAN University Network (AUN)	Association	1995	30, from 10 countries
6	Consortium Linking Universities of Science and Technology for Education and Research (CLUSTER)	Consortium	1990	12
7	Baltic Sea Region Universities Network (BSRUN)	Network	2000	26
8	CAMPUS EUROPAE	Association	2001	30 from 20 countries
9	UTRECHT Network	Association	1987	32 from 27 countries
10	League of European Research Universities (LERU)	Consortium	2002	23
11	Coimbra Group	Association	1985–1987	39
12	Compostela Group (CGU)	Association	1993	67
13	SGroup European Universities' Network (Santander)	Network	1992	30 from 15 countries
14	Matariki Network of Universities (MNU)	Association	2010	7
15	Mediterranean Universities Union (UNIMED)	Association	1991	93 from 22 countries
16	Universitas 21	Network	1997	25 from 15 countries

(continued)

Table 77.1 (continued)

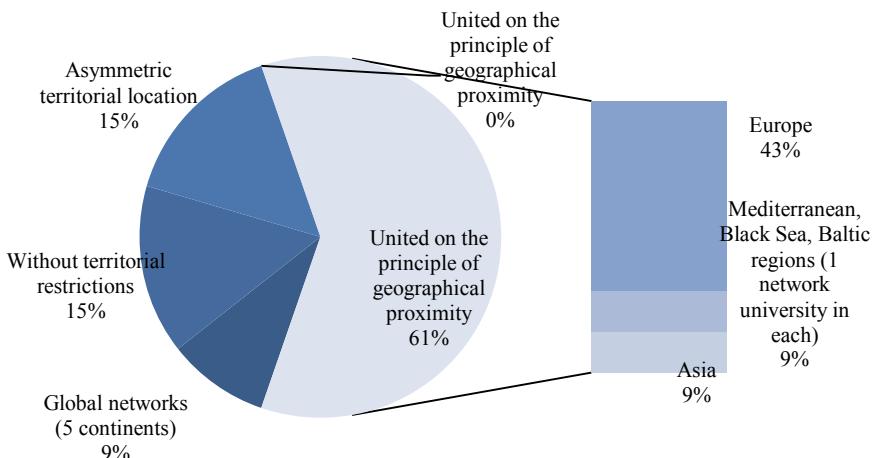
	Name of network university	Type	Foundation date	Number of members
17	University Network of the European Capitals of Culture (UNeECC)	Association	2006	47
18	Black Sea Universities Network (BSUN)	Network		110
19	International Research Universities Network (IRUN)	Network	2006	10
20	Austrian South-East Asian University Partnership Network (ASEA UNINET)	Network	1994	80 from 20 countries
21	International Strategic Technology Alliance (ISTA)	Association	1995	27
22	Top Industrial Managers for Europe Association (TIME)	Network (association)	1989	53
23	Academic Consortium for the Twenty-first Century	Network	2002	21
24	European Consortium of Innovative Universities (ECIU)	Consortium	1997	12
25	Prime Networking	Association	2001	20
26	European Association of Distance Teaching Universities (EADTU)	Online Association	1987	More than 200, 25 countries
27	Association of American International Colleges and Universities (AAICU)	Consortium	1971	27
28	European University Association (EUA)	Association	2001	850 from 47 countries
29	Universities of Applied Sciences Network (UASnet)	Network	2011	11
30	CIS Network university	Consortium	2008	28 from 9 countries
31	University of Shanghai Cooperation Organisation	Consortium	2008	79 (6 countries), 4 country- observers
32	European Association of Institutions in Higher Education (EURASHE)	Association	1990	62

(continued)

Table 77.1 (continued)

	Name of network university	Type	Foundation date	Number of members
33	BRICS University network	Consortium	2013–2015	56

Source Compiled by the authors, gathered from the official websites of the studied network structures

**Fig. 77.1** Geographical distribution of network structures members

Universities can be networked also by merging old structures, as in the case of the European Association of universities in 2001 [34]. The geographical distribution of network universities represents an interest as indicated in Fig. 77.1.

As mentioned in Fig. 77.1, global and world networking structures have no geographical restrictions on the entry of new members. Examples of such networks are GUNI, INU, WUN, CGU, Universitas 21, TIME, Prime Network, and the twenty-first century Academic Consortium. A certain asymmetry of the distribution of the participants is observed in five structures: ISTA (the universities of China, the USA, and the UK), the network University of the BRICS, the Association of American International Colleges and Universities, networks of universities of Matariki, and partnership network of the universities of Austria and South-East Asia.

However, the most numerous groups (20 network universities, or 61%) are the structures united by geographical proximity, of which the majority of the network universities are located in the European area (15 network structures out of 33 or 46%). Historically and geographically, the universities have been organised by themselves into networks and associations in the Mediterranean, Black Sea, and Baltic regions (the association of Mediterranean universities (UNIMED), the network of universities of the Black Sea region (BSUN), network of universities of the Baltic Sea region (BSRUN)).

The most developing and expanding networks that respond to the increasing demand for educational services are the network of universities of Asia: University Network of ASEAN, University Network of the CIS, the SCO Network University. In addition, Asian universities actively cooperate with European networks. The European CLUSTER structure has a so-called Sino-European platform with the participation of 18 Chinese universities. Within the framework of this platform, it is possible to exchange students, employees, and teachers, as well as to conduct the research projects within the priority areas defined by partners [29].

Russian universities are represented in 13 of 33 considered networks. The most extensive participation of the Russian Federation is in the network universities of CIS, BRICS, and SCO, as well as in the networks of the Baltic and the Black Sea regions. The membership system is used in all considered international network structures. There are several types of membership: full (or active), associative, affiliated, individual, and institutional (partnership). The main difference between the categories of membership is the rights and obligations of participants, spelled out in the relevant agreements concluded when the organisation enters the network structure. In some networks, institutional structures can participate as collaborators (Compostela group), without being full members, and can also participate as observers (SCO Network University).

Membership categories are determined on the basis of several criteria, such as *type of participant structure*: for example, only higher education institutions, research centres, UNESCO chairs in higher education institutions or other networks that have existed for more than eight years can become full members of GUNI, while non-governmental organisations, civil society organisations and foundations related to higher education, institutes related to the UN and UNESCO, institutions working on sustainable development, human values and rights, and changes in society can become associative members.

At the same time, the institute should exist for more than five years. *On a territorial basis*: Only European universities can be full members of the Santander network, and universities outside Europe can be associate partners. In EURASHE, full membership is valid for national higher education associations operating in the European higher education area (EHEA). The associative one is open to international sectoral associations of higher education within EHEA, and the affiliated one is open to individual universities and associations outside EHEA or to institutions that do not meet the criteria of full and associative membership.

More than half of the networks (19 out of 33) are open to new members, and each network structure has strict selection criteria: selection can be made only after approval of all the network members during the assembly of the network university heads; joining the network is possible only by the invitation of the current network member; structures applying to join the network should already have existing cooperation agreements with other members of the network; there are one-time and annual membership fees for partners, depending either on the category of membership (full, associate, or affiliate) or on the GDP per capita of the applicant organisation's country; structures applying for membership should meet strict qualitative and quantitative requirements (CIS University Network, LERU).

77.5 Analysis of Network Universities' Projects

Different projects launched by partner organisations are the result of the joint activities of the network structures, which also is an indicator of the success and efficiency of the network interaction of partners. Innovative clusters help to create, diffuse knowledge for economic growth [22]. Figure 77.2 presents the types of activities realised within networks of universities.

The most common form of cooperation among partners is the organisation of joint events: conferences, seminars, meetings of university rectors, forums, and workshops. Thus, 29 of the 33 network structures organise such events, while for some existing networks, it is the unique form of active cooperation of partners (BSUN, UNeECC, IRUN, UASnet). It happens since the format of the event is flexible and the least expensive for network structures in terms of resource costs. The second most popular type of cooperation is the organisation of summer and winter schools in partner universities. Around 21 out of 33 networks offer students different levels of education, as well as teachers and staff to attend summer, winter, or autumn language schools. There are also thematic schools in partner universities, including short-term training courses.

The third most popular type is the exchange of resources such as exchange and mobility programmes for students, teachers, staff, and research scholars. Around 20 out of 33 network structures follow this type. The implementation of such programmes is the goal of most of the established network universities and it is a real indicator of the interaction's efficiency within the network, contributing to the internationalisation of the education. In several networks, both external and domestic financial resources and fellowships and grants are provided for such international exchange programmes and projects. An example would be the WUN network, AUN, CLUSTER, CAMPUS EUROPAE, CIS Network University, SOC Network University, and BRICS Network University. Financing such programmes of mobility also involves the funds of the European Union in the framework of programmes, such as

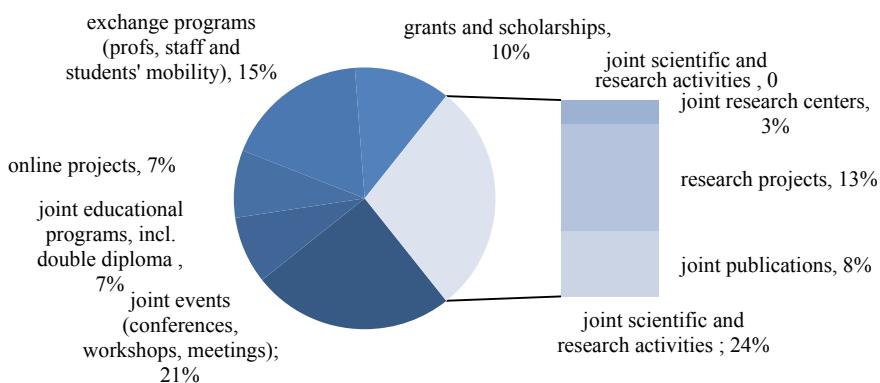


Fig. 77.2 Types of activities realised within network universities

Erasmus+, Erasmus Mundus, and Tempus, which could be gained by the creation of an additional consortia of universities.

Joint research projects within networks require special attention. In total, 24% of the activity of the networks engaged in joint research scientific activity in various forms, such as creation of joint laboratories and research centres (joint laboratories are created in ISTA, and research centres exist in AUN, UNIMED, and ISTA). At the same time, 18 out of 33 networks (or 13%) implement joint research projects in various fields. For this purpose, joint interdisciplinary research groups and teams of scientists are created, and significant financial resources and research grants are allocated. For example, some of research projects of European networks are financed by the Horizon 2020 programme, which is the eighth framework programme for research and technology development of the European Union. This is the largest framework programme in the history of the EU, with the budget of 80 billion euros (e.g. such programmes are implemented by UNICA and GUNI) [12].

Some networks create their own funds to finance research projects. So, in 2016, WUN allocated 42 grants for total amount of 8,016,440 GBP, and the budget of the research development fund was 1,300,000 GBP. Most networks support researchers with grants and the joint thesis supervision projects are actively developing. “Joint” PhD students are granted scholarships for their research projects. The results of such research projects are different types of joint publications. About 11 out of 33 network structures make joint publications on a regular basis. The OECD Global Science Forum Report [23] considers research cooperation among developed and developing countries in relation to research capacity building and for knowledge generation and sharing. For Bukvova [6], the potentials of collaborative research are: access to expertise, access to resources; exchange of ideas across disciplines; pooling expertise for complex problems; keeping activities focused; learning new skills; higher productivity; higher quality of results; access to funding; prestige; political benefits; and personal factors such as fun and pleasure.

Various online projects make up 7% of the activity of all network structures. This form of interaction can mean, sending online information letters about the activities of the network and partner organisations, the creation of online platforms for learning languages, online platform for the selection of training programmes for exchange programmes (Campus Europae) and web conferences, or the introduction of new technologies for distance education and the development of virtual mobility programmes (EADTU). The most complex form of networking between universities is the development and implementation of joint programmes and double degree programmes between partner universities at different levels of education [21]. Only nine of the considered network structures implement such programmes as indicated at Table 77.2.

Much of the dual degree programmes have helped increased university collaboration within and beyond the borders of nations. Universities do extent their collaboration with other stakeholders such as industry and society, as the triple helix model indicates [11].

Table 77.2 Joint and double diploma programmes of network universities

	Name	Type of the joint and double diploma programmes
<i>USA</i>		
1	AAICU	Double masters' degree programmes prevail in various fields with delivery of national diplomas and diplomas of American partner universities, simultaneously with exchange programmes
<i>Europe</i>		
2	CLUSTER	Double masters' degree and doctorates' degree programmes (PhD) with the universities network members
3	TIME	Double diploma programmes (53 members); annually 540 students take part in the mobility programmes as a part of the double diploma, total number—2160 people, total number of double diploma agreements—315 doctorate programmes between some members
<i>World</i>		
4	Universitas 21	Joint thesis supervision programmes in partnership with members of the network, together with exchange programmes and summer schools
5	ASEA UNINET	Joint master degree programmes in the field of biomedical engineering, international management, public health, and regional and local planning
<i>Joint thesis supervision</i>		
6	BSUN	The main double master programme for the management of renewable energy resources (financed by the European Union at the sum of 206,000 euros). It is realised together with universities of Romania, Moldova, Bulgaria, Crimea, Turkey, and Italy

(continued)

Table 77.2 (continued)

	Name	Type of the joint and double diploma programmes
<i>With Russian Federation participation</i>		
7	CIS University Network	An analogue of the Erasmus project for the CIS countries. Implementation of joint programmes: postgraduate and doctorate, master, continues education programmes Development of mobility programmes
8	SCO University Network	Implementation of joint programmes at the master's and doctorate levels
9	BRICS University Network	Creation and implementation of programmes for masters and graduate students, reflecting the common interests of universities partners and projects of the BRICS countries Providing joint leadership of dissertational projects

Source compiled by the author

77.6 Conclusion

It is important to understand that universities are not just integrated into network for mutual interactions but aim to create a new model of the university network. However, according to some researchers, there are several unresolved problems in the development of network interactions between universities. International experience shows that the network system should be built based on centres of excellence, for meaningful interaction with the other universities, research institutes, and innovative enterprises. Management model of network should be decentralised, based on multilevel cooperation scheme, and not obey orders from a single centre. But the most important requirement for the participants of the network community is the readiness to provide resources for the implementation of common goals, their accumulation and redistribution.

One of the most important conditions for the network interaction is the availability of information sharing platform and efficient communication among the partners. As we see from the analysis, the interaction of the network participants is organised, as a rule, not through administrative channels. The new forms of university collaborations and networks must therefore engage in meaningful interactions, with wide range of possible interrelations. Such interactions require new approaches to solve

leadership, management, and other organisational problems to increase the efficiency of university collaboration and university networks throughout the world.

The study aimed to account the nature, opportunities, and challenges of the new forms of university cooperation and networks. The exploration of relevant literature and network models allowed the study to achieve its aim by presenting the nature of new forms of university cooperation and the potential challenges and opportunities in order to speculate potential prospects of new forms of university cooperation. As the study maps the terrain of the new forms of university cooperation, it offers necessary insights for researchers, policy makers, university networks, and for all other stakeholders. The current study mainly explored literature and secondary data. Future studies may involve other methods, more cases to enrich the thoughts in this field. In such understanding, the study, therefore, concludes that the availability of technological information, the communication platforms, and the adherence to the developed standards for the implementation of international projects are important for the effectiveness of these networks and their cooperation. The study further accounts that the new forms the current study explored, and other similar models of university cooperation would continue to evolve as such cooperation and networks have certain values and scope for different stakeholders.

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Chapter 78

Project-Based Approach in Implementing Relevant Educational Models in the Republic of Altai (Exemplified by the Regional Technology Park Quantorium-04)



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Abstract *Problem and purpose* The article is devoted to the problem of developing the system of additional education for talented and science-oriented children and youth in our country. The purpose of the work is to determine the features of the model of continuing education that uses the idea of a project approach and underlies the creation of the federal network of children's technoparks «Quantorium». *Introduction* At the beginning of the work, the authors give a retrospective overview of the concepts being the structural basis for the appearance of the term «children's technopark». Based on the results of the analyses of numerous sources, the goals and objectives of the system of additional education being created on the territory of Russia, implemented in the form of a network 'Quantorium.' The connection between the created children's technoparks and the implementation of the national project «Education» is emphasized. *Materials and Methods* A wide range of educational trajectories (directions) implemented federal network of 'Quantoriums,' some of which are presented in the «Quantorium-04» educational model, is given as one of the structural positions of the methodological base, the studied system of additional education. In the process of analysis, the authors use modern educational technologies used in various educational systems as patterns for conducting a comparative analysis of already proven educational concepts and approaches that underlie the newly created model of additional education. *Results* In this section, the authors analyze the structure of external and internal (inter-quantum) connections of the educational model 'Quantorium-04,' as well as the role and characteristics of the staff who are called to implement this educational model into reality. The main part of the section is devoted to the analysis of factors that, according to the authors, should be paid

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special attention to. We are talking about the so-called points of instability (bifurcation) of the educational model under study. As such special points, two aspects of the personnel problem are noted, two aspects associated with the complexity of the equipment used in the educational process and elements of structural and organizational feedback on the quality indicators of the educational process. Along with analytical calculations, concrete steps are proposed that could minimize the risks of problem situations and would increase the effectiveness of the educational process.

Discussion In this section, as a hypothesis under discussion, it is proposed to consider a number of measures and technological methods that make it possible to optimize and make more stable the model of continuing education used not only in the Altai Republic, but also in other regional educational subsystems. *In conclusion* it is noted that the project approach, in particular, and the model of additional education implemented by the federal network of children's technoparks «Quantorium», in general, is consistent with the goals and objectives of the system of additional education for youth and schoolchildren, designed to educate future engineers and scientists, who shape the basic level from which the revival of the prestige of engineering and scientific professions will begin.

78.1 Introduction

A new innovative model of additional education Quantorium has emerged and is successfully developing in the education system of the Russian Federation [1]. It unites talented children who are passionate about science, forms a new layer of the younger generation focused on using a project-based approach in their creative activity, under which schoolchildren develop and implement complex projects in various fields and formats.

Currently, according to the Government Decree No. 317 ‘On the Implementation of the National Technological Initiative’ (NTI) dated April 18, 2016 [2], and financial support of children's technoparks approved under the Federal Target Program for the Development of Education for 2016–2020, a network of federal children's technoparks operates, which is constantly developing and supplemented by new spots [3].

What is the phenomenon we call a children's technopark? Analysis of various sources has shown that to date, there is no generally accepted definition and classification of technoparks [4]. In early 2002, the International Association of Science Parks defines a science park as ‘an organization managed by specialized professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions.’ The above rather broad definition of a technopark determines the equivalence of such concepts as ‘technology park,’ ‘technopark’ (Russia), ‘research park’ (USA), and ‘science park’ (Great Britain).

As for the Russian children's technoparks called Quantoriums, in the Russian Federation, more than 100 such institutions are currently operating [5], each of which

includes specialized training classes, laboratories, and high-tech workshops, where various practices of teaching children are implemented in the framework of additional education [6]. The experience of educational practices used in Quantoriums [7] has shown various approaches implemented and developed at different stages of the educational process [8, 9].

The priority goal of creating such innovative sites as Quantorium is to promote the accelerated technical development of children, who will further become a talent pool of scientific and technical leadership and technological progress in Russia, the main driving force in implementing its scientific and technical potential and form the basic level to start the revival of the prestige of engineering and scientific specialties.

The main Quantorium tasks include creating a system of scientific and technical education through the involvement of children and youth in the study and practical application of science-intensive technologies, providing a social lift for young people who have shown pronounced talents in scientific and technical creativity, ensuring the preparation of a nationally-oriented reserve for the science-intensive and high-tech sectors of the Russian economy, particularly, the space industry, creating a Russian format for additional education of children in engineering sciences, and ensuring the systematic identification and further support of children gifted in engineering.

According to the Decree of the President of the Russian Federation ‘On National Goals and Strategic Objectives of the Development of the Russian Federation for the Period up to 2024’ dated May 7, 2018, the key goals of the national project Education in the Republic of Altai are:

- ensuring the global competitiveness of Russian education, the inclusion of the Russian Federation into the top 10 world countries in terms of the general education quality by 2024,
- upbringing a harmoniously developed and socially responsible personality based on the spiritual and moral values of the peoples of the Russian Federation, historical and national-and-cultural traditions.

Under the national project, the regional project Success of Every Child is being implemented, which is aimed at creating an effective system to identify, support, and develop the abilities and talents of children and youth, as well as self-determination and professional orientation of the younger generation.

The content of educational programs of the system of additional education for talented children and youth of the Republic of Altai implemented under Quantorium-04 rests on using a project-based approach in the educational process. Work in six main (high-tech, bioquantum, promroboquantum, energyquantum, geoquantum, and IT-quantum) and three additional (mathematics, English, chess) educational areas for young city residents is aimed at instilling creative skills and teamwork and simulating behavioral model in the future professional activity. As the head of the Republic of Altai O. Khorokhordin noted, ‘... this is a truly breakthrough project aimed at the future. It is created to provide children who wish to be engaged in scientific and technical creativity with the opportunity to develop their talents in the Quantoriums.’

78.2 Materials and Methods

The educational areas (trajectories) of the Quantoriums federal network [10] include the following quantums: Autoquantum (promising vehicles), Aeroquantum (small unmanned aircraft (drones)), Bioquantum (microbiology and biotechnology), Geoquantum (geoinformatics), Cosmoquantum (applied astronautics), Laserquantum (laser technologies), Nanokantum (research of nanomaterials), Neuroquantum (neurotechnology and neurobiology), Roboquantum (mechatronics, applied programming), energy quantum (studying the main alternative energy areas), Industrial design (high-tech prototyping, design), IT-quantum (programming and information security), Data-quantum (processing mass data obtained on the Internet), and VR/AR (augmented and virtual reality).

In the Republic of Altai, the federal project of additional education in engineering and technical and natural sciences—the children's technopark Quantorium-04 was launched in 2019. In the Quantorium, children acquire the engineering skills, working on modern high-tech equipment under the guidance of highly qualified practicing teachers. The training program includes not only engineering (hard) skills but also soft skills of critical thinking, leadership, teamwork, time management, etc.

Even a brief overview of the Quantorium-04 educational programs shows that modern teaching methods are planned to be used or already being used in education, and specialized teachers are invited who have work experience not only in special educational institutions and universities but also an area they represent or will represent in their quantum. It is assumed that in the short term, complex projects in teaching will be calculated and simulated to a certain extent based on an algorithmic approach [11]. For junior schoolchildren, projects based on educational gaming technologies are preparing for implementation and are already partially implementing [12]. This educational system is based on real complex cases focused on implementing a specific activity product—a project, also including a research component [13]. When working on the project, the Quantorium-04 students will learn to analyze information and make decisions, acquire teamwork skills, and demonstrate their readiness for self-education. Such work will allow developing critical thinking, self-motivation, and self-evaluation of activities.

78.3 Results

In the Republic of Altai, the children's technopark Quantorium-04 was launched on December 19, 2019. Intended for the region residents—schoolchildren aged 12 to 18—it provides about 800 children with free annual education. As noted above, training is performed in six main and three additional areas. Enrolment of children and informing parents started a few months before the official opening of Quantorium. Thus, e.g., as part of the City Day celebration, which took place from August 30 to September 1, 2019, the Quantorium-04 employees held masterclasses in six

main (high-tech, bioquantum, promroboquantum, energyquantum, geoquantum, and IT-quantum) and two additional (mathematics and English) areas. At these master-classes, young city residents and their parents could see how to create a true robot with own hands, write a program not only working on a computer but also controlling a microcontroller, study the operating principles of a hydrogen engine and wind generator, and get a lot of other useful information and positive impressions.

Further development of the additional education system for schoolchildren in the Republic of Altai supposes creating three mobile Quantorium technoparks by 2024.

It should be noted that many Quantorium-04 activities are in one way or another related to the work of structural subdivisions of the Federal State Budgetary Educational Institution of Higher Education Gorno-Altaisk State University (GASU). This interaction is beneficial to both structures and has a variety of formats. Thus, e.g., the university undergraduates are involved in the Quantorium-04 activity, for whom the educational practice is the opportunity to acquire ‘hard’ and ‘soft’ competencies required for the practical and theoretical work of future specialists they plan to perform in the coming years. Along with undergraduates, Quantorium-04 attracts teachers, lecturers, education system experts, and engineers providing technical support for the educational process. Educational programs are divided into several training levels and implemented on a modular basis. The criteria used as indicators of the efficiency of work in groups on project activity are teamwork, proficiency in software tools, the product created as a result of design, and practical project orientation [14, 15].

Developing a creative personality, teachers not only take care of specialized (within a single quantum) education and self-education of schoolchildren but also try to expand their horizons in related fields of knowledge. Thus, along with classrooms, in the premises occupied by Quantorium, a chess lounge, a lecture hall, and a coworking area, which serves as a platform where students can exchange ideas and learn to find joint solutions of an interdisciplinary nature, are arranged.

Like any complex system at a stage of formation, the Quantorium-type children’s technoparks have some issues, the solution of which will allow raising the additional education of the younger generation to a new quality level. Below we will focus on several problematic points and consider possible ways to solve them.

78.3.1 The Regional Staff Issue

As noted above, the Quantorium children’s technopark is a unique educational center equipped with modern and, most importantly, high-tech equipment. Herewith, the issue of staff, which are not only competent in the disciplines they teach but also fully able to use the technical means available in their quantum in the development and creation of educational projects, is thrown into sharp relief.

The educational activity experience has shown that not every educational institution of higher education, especially that geographically far from the central cities of Russia, has a ‘quantorium technical line.’ Therefore, even present-day university

graduates, not to mention the veterans, could hardly have dealt with such devices, instruments, and design tools somewhere earlier. Thus, without the experience of work with technical means, two ways of mastering the complex technique available in Quantorium remain, i.e., special courses and self-education.

Given the intensity of launching Quantoriums throughout Russia and the accelerated pace of recruitment, it is difficult enough to arrange long-term (1–2 months) off-job training courses for ‘newly minted’ specialists.

For regional Quantoriums, the selection and initial training of staff look as follows. The applicants for the position of quantum teachers are chosen within the educational environment, by word of mouth, and through other information sources. First, the registration of applicants in the centralized (unified throughout Russia) database is arranged, and almost simultaneously, initial online testing is performed, designed to ‘sieve away’ completely incompetent candidates. Further, after about a week of processing the test results, the applicant is invited to a face-to-face interview with the regional Quantorium leadership. In a while, centralized weekly methodical and technical courses are arranged based on the country’s leading educational sites for newly hired teachers, who have successfully passed interviews. However, according to those who have been trained in such courses, these educational measures cannot ensure a full-fledged technical retraining new staff within such a short period. Such courses usually allow making useful contacts and pointing in a vector (direction) to move with further self-development. Herewith, it should be noted that the younger generation of teachers overcome their technical ‘backwardness’ much faster as compared with elder colleagues more experienced in methodical terms.

Educational practice shows that in the regions, at least in the engineering orientation quantums, the staff issue is solved by attracting already well-trained ‘fans’ of their business, who are motivated to work in Quantorium largely due to the possibility of access to modern equipment and the prospects of working upon interesting projects together with students, while solving non-routine creative problems.

If at the first Quantorium formation stage, the staff issue is associated with the search, training, and involvement of specialists in the educational process, then at the next stage, a pressing problem of ‘retaining’ the most trained teachers and methodologists in the regions emerges. Since, according to statistics, the most trained staff are young people aged under 25–30 (often university graduates or young specialists who have recently graduated from universities), who are also the most mobile part of society; the opportunities and salaries of their colleagues from the central regions (Moscow, St. Petersburg, Yekaterinburg) become a driving force for them to change the place of work. To retain them in the region, some special conditions are required, creating which completely falls on the shoulders of the regional children’s technopark leadership. Experience shows that in such situations, artificial restrictions are ineffective, and the work efficiency of a forcibly retained employee is significantly less than that of a creatively working one. Therefore, even special labor agreements drawn up with the obligation prescribing them to work off the funds spent on their advanced training do not always save the situation.

We see one of the possible solutions to the staff issue in creating a long-term program (at the level of regional ministries of education) and a system for training the

staff for Quantoriums on the joint material, technical, and methodical base of regional universities and Quantoriums. Implementing such a program could contribute to forming the required staff reserve, which would solve the ‘brain drain’ issue.

78.3.2 *The Technical Equipment Issue*

For each quantum, along with educational equipment (smart boards, smart displays, projectors, printers, network equipment, etc.), there is a wide range of technical devices associated with the quantum specifics. For some quantums, these are modern diagnostic electronic laboratories, and for other ones—unmanned aircraft and high-quality photo and video equipment, or almost professional mobile robotic devices, or complex robotic manipulators equipped with technical vision elements. Thus, e.g., in promroboquantum, only among the design tools used to teach schoolchildren, it is possible to distinguish four categories in terms of the mastering complexity and, according to experts, only one or two of them are more or less intuitive.

This issue has already been partially touched upon above when discussing the issue of training staff for Quantoriums. It has been noted that currently, the efficiency of mastering and using high-tech equipment almost completely depends on the teacher’s self-training degree and his/her ability and desire to devote a fairly large amount of personal time to solve this issue.

Another reverse side of the modern technical support of the educational process, no matter how paradoxical it may seem, is the high cost of equipment (especially the design tools, machines, etc.). This situation is associated with an actual possibility of failure of complex expensive devices during the educational process. Therefore, a teacher who has about two dozen students in the class is simply physically unable to keep track of all of them during their work with complex instrumental complexes.

It is worth noting that schools and universities have faced and are facing a similar issue when performing high-tech laboratory work. The way out of such situations is, as a rule, either virtualization of the work through computer simulation or strict limitation and prescription of what, in what sequence, and how to do. Before each laboratory work, along with safety instructions, a detailed step-by-step laboratory experiment description is studied. In many cases, a laboratory assistant helps the teacher to monitor the equipment, its intactness, and serviceability. However, this approach, which can be called ‘...press this, press that...’, supposes only a pre-planned consequence of steps, as a result of which students or senior pupils should get a predetermined result. In this case, the element of creativity is almost completely missing.

In a children’s technopark, in essence, the entire educational process should be aimed at realizing the student’s creative potential. To get something new, the flight of the student’s imagination should be continuously ‘awakened,’ and creative experiments implemented. If as a result of not entirely thought out ‘creative attachments and detachments,’ a design tool costing several tens or even hundreds of thousands of

rubles may entirely and permanently fail, then any experiment will be placed in question. Therefore, teachers who either do not give expensive design tools to students at all or hold classes with step-by-step assembling structures identical ‘in the image and likeness’ and using the aforementioned educational method ‘...press this, press that...’ can easily be understood. Of course, senior and experienced schoolchildren can be entrusted, to a certain extent, with even expensive devices for independent mastering, but, as experience shows, they should first be educated, trained (which takes quite a long time), and even if these conditions are met, such students are extremely rare in the general educational stream.

A way out of the situation described can be a decrease in the load on a teacher, i.e., the number of students simultaneously involved in the practical training. The best way is to attract several teachers (laboratory assistant—leader) to each practical training, which is the most adequate and proven model of educational and practical interaction with schoolchildren.

As for the complexity degree of the technique used in the educational process, there is another related issue, which is not manifested immediately. Experience shows that no matter how remarkable and reliable the equipment is, but it tends to fail over time, especially when intensively used by children, which requires arranging departmental service centers maintaining a wide range of quantorium devices.

78.3.3 The Issue of Indicators

In the modern economic community, to estimate the efficiency of any activity or investment, a simple linear model is often used, which is based on a simple rule: ‘the more resources are invested, the more essential final product or faster result should be obtained.’ The more funds are invested in science, laboratory equipment, and scientists’ salaries, the sooner they should give a world-class ‘breakthrough result.’ The more funds are spent on higher education and financing national research centers and federal universities, the more talented and educated the graduates of these higher educational institutions, and the more expressive and brighter the achievements they should demonstrate in the learning process. The more funds are invested in the equipment for modern schools, the more ‘Kulibins’ should be born there. Interestingly, only a few people have thought about the possible nonlinearity of such an approach to evaluating the results, and not always great investments allow achieving the desired result. However, such an estimation model exists, and a ‘breakthrough’ result should be demonstrated since ‘it is better to have funding than not to have it.’

In fact, achieving high indicators is possible. Thus, e.g., to get quick results in scientific research, for quite large funds (of course, if any), scientific laboratories can be equipped with ultramodern equipment and for mega-grants, ‘mega-professors’ with world names invited to continue their ‘mega-research’ in a new place, and the results of these studies should be published already on behalf of the new ‘alma mater,’ thereby increasing the indicators of its scientific achievements. Actually, this approach is quite good since around such non-standard persons, scientific teams are

formed which further may already become the foundation of local scientific schools, however, with a proviso that if shortly, the mega-financing is not redirected to other new ‘super-mega-educational research center’.

If in ‘adult’ education, the above exemplary scheme somehow works, then what to do with the performance indicators of such institutions of additional education as Quantoriums? Collective ‘mega-publications’ do not count here, and actually ‘spectacular’ projects created by the hands of local schoolchildren and not those invited from Moscow or St. Petersburg should be demonstrated at exhibitions.

It turns out that there is a decent way out of this situation. To get quick results, such a technical ‘semi-finished product’ as a design tool can be used. And the more expensive the design tool will be, the more impressive project created using it will look. The vivid TV reports could be recalled, in which children of all ages demonstrated creating and programming a true robot during just one school lesson, using, e.g., the LEGO MINDSTORMS EV3 design tool. Modern design tools, with which Quantoriums are equipped, are an order of magnitude more complex and effective as compared with LEGO, and no doubt, they can be used to demonstrate even more representative results. So, what is wrong with that?

The world outside the school or technical circle, to one degree or another, can be represented in the form of a design tool with its modules and assembly rules, especially if after graduating from first a school and then a university, a person gets in an already well-adjusted system (corporation, government structure), is embedded in the ‘paper conveyor,’ and performs one or more well-defined and understandable operations for the rest of his/her life. If children are prepared for such a life consisting of a set of certain standard functions, then working with design tools is an ideal option for a child’s development. However, it is difficult to assemble an actual non-routine example of a scientific or technical solution from large modules and blocks.

Speaking about the ‘erector game,’ it should be noted that the availability of design tools is more useful for teachers, whose life is facilitated by getting an opportunity to ‘raise’ (start and complete) an entire complex project for just a single lesson. The teacher is happy not to have to invent anything, the child is happy to manage quickly and easily doing something functional without much effort, and the parents are satisfied with the bright success of their child. The question arises, what is the result of such creativity? Attention is drawn to the fact that the majority of schoolchildren ‘playing’ the design tools more and more set their mind on step-by-step following the instructions for assembling a particular project. For them, the process of solving any problem comes down to finding a ‘blueprint’ either in the instructions for the design tool or on the Internet. Moreover, they search for the solution in its entirety. If such a solution can be found neither in the instructions nor on the Internet, then the problem is recognized unsolvable, and they foul up it.

Another point associated with the excessive using the design tools, which few people pay attention to, is the growing ‘virtualization’ of teaching children. Most of the creative process results assembled from expensive design tools can work and compete without failures only in the ‘greenhouse’ conditions of laboratories and classrooms. If earlier ‘karters’ have tested their designs on real race tracks, control line aircraft models flown freely in the open space of sports grounds or in

front of Youth Clubs, and it has been most interesting to drive radio-controlled ship models in local water reservoirs, then to ‘survive,’ present-day designs assembled from expensive design tools require indoor operation only, and to drive, e.g., a flying machine in a city, a special permit is required, which is rather difficult to obtain.

Based on the foregoing, we may conclude that currently, mastering remarkable and high-tech design tools and using them in the training system is a necessary part of the educational process. However, the issue of acquiring more universal consumables for creative endeavors to implement complex and interesting projects using simple components is becoming more relevant.

78.4 Discussion

Given the undoubted innovation and producibility of the Quantoriums equipment, certain objective and subjective difficulties associated with its rapid and high-quality mastering should once again be noted. To increase the teaching staff motivation in mastering new technology, the Quantorium leadership would be suggested to allocate certain ‘park and practical’ hours that teachers could use to not only study instructions for the proper operation of new equipment but also prepare special interdisciplinary (inter-quantum) exhibitions and seminars demonstrating the capabilities of new techniques and technologies.

It should be noted that teams formed of ‘advanced’ schoolchildren studying in different-age educational groups can be involved in developing special projects and the accelerated mastering high-tech equipment. Also, the development and publication of a special internal (Quantorium) methodical support describing the principles and methods of using new equipment would be useful in mastering new techniques. In this process, not the least role could be played by the publication of special manuals—collections of proven designs that allow not only self-mastering new technologies but also receiving real-time author’s advice. Creating an educational channel involving schoolchildren in a blitz interview on “what I have learned today” would also be effective.

Expanding inter-quantum interactions through the implementation of interdisciplinary projects is important within the framework of the study. In this context, projects for automation and mechanization of other quantum developments implemented jointly with promrobo- and IT-quantums could be well-positioned. In this case, high-tech quantum could act as a link for both the housings of the designs being developed and the design of the appearance of the systems being created as a whole.

To develop creative initiatives and bring them closer to the real world outside the Quantorium walls, it would be desirable to have, along with the design tools, a certain set of consumables, i.e., parts that could be used to create ‘street’ projects. Herewith, more attention should be paid to testing projects under real-world conditions. As for the creative activity indicators, reducing the ‘reporting’ events and scheduling and approval of their holding are outlined as a necessary component.

As an important teaching technology, we consider ‘chain’ projects, under which the continuity of design ‘from simple to complex’ would be embodied. In this context, more attention could be paid to developing a mechanism for encapsulated ‘library’ projects—‘design functions’ (by analogy with program functions or procedures) that could be reused for other projects. This could be another aspect of applying the method of project interfaces in additional education.

Within the framework of the study, it seems expedient to develop a mechanism for forming project teams when working on complex projects. In this vein, it is advisable to pay attention to studying the model of the types of informational metabolism of the personality and the elements of interpersonal relations of schoolchildren in various conditions. It is necessary to perceive how to properly form development teams and instill in schoolchildren the skills of working in such teams, trusting the role of mentors or ‘playing coaches’ to ‘advanced’ educational process participants. This would, to a greater extent, allow diversifying the ways of ‘bringing’ information to a larger number of students.

To develop the speech skills and competence to isolate the main meaning from a large amount of ‘noisy’ data and systematize them, students should get the opportunity to learn to describe their projects and formalize the development stages for their solutions. In this context, something like tube channels with stories about current and future developments could be created. In the context of the development of verbal competencies, arranging training on interviewing confabulators would be useful for children to learn asking questions and practice highlighting the main idea in the dialogue. To develop the visual component, the skills of the structural representation of the project model should be practiced for both individual work (one student—one project) and team creativity. To develop competencies in the analysis and synthesis of complex systems, students should both work upon individual project parts (with a preliminary substantiated discussion of the current decomposition when solving an analysis problem) and have an opportunity to integrate and test the project when solving the synthesis problem.

78.5 Conclusion

Thus, the new innovative model of additional education for schoolchildren created in the Republic of Altai uses a project approach as a methodical basis, within which various projects are implemented aimed at developing the young people’s creativity and the ability to teamwork and making responsible decisions. With the launch of Quantorium-04, work has been started to improve the educational process in the field of additional engineering, technical, and research education for schoolchildren. The further development of the additional education system in the Republic of Altai supposes creating mobile Quantoriums, which along with the already operating Quantorium-04 will make a significant contribution to shortly solving the issue of training engineering personnel for the region. The relevance of this study for the

Republic of Altai is justified by its extreme importance and the need to train a generation of professionally competent young people with special experience in working upon complex projects, who will be ready to develop new complex solutions in science, technology, industry, and economy after receiving higher education.

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Chapter 79

The Inevitability of Financial Risks in Businesses and How to Overcome Them: Saudi Arabia in Focus



Nasser Mohammed Lasloom

Abstract Financial risk is made up of potential volatility or changes in earnings that differ from participants' expectations and estimates of these values. This can have both positive and negative impacts depending on the preferences of risk consumers, the investment climate of a nation, especially for developing economies has a great role to play in the level of financial risks that an organization can be exposed to. Even if the best company in the world hires the best managers obtainable in a field to run a company in a country where the stakes are high as regards risk, the company will most likely show signs of financial risks that may just be inevitable. This study carefully analyzed financial risks in businesses with a focus on efficient management in a developing country like Saudi Arabia.

79.1 Introduction

Business is not without risks. Thus, people who choose to do business must accept the fact that risks are an integral part of their business. Obviously, the biggest concern of all businessmen and entrepreneurs when they do business is that their company is profitable and impresses spectacularly. While some fear that their business may not be profitable enough to support its continued operations and growth, there are those who fear that their business may not survive a few years. Some companies that have existed for years, even decades, are still constantly confronted with various types of business risks.

The fact that a business has been operating for more than 5 or 10 years does not mean that it has become immune to risks. It is possible that the organization is using effective risk management strategies that allow businesses to thrive and even grow. From a financial point of view, risk can be considered as the possibility of a deviation in the expected future, which causes the desired results to be differ from the expected, or uncertainty of the future financial product due to a decision made

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by an economic person in the present based on the results of a study of the behavior of a natural phenomenon in the past.

There can be both positive and negative meanings depending on the preferences of risk consumers. The phenomenon of loss aversion means that the assessment of losses has a greater impact on people's behavior than a similar level of profit. However, risk-loving agents may in some cases take on additional risk [1]. Risk can also be seen as making differences in the yield between the planned, the required and the expected to occur [2].

The investment climate of a nation, especially for developing economies has a great role to play in the level of financial risks that an organization can be exposed to. Even if the best company in the world hires the best managers obtainable in a field to run a company in a country where the stakes are high as regards risk, the company will most likely show signs of financial risks that may just be inevitable. Corruption, lack of internal control and mismanagement creates enabling environment for risks to thrive. Management issues like lack of control, expertise and transparency can also trigger risk. It is also worth mentioning that governance has emerged as part of a global culture aimed at increasing the participation of various parties in the community with the government in the development and implementation of public policies to express interaction or partnerships between the state, civil society and the private sector to achieve sustainable development [3].

79.2 Financial Risk

Financial risk is made up of potential volatility or changes in earnings that differ from participants' expectations and estimates of these values. This can have both positive and negative impacts depending on the preferences of risk consumers. The phenomenon of loss aversion means that the assessment of losses has a greater impact on people's behavior than a similar level of profit. However, risk-loving agents may in some cases take on additional risk [1]. Financial risk can occur from sudden changes in exchange rate, commodity prices and interest rates. Business cooperation especially in countries security volatile countries like Saudi Arabia (judging from recent happenings) are susceptible to all these risks especially in the face of increasing global business activities. However, non-financial multinational can take advantage of financial or operative hedging to shield themselves against these risks.

Management of financial risks should be done by the firm and its shareholders. Studies show that shareholder value can be increased through corporations' risk management in the face of capital market imperfection such as costly external financing, agency conflicts, taxes as well as direct and indirect financing. Proper corporate risk management can make corporations to be more valuable to the benefits of its owners as agency cost that can be incurred during the process of shareholders, bondholders diverging and managers interest can be greatly reduced. Other benefits include: lowering expected cost of bankruptcy, coordination of corporate financing and investment policies, reduction of corporate tax burden and financial distress [4].

Though risk is predictable, but it is always accompanied with other things. That is, the consumption of net risk as a separate product is impossible. As with many products, the consumer's perception and taste for risk may vary depending on experience. Hidden or explicit insurance from government sources can further change consumers' perceptions of risk, thereby making them to favor a more acceptable consumption pattern. These stylized facts allow us to argue that financial risk can be classified as a private product in small products, but when a certain size is reached, the threshold risk is no longer a private product. With increasing thresholds, it becomes a common pool and, as the total financial risk approaches the global system size, it becomes a public good. This "transmutation" of risk into another type of product can cause profound changes in the systemic level of risk, which, can be argued, has manifested itself in the most recent financial crises. Since risk is simply risk, additional products must be added to the original risk unit(s) for this transformation to take place [5].

The following are various types of financial risks that can occur in a multinational:

- Credit risk or default risk arising from the inability of one party to pay or fulfill its obligations to the other, so that they will not be fulfilled. If the company is unable to receive receivables from customers, it will have a poor cash flow and lost revenue.
- Market risk arising from a recession in the market, which subsequently leads to a decrease or loss in the value of investments. If business assets decline in value, but everything else remains the same, the company's net worth will also decrease.
- Liquidity risk that arises when assets or securities belonging to a business cannot be immediately converted into cash if necessary. This leads to the risk of the enterprise defaulting on its obligations, such as payments on loans to creditors and dividend payments to owners and investors. Owners or board members may ultimately be held personally liable for business debts.
- Operational risk that arises from problems or problems in conducting daily business operations, such as equipment breakdowns, failure of business processes, and errors in the workforce. Mistakes made can result in significant financial losses, and this is just one of the many operational risks that enterprises face every day.
- Interest rate risk arising from sharp changes in interest rates, in particular, sudden drops that result in financial losses. This is often an offshoot of market risk, since interest rates are directly dependent on changes in the economy.
- Foreign exchange risk arising from movements in foreign markets. Currency exchange rates, of course, will affect the profit of a business with foreign operations or conduct foreign transactions. All these risks can be triggered by the following factors:
- **Instability of the financial market.** As a rule, financial markets are unstable and unstable, which can lead to losses for businesses and investors. This instability is often characterized by unstable movements in stock prices and currencies and fluctuations in interest rates.
- **Economic factors.** National economies and various industries can face large-scale problems, a classic example of which is the case of recession. Enterprises

can suffer financial losses when a sector-wide economic shift occurs with unstable supply and demand behavior leading to lower prices, lower production and even lower purchasing power of customers.

- **Actions and decisions of third parties (Counterparty risk).** Financial risks can also arise from the actions of external parties such as suppliers, suppliers, competitors and even customers. For example, a business will also suffer if its customers' ability to pay their accounts receivable is impaired. The inability to receive from customers inevitably leads to significant financial losses for the company.
- **Internal actions (and inaction).** Failures in the company's internal processes, systems, and workforce can also increase the organization's exposure to financial risks. If employees refuse to do their job, this can lead to low productivity and, as a result, to a low level of production. This means low inventory levels and fewer goods sold, which ultimately leads to lower incomes.
- **Legal interventions.** Often, governments develop new laws or update existing ones that will affect the financial aspect of the business. This can increase costs or expenses that will reduce profit margins, or it can also affect the decision-making processes for purchasing customers at the expense of the business.

From the foregoing and as illustrated in Fig. 79.1, it is clear that financial risks can emanate from all sides, which makes their prevention or minimization even more urgent. Businesses should be guided by these risks.

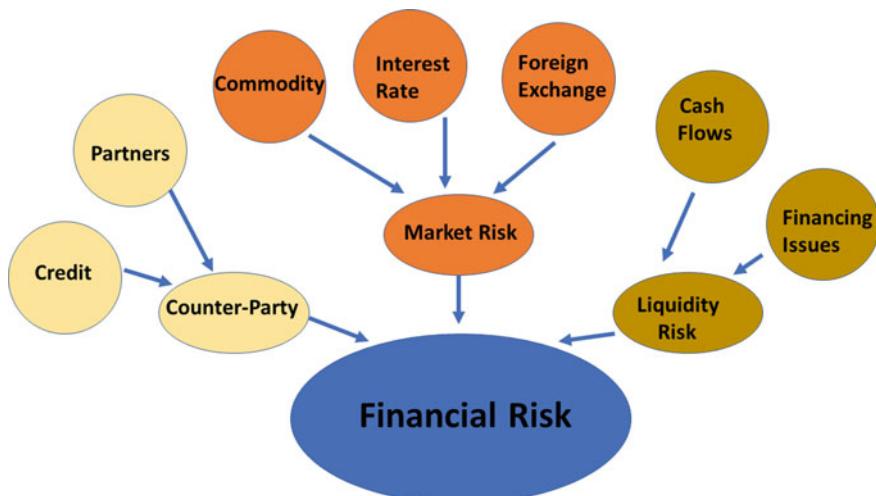


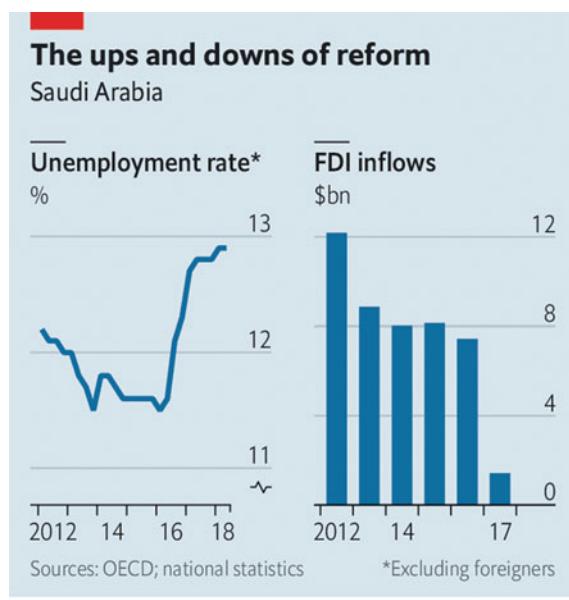
Fig. 79.1 Classification of financial risks

79.3 An Overview of Risk in Saudi Arabia

Saudi Arabia is the largest economy in the Middle East and the richest Arab country in the region. The policy of large-scale public works undertaken by the authorities, as well as foreign direct investment and the reliability of the banking and financial system allowed the country to become the number one and one of the largest regional economy in the world. However, the Saudi economy relies almost entirely on oil. GDP growth has gradually decreased since 2015 to the point where the economy entered into a historical recession in 2017 (-0.7%). Growth was expected to reach 1.9% , and the non-oil economy would grow faster by 2.3% . The IMF reduced its growth forecast for Saudi Arabia in 2019 from 2.4 to 1.9% amid regional and global geopolitical tensions and lower oil prices since late 2018.

Figure 79.2 graphically shows how the economy of Saudi Arabia has declined in the last five years, especially as regards Foreign Direct Investment, this underscore the need to adopt efficient strategies that will minimize financial risks which is a major concern to foreign investors as well as owners of multinational companies. The Saudi Arabian Monetary Policy Authority (SAMA) has introduced a risk management and compliance strategy in its strategy to maintain a culture with a high level of knowledge and awareness on a scientific and technical basis. In order to protect SAMA resources, the Risk and Compliance Department has developed mechanisms and methods for managing potential risks, constantly improving the risk culture and at the same time increasing the level of compliance with international, local and domestic standards.

Fig. 79.2 Sequence in the decline of Saudi Arabia economy



The Economist

In addition, the department provides the necessary support to ensure the continuity of critical tasks at SAMA.

A review of a case study (a mining company named Maaden), in Saudi Arabia gives an insight into corporate risk management in the country. The study shows that Maaden's corporate governance concept is based on the three main pillars presented in the corporate system, corporate governance rules and company charter, in addition to the best practices that apply to the management requirements established by Maaden [6]. The government's requirements imposed by Ma'aden are listed below, such as an authority matrix, conflict of interest guidelines and professional conduct, a guide to punctuality policies and procedures, and a guide to shareholders. In addition, the leadership of the board of directors, the rules of the management committee, the rules of the strategic risk management committee, the regulation on the review committee and the regulation on the executive committee. Finally, the provisions of the Human Resources and Compensation Committee, the Social Responsibility Committee, a disclosure policy and transparency document, and a communications policy document for company management [7].

Ma'aden has adopted a risk management method in accordance with the ISO 31000 standard, which is based on monitoring, analysis and risk assessment by establishing a situation: (risk identification, risk analysis, risk assessment), and then how to deal with risk by contacting consultants and old experience, and the review committee, coming from the Board of Directors, takes responsibility for monitoring the internal control system, as well as the procedures and rules that govern risk management and access to periodic reporting and monitoring in risk management. Through the Tactical Risk Committee and the Operational Risk Committee, and this is followed by financial strategies that determine the numbers of risks in the numbers by which the company must make a decision; and, therefore, applies to the financial industry of derivative financial instruments and the insurance industry, since any risk is associated with a financial transaction, for this it is necessary to identify scenarios that define the risks to eliminate them [8]. An external audit, which is one of the requirements of the Saudi body for legal accountants, represented by the Internal Audit, the audit bodies are concentrated around, and also include an assessment of practice, monitoring of risks for the fight and reporting to company management, as well as making suggestions for improvement [8].

In another study that investigated 49 companies' German companies operating in Saudi Arabia, the study shows that cultural risk is assessed as more important in the business environment than political, financial and economic risk. The most critical risk factors are not sufficiently included in the country risk assessment methodology, which is often used as a source of risk information for a particular country. In terms of risk management strategies, participating firms use mostly informal approaches rather than structured hedging or insurance products. In addition, the researcher believe that the size of the firm affects the perception of certain risk factors and the level of complexity of risk management [9].

79.4 Financial Risks Management

The financial risk management process is not a one-time thing. It should be a continuous process that should not be taken for granted, as financial risks can arise from all sides and at any time. Before starting the financial risk management process, there should be a clear understanding of the goals and objectives of the organization, since they will determine the direction of all activities.

The first step is to identify and prioritize financial risks that relate to the business. What follows is determination of the processes that help the company conduct a detailed assessment and analysis of the specific risks it faces: Companies have several ways to identify and evaluate risks. Some of these processes are:

- Quantitative risk management. This is the detection, assessment and monitoring of financial risks in the financial operations of a business using mathematical calculations or estimates. Typically, these calculations relate to income received by the company from sales, investments, and the like. Calculations are also used on historical financial data for forecasting purposes.
- Risk assessment and control. This includes considering the company's internal control when it comes to all its financial transactions. As a rule, a weak internal control system will indicate high financial risks. For example, the absence of a reliable system for monitoring and selling sales and collection fees will increase the risk that payments on receivables by customers will not be properly recorded and money will be misappropriated into the hands of employees collecting money.
- Audit of financial risks. This is a process that entrepreneurs take to evaluate that a company has proper internal controls and policies, especially in the accounting and reporting system. It will also reveal weaknesses in how transactions are recorded and accounted for.

After identifying the specific financial risks that are applicable in the case of a business, it is necessary to prioritize or rank them according to the severity of the risks and their potential consequences. Typically, the risk that poses a greater threat is the risk that can lead to higher financial losses (and even bankruptcy).

The second step is the determination of the level of risk tolerance in the organization: If managers and employees suffer from financial risks, their every move, every decision and every action will be guarded and permeated by a lack of trust. One of the worst things that can happen is that they will always choose the safest route, "play safe" in their business decisions and miss out on promising opportunities, fearing that using them will pose too much risk for the company. Thus, there must be a predetermined level of risk exposure that the company is willing to accept or tolerate. Setting this level will give them the opportunity to move, so they can focus on creating value, knowing that they are still working within acceptable limits in terms of risk.

Factors to consider when setting a financial risk threshold are:

- The period or time horizon during which financial risk is expected. A company may find that the risk is higher if it cannot receive receivables over a three-year period than when customers cannot make payments within one year.
- Materiality. A cost–benefit analysis may show that certain costs exceed the benefits derived from it. As a rule, higher costs are considered more substantial and therefore more risky. The company can set a certain ceiling or maximum amount for its materiality level, that is, if losses exceed this level, then it is significant and, of course, represents a high risk.
- The volatility of the economic and financial environment. Companies that are in an industry with a volatile nature, such as the banking industry or industries subject to frequent fluctuations in costs and interests, can set lower thresholds for financial risk.
- Confidence levels of managers. This is largely personal, on the part of management members. Some managers are “braver” than others, so they are more risk tolerant, while enterprises run mainly by conservative managers should be more careful.

There are several measures of financial risk (or calculation methods) to obtain a risk metric (quantitative result). Examples of risk metrics:

- Standard deviation of company investment returns for measuring volatility
- Estimated losses due to the default of the debtor on his payments to assess credit risk
- Financial liquidity ratios, such as current ratio, quick ratio, cash ratio and asset turnover ratio, to measure company liquidity.

The third step is to formulate risk management strategies. Here, the business will identify risk mitigation strategies that it will adapt to manage the financial risks it faces. The choice of mitigation strategies largely depends on the particular risk that is being managed and the resources available to implement them. In short, let's take a look at some of the most commonly used risk mitigation strategies for financial transactions, especially for various financial risks.

Liquidity risk: The company would like to improve its liquidity by ensuring that it always has enough funds to pay off its debts when they mature, as well as other operating expenses. The following are strategies that can be adopted:

- Determining periods of slow and low cash inflows using various forecasting methods and planning cash budgets around them;
- Careful monitoring of cash inflows and outflows on a regular basis (e.g., daily, weekly, bi-monthly, or monthly);
- Regular fulfillment of the maturities of receivables to track payments of debtor customers in order to identify overdue accounts and take the necessary measures to receive them;
- Sending messages or collecting reminders to customers about their amounts due; as well as
- Maintaining strong relationships with financial institutions, banks and other lenders, to which the business has obligations.

Credit risk: As much as a business would like to sell exclusively for cash, there are many who cannot do this, and they have no choice but to sell their products or services on credit. Problems can arise when customers are unable to pay, which leads to slow cash inflows and loss of income, when bad amounts should be written off as bad debts. Below are strategies that can be used:

- Conducting a thorough verification of data and checking the creditworthiness of customers before selling them on credit;
- Establishment and establishment of credit policies and conditions and their clear informing (in writing, signed by both parties) for clients before concluding a purchase and sale transaction;
- Maintaining strong and positive relationships with debtor customers to ensure that they are constantly informed.

The fourth step is the Implementation of the planned strategies.

Risk reduction strategies should be applied or implemented, but in accordance with a policy set in advance. Here plans and strategies are transformed or transformed into actions.

In the fifth step, we can measure and refine: Risk reduction strategies that need to be implemented should be closely monitored to track their progress and determine whether they are effective or not. This allows them to control risks, mainly by making the necessary adjustments in those areas where they are needed. This may be the adjustment of operations or systems or some other corrective action in relation to implemented strategies or methods. As mentioned earlier, financial risk management—and risk management in general—is an ongoing process. Therefore, it can be refined as necessary. Monitoring should also be a continuous event, with no room for complacency.

In seventh step, we can Report and report the results of the process. At each stage of the process, communication is very important. Top management should be aware of the entire risk management process, especially because it is, they who decide which risk reduction strategies to use and how to implement them. It is also strongly recommended that other members of the organization be informed of the company's risk management initiatives to strengthen their confidence in the company, as well as increase their morale and encourage them to work harder to achieve the organization's goals.

79.5 Conclusion

Financial risks will always be present, in business organizations. Management and owners can “manage” these risks—mitigate or minimize the negative consequences of risks for the company. They can also be avoided, however, but they will always be there, creating varying degrees of threats to the business. Consequently, one of the realities that managers of business must make is to recognize that there are risks and they can never do away with them, the prevailing economic situation either at

country level or global creates environment for certain types of risks to thrive in businesses especially with multinationals. Careful attention should be paid to these types of risks. In the case of Saudi Arabia, counter party risk and market risk are the most susceptible sources of risks for businesses. Risk is a critical variable for understanding entrepreneurial behavior and the cornerstone of any decision to run a business [10].

The measures adopted by Ma'adem in their operation to mitigate risk in Saudi Arabia investment climate is good, especially for the use of two standing committees (Tactical Risk Committee and Operational Risk Committee), to monitor risk occurrence and also to fashion out appropriate responses. The report from the investigation of 49 German companies in Saudi Arabia placed high premium on cultural risks and also placed it as a priority over political and economic sources. The case study shows a loop hole in risk management in Saudi Arabia as the approach is informal, and there is also absence of critical risk factors. This study addressed all the challenges noticed in the case studies. The step-by-step approach to risk identification and the methodological analysis of how risk management can be approached as discussed in this study provide a valuable guide to risk management in Saudi Arabia and in other developing economies.

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Chapter 80

Competitiveness of Circumpolar Countries in the Digital Environment



V. P. Samarina, A. V. Samarin, and T. P. Skufina

Abstract The paper is devoted to solving the fundamental problem of the countries which Arctic territories are rich in natural resources. This is a contradiction between the necessity of forming an innovative, digital model of the economy and the reality of the extractive economy. The aim of the research is to assess the competitiveness of circumpolar countries in the digital environment. The authors have revealed several deterrents holding back development of projects in circumpolar countries that are not related to the extraction and primary processing of natural resources; assessed the subjective prerequisites for using a digital product to solve the production and infrastructure problems of the circumpolar countries; compared circumpolar countries in terms of number of student—one of the factors of competitiveness in the digital environment; rated the circumpolar countries in terms of competitiveness in the digital environment.

80.1 Introduction

The developing crisis caused by the pandemic coronavirus is forcing to look for new ways of economic development. The crisis has already largely changed the economy of most countries of the world and changes continue to take place. The crisis has affected also circumpolar countries which have Arctic territories. Arctic territories are usually rich in minerals and this determines the development of the extractive-type economy.

Circumpolar countries run into such fundamental problem as the contradiction between the problem of building an innovative, digital economical model and the

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reality of the extractive-type economy. Recently, foreign researchers of the circumpolar countries have been increasingly referring to so-called notorious curse of natural resources [1–3]. This is a situation in which the territories, rich in natural resources, demonstrate lower economic and social indicators than the areas having not large natural resources. With regard to circumpolar countries, one more very important problem is fixed—there are several factors constraining the development of projects in the Arctic territories, not related to mining and primary processing of natural resources. The authors have already noted these trends in their papers [4–6].

At the same time, more and more extractive and processing enterprises start to operate in the digital environment. According to researchers' opinions, digital technologies raise labor productivity and safety and improve the environment [7–9]. In addition, the ability of business to adapt to external changes improves and this fact increases antirecessionary stability [10–12].

The aim of the research is to assess the competitiveness of circumpolar countries in the digital environment.

The objectives of the research are the following:

- to reveal factors constraining the development of projects not related to mining and primary processing of natural resources in circumpolar countries;
- to assess subjective prerequisites for the use of digital products in order to solve production and infrastructure problems of the circumpolar countries;
- to compare the circumpolar countries by the number of students—one of the factors of competitiveness in the digital environment;
- to determine the rating of the circumpolar countries for competitiveness in the digital environment.

80.2 Materials and Methods

The object of research is eight circumpolar countries which have Arctic territories.

The subject of the research is the competitiveness of the circumpolar countries in the digital environment.

To solve specific problems of the research, the methods of comparison and matching of information in the circumpolar countries were used. The method of summarizing the information obtained from various literature sources was used as well. The comparison of circumpolar countries was made in terms of student numbers, as one of the factors of competitiveness in the digital environment. To do this, the number of students has been calculated (students enrolled in higher education programs in educational institutions of higher and postgraduate education) per 1000 people. The calculations were carried out by the authors on the materials of the Internet portal Infotables. Ru [13]. The comparisons have been made for the circumpolar countries with Arctic territories.

In order to determine the ranking of the countries with Arctic territories in terms of competitiveness in the digital environment, the authors used the data of the Swiss

business school IMD [14]. For the formation of the IMD World Digital Competitiveness Ranking, 50 criteria are used. A total of 30 criteria are based on statistical data, and the rest ones are based on survey results. The criteria characterize the three components of the rating: “Knowledge” (quality of training, education and science), “Technologies” (regulatory surroundings, financial capital in the IT industry, and state of Internet and communication technologies) and “Future willingness” (level of readiness to use digital transformation).

80.3 Results and Discussion

80.3.1 *Deterrents for the Development of Projects not Related to the Extraction and Primary Processing of Natural Resources in Circumpolar Countries*

It is rather difficult to carry out economic activities in the high Arctic [15–17]. Having studied the features of economic activity in the Arctic territories of the circumpolar countries, we have revealed several deterrents for the development of projects not related to the extraction and primary processing of natural resources. Among them there are deterrents which, in varying degrees inherent to all Arctic areas. We have called them objective factors. Among these are:

- extreme climatic conditions;
- remoteness from administrative and financial centers;
- high cost of production;
- direct dependence on financing from the Federal budget;
- not well-developed industrial and transport infrastructure;
- small size of the population;
- high vulnerability of the natural environment.

Another group of the deterrents linked to poor governance of the Russian Arctic's territories. We have called these factors subjective. They include:

- lack of coordination of Federal and regional authorities activities with organizations realizing projects in the field;
- fragmentary and not systematic solution to the problems of realization projects concerning digital product implementation;
- lack of reasoning of some projects from an engineering and operational points of view;
- lack of modern domestic equipment capable of operating in Arctic conditions;
- insufficient number of management personnel capable of managing implementation and working out of digital projects in difficult conditions;
- shortage of skilled labor force and its low quality.

Thus, we can see that there are lots of objective and subjective factors for the development of the circumpolar countries' Arctic territories. These deterrents are complex and various.

Under the circumstances, the introduction of digital technologies could be the problem-solving.

80.3.2 Subjective Prerequisites for the Use of Digital Products to Solve the Circumpolar Countries' Production and Infrastructure Problems

In a digital economy, the result of the realization of intellectual potential and the result of the work become “digital product” as a special one. It has fundamentally new and useful properties. This product is recorded in a digital code [18–20]. Digital products also include textual, graphical and other information meant for selling: software, e-books, scripts, video tutorials, etc. It is important to point out the dialectical nature of this particular product. On the one hand, like any product, it is meant for selling, exchange or other forms of commodity relations. Thus, its circulation involves making a profit or recovery of expenses. On the other hand, “digital product” serves as a means of self-expression and can be provided free of charge [21–23].

Among the subjective prerequisites for using digital products to solve the circumpolar countries' production and infrastructure problems, we highlight the following prerequisites:

1. High added cost of the results of digital products implementation. According to experts' opinions, the average sectoral ratio of final products and raw materials prices is 3:1. The ratio of the ultimate digital product price and its creation cost may be 10,000:1 and more [24]. This is due to the fact that the digital product added cost is created by its developer's intellectual potential, i.e., the renewable and growing resource that is not always appreciated, and, accordingly is not well-paid [25, 26]. Thus, such digital products as an innovative technology, product or service can be an actualized result of the intellectual potential use. This will contribute to high cost-efficiency of production problem-solving and solution of the problems in the circumpolar countries' infrastructure.
2. The increasing demand for digital products. Spread world crisis has revealed the inability of the economy focused on the extraction, primary processing and export of raw materials, to withstand external actions. The digitalization of the economy will promote the Arctic territories' way out of the crisis both with minimal losses, and with acquired development potential. It will reduce crisis vulnerability of industrial and infrastructure projects in future as well.
3. The multiplicative effect of the digital product implementation. The output of innovative digital products and services is often accompanied by the increase of the conjugate production in technologically interrelated branches of production. The positive effect of one project realization is superimposed on the effect of

another project and greatly intensifies at the same time. Thus, it can be seen the reflection of emergent properties of socio-economic systems, which manifest themselves through the increase. The result is the manifestation of positive multiplicative effect of digital products introduction. The results are manifested not only in individual circumpolar countries, but in the Arctic as a whole.

80.3.3 The Number of Students in Circumpolar Countries as a Factor of a Country's Competitiveness in the Digital Environment

The basis for the development of the digital environment, among other things, is the existing system of higher education. This system provides all sectors of a country's economy with diplomaed specialists, thereby promoting the creation of conditions for digitalization. As of 2018, higher education in Russia can be obtained at 607 state and 358 non-state universities. That is, the number of higher education institutions exceeds 1000. Since 1990, their number has doubled. The number of students over the same period increased to 68%: 4.7 million people in 2018 compared with 2.8 million in 1990.

It is of interest to determine Russia's rating among circumpolar countries by the number of students (Fig. 80.1).

The analysis shows that the number of students in Russia exceeds some economically developed countries' indices. Among the eight circumpolar countries, Russia takes 4th place in the number of students per 1000 population. This is a favorable but insufficient factor for increasing the country's competitiveness in the digital environment.

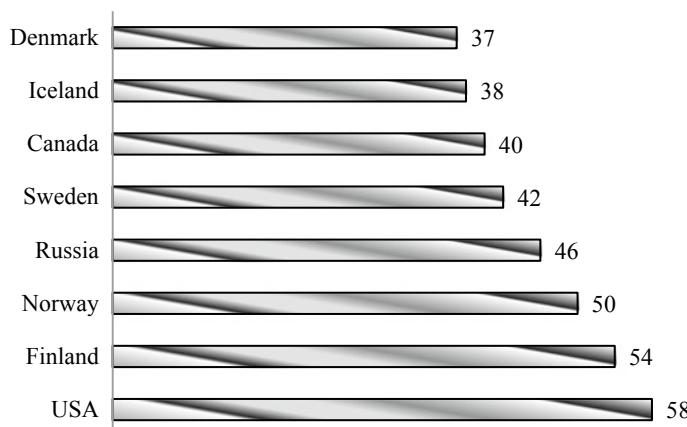


Fig. 80.1 Number of students per 1 thousand people of circumpolar countries' population (The authors' calculations based on the materials of the Internet portal Infotables Ru [13])

80.3.4 Circumpolar Countries' Digital Competitiveness Ranking

In the context of the digitalization of the economy, a country's competitiveness in the digital environment is of great importance. In order to determine Russia's rating in accordance with this index among the countries with Arctic territories, we use the data of the Swiss business school IMD World Digital Competitiveness Ranking [14].

For the formation of the IMD World Digital Competitiveness Ranking, 50 criteria are used. Thirty ones are based on statistical data, and the rest are based on survey results. The criteria characterize three components of the rating: "Knowledge" (quality of training, education and science), "Technologies" (regulatory surroundings, financial capital in IT industry, and state of Internet and communication technologies) and "Future willingness" (level of readiness to use digital transformation).

Circumpolar countries' Digital Competitiveness Ranking is shown in Fig. 80.2.

The competitiveness rating in the digital environment in 2019 was distributed in the following way:

- USA—1st place among circumpolar countries and 1st place in the world;
- Sweden—2nd place among the circumpolar countries and 3rd place in the world;
- Denmark—3rd place among the circumpolar countries and 4th place in the world;
- Finland—4th place among circumpolar countries and 7th place in the world;
- Norway—5th among circumpolar countries and 9th in the world;
- Canada—6th among circumpolar countries and 11th in the world;
- Iceland—7th place among the circumpolar countries and 27th place in the world;
- Russia—8th place among the circumpolar countries and 38th place in the world.

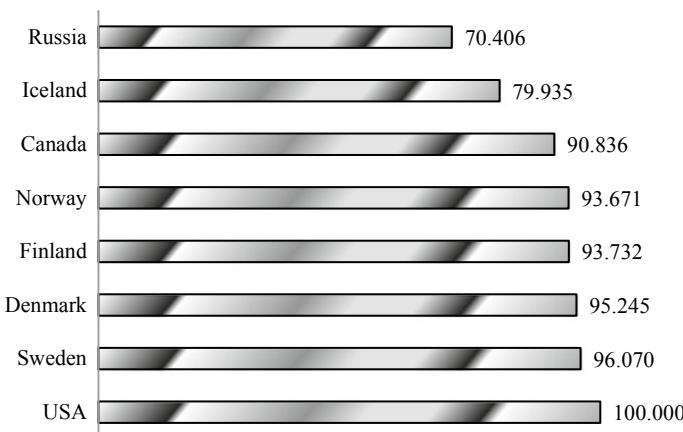


Fig. 80.2 Circumpolar countries' Digital Competitiveness Ranking (the authors' calculations based on the materials of the Internet portal IMD World Digital Competitiveness Ranking [14])

As we can see, most circumpolar countries have very high rates of competitiveness in the digital environment.

The diagram shows that the Russian Federation has the lowest rating among the circumpolar countries. Low values were demonstrated for all complex indicators: "Knowledge," "Technologies," "Future Readiness." Even Iceland was ahead of Russia by 9.529 points.

It should be noted that the generalized competitiveness rating in Russia's digital environment is gradually growing. In 2018, the Russian Federation took 40th place among 63 countries, and in 2019—38th. During the year Russia managed to get ahead of Chile and Thailand. However, Russia's low ratings of in terms of Future Readiness indicator (43 ratings out of 63 in 2018 and 2019) and Technology indicator (51 rankings out of 63 in 2018 and 42 rankings in 2019) are depressing.

Thus, despite the relatively large number of students, Russia is not a competitor in the circumpolar countries' digital environment. According to IMD experts' opinions, the rating of digital development correlates with labor productivity in the country. Even better, productivity correlates with Future Readiness indicator [27].

We believe that the improving Russia's competitiveness in digital environment among other circumpolar countries should be based on the following:

- firstly, to improve current legislation concerning the development of digital environment;
- secondly, to increase government funding for IT branch;
- thirdly, to involve big business, including venture capital for the development of digital environment;
- fourthly, to develop educational process in terms of digital environment requirements;
- fifthly, to involve public administration, population and business of the Arctic territories in the digital environment.

The implementation of these regulations, of course, will not change the extractive nature of the Arctic territories' economy, but can extend its capabilities. Digital technologies not only increase labor productivity and safety, but will improve business ability to adapt to external changes as well.

80.4 Conclusion

The study concluded:

1. Arctic territories of the circumpolar countries, as a rule, are rich in minerals and that determines the development of the extractive-type economy. For all that more and more enterprises operate in the digital environment, increasing labor productivity and safety. Therefore, the circumpolar countries run into such fundamental problem as the contradiction between the problem of building

- an innovative, digital economical model and the reality of the extractive-type economy.
2. Having studied the features of economic activity in the Arctic territories of the circumpolar countries, we have revealed several deterrents that inhibit economic development. Objective factors related to the natural, geographical, economic, infrastructure and demographic characteristics, in varying degrees, common to all Arctic areas. Subjective ones are associated with the imperfection of management of the Russian Arctic territories.
 3. Our research has shown that the digital product has many subjective prerequisites for the use of digital products in order to solve production and infrastructure problems of the circumpolar countries. Firstly, high added cost of the results of digital products implementation. Secondly, the increasing demands for digital products. Thirdly, the multiplicative effect of the digital product implementation.
 4. The analysis shows that the number of students in Russia exceeds some economically developed countries' indices. Among the eight circumpolar countries, Russia takes 4th place in the number of students per 1000 population. This is a favorable but insufficient factor for increasing the country's competitiveness in the digital environment.
 5. In the context of the digitalization of the economy, a country's competitiveness in the digital environment is of great importance. The research has shown that, despite the relatively large number of students, Russia is not a competitor in the circumpolar countries' digital environment.
 6. We consider that improving Russia's competitiveness in the digital environment among other circumpolar countries should be based on improving legislation concerning the development of digital environment; increasing government funding for the IT branch; involving big business, including venture capital in the development of digital environment; development of the educational process in terms of digital environment requirements; involving public administration, population and business of the Arctic territories in the digital environment.

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Chapter 81

Activating Foreign Language Teaching in the Conditions of a Forced Transition to Distance Learning



I. Grubin and E. Dmitrieva

Abstract The paper dwells upon using three types of online tools to activate foreign language teaching: blogs, social networks, and LMS. The task of using these tools has become especially urgent in 2020 due to the forced transition to distance learning because of the COVID-19 pandemic. The authors analyze the usage of the abovementioned tools and carry out a quantitative analysis of their efficiency

81.1 Introduction

The aim of this paper is to consider the prospects of using Internet resources in the context of teaching a foreign language. The relevance of the article is due to the fact that in the modern world multimedia resources are widely used in the learning process. Therefore, one of the best options for using media resources in education, according to the authors, may be to include them in the process of learning foreign languages. The use of these technologies has become especially relevant in the context of the forced transition to distance learning, which the world community faced in 2020. As an example of such resources, blogs, social networks and the Canvas online platform were selected, since in connection with the widespread adoption of Web 2.0 technologies, it is the services that provide online communication for users are the most promising. The objectives of the study include: a review of social resources that can be used in teaching a foreign language, a comparison of the educational potential of the largest social networks, consideration of the advantages and disadvantages of using social networks in the educational process, a survey of university representatives on the use of social networks in the educational process, assessment the effectiveness of online resources by mathematical methods.

Teaching foreign languages presents great opportunities for using advanced technologies. An example is the fact that listening began to be applied in the methodology of teaching a foreign language as soon as it became technically feasible. When talking about electronic tools in teaching a foreign language, it largely means working with

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audio and video materials. Now, in the modern world in this area, computer technologies and programs have come first. They provide a huge number of opportunities for the transfer, storage, dissemination of information and communication in real time, which makes it appropriate to use them in the learning process. The first to use computer technology in the learning process were universities in the USA and Europe. Today it can be argued that various computer technologies and training programs are applied in one form or another in every country in the world [1].

In many universities (both in Russian and abroad), the blogging system and social networking are used not only by teachers and students, but also by various administrative units (institutes, faculties, departments, student councils) for the rapid transfer of relevant information [2].

81.2 Using Blogs to Intensify Foreign Language Teaching

The following are the most popular social Internet resources.

Blog—a Web site the content of which is regularly added entries with text, images or other materials. Such sites have the following feature—by short entries, sorted in reverse chronological order [3, p. 71]. The difference between blogs and traditional newspapers and diaries is presented in Table 81.1.

Blogs vary in the number of authors and can be personal (in this case, the author of the blog entries is one person) or group (the posts are published by a group of authors). For example, the teacher's blog will be an author's blog, and the study group's blog will be a collective blog. Blogs can also vary in the content of the posts and be both thematic and general. In the educational process, thematic blogs are more often used devoted to particular disciplines taught or to individual issues within the disciplines studied.

Today, there are many sites where you can maintain your blog. The most popular ones are Blogger.com and WordPress.com. The popularity of these sites for creating and maintaining blogs, including for the educational process, is explained by the following:

- free access;
- simplicity in management;
- a wide range of functions for presenting various materials.

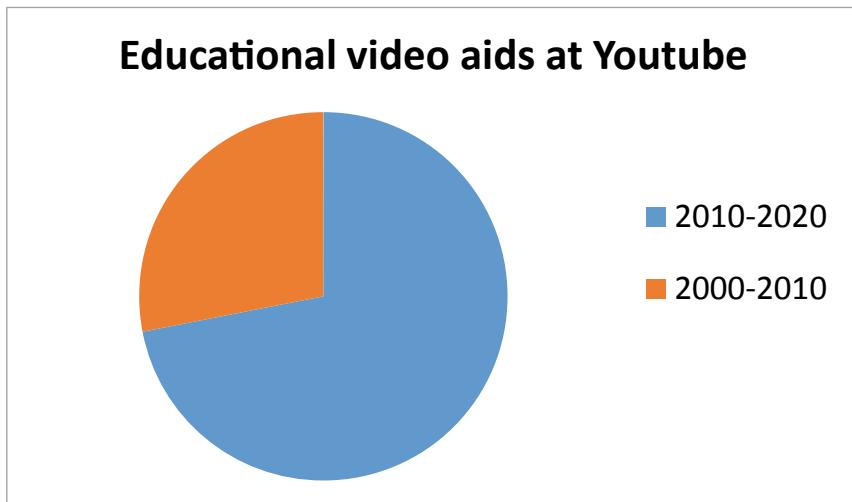
Naturally, today each university has its own Web site, and in many cases, American and European teachers have the opportunity to use the university's Web site as a platform to create their own educational blog within the framework of the taught

Table 81.1 The difference between blogs and traditional newspapers and diaries

	Blog	Diary	Newspaper
Wide access	+	-	+
Readers' feedback	+	-	-

disciplines. Although when compared with blogs created on the aforementioned sites, such blogs are inferior due to limited functionality.

Also, the most popular blogs to date, used in the educational process at universities in the USA and Europe, include Twitter, Tumblr, Instagram, and YouTube. Although they cannot be called full-fledged blogs, Twitter and Tumblr are used to create microblogging. In the meanwhile “Instagram” and “YouTube” are used to upload various videos, audio, and graphic material related to a particular discipline. There are entire channels on which entire training courses, video tutorials, and video lectures are laid out. The latter are most popular in the process of distance learning, as they allow you to study the materials of the training course at a convenient time for the student.



It can be assumed that teachers of any discipline can use the blog in their work, although it is worth noting that most often blogging services are used by teachers of humanitarian disciplines and a number of general exact disciplines.

First of all, blogs can be used as a platform for posting special material (thematic blogs);

Second of all, blogs can be used as an interaction channel both between teachers and students, and within a student group [4, 125].

When using blogs in the learning process, teachers and students should take into account some features of this Internet product, which can be attributed to its shortcomings.

- (1) the blog has a linear structure. To see the main text or an interesting comment, you should see almost all posts. This fact significantly reduces the usability of this type of resource;
- (2) the text on the blog, whether the main material or comments will be available for reading by all participants;
- (3) the amount of functions is rather limited, compared to social networks.

81.3 Using Social Networks to Intensify Foreign Language Teaching

Alongside with blogs on Internet, there is such a resource as a social network. Over the past decade, the popularity of social networks has grown significantly, especially among young people. Now there is a lot of debate and discussion about the benefits and harms of social networks in general, and their use in the educational process. According to the authors, social networks can be used as an excellent tool in the learning process, and in particular a foreign language.

Below will be presented in more detail the social networks most popular in the Russian Internet space: Vkontakte and Facebook.

Comparative data on user audiences of these networks is presented in Figs. 81.1 and 81.2.

Social networks such as Facebook and Vkontakte have a sufficient set of functions that provide for the online study process. These features include:

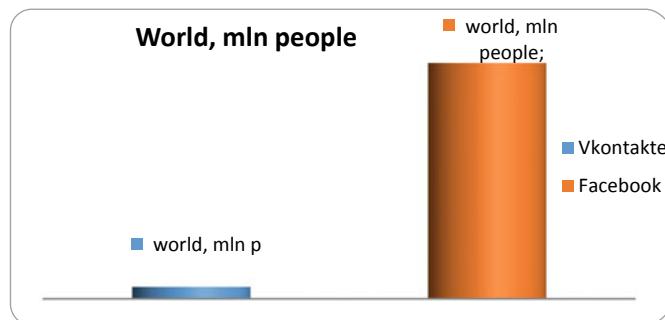


Fig. 81.1 Audiences of social networks around the world

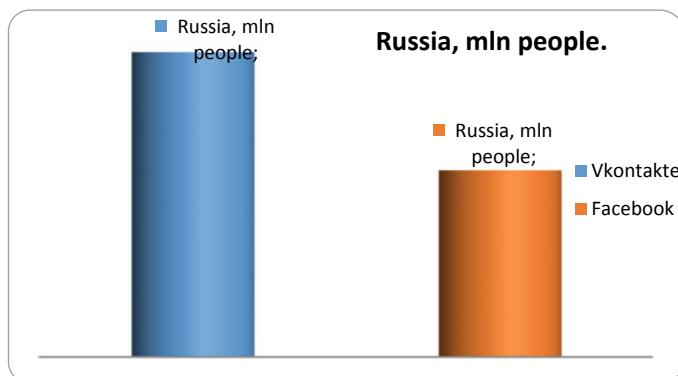


Fig. 81.2 Audiences of social networks in Russia

1. The opportunity to publish audio and video files, with limited access to these resources;
2. Creation of separate groups (both open and closed) for discussion and exchange of necessary information. They can be used, for example, when discussing plans for any activities;
3. the ability to create and conduct surveys [3, p. 74].

Facebook and Vkontakte possess some similar features based on the functioning of the social network in the modern Internet:

- (1) Most social networks require obligatory user registration. The future user of the social network is obliged to provide information about himself. As a rule, you need to enter a name (not necessarily real), gender, and date of birth. For example, when registering on Facebook, a photograph of any real documents confirming your identity is now required. After registration, the user can set up his personal page. Personal data contains several required fields: name, age, and gender. In addition, there is a lot of information about yourself that the user can post to potential “friends” on social networks: the city in which they live, parents, children and other relatives, their interests, other personal information worked [3, p. 74].
- (2) After registration and approval, the user can set up his personal page. The personal page contains a number of required elements: name, age, gender, indicated at registration. In addition, there are many other “about yourself” data that the user can send to potential “friends” on the social network: city of birth, permanent residence, parents, children and other relatives, information about their interests, places of study, work, and other personal information.

There is a function such as a dialog box where all members of the group, including students and teachers can communicate. This allows you to conduct discussions almost as in full-time study. Another form of communication that exists in the social network and can be used in the learning process—this is a forum. The teacher or student creates a topic for discussion, where group members can leave their comments, which in the future can also be denounced in some form of discussion. A function such as “create a photo album” can also be used in the educational process. If necessary, the teacher can publish the necessary material (diagrams, tables, examples, etc.) in special albums in the form of photographs that group members can view and leave comments. Under each photograph, you can leave a brief explanation. In addition, Vkontakte allows users to leave messages on their “wall” or “wall” of other users. Thus, for example, more teachers and classmates learn about an important event in their studies. On the “wall”, as well as in a personal or group message, you can timely post information about postponing or skipping classes, which will significantly reduce misunderstanding and conflict between teachers and students. When using this social network, there is always a feedback effect, that is, each action has a result, for example, a response to a message, a comment on the video material, or a message in a specific topic. You can always see if a message has been read, how many times the video has been viewed, or how many comments are left on the

forum. All this can be tracked in real time. In order not to miss an important event or information, there is an alert function. This simplifies the process of monitoring the work of students, teachers.

One of the important features of VKontakte is that you can create your own communities. Communities can be created for each study group in which the lesson is held (thus the number of them will increase), or for the common course or stream (this will provide for a restricted number of large communities). The creation of such a community opens up a number of educational opportunities in this social network:

1. increasing students' interest in learning foreign languages. For this purpose video and audio materials can be created both in the classroom and at home. These materials can be published by both the teacher and the student, which in turn facilitates the exchange of experience between the "young" and "older" generations. During the lesson, you can watch videos accompanied by lexical or grammar analysis and discuss them in a review class or on the Internet.

You can also leave comments under one or more videos, so that the teacher can indicate, for example, important language issues that the student should pay attention to when watching.

2. This social network provides for the exchange of messages and materials. This feature is empowered by the option of a dialogue, in which both two people and all group members, including students and teachers, can communicate.

3. opportunity of creating a forum. The teacher or student creates a discussion topic so that community members can post comments on the issue.

4. The ability to upload photographs can also be used as a good tool for online learning through social networks. If necessary, the teacher can distribute the necessary printed material in the form of scanned images or pictures, presentations [3, 75].

In general, according to the set of functions, capabilities and tools that can be used in the learning process, the American social network Facebook is similar to the Russian Vkontakte.

Although it is necessary to mention that the use of "Facebook" in the process of teaching a foreign language is more suitable for students with an advanced level, so with the help of this social network they have the opportunity to communicate directly with native speakers, since half of the users are representatives of English-speaking countries.

Based on the foregoing, it can be argued that almost all students have their own pages in such networks, the most developed social networks have a large set of functions that can be used in the educational process, the ability to carry out some learning processes in absentia or online.

Table 81.2 compares the functions of the blog and the social network that can be used in the learning process.

When you use a social network, visibility is always present, that is, every given result of an action, such as a reply to a message, a video comment or a comment on a specific topic, is immediately displayed. The process of checking the student's work as a teacher is simplified due to the swift work of the notification service, tracking the appearance of changes in old material or adding new material, responding to messages, etc.

Table 81.2 The functions of the blog and the social network

	Multimedia, documents	Forum	Online events	Groups and communities	Dialogs (personal and group)
Blog	±	+	±	-	-
Social network	+	+	+	+	+

Table 81.3 Social resources around the globe

	Blogs (Twitter, ...)	Instagram	YouTube	Social network
Europe	-/+	-/+	+	+
Russia	-	-	+	-/+
The USA	+	+	+	+

From Table 81.3, you can see which social resources are actively used in different countries for educational purposes:

Finally, the following is worth mentioning: the Internet, with its growing segments such as blogs, social networks, forums, is an integral part of the life of modern people, especially modern students. With the right program and motivation for using social networks, this can become a good aid to the student in the process of learning foreign languages.

Unfortunately, it should also be noted that social networks and blogs can have a negative impact on learning process. This happens for a number of reasons:

First of all students' personal motivation and self-control come first when we talk about the use of any Internet resource in education. For example, the efficiency of studying can drop, when a student, instead of completing assignments or using the capabilities of the social network for the educational process, chats with friends in correspondence, play flash games, etc. The distraction factor is rather high. Today, social networks are the main reason why people spend a lot of time visiting the Internet space.

As a result, this leads to learning errors, when the teacher or student fails to provide the necessary content and feedback.

Secondly, purely technical problems, such as limited Internet access, network interference, etc., can reduce the effectiveness of online training.

Thirdly, in the case of frequent use of social networks or a blog, the student begins to lose touch with the teacher, which leads to poor performance in many aspects of the learning process.

Fourth, online communication is the most anonymous and the use of text messages in most cases leads to certain changes in behavior and communication in a normal environment [6]. In addition, the anonymity of online communication can provide dishonesty and non-self-reliance on the work of some students (in the absence of proper motivation) [4, p. 131].

During the study, we conducted a survey among teachers of a foreign language at universities (the number of respondents was 30). The survey found that social networks are used by 23 people in their work (76% of respondents). Of these, 20 people (86.9%) use the social network on Vkontakte, 3 people use both Vkontakte and Facebook. The data are presented in Figs. 81.3 and 81.4:

From the foregoing, we can conclude that the use of social networks in the process of teaching a foreign language has good prospects, it is devoid of a number of disadvantages that are inherent in the use of blogs. However, it still has some challenges, inherent to any online communication.

Fig. 81.3 Usage of social networks

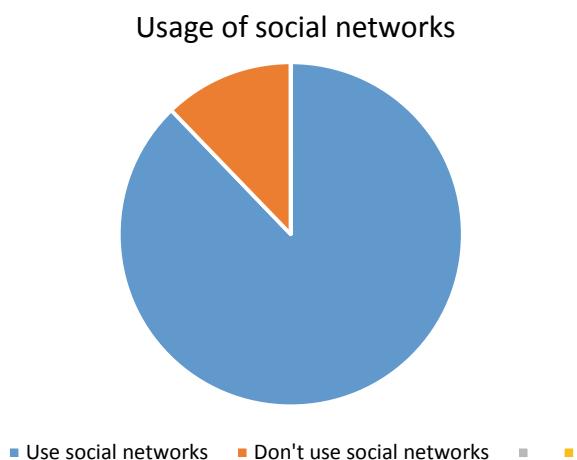
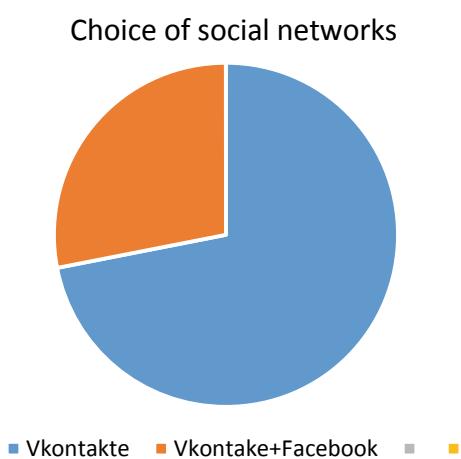


Fig. 81.4 Usage of social networks



81.4 Using LMS to Intensify Foreign Language Teaching

In addition to social networks and blogs, distance learning uses specially developed online learning platforms. A detailed research on the developed course for master students is described in the paper by Grubin “The use of distance learning elements in the language training of masters” [5]. Below is presented the online American platform LMS Canvas, which was selected by the authors of the article to teach graduate students.

Canvas is a platform for creating fully featured, massive open online courses. These types of courses are often used today at many universities in the USA and Europe. They are integrated as one of the elements in the mixed type of training. Some of these courses can also be used as a full-fledged educational product. This primarily concerns lecture subjects.

The Canvas platform provides a free hosting service, which has tools for developing both individual lessons and full-fledged educational courses. One of the important advantages of this platform is that it is free for both teachers and students.

Consider what you can do on this platform, using it to create an educational course.

The Canvas platform allows you to take action and provides the following tools:

- analytics of the learning process both throughout the course and for each student;
- the ability to import ready-made online courses;
- internal mail;
- give tasks with setting deadlines;
- add documents and files;
- assessment tools;
- calendar of events;
- organize mutual appreciation of each other;
- hold conferences;
- attract students to collaborate on a project, document
- create pages with text and images;
- make tests with various settings, e.g., time limit, number of attempts, etc.;
- hold conferences;
- attract students to collaborate on a project, document.

From the above list, you can see that the Canvas platform has a wide range of tools that allow you to use almost everything from the online conference to simple test tasks in the learning process. Using this platform, you can convey to students almost any grammatical or lexical material.

Any online course created on the Canvas platform is divided into modules that are published separately. Modules in the course can be an unlimited number. Each module has a very different content from lecture materials to external resources.

Materials for each module (lectures, assignments, tests, etc.) are also published separately. The teacher can independently indicate the date and time when this or that material placed in the module will become available to students. The teacher also indicates the time and date when it is necessary to pass the assignment. The course

planner can add other teachers to work with a particular course. Students are added via e-mail. After students register in the system, open materials and assignments become available to them, and the teacher gets the opportunity to see the results of students' work.

On the Canvas platform, it is also possible to use courses developed by other teachers and in other subjects.

Teachers of the Department of Foreign Languages at the IMDT in the course of working with the Canvas platform created an online course consisting of 8 modules. In, for each module, three tasks were developed, which included: specially oriented text, true-false tasks in the text, and a grammar test. These three types of tasks were chosen on the basis that the objective of this course was to replace some elements of the full-time educational process with distance learning and give students more material for self-study that was completed in the theory's full-time classes.

81.5 Estimating Efficiency of Online Technologies in Conditions of Switch to Distance Learning

To objectively evaluate the use of LMS, social networks and blogs in the context of a forced transition to distance learning, the following are the results of two studies conducted during the implementation of distance learning from March to May 2020. For research purposes, group names are replaced by letters.

To assess the effectiveness of using social networks in the learning process, groups of 1 course of the specialty were selected. The quantitative composition of the groups is 14 people. In group A, social networks were used to intensify the learning process (to solve the following problems: organizational announcements, duplication of information in cases of inoperability of the educational environment, organization of student participation in external online events). In group B, social networks were not used.

Two indicators were selected for evaluation: students' involvement in the educational process and the timeliness of students' completion of the proposed tasks.

Engagement refers to the percentage of students who are actively involved in the learning process. The student involvement coefficient is determined by the following formula:

$$Q_{BC} = N_B / N_o,$$

With Q_{BC} —being coefficient of involvement of students of the specialty, N_B —the number of students actively involved in the educational process, N_o —the number of students in the group.

For group A, the indicator was: $13/14 = 0.92$

For group B, the indicator was: $12/14 = 0.85$

To assess the timeliness of the implementation, the number of students who completed the tasks on time was taken as the basis.

The coefficient of timeliness is calculated by the formula:

$$Q_{cc} = N_c / N_B$$

With Q_{cc} being coefficient of timeliness for students of the specialty, N_c —the number of students who completed the tasks in a timely manner, N_B —the number of students involved in the educational process.

For group A, this indicator was: $11/13 = 0.84$

For group B, this indicator was: $7/12 = 0.58$

From the foregoing, it can be concluded that the use of social networks in the organization of distance learning has a greater effect on the timeliness of assignments (students actively use social networks, respectively, there is a greater likelihood that they will see an organizational message on time and begin to complete tasks on time) than the involvement of students.

To assess the effectiveness of the use of LMS in the learning process, groups of 1 master's course were selected. The quantitative composition of the groups is 28 people (group C, LMS was used) and 29 (group D, LMS was not used). For the purposes of evaluation, the same coefficients were calculated as in the analysis of the use of social networks.

The student involvement coefficient is determined by the following formula:

$$Q_{BM} = N_B / N_o,$$

With Q_{BM} being the number of students actively involved in the educational process, N_o —the number of students in the group.

For group C, this indicator was: $24/28 = 0.85$

For group D, this indicator was: $19/29 = 0.65$

The coefficient of timeliness is calculated by the formula:

$$Q_{CM} = N_c / N_B,$$

With Q_{CM} being coefficient of timeliness for students of the master group, N_c —the number of students who completed the tasks in a timely manner, N_c —the number of students involved in the educational process.

For group C, this indicator was 0.91

For group D, this indicator was 0

From the foregoing, it can be concluded that the use of LMS in the organization of distance learning has a greater effect on student engagement (having a single platform, students always know where all the resources necessary for learning are located).

To assess the effectiveness of using blogs in the learning process, 2 specialty groups were selected. The quantitative composition of the groups: 14 (group E, blogs were used) and 15 (group F, blogs were not used). Next, we consider the calculation of the corresponding coefficients.

The involvement rate is calculated by the formula

$$Q_{BC} = N_B / N_o,$$

With Q_{BC} being coefficient of involvement of students of the specialty, N_B —the number of students actively involved in the educational process, N_o —the number of students in the group.

In group E, he was $12/14 = 0.85$

In group F, he was $11/15 = 0.73$

The coefficient of timeliness is calculated by the formula:

$$Q_{cc} = N_c / N_B,$$

With Q_{cc} —coefficient of timeliness for students of the specialty, N_c —the number of students who completed the tasks in a timely manner, N_c —the number of students involved in the educational process.

In group E, this ratio was 0.83

In group F, it was 0.72

Comparative experimental results are shown in Table 81.4.

An analysis of these tables showed that the indicator of the dynamics of changes in the D coefficients is highest when using LMS as a means of increasing student engagement and social networks as a means of ensuring the timely work of students. Obviously, a combination of all three of the above methods will be optimal.

81.6 Conclusion

As a conclusion, the following points should be noted.

Firstly, modern conditions require the educational process to develop skills in using modern technologies in the process of teaching a foreign language.

Secondly, the elements of distance learning allow students to fully pass the program to working students or those who for some reason missed classes, and also, as practical experience has shown, to quickly adapt the curriculum in extreme conditions.

Thirdly, with the combination of full-time and distance learning elements, in full-time classes, more time can be devoted to analyzing theoretical material and speaking skills, transferring most of the written work to an online course. This is especially true for master's programs.

Table 81.4 Comparative experimental results

Social networks		LMS		Blog	
	Experiment group	Standard group	D	Experiment group	D
Q_B	0.92	0.85	0.7	0.85	0.65
Q_c	0.84	0.58	0.26	0.91	0.89

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Chapter 82

Historical and Pedagogical Analysis of the Online Education



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and A. Zyryanova

Abstract In modern information society, there is no edge between the traditional and distant education because of the popularity of online teaching technologies among the students and teachers in process of training. There is a wide amount of information that offers the Internet world network. It helps the researchers and scientists to retrieve the required information and shortens the duration of the scientific inquiry. E-learning is considered as the demonstration of the virtualization of the society and is one of the worthwhile trends in the education system. It makes possible the organization of the training different specialists without discontinuing work, to get an education from the house. The Internet world network is quite young phenomenon, but the history of E-learning is quite old and not always was on such high level. And the authors suggest the consideration of the developmental history of E-learning.

82.1 Introduction

The conventional everyday learning routine of today's students, who are the representatives of information generation, is closely related to electronic educational programmes and courses, textbooks, assignments, and projects. The information support of the educational process is the precondition of the students' obtaining the respective professional competencies, as well as of their successful professional career and promotion. The rapid development of online technologies acted as a catalyst for the emergence and spread of information educational technologies including online education.

Such term as "electronic distance learning" first appeared in the area of vocational education at the methodological seminar on vocational computer training held in October 1999 in Los Angeles. The concept of electronic distance learning (e-learning)

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was similar in content and meaning to the concepts of “online learning” and “virtual learning”. It implied an interactive online learning method, often individualized, which involved the use of new technologies, such as Internet, intranet, extranet, interactive TV, and CDs. One of the key goals of e-learning implies the development of competencies while maintaining the independence of the learning process from a particular time and place.

The concept of e-learning has emerged due to a number of reforms in the education system, including the appearance of a profession of a teacher, the beginning of book-printing, and the development of electronic technologies. Conducting a historiographical analysis of the concept of e-learning, it is necessary to particularly dwell on the first distance education courses on shorthand organized in Great Britain by Sir Isaac Pitman in the middle of the nineteenth century. Pitman was a highly skilled teacher and had a private school of his own. It was he who organized the first distance education courses, which implied teaching students by mailing assignments to them. The feedback from students was also carried out by mail in the form of receiving the assignments made by them.

82.2 Methodology

This study aims at theoretical justification of the e-learning process, its historical and pedagogical analysis, and description of its methodological apparatus.

In accordance with the purpose, the study has the following objectives:

- (1) to describe the historiography of the problem of e-learning using the method of historical and pedagogical analysis, and to provide insight into the current state of this problem in pedagogical theory and practice;
- (2) to use the method of theoretical and methodological and conceptual and terminological analysis for establishing the terminological system for successful and adequate use of e-learning methodology in training experts of different levels and areas of knowledge.

82.3 Results

The innovation made in the middle of the twentieth century by Sidney Pressey, an American Professor of Psychology at Ohio State University, may be considered a real breakthrough in e-learning. He invented a special machine for teaching students and enabling practical application of the material learned by them after the introductory course. The author and developer claimed that such technique of mastering the learning and information material showed sufficient simplicity and clarity, giving the technical learning facilities the possibility to administer a major part of the educational process. Pressey's teaching machine had some resemblance to the typewriter; it had a window showing a question and four answers. The user had to press the

key to the chosen answer, and then the machine recorded the answer on a special device and showed the next question. When the test was completed, a person, who was going to do the checking, inserted a sheet of paper into the machine, and it recorded the results of the test thereon. Nowadays, similar methods for checking the learners' knowledge are widely and successfully used in online systems. Testing and educational support may be successfully automated, thus facilitating and improving the quality of tests and assignments.

It should be noted that despite the fact that in the second half of the twentieth-century films have become increasingly popular with the population, the education system did not show the slightest interest in television or films as mass media. Moreover, the outbreak of World War II contributed to this situation, revealing a huge number of educational problems—there was an urgent need to train thousands of new recruits as fast as possible, whereas the complexity of new weapons required an unprecedented level of skill. Thus, the war turned into an “engine for progress and business”.

The activity of Burrhus Frederic Skinner, a Professor of Psychology at Harvard University, may be considered the next stage in the world history of e-learning. In the 1950s Skinner invented a teaching device, which radically changed the global attitude to teaching machines. It should be noted that there was an acute shortage of teaching staff in the USA at that time, whereas mass media were very popular even in the education system [1–16].

The essence of Skinner's teaching device was to electronically present the learning content in small portions, while the learners did not receive multiple-choice tasks. The learners' answers, which they believed to be correct, were recorded on paper. Nowadays electronic educational software pieces are gaining popularity and widespread use, if applied at the digital self-learning education courses.

By the end of the twentieth century, there was a final breakthrough in electronics, and this breakthrough was related to the emergence of the first personal computer. It was the Altair 880, which appeared in 1975, and brought about the invention of Apple II and IBM. The computers of that period demonstrated sufficient reliability and wide popularity in the area of education and science. Due to them, many innovative teaching projects, mainly simulators and educational software, were launched (such as de Jong's software, which appeared in 1991). Personal computers evidently were used for facilitating the existing teaching objectives and were extremely useful for teachers being an effective teaching tool. As a result, plenty of original educational software pieces and training exercises were developed.

The end of the 1990s is associated with the emergence of Learning Management Systems (LMS) in the European educational institutions. These systems were designed to provide administrative and technical support of e-learning processes.

The first overview of the basic concepts of e-learning was done by Axel Wolpert, a Senior Sales Consultant of time4you GmbH. He emphasized that a certain content is available in e-learning as well. The classic type of the digital learning process content is based on the educational software implemented via the Internet. Nowadays most of the educational software pieces are available for download in e-learning libraries and are related to a certain learning platform.

The LMS platform is a structural basis of training and educational processes inside the e-learning system. The learning platforms help many companies and enterprises to provide training and retraining of their employees, clients, and partners. Besides, the learning platforms may be used for managing the learning process effectively and for tracking the learners' progress by means of analysis and interpretation of the data obtained.

Blackboard, an American company, is considered to be a pioneer and a leader in the market of educational services, and particularly in the field of LMS. Such companies as SABA and Docent were popular beyond the sphere of education. It should be noted that Blackboard e-learning system was a perfect solution for organizing and managing of various educational courses. This system allowed teachers and learners to share learning materials; to do online tests; to communicate with each other in various ways; to record and to track their progress, and much more.

The emergence of Blackboard learning platform allowed to facilitate the learning process in an absolutely easy and natural way. The teachers could use this product so easily because there were no excessive and overloaded learning pathways in it, and that is the reason why this platform was so popular. Its critics, in turn, spoke about the lack of any educational innovations in this platform, describing the general content of the Blackboard platform as an old pedagogical model supplemented by new methods of interaction [1–12].

E-learning platforms represent a significant potential for higher educational institutions, especially for small ones. The digitalization of the learning process provides the universities with the opportunity to attract foreign students, granting them the access to the available educational opportunities without them leaving their countries. This, in turn, will help increase the motivation and improve the level of efficiency and effectiveness of the vocational training process. In addition, the simultaneous involvement of highly skilled foreign and out-of-town experts from different areas of knowledge may also prove an important advantage of digital learning. Such experts will communicate their content to students through media platforms, and both students and researchers will benefit from it.

Using online platforms as a basis for learning implies certain criteria for forming academic groups, such as level of education, personal characteristics (geographical location, country of origin, etc.), and the desired level of education in the end. The intensive mentoring support provides a continuous supervision of the learners by people, who are not de facto or de jure members of the faculty staff. Senior and more experienced students can be appointed as mentors, and they become a kind of connecting link between students and teachers.

The expert teachers, who accompany the learning process with the thematic counselling, make the video introduction to the online learning process. Feedback is provided by the qualitative assessment of final qualifying papers of the students. The group of tutors is responsible for a smooth and even "entry" to the online course. They provide coverage of the thematic issues and assess final papers. Every tutor supervises five students. The tutor's task is to guide the process of collaboration among the group of learners; to monitor academic achievements of the group; to send

academic credentials, and to support the learners during examinations and formative and summative assessments [14–16].

Modern educational platforms also provide a regular academic exchange and feedback. The mentorship is actively supported with a transparent, public and moderated chat that provides for a comprehensive solution to any learning issues and problems that may arise, as well as for bilateral feedback and assessment. The students become involved in the traditions of academic discourse and independent peer review. The main aim here is to involve the individual experience of every participant of the educational process into the learning process, as well as his or her national and cultural features, personal preferences and interests. It is also important not only to develop the students' confidence in the fact that there is always a way to solve any problem, but also to open new perspectives. We will now describe the basic concepts of e-learning, which exist and are widely used in modern pedagogical science:

- (1) augmented reality representing digital augmentation of reality, mostly due to some additional visual information that may be downloaded to a smartphone (specially designed applications read the link from a QR-code);
- (2) blended learning representing a mix of a traditional communicative learning process with an electronic one, in which conventional forms of learning are supplemented by new digital opportunities. The classic scenario of blended learning implies a personal meeting of all participants in the process followed by a self-learning stage complemented by a live chat and a forum, and followed by a traditional communicative form of learning;
- (3) computer training representing the first generation of educational software based on the “question–answer” principle, when the system interprets whether the results are right or wrong, and gives the learners information on the number of correct answers;
- (4) copyright law implying that the authors of intellectual property possess a licence permitting the public to use their intellectual property and restrict the right to use it if necessary;
- (5) e-learning implying the form of learning with the use of digital information and communication technologies;
- (6) interactive simulators representing the application of interactive technologies and processes in the unfamiliar context of a certain game following the realistic pattern;
- (7) learning platform, or LMS (Learning Management System): a software system representing a technical basis of a complex e-learning infrastructure with Internet access;
- (8) Massive Open Online Courses (MOOC): online courses designed for a wide range of consumers, up to 150 people, characterized by openness and accessibility;
- (9) open content representing the information found in the public domain for free use and distribution without any restrictions (e.g. Wikipedia, the largest archive of publicly available information in the global network);

- (10) virtual classroom representing an online training event accompanied by synchronous forms of communication, control, and feedback between teachers and students, and much more.

82.4 Conclusions

Summarizing the above, let us note that e-learning is a versatile and diverse phenomenon being applied in individual, collective, traditional, and non-traditional forms of learning. It operates plenty of didactic learning tools (such as webinars, virtual classrooms, games, forums, social networks, chats, learning videos, and blogs). Here, it is the selection of the appropriate didactic-methodological concept that is a crucial factor for the organization of e-learning. This concept is implemented through an appropriate mix of various forms of learning aimed at the target audience and the learning objectives to be reached. In addition, a qualified teacher, who uses electronic tools and forms of learning in an appropriate and intelligent way, should be also considered a mandatory element of e-learning.

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Chapter 83

Assessment of the Quality of Life of the Population of the Republic of Sakha (Yakutia)



I. Danilova , I. Ammosov , and K. Postnikova

Abstract Analysis of the quality of life of the population, the Republic of Sakha (Yakutia) and its individual components comparing to other subjects of the Russian Federation reserves the status of a territory with quite contradictory research assessments. Some authors attribute Yakutia to the number of regions with the best positions in terms of the most important indicators of the level and quality of life. On the other hand, they emphasize a high level of inequality and refer to regions with signs of social disadvantage. Currently, various methodological approaches to measuring quality of life based on the integral index are increasingly being used. The article focuses on identifying the dominant trends and prospects for changing the quality of life of the population of the Republic of Sakha (Yakutia) as a territory that is a part of the Far Eastern Federal District of the Russian Federation. A comparative analysis of the integral index of the quality of life of the population and a comprehensive indicator of the level and quality of life of the population in the Republic of Sakha (Yakutia) at the federal and municipal levels, and at the level of the macro-region, the Far Eastern Federal District, was carried out. Significant factors affecting the quality of life of the population of the region were identified using correlation and regression modeling, and a forecast is made for changes in the integral index of the quality of life of the population in the Republic of Sakha (Yakutia).

83.1 Introduction

With the advance of a new geopolitical development strategy in the east of the country, special attention in the formation of regional economic policies for the Far East and the Arctic, improving the quality of life of the population living in this territory, is important. This requires the study of the quality of life of the population using various methods based on modern approaches.

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83.2 Literature Review

From the second half of the twentieth century, a variety of interpretations of the quality of life and concepts of quality of life both of an interdisciplinary nature and of representatives of various branches of science had been published [1–4]. Many authors paid attention to the methodological issues of studying and assessing the quality of life of the population of the Russian regions, and they emphasized regional differentiation. Regional differentiation is associated with the need to equalize the quality of life of the population of the regions and the development of national and regional programs to improve the well-being of the population and with a further assessment of their effectiveness. Researchers are particularly interested in various approaches to determining the integral index of the quality of life of the population. Regional authors published many studies about certain aspects of the quality of life of the population of the Republic of Sakha (Yakutia) [5–15]. We should note it that domestic and foreign authors determine the quality of life depending on the goals and objectives of the study and adhere to the comprehensive characteristics of the quality of life. In this article, the authors consider the quality of life as a complex category which includes a set of environmental conditions necessary for the life of the population and expressed through the following seven blocks of indicators—demography, population incomes, health and safety, the consumer market, ecology and nature, economics and transportation, the population housing and quality of living conditions.

83.3 Methods

The statistics of the Federal State Statistics Service of Russia, the Territorial Authority of the Federal State Statistics Service for the Republic of Sakha (Yakutia) and the results of an expert survey compiled the information base.

A comprehensive assessment of the quality of life of the population of the Republic of Sakha (Yakutia) was carried out using the integral index of quality of life using the structure of the integral indicator of quality of life adapted to this study based on the method developed by the Council for the Study of Productive Forces [11] and subsequently improved and tested by E. Mosyakina [16]. The integral indicator of the quality of life of the population includes 28 indicators for 7 blocks, given in Table 83.1. The results of an expert survey in which ten experts from various fields of activity related to social development confirmed its structure. Also, to confirm the

Table 83.1 Results of an expert survey

	General blocks						
	K1	K2	K3	K4	K5	K6	K7
Weight	0.137	0.152	0.148	0.145	0.131	0.144	0.145

results of the study according to the above method, an analysis was carried out using the method of a comprehensive assessment of the level and quality of life in the Far Eastern Federal District based on nine indicators characterizing the degree of uneven distribution of the population by income level, purchasing power of money income, structure of consumer spending, and the share of low-income people population, working and living conditions of the population proposed by Stroeva [17].

The set of indicators is three times smaller than in the first method, but it mainly takes into account those indicators that were not taken into account in the previous method—indicators characterizing income differentiation and poverty, such as K_p, portion of the population with incomes below the subsistence level,%; K_f, fund ratio; P_{fe}, portion of food expenses in consumer spending, including meals outside the home,%; demographic indicators like life expectancy (LE), life expectancy at birth, years and Kim, infant mortality rate) and an indicator characterizing the state of the labor market (U_r, unemployment rate,%). In addition, we include indicators from the first method—PPACMI, purchasing power of average per capita money income (the ratio of average per capita money income of the population to the cost of a fixed set of consumer goods and services); ALQ, the total area of living quarters per inhabitant on average, meter square; and RC, the number of registered crimes per 100,000 people.

The complex indicator of the level and quality of life of the population is calculated as the sum of points for each indicator, the level of which is determined by the value of its deviation from the threshold value and is estimated in points: high—1, medium—2, low—3, unacceptably low—4 [17].

We carried out a further assessment by analyzing the quantitative change of the integral indicator of the quality of life, depending on the change of parameters affecting it using correlation-regression modeling. The extrapolation method using Microsoft Excel compiled the forecast of the integral indicator of the quality of life of the population of the Republic of Sakha (Yakutia) for 2019–2024.

83.4 Results and Discussion

The major features and problems that have the greatest impact on the quality of life of the population in the largest region of Russia—in the Republic of Sakha (Yakutia)—include:

- extreme climatic conditions;
- low population density;
- focal nature of the location of production (industry);
- the focal nature of population settlement with the simultaneous status of a territory with a sufficiently high birth rate, determined both by the preservation of the traditions of large families and the response of families to state support measures, which directly affects the quality of life of families with children;
- high differentiation of incomes and a significant proportion of the poor;

- dependence on the development of agriculture as a traditional form of employment, where the wage in the industry is less than 50% of the national average;
- high morbidity rate;
- low level of improvement of the housing stock, high cost of housing and communal services and a high proportion of housing in a dilapidated and emergency condition or requiring major repairs;
- underdeveloped transportation infrastructure and complex transport scheme;
- high vulnerability of northern nature (fragility of northern ecosystem) and low self-cleaning and self-healing ability.

Next, we move on to the results of an expert survey to determine the weighting coefficients of indicators (Table 83.1). The major result of an expert survey is the confirmation of the significance of all indicators and general structural blocks included in the integral indicator of quality of life.

Based on the identified features and problems that have the greatest impact on the quality of life of the population of the Republic of Sakha (Yakutia) and taking into account an expert survey, we proposed the following structure of the integral index of the quality of life of the population (Table 83.2).

The results of the analysis of the levels of structural components for the seven blocks stated above showed that Yakutia is behind the average Russian level for all criteria except the Demography block. The most pronounced discrepancy we observed in the structural blocks “Housing and the quality of housing conditions” and “The level of development of the consumer market” (Fig. 83.1), while taking 28th place in the ranking among 84 subjects of Russia in 2018 with an index value of 0.494 with the average Russian 0.474. This is because the region has the highest share of dilapidated housing and low rates of improvement of the housing stock. In addition, in view of the territorial features of the Republic of Sakha (Yakutia), the points of trade, food and paid services are concentrated mainly in cities and urban settlements. Considering the existing gradation of the integral and private indicators of the quality of life of the population, the region is at an undesirable level, which is better than low, but worse than average.

Lower than average for the RF positions in terms of the level and quality of life of the population of the Republic of Sakha (Yakutia) are emphasized by the results of the assessment using the scoring method for assessing the level and quality of life—unacceptably low in 2013–2014 and low in 2015–2018 (Table 83.3). The coefficient of funds (14–15 times) and the unemployment rate (about 7%) primarily affected the ILQL score. For 2013–2018, there is an improvement in the comprehensive indicator of the level and quality of life of the population of the Republic of Sakha (Yakutia) by four points because of a decrease in the infant mortality rate from 9.6 in 2013 (unacceptably low level) to 5.0 in 2018 (high level). Also, we noted a positive trend in such an important indicator of quality of life as life expectancy—increasing from 69.13 years in 2013 to 72.72 years in 2018, i.e., from medium to high level [22].

Yakutia does not differ from the subjects of the Far Eastern Federal District (FEFD), which occupy without exception the worst positions according to the second

Table 83.2 Structure of the integral indicator of the quality of life of the population

#	General blocks	Specific indicators
K1	Demography	1. General rate of natural increase 2. Coefficient of migration growth 3. Coefficient of stability of marriages 4. Infant mortality rate
K2	Income level of the population	1. Real accrued wages of employees of organizations, in % to 2013 2. The real size of assigned pensions for seniors, in % to 2013 3. The ratio of the average monthly wages of employees with the size of the subsistence minimum 4. The ratio of the average size of pensions to the subsistence minimum for seniors
K3	Health and safety	1. Morbidity per 10,000 population 2. The number of hospital beds per 10,000 population 3. The number of doctors per 10,000 population 4. The number of nursing staff per 10,000 people 5. The number of registered crimes per 10,000 population 6. The number of road traffic accidents per 10,000 population
K4	The level of development of the consumer market	1. Turnover of public catering per 10,000 people 2. Retail trade turnover per 10,000 people 3. The volume of paid services to the population per capita
K5	Ecology and environment	1. The volume of wastewater discharge into surface water bodies by districts 2. Emissions into the atmosphere of pollutants from stationary sources 3. Average monthly air temperature (January)
K6	Economy and transportation	1. Share of profitable enterprises 2. Investment in fixed assets per capita 3. Number of cars owned by the population per 1000 population 4. The length of public roads with hard surface

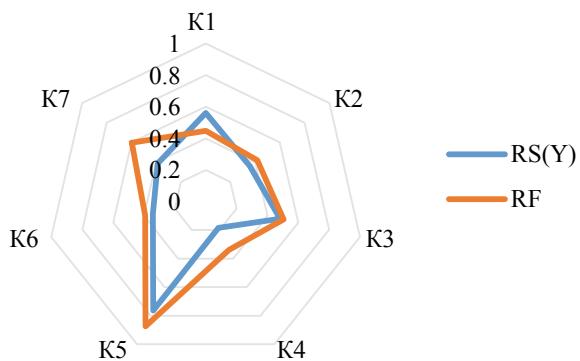
(continued)

Table 83.2 (continued)

#	General blocks	Specific indicators
K7	Housing and the quality of housing conditions	<ol style="list-style-type: none"> 1. The total area of residential housing, on average per one inhabitant 2. The share of dilapidated and dilapidated housing in the entire housing stock 3. Building of new residential housing per 1000 inhabitants by districts 4. The level of improvement of the housing stock

Sources [11, 16, 18]

Fig. 83.1 Structural components of the quality of life in the Republic of Sakha (Yakutia) and the Russian Federation for 2018. Sources for calculations [19–21]

**Table 83.3** Calculation of a comprehensive indicator of the level and quality of life of the population (ILQL) of the Republic of Sakha (Yakutia) for 2013–2018

Indicator	2013		2014		2015		2016		2017		2018	
	IV	S	IV	S	IV	S	IV	S	IV	S	IV	S
PPACMI	2.3	3	2.3	3	2.2	3	2.2	3	2.2	3	2.2	3
Kp, %	16.8	3	18	3	19.4	3	19.8	3	19.6	4	18.6	3
Kf	14.5	4	14	4	13.7	4	13.7	4	14	4	14.8	4
LE	69.1	2	69.8	2	70.3	1	70.8	1	71.7	1	72.7	1
Kim	9.6	4	8	4	7.6	3	7.2	3	5.1	2	5	1
Ur	7.4	4	7.4	4	7.3	4	7.2	4	7.1	4	6.9	4
Pfe	34.2	3	37.4	3	36.7	3	33.2	3	35.2	3	34.7	3
ALQ	20.6	3	21.1	3	21.5	3	21.7	3	22.1	3	22.5	3
RC	1133	2	1121	2	1236	2	1287	2	1287	2	1234	2
Total ILQL		28		28		26		26		26		24
Level	Unacceptably low		Low									

Note IV—indicator value, S—score; indicators abbreviations are described in methods

Table 83.4 Calculation of ILQL in FEFD for 2013–2018

Subjects of the FEFD	2013	2014	2015	2016	2017	2018	Level
The Republic of Buryatia	31	29	29	29	27	28	Unacceptably low
Zabaykalsky Krai	31	30	32	29	29	29	Unacceptably low
The Republic of Sakha (Yakutia)	28	28	26	26	26	24	Low
Kamchatka Krai	29	28	26	26	23	23	Low
Primorsky Krai	30	29	30	28	25	23	Low
Khabarovskiy Krai	29	28	26	25	24	21	Low
Amur region	31	29	29	27	26	26	Low
Magadan Region	25	23	23	23	22	22	Low
Sakhalin Region	26	25	25	23	22	22	Low
Jewish Autonomous Region	33	33	33	32	31	31	Unacceptably low
Chukotka Autonomous District	24	23	24	24	23	24	Low

method, which emphasizes the need for a regional socioeconomic policy in the Far East (Table 83.4).

Using correlation and regression modeling, we identified factors that affect the quality of life of the population of the Republic of Sakha (Yakutia). Out of 28 indicators, five factors together have the greatest impact on the integral indicator of the quality of life of the population of Yakutia. The factors are average monthly air temperature—X20, fixed capital investment—X22, length of public roads with hard surface—X24, level of improvement of the housing—X27, the commissioning of residential buildings per 1000 inhabitants—X28, of which all but the first can be regulated. Thus, we have a multivariate linear equation of the following form to predict the integral indicator of the quality of life of the population:

$$Y_{\text{theoretical}} = 0.44 + 0.0048 * X20 + 0.0002 * X22 \\ + 0.00007 * X24 + 0.0014 * X27 + 0.00008 * X28 \quad (83.1)$$

As a result, the forecast for 2019–2024 showed that an increase of 2.6% is expected in the RS(Y) in 2024 relative to 2018 (Table 83.5). However, we observed a decrease in 15 out of 35 municipal districts forecast.

83.5 Conclusion

In the Republic of Sakha (Yakutia) for 2013–2018, there is a positive trend in the dynamics of life expectancy at birth, unemployment rate, indicators of housing

Table 83.5 Forecast of the integral indicator of the quality of life of the population in the municipal regions of the Republic of Sakha (Yakutia) until 2024

Municipal districts of the RS(Y)	2018	2019	2020	2021	2022	2023	2024
Average for the RS(Y)	0.379	0.370	0.374	0.378	0.381	0.385	0.389
Yakutsk city	0.583	0.573	0.572	0.572	0.571	0.571	0.570
Neryunginsky	0.514	0.503	0.509	0.514	0.519	0.525	0.530
Aldansky	0.497	0.496	0.506	0.517	0.527	0.538	0.549
Mirninsky	0.497	0.507	0.507	0.507	0.507	0.506	0.506
Lensky	0.481	0.485	0.485	0.484	0.484	0.484	0.483
Oleneksky	0.447	0.459	0.486	0.514	0.541	0.569	0.597
Megino-Kangalassky	0.407	0.419	0.418	0.418	0.418	0.417	0.417
Tomponsky	0.406	0.396	0.397	0.398	0.399	0.400	0.401
Verkhnekolymsky	0.399	0.358	0.373	0.388	0.403	0.418	0.434
Suntarsky	0.397	0.393	0.393	0.393	0.392	0.392	0.392
Olekminsky	0.397	0.392	0.396	0.399	0.403	0.407	0.410
Ust-Maisky	0.397	0.403	0.413	0.423	0.434	0.444	0.454
Nyurbinsky	0.392	0.401	0.401	0.402	0.402	0.403	0.403
Anabarsky	0.389	0.351	0.345	0.340	0.335	0.329	0.324
Nizhnekolymsky	0.381	0.334	0.342	0.350	0.358	0.366	0.374
Vilyuisky	0.377	0.388	0.392	0.395	0.399	0.403	0.407
Oymyakonsky	0.375	0.388	0.382	0.376	0.370	0.364	0.358
Gorny	0.375	0.380	0.383	0.385	0.388	0.390	0.393
Allaikhovsky	0.365	0.330	0.348	0.365	0.383	0.401	0.419
Kobayasky	0.363	0.366	0.367	0.369	0.370	0.371	0.373
Amginsky	0.357	0.347	0.348	0.349	0.350	0.351	0.352
Zhilgansky	0.349	0.286	0.288	0.290	0.291	0.293	0.295
Khangalassky	0.344	0.341	0.337	0.334	0.330	0.326	0.322
Namsky	0.337	0.330	0.333	0.336	0.339	0.342	0.345
Ust-Yansky	0.333	0.349	0.345	0.341	0.337	0.334	0.330
Srednekolymsky	0.333	0.271	0.275	0.280	0.284	0.288	0.293
Verkhoyansky	0.327	0.326	0.330	0.334	0.338	0.343	0.347
Tattinsky	0.324	0.316	0.312	0.309	0.306	0.303	0.299
Bulunsky	0.324	0.319	0.330	0.341	0.352	0.362	0.373
Ust-Aldansky	0.320	0.311	0.311	0.311	0.310	0.310	0.309
Abyisky	0.319	0.315	0.330	0.344	0.359	0.374	0.389
Churapchinsky	0.313	0.302	0.296	0.291	0.286	0.281	0.276
Verkhnevilyuisky	0.309	0.319	0.330	0.341	0.352	0.362	0.373
Momsky	0.291	0.269	0.266	0.263	0.261	0.258	0.255
Eveno-Bytantaysky	0.250	0.229	0.234	0.239	0.244	0.249	0.254

improvement and other indicators of quality of life. However, a comprehensive assessment of the quality of life of the region's population using the integrated index by two methods emphasizes the unfavorable picture.

For 2013–2018, in the Republic of Sakha (Yakutia), there is a low level of the integral index of the quality of life of the population. Particular attention should be paid to the state of the housing—the proportion of dilapidated and dilapidated housing in the entire housing stock in 2018 amounted to almost 8% with the average in the Russian Federation—0.7% [22]. In addition, despite some positive changes, the level of improvement of the housing stock in rural areas is depressing—the proportion of the total area of housing equipped in 2018 with hot water barely reaches 6%, water supply—7%, sewage—8% and heating—57% [21].

This situation affects the migration behavior of the population and its concentration in the city of Yakutsk. In addition, the development of the agricultural sector affects the quality of life of the rural population. Thus, the average wage of agricultural workers is the lowest in the region and amounts to less than 50% of the average republican level.

The results of the study show the low level and quality of life in the region according to the used method.

The dependence of changes in the integral index of quality of life is mainly noted on five major factors characterizing the most important living conditions, including the ecology and environment, economy and transportation and the population housing and housing quality. According to the forecast, while maintaining the prevailing trends, an average increase in the indicator in the region is expected but with a decrease in almost half of the municipal areas.

The national projects of the Russian Federation, and regional programs in the Republic of Sakha (Yakutia), aim at solving the identified problems and improving the quality of life of the population of the regions.

The activities of state authorities, implementing the strategy for the socioeconomic development of the Republic of Sakha (Yakutia) until 2032 with a targeted vision until 2050, the state programs of the Republic of Sakha (Yakutia), implementing regional programs of national projects of the Russian Federation, are aimed primarily at improving the quality of life of the population of the republic. However, the effective implementation of programs may be affected by the single-source orientation of the economy of the Republic of Sakha (Yakutia), where the mining industry forms almost half of the gross regional product and over 60% of the tax revenues of the consolidated budget of the Republic of Sakha (Yakutia). Changes in raw material prices and global trends in the development of markets and industries along with the prospect of producing artificial diamonds and the development of alternative energy and fuel sources might negatively affect key sectors of the economy and the state budget of the Republic of Sakha (Yakutia) [23].

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Chapter 84

Educational Policy of China: Strategic Plans and Implementation Mechanisms in the Twenty-First Century



Z. V. Petrunina and G. A. Shusharina

Abstract The proposed work examines the trends in the development of Chinese education in the twenty-first century. The policy of the PRC leadership concerning education in the period under review is aimed at solving the following tasks: to win over illiteracy in the country; to computerize education; and, relying on the age-old cultural values of China and preserving national traditions, to integrate Chinese education into the world educational system. Such a policy of China corresponds to the geostrategic tasks of the state aimed at achieving the leading positions of the state in the world. The purpose of this work is to study the trends in the education development in modern China and to identify the most promising vectors for the development of the educational sector. The paper describes the characteristics of computer activity and digitalization of education, which have become widespread in China in the twenty-first century. By the beginning of the twenty-first century, China has managed to achieve significant success in solving problems in the educational sector, which allowed the state to intensify its policy of “going outside” and to solve geostrategic problems on the world stage. The high level of education in modern China is confirmed by the demand for graduates of Chinese universities in the international labor market. The modernization of education in China contributes to the modernization of the state as a whole. The authors believe that the experience of the PRC in education can be considered successful.

84.1 Introduction

In the twenty-first century, the foreign policy of the People’s Republic of China (PRC) is aimed at achieving a leading position in the world arena. Establishing and developing relations with foreign states, the PRC government is guided by

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five principles of peaceful coexistence (mutual respect for territorial integrity and sovereignty; mutual non-aggression; non-interference in internal affairs; equality and mutual benefit; peaceful coexistence in the development of diplomatic relations, economic and cultural exchange with other countries), nominated by the Premier of the State Council of China Zhou Enlai at the end of 1953, officially enshrined in the intergovernmental declarations of China, India and Burma in 1954, and included in the Constitution of the PRC in 1982. To create a positive image of the country, China uses various tools that contribute to strengthening political dialogue and expanding trade and economic cooperation with foreign partners in the long term. The use of “soft power” should be noted among such tools, which includes the promotion of state achievements in the field of culture, science and education.

Educational policy of China in the twenty-first century is associated with the development and use of new knowledge and technologies in all spheres of life. The study of the PRC educational policy, directed outward, will reveal factors that can influence the development of international relations in the near future.

In the proposed study, on the basis of official documents, materials of media resources of Russia and China, analysis of scientific research literature, goals and promising directions of educational policy, which are being developed by the leadership of the Celestial Empire in the twenty-first century, are considered.

Development stages of China's educational policy through ages and at the present stage are reflected in the works of domestic and foreign researchers [1–8]. All periods of the education development in the PRC by the beginning of the twenty-first century are considered; and elements of China's strategy in the internationalization of education at the present stage are analyzed.

The hypothesis of this study is that the digitalization of education being actively implemented in China contributes not only to the development of technical progress but also aims to achieve China's leadership positions in the context of geopolitical competition of the twenty-first century. Studying the experience of China in this issue will be useful to many countries, including Russia, which seek to retain their influence in the international arena [9].

84.2 Theory

In the twenty-first century, the world has undergone significant changes. Direct armed conflicts, which characterized the struggle between countries in the twentieth century, began to be supplanted by economic competition. Interstate political confrontation is shifting to information and cultural spheres. Globalization processes cover different areas, including education. Its position in the international arena depends on the extent to which a particular state is able to adapt the national education system to changing conditions of the globalizing world.

In recent years, the People's Republic of China has been demonstrating high rates of economic growth and is one of the world leaders in such science-intensive industries as medicine, space exploration, electronics and new types of transport.

Over a relatively short period of time, the PRC has turned from a backward country into a powerful state, whose influence on the world arena is only increasing. One of the conditions contributing to the achievement of leading positions was the educational policy that the Chinese leadership has consistently pursued since the beginning of the twentieth century.

Educational policy meets the goals of China's development at different historical stages and is viewed as an important component of the economic life of the country, where about 80% of the population remained illiterate for a long time. In the twentieth century, China's national education system went through several stages of reforming, which coincided with socio-political transformations of the state itself (democratic reforms of the early twentieth century; reforms designated by the Sanmin doctrine (1930–1940); modernization of higher education (1949–1956); the policy of the "Great Leap Forward" (1960); the policy of reform and opening up (since 1978) [4]. A significant event for imparting an impetus to Chinese education was the speech of the PRC leader Deng Xiaoping at the Third Plenum of the CPC Central Committee of the XI convocation (1978), who stressed that education and science are the "main productive forces" of modernizing the national economy [10]. In 1995, the PRC adopted the Law on Higher Education, which consolidated priority directions in the development of education in the country. Compulsory nine-year general education was introduced in China; programs aimed at the complete illiteracy elimination of the population and raising its "cultural, scientific and moral level" have received the implementation; the structure of basic higher education was optimized; the modernization of the system of higher professional education began [11]. In the process of modernization, education began to play a key role in overcoming China's technical and cultural lag behind the world's leading powers. By the end of the twentieth century, in the PRC as a whole, main problems faced by higher education were regulated: the reorganization of universities was carried out; issues of training national personnel were resolved; the number of illiterate population in the country reduced from 80% in 1949 to 12% in the early 1990s. Education has become widespread. In the early years of the twenty-first century, residents of China over the age of 15 had 8.4 classes of education [12]. The influx of students to universities and institutes in the PRC has gradually increased. In the period from 1978 to 2008, the total number of people passing entrance exams to Chinese universities was about 128 million people [12].

The great work that the leadership of the PRC carried out in the development of education in the twentieth century made it possible to move on to solving the problems facing the state in the new century. The proclaimed "Action Plan for the revival of education in the twenty-first century" (1998) once again reaffirmed adherence to the course set by Deng Xiaoping and noted that in the new century, the "knowledge economy" based on high technologies will dominate, and China's competitiveness in the international arena will depend on development of education and science [10].

Work on the development of education in China in the twenty-first century is carried out in different directions. It is necessary to highlight several interdependent vectors in the implementation of the PRC educational policy, which the leadership of this country plans to develop in the medium and long term.

Despite technological progress, which is an integral part of modern education, the influence of Eastern traditional culture still remains in the organization of the educational process in China. China intends not only to support but also to use educational traditions laid down in previous historical eras. Chinese scientists acknowledge the leadership of the West in the development of natural sciences. However, traditional educational values in the PRC are based on Confucian cultural values, destroying Western stereotypes. Confucianism, which has a significant impact on China's national identity, emphasizes harmony between the inner and outer world. Peace and development in the international arena are possible only when each country has a chance to develop its own way, relying on its own cultural and historical traditions. On the basis of these ideas, traditions of good neighborliness of Chinese foreign policy and the position of a multipolar world were formed. However, it is this ideology that currently ensures the stability of the international situation and the effectiveness of the state's domestic and foreign policy [13]. Awareness of the correctness of this approach, the opinion that even in the conditions of globalization, one can preserve and root its national identity, as China does, comes to replace the understanding of globalization as a phenomenon that destroys the identity of a particular people. Researcher at the National University of Singapore K. Mahbubani underlines: "the COVID-19 pandemic will not fundamentally change the direction of global economic development. It will only accelerate those changes that have already begun. It is about moving away from US-centric globalization and moving toward China-centric globalization" [14]. Eastern traditional culture, being even today a rich source of information, continues to influence creation of concepts, methods and theories used by Chinese teachers in education and scientific and technical innovations in the twenty-first century.

This approach is directly related to the ideological and moral education of the Chinese population, which is organized in elementary school. In 2017, three textbooks became compulsory in primary school: "Ethics and Law," "Chinese Language," "History." The study of all these subjects is designed to preserve traditional educational values and educate a generation that knows the basics of Chinese culture and is free to navigate the problems of national sovereignty and territorial integrity of the state.

China understands the need and importance of the development of high-quality education, which means the creation of conditions for the comprehensive development of Chinese citizens. Close attention to this problem is associated with the current situation in the international arena. At the beginning of the twenty-first century, China has demonstrated high rates of economic development. However, the country could not withstand competition with world leaders in matters of innovative development. The solution to the problem was seen in the search for other approaches to educational policy. In the early years of the twenty-first century, the school was given the task not only to transfer knowledge, but also to teach Chinese citizens to study, independently obtain knowledge and be able to use it in life [15]. Thus, tools were created to make up a new learning model. According to Chinese experts, such a campaign will develop the creativity and innovative spirit of students. This should become an incentive for the integration of theory and practice, fundamental science

and technology, natural and socio-humanitarian sciences, economics and society. The political, economic and sociocultural development of China should receive an impetus, and the country itself should consistently move toward leading positions in the international arena.

An important step in the implementation of Beijing's plans to achieve a leading position in the world is the computer activity of education. This process began in China in 1984 after Deng Xiaoping attended the Shanghai Microelectronics Technology and Applications Exhibition. The leader of the PRC noted that computer skills should be developed from childhood [16], provoking a surge of interest in computers among young people, and, as a result, contributed to the adaptation of the population to the expanding process of informatization of education in the country. From year to year, China increases the volume of investments in the computerization of education, striving to reach the level of the leading countries of the world. The results of this policy became noticeable by the mid-1990s. In 1994, the first educational and research computer network (CERNET) appeared in the PRC, which united educational institutions of large cities in China at different levels. In 1995, CERNET linked 100 large PRC universities into a single network (Project 211). In accordance with the project, leading universities in China were to train high-level specialists for the implementation of national socioeconomic development plans of the country. The volume of investments in the development of the selected universities in the first five years amounted to a total of \$ 2.2 billion [17]. In 1996, the Qing-hua Polytechnic Institute developed a plan for the development of modern long-distance and network learning. In 1997, the State Education Commission of China proclaimed a "Notice on Issues Relating to the Development of Long-distance Education in Higher Education." Online distance learning has entered the stage of national development of the country and was included in the "Action Plan for the revival of education in the twenty-first century."

In 1998, the leader of the PRC, Jiang Zemin, at the celebration of the 100th anniversary of Beijing University, announced the start of a new project (Project 985). The main goal of Project 985 was "to promote the development and strengthening of the reputation of the Chinese higher education system by creating world-class universities in the twenty-first century." Within the framework of the project, the Chinese government allocated additional funding for the development of the material and technical resources and the attraction of leading scientists of the world. The total funding in the first three years was \$ 1.8 billion [17].

In China, work has begun on the creation of a public broadband network of schools and school communications, classes with a good material and technical resources have appeared and the basis for Internet learning ("3 links") has been created. At the same time, a single platform of public services for educational resources and a single platform of public services for education management ("two platforms") began to form. In 2011, the "Ten-Year Plan for the Development of Informatization of Education (2011–2020)" was adopted. In accordance with the adopted plan from 2012 to 2016, China has done a great job of integrating technology and education, which has resulted in an increase in learners through the Internet and a change in teaching and learning methods. For five years, information technology has become

a ubiquitous phenomenon that has covered all spheres of public and political life in China. In the course of the ongoing modernization, the digital structure of the national education system was formed. This structure involves the creation of digital spaces and access to the Internet for schools in large cities and economically developed regions; computerization of schools in rural areas; updating digital educational resources in schools and the use of online learning technology [18].

Intermediate results of the informatization of education carried out by China were put into practice in the first half of 2020 in the context of the fight against the pandemic. In accordance with the decisions of the CPC Central Committee, the Ministry of Education of China issued a “Notice on Supporting Education and Teaching Using Information Technology During the Epidemic,” which explained the need and importance of using information technology to ensure the stable operation of educational institutions and the conduct of teaching activities [19]. In order to maintain the video conferencing service in educational and research institutions of the country, the Chinese Education and Research Computer Network (CERNET) cooperated with the renowned video conferencing provider ZOOM.

The development of digital education is supported at the state level. The introduction of new teaching methods and technologies in education has become possible due to the active interaction of the Ministry of Education of the PRC with other government agencies involved in the development of the digital economy in the country. For example, the Ministry of Industry and Informatization of the PRC declared the need to attract to enterprises those university graduates who possess new knowledge and are ready to introduce it into production [20]. Graduates of e-business and e-commerce areas are in demand on the labor market in almost all spheres of business using modern Internet technologies. Digital technologies are used in the service sector, including educational, industrial and agricultural sectors. In 2019, the digital economy covered 30.6% of China’s GDP [21].

By the beginning of the twenty-first century, China was ready to begin the process of integrating Chinese education into the global educational system. It is the interaction of higher education institutions in China with foreign institutions involved in the educational process that has become a new phenomenon. At the state level, a system of teaching Chinese youth abroad was fixed. China has become the world leader in the number of students enrolled in foreign universities. According to UNESCO statistics, by the end of the first decade of the twenty-first century, 1 million 911 thousand 300 students from China studied in foreign universities, which amounted to 14% of the total world volume [22]. At the same time, Chinese universities have become attractive to foreign students.

To attract students from abroad and create world-class universities, Project 211 and Project 985 were merged into a double first-class university plan in 2017. The leading universities of the PRC, along with the task of entering the world educational rankings, were set and the task to become the best in the world by 2050 [23]. Currently, 23 Chinese universities are already included in the top 500 universities in the world. Specialists from the Ministry of Education and the Ministry of Finance of the People’s Republic of China, as well as the National Development and Reform Commission of China, were involved in the implementation of these tasks.

Chinese leaders believe that a change in approach to educational policy should not cause fear or scare off China's potential partners in the international arena Beijing, as before, is determined to make full use of the potential of cultural diplomacy, which is part of the policy of national security and public diplomacy. Cultural diplomacy allows to create a positive image of the state, to achieve results that are extremely difficult to achieve by political or economic measures. In 2004, at the 4th Plenum of the 16th CPC Central Committee, the task of exporting Chinese culture was set: “[it is necessary] to strengthen the complex power of Chinese culture. To promote Chinese culture, even better to go out into the world, and to increase its international influence” [24]. A specific course toward expanding foreign cultural activity dates back to 2007, when, at the 17th CPC Congress, Chinese President Hu Jintao put forward proposals to expand cultural exchanges and raise the status of Chinese culture in the world arena [25].

Increasing the popularity of Chinese culture in the world is among the priority tasks of developing cultural ties with foreign countries. National culture is perceived in China as a tool for preserving national identity in the context of globalization, providing protection from unwanted external penetration. In the PRC, the ideas of the dialogue of civilizations, the mutual enrichment of cultures and value systems are resonating, and they treat the attempts to unify the values, culture and behavior models of various peoples in accordance with Western standards in a negative way [13]. The solution to this problem contributes to the strengthening of China and the reduction of Western cultural influence in the international arena. Confucius Institutes (there were 550 Confucius Institutes in the world in December 2019) play an important role in achieving this goal [26].

Digital technologies are also involved in the development of cultural diplomacy. During the spring of 2020, almost all major Chinese museums went online. Shanghai Museum, Henan Provincial Museum, Inner Mongolia Museum in the Chinese city of Hohhot, Palace Museum and National Museum of China in Beijing, Hebei Provincial Museum and Museum of Ancient Chinese Art in Suzhou City, Zhejiang Provincial Natural History Museum and China Academy of Cultural Dunhuang heritage opened its doors to visitors in the virtual space. It should be noted that this practice has already been tested by China earlier. In 2018, Chinese museums began using artificial intelligence technologies to support the country's efforts to spread Chinese culture and history. Even then, an online map became available to visitors, which contained information about more than 1000 digital museums throughout the country [27], which could be used not only by the inhabitants of the Celestial Empire.

Thus, the policy of reform and opening up has led to significant changes in the education sector in the PRC. The Chinese leadership, on the one hand, continues to fight against illiteracy in the country, and on the other, it is pursuing a policy that contributes to the adaptation of the population to the ongoing changes and enhances the cognitive activity of the country's youth. At the same time, realities of the twenty-first century force the country's statesmen to set and solve world-class tasks that would allow China to achieve the highest results in various directions in the medium term.

84.3 Proposals and Results of Implementation

Educational policy of China in the twenty-first century is characterized by high dynamics and mobility. This is explained not only by the internal needs of China itself, whose economic development in this century has an impact on all spheres of activity of this state. The use of new educational technologies and the preservation of Chinese traditions, the involvement of leading universities of the PRC in the modernization of education and the promotion of new ideas in provinces remote from the center contribute not only to an increase in the general level of education of the population, but also solve the problem of increasing the competitiveness of the country's economy in the international arena. China continues to position itself as a developing nation. In the face of external challenges and pressure, including the trade war with the USA, the development of education is viewed by Beijing as one of the tools for economic growth.

New approaches to education allow China to conduct scientific research in such areas as artificial intelligence, high-tech equipment, biomedicine and others. This contributes to the development of the digital economy as a whole in the PRC and gives an additional impetus to its economic development. The development of new approaches to education in the PRC suggests that in China in the near future, there will be a sufficient number of young people whose education corresponds to the world level. China will move forward by introducing new technologies into the main sectors of the economy.

In these conditions, leaders of many states should not only study the experience of China but also make efforts to keep up with the Celestial Empire.

84.4 Conclusion

Thanks to the implementation of the policy of reform and opening up (1978), major transformations have been carried out in China, affecting the education sector. In the twentieth century, main, acute problems were resolved related to solving the issues of combating population illiteracy, providing educational institutions with teaching staff, building schools and integrating Chinese education into the world system. This allowed China to solve tasks aimed at raising the status of the state in the international arena in the twenty-first century.

General strategy for the development of education in China in the twenty-first century is aimed at realizing the geostrategic plans of the state. In accordance with these plans, by 2049, China should become one of the leading states in the world, a benchmark for the world community in issues of economic and social development. China is trying to find its own development model and integrate with it into the world community. Beijing is committed to expanding multilateral cooperation, creating conditions for prosperity and peaceful coexistence. This corresponds to the country's idea of "taking origins in China and belonging to the whole world." To achieve

this goal in the coming years, the country needs to implement a large number of infrastructure projects, plans for reorganization and modernization of many sectors of the economy. China's new initiatives are directly related to the availability of qualified and highly educated specialists. Therefore, education is seen as an important element in achieving the set goals.

When forming educational policy in Beijing, they take into account the need to find a balance between national interests and traditions, on the one hand, and global processes, on the other hand. China is building up its educational potential by studying and using the progressive experience of the world's leading powers. In the Celestial Empire, they do not want to adopt the Anglo-Saxon model of education; nevertheless, they do not exclude the use of the most successful results and methods of the Western system. For the leadership of the PRC, it seems important to preserve the foundations of national identity in a globalizing world. New approaches to educational policy have an impact on changing the way of thinking and behavior. Despite new trends in education in the twenty-first century (e.g., the use of digital technologies and long-distance learning), noticeable manifestations of globalization, where national traditions can be erased, China continues to pay great attention to the issues of ideological and moral education of the younger generation. This allows to remain faithful to the Confucian foundations and maintain the patriotic feelings of the Chinese toward their country.

China sets the task of creating conditions for obtaining high-quality education for citizens of the country, which guarantees the demand for graduates in the labor market. The priority is to attract young specialists to the economy of the PRC. However, China does not exclude the possibility of the work of Chinese citizens outside the state. Such a policy is viewed by Beijing as one of the manifestations of the "soft power" policy, where the world community will not fear the strengthening of China but will consider this process as a catalyst for the development of the world itself.

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Chapter 85

Verification of the Applicability of Trend Strategies in Modern Financial Markets



S. V. Bukunov

Abstract The paper discusses the applicability of trading strategies based on traditional technical analysis indicators for trading in modern financial markets. The time period of various securities on trend has been assessed. The paper contains results of testing a trend trading strategy based on historical data on Russian securities quotations and their comparison with the conservative strategy and profitability of bank deposits. The obtained results make it possible to conclude that despite the growing popularity of high-frequency trading, the use of traditional trend strategies over relatively long-time intervals is fully justified.

85.1 Introduction

A distinguishing feature of our time is the widespread presence of the Internet and information technologies. Exchange trading over the Internet has become a common practice now available to almost anyone. The great capabilities of modern computers to process huge amounts of data together with the high speed of their transmission over the Internet have recently resulted in the rapid development of the so-called algorithmic trading (high-frequency trading, algo-trading) [1–3]. The Russian stock market is no exception in this field [4]. A trading robot is a computer software running according to a certain algorithm implementing a particular mathematical model or trading strategy. The variety of approaches used to create such software might be envied by many industries [5–9].

According to the Moscow Exchange, already in 2018, the share of exchange transactions made by trading robots amounted to 40–50% of the total number of transactions [10]. This figure in the USA in the same year was 80%. However, even 10–15 years ago, the few developers of trading robots were considered a small group of “financial intellectuals.”

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The above-mentioned publication of the Central Bank of Russia (CBR) [10] states that the share of trading robots on the exchange will increase over time, and therefore, their influence on the market will rise. The experts of the CBR note that, on the one hand, high-frequency operations make financial markets more stable against the external factors and ensure the liquidity of financial markets; however, on the other hand, they may also act as destabilizing factors since the algorithm malfunction or deliberate actions may result in avalanche effect in the market, not subject to objective factors [10].

Therefore, in my opinion, the possibility of profitable trading on the exchange without using high-frequency algorithms, i.e., using traditional methods of analyzing financial markets, is quite relevant.

The purpose of the study is to assess the applicability of traditional methods of analysis and conservative trading strategies in the modern financial market.

85.2 Basic Approaches to Trading Systems Building

The basis of any trading strategy is a trading method [11, 12]. The development of a trading method is a multistage process. Various approaches can be used for developing a trading method: fundamental analysis [13], technical analysis [14], statistical analysis [7], machine learning [7, 9], text mining [15], etc.

A trading method is a set of fully formalized rules for opening and closing positions in the course of exchange trading. These rules should consider various possible situations in the behavior of prices and contain instructions to timely address them.

Technical analysis is the most popular approach for developing a trading method. Despite their insufficient theoretical validity, it is all kinds of indicators and oscillators of technical analysis that underlie the majority of trading systems. A large number of various indicators and oscillators are integrated into all modern trading platforms.

In turn, trend indicators are the most popular among the technical analysis indicators. In my opinion, the popularity of this type of indicator is quite natural and attributed primarily to the fact that it is trends that provide opportunities for maximizing profit with minimal effort. The well-known trading strategy called “buy & hold” can be called an extreme expression of the trend approach to trading, which normally implies making only two transactions over the considered time period: one purchase and one sale. Real trading uses a variety of trading systems based on trend analysis [12, 16]. However, in my opinion, the limited use of such systems is due to the fact that all trend indicators have such a disadvantage as delay relative to price changes, and the times of strong and long trends are, unfortunately, over. It is the strong volatility of current financial markets that involves more and more high-frequency traders and enables them to make statements that soon trading robots will completely cover the exchange industry.

85.3 Data Sources

The paper uses the portal of the FINAM financial holding as a source of prices for financial assets [17]. This source provides quotes of all financial assets traded on the Moscow Exchange for any period of time. The data can be saved as a.txt file (text file), a.csv file and in the MetaStock software format.

For this paper, the stock quotes of three Russian issuers (Sberbank, Norilsk Nickel, and Rosneft) were imported from the FINAM website for the past five years (2015–2020) for various time intervals, namely one week, one day, and one hour.

85.4 Software

Correlation and trend analysis were performed using the MATLAB software package [18]. This package is intended for technical computing and used for a wide range of research tasks, including technical analysis tasks.

The MetaStock software was used to test the trading strategy [19]. This software is intended for technical analysis of quotes and also makes it possible to create, optimize, and test trading strategies based on various integrated technical indicators and oscillators. Moreover, the software has a set of built-in strategies and a built-in programming language making it possible to create own indicators and strategies.

85.5 Correlation Analysis

At the first stage, correlation analysis was performed for the selected securities using the MATLAB package. The purpose of this analysis was to ensure the lack of a strong correlation between the selected securities, as these securities belong to three different sectors of the economy.

The calculated correlation matrices are provided in Tables 85.1, 85.2 and 85.3.

The obtained values of the correlation coefficients allow for the conclusion about a relatively weak correlation between the selected securities making it possible to use a common trading strategy for testing these securities.

Table 85.1 Correlation matrix for one-week time frames

1 Week			
Security	Sberbank	Norilsk Nickel	Rosneft
Sberbank	1	0.6203	0.7324
Norilsk Nickel	0.6203	1	0.6065
Rosneft	0.7324	0.6065	1

Table 85.2 Correlation matrix for one-day time frames

1 Day			
Security	Sberbank	Norilsk Nickel	Rosneft
Sberbank	1	0.6184	0.7361
Norilsk Nickel	0.6184	1	0.6007
Rosneft	0.7361	0.6007	1

Table 85.3 Correlation matrix for one-hour time frames

1 h			
Security	Sberbank	Norilsk Nickel	Rosneft
Sberbank	1	0.6176	0.7374
Norilsk Nickel	0.6176	1	0.6031
Rosneft	0.7374	0.6031	1

In addition, the obtained results show that the correlation between changes in the prices of the selected securities is virtually independent of the selected time period.

85.6 Trend Analysis

It was necessary to ensure the trends availability prior to creating and testing a trading strategy based on trend indicators.

The MATLAB software package was used to perform trend analysis [18]. This package is intended for various calculations and used for a wide range of research tasks, including technical analysis tasks.

In order to determine the time of price being on trend, a script was written in the MATLAB environment determining the availability and direction of the trend, based on two DEMA indicators (with a period of 13 and 21) and then calculating the proportion of time (in % relative to the duration of the entire period under consideration) of prices being in a particular state.

The double exponential moving average (DEMA) indicator was developed in 1994 by Patrick Mulloy to reduce the lag behind the price change inherent in the classic version of the exponential moving average [20].

Table 85.4 Time (in %) of prices being in each state for weekly time frames

1 week			
Security	Up-trend (%)	Down-trend (%)	Flat (%)
Sberbank	20	24	56
Norilsk Nickel	26	28	46
Rosneft	38	22	40

Table 85.5 Time (in %) of prices being in each state for daily time frames

1 Day			
Security	Up-trend (%)	Down-trend (%)	Flat (%)
Sberbank	16	37	47
Norilsk Nickel	27	25	48
Rosneft	28	28	44

Table 85.6 Time (in %) of prices being in each state for hourly time frames

1 h			
Security	Up-trend (%)	Down-trend (%)	Flat (%)
Sberbank	17	19	64
Norilsk Nickel	19	20	61
Rosneft	17	17	66

The results of the developed script are provided in Tables 85.4, 85.5, and 85.6. These tables show percentages of time when prices were in one of three possible states: rising prices (rising trend), falling prices (falling trend), prices not changing (“flat”).

The results obtained allow for the following conclusions:

- directed development of prices exists in all periods;
- the time of prices being on a particular trend normally does not exceed 25–30%;
- as the time frame decreases, trends become less pronounced, i.e., “flat” behavior begins to prevail.

85.7 Trade Method

Since the performed trend analysis revealed the availability of trend components in the price performance of the selected securities, the next step was the development and testing of trading strategies using trend indicators.

The first step in creating a trading strategy is to develop trading rules it will follow. Two strategies were tested during the study. One of them is based on the moving average convergence divergence (MACD) indicator (for moving averages of different orders), and the second one uses the equally popular stochastic indicator [20].

For the purpose of improving the results of both strategies, the parameter values of the indicators used in them (in particular, averaging periods) were optimized by selecting the optimal parameter value with a certain increment. Profitability maximization was set as the target function during the optimization.

The trading methods used in the work provide for the possibility of opening both long and short positions.

85.8 Results

The testing results were compared with the values of profitability that could be achieved using the conservative buy & hold strategy, as well as with the profitability of bank deposits for a selected period.

In general, despite the absence of a strong correlation between changes in the prices of the selected assets, many results were similar. For instance, for all securities and for both strategies with a decrease in the time frame, the profitability of the strategy decreased upon an increase in the number of transactions.

Table 85.7 presents the results of testing the Sberbank shares according to the first strategy (based on the MACD indicator) for the time period from November 09, 2015 to January 18, 2016.

Figure 85.1 shows a price change diagram for the Sberbank shares with highlighted purchase and sale transactions (middle diagram) and a profit accumulation diagram (upper diagram). The green arrow pointing upwards on the price diagram corresponds to the opening of a long position, and the red arrow pointing downwards corresponds to the opening of a short position. The red rectangle corresponds to position closing.

The financial asset price (middle diagram) in rubles or account size on a cumulative total in rubles (upper diagram) is plotted along the vertical axis, while time is plotted along the horizontal axis. In the lower diagram, the transaction volumes in units are additionally plotted as a bar chart.

Table 85.7 Results of testing the Sberbank shares for different time frames

Time frame	MACD strategy (profitability, %)	“Buy and Hold” strategy (profitability, %)	Profitability of bank deposits (%)	Trades
1 week	17.83	-7.75	1.5	2
1 day	12.64	-7.75	1.5	19
1 h	8.94	-7.75	1.5	35

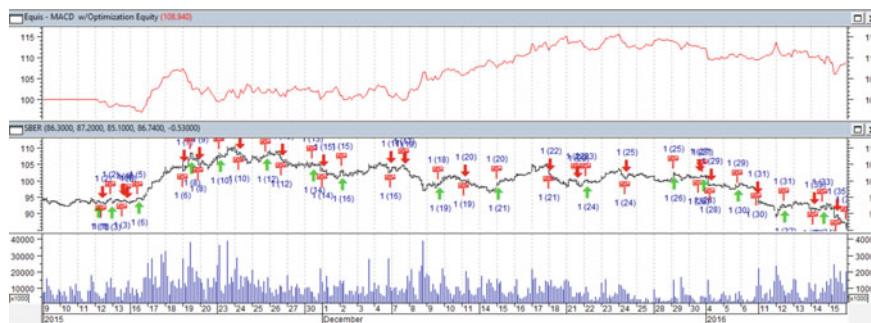


Fig. 85.1 Testing results of Sberbank shares for one-hour time frames

Table 85.8 Results of testing Norilsk Nickel shares for different time frames

Time frame	Stochastic strategy (profitability, %)	“Buy and Hold” strategy (profitability, %)	Profitability of bank deposits (%)	Trades
1 week	17.97	4.14	6.9	1
1 day	11.53	4.14	6.9	28
1 h	5.76	4.14	6.9	64

**Fig. 85.2** Testing results of Norilsk Nickel shares for one-week time frames

Table 85.8 presents the results of testing the Norilsk Nickel shares according to the second strategy (based on the Stochastic indicator) for the time period from January 02, 2017 to November 20, 2017.

Figure 85.2 shows the results of testing Norilsk Nickel shares for weekly time frames.

85.9 Conclusion

The analysis results show that even in the conditions of constantly changing modern financial markets, many securities remain on a particular trend for a significant part of the time, which allows for the use of traditional trend indicators for their analysis. The trading strategies developed on the basis of such indicators may bring to investors returns exceeding those of the buy and hold strategy and returns of bank deposits. As the time frame decreases, the efficiency of classical trend models decreases as well owing to an increase in the lag of trend indicators, and it is most likely the main reason for using high-frequency algorithms over short-time periods. However, over long-time periods (one day or more), traditional trading strategies may well coexist with high-frequency algorithms providing conservative investors with acceptable returns

upon a small number of transactions and, accordingly, lower commission costs for the exchange and broker.

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Chapter 86

Developing the Theory of International Banking Competition



E. M. Kolikova, T. I. Demidenko, and A. A. Arzumanyan

Abstract The paper is devoted to the basic aspects of the international competition of national banks under the current conditions, considering its systemic component. The main conditions ensuring the competitiveness of banks in the world financial market have been determined. **Design/Methodology/Approach:** Historical and logistic analysis and system research are based on system theory and the studies of foreign and Russian scholars devoted to the theory and practice of banking in the global financial market. System research covers the banking sector and its constituents. The features ensuring the bank competitiveness in international activity in the existing international legal area and the impact of the totality of political and economic interstate relations on it have been determined. **Findings:** It has been determined that the basic conditions for ensuring the bank competitiveness in the global financial market are not their features but the opportunities of the banking system they are related to. The latter, in turn, is determined by the state economy as a whole and its political weight in international relations. **Practical Implications:** The study conclusions and generalizations can be practiced when elaborating appropriate competitive strategies for developing national commercial banks, aimed at implementing international expansion projects and improving the state's foreign economic policy. **Originality Value:** A technique for the systemic studying the competitiveness of banks as elements of higher-level systems has been developed and tested, which ensures interconnecting existing banking competition practices with the ongoing global economic transformations.

86.1 Introduction

In each independent state, a banking system adequate to some extent to its economic level has been developed, including a set of banks, the activity of which supposes, to one degree or another, their participation in the international banking market, and regulatory ones. In the system, the banking product prices are always subject to

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adjustment and determined by the peculiarities of the entire system considered by the central bank or another national regulatory body. When performing international transactions, banks interact at the supranational level. To operate effectively in the global banking market, national banks should have somewhat different features as compared to financial and credit institutions operating mostly in the domestic market. The national economy nature, the currency of the bank location country, and a wide range of other circumstances have a significant impact on the international activity of national banks included in the national banking systems.

The basic systematic approach provisions extrapolated to the banking system and underlying our research are reflected in the works by S.L. Opner and S.T. Beer. The issue of developing the banking system and the international banking market, including their competitiveness, has been considered by researchers such as Kuznetsova [1], Pilnik [2], Radionov [3], Ulyanova [4], Yazykov [5], etc.

86.2 Materials and Techniques

Let us consider the issue of foreign economic activity of Russian national banks based on general scientific techniques and a systematic approach. Almost all the world countries have national banking systems, which include a certain set of financial and credit institutions temporarily accumulating free funds of enterprises, organizations, and individuals and providing them for temporary use to business entities in various forms, and acting as mediators in payments and settlements between them. Supervision over the commercial bank activity and its regulation is performed by *central banks*, which institutionally implement the monetary policy in the country, including the money emission and the purchase and sale of foreign currency, gold, and securities, and thereby actively impact the cost of banking products within the system.

The dialectical unity of the central and commercial (specialized and universal) banks and non-bank credit organizations operating in interconnection and interdependence with each other and the surrounding socioeconomic environment form a *national banking system*. Non-bank profit organizations performing certain banking transactions based on the relevant Central Bank's decisions do not significantly affect the national banking system and virtually do not carry out foreign economic activity; therefore, they will not be considered in the study.

The founder of cybernetics Stafford Beer has viewed a system as a set of dynamically interconnected elements, parts. Other scholars have formulated and used for their research and field of knowledge other definitions of a system, different from the above very common formulation given by Stafford Beer. In this study, we will give another definition of world-renowned scientist S.L. Optner: "A system is a continuous-time process; a set of parameters with given properties, including input, process, output, and feedback control, having a limited set of links between parameters and their properties."

Based on the definitions by S. L. Optner and S. Beer, we will consider the *banking system* as a totality of commercial banks and their regulatory and supervisory bodies interacting with each other and the environment. All the world countries, except for a limited list of small dependent ones, have their banking systems with certain historically formed national peculiarities, uniting commercial banks and regulatory bodies supervising their activity. The functions of regulatory and supervisory bodies are performed by the central banks in most EU countries or other specialized structures: in Canada, the Central Bank of Issue and the Committee for Clearing and Mortgage Banks, in the USA, the FRS, the US Treasury, and the Federal Deposit Insurance Corporation, and in Germany—the Bundesbank and federal state banks.

Central banks universally impact *banking and quasi-banking structures*. Central banks have control and supervisory powers. Central banks are charged with facilitating the effective operation of commercial banks in financial markets; they are also lenders of last resort for them and determine the rules for performing banking transactions. The Central Bank of the Russian Federation prescribes the mode and controls the activity of commercial banks in the security market. In the USA, the US Securities and Exchange Commission performs these functions [5].

Virtually all banking systems operate on the same principles, differing in the composition of regulatory structures, commercial bank specialization, and national legislation. Disputes between commercial banks and regulatory structures and other public economy entities are resolved by courts of various instances. Despite all the differences in the composition of state and self-regulatory institutions exercising control and supervision over the commercial bank activity, they all affect their motivation and behavior, having determined, in many respects, their operating conditions. Accordingly, *all national banking systems are fundamentally identical and are understood as a totality of credit institutions acting according to specialization to achieve their goals within the framework prescribed by the regulatory bodies and the national legislation in unity with the changing socioeconomic environment*.

At the national level, a certain basis is being formed allowing Russian banks to participate in the *international banking market*, which is a set of services rendered by banks according to the legislation of the country of their provision. Thereat, banking services are specific goods since they are characterized by physical intangibility, inseparability from the source, inconsistent quality, and the period of use. The consequence is the specificity of promoting banking services in the market compared to sectors producing material goods.

Banking services are usually provided, including at the international level, by commercial banks being the banking system constituents.

The definition of a commercial bank, according to Usoskin [6], “arose in the early stages of banking development, when banks served mainly trade and commodity exchange operations and payments.” With the development of commodity-money relations, the commercial bank concept has lost its original meaning. A commercial bank is currently regarded as a credit institution serving all resident and non-resident entities of the national economy, regardless of their activity.

In some countries, banks are divided into commercial, investment, retail, regional, and national ones and have certain restrictions on the types of banking activities. In

the USA, e.g., until the mid-90s, the Glass-Steagall law dated July 16, 1933, was in force, which determined the division of banks into commercial and investment ones. Moreover, during the economic crisis of 2007–2008, in the USA, proposals have been considered to return the restrictions imposed by this law on banks due to the high risks of security transactions [7, 8].

Since the study is devoted to the issues of positioning national banks in the international banking market, we will not consider all the variety of banks within the national banking systems and define a commercial bank as an institution relatively unlimited in providing loans and entitled to attract deposits.

Based on the bank and system categories considered, let us study the features inherent in the commercial bank system understood in the above definition as a totality of commercial banks operating to achieve their goals within the scope of activity prescribed by the central regulatory body (bodies) under the condition of a changing environment.

The feature of synergy (or purposefulness) of the system components' operation aggravates the effect of its activity. In terms of the banking system, synergy is expressed, particularly, in increasing profits due to the banking multiplier, and foreign funding of the largest Russian banks through the interbank market expands the passive base of the banks not having access to the global banking market [9, 10].

Domestic scholar V. N. Sagatovsky considers the *target orientation* as the main feature among those of a socioeconomic system. Article 1 of Federal Law No. 395 dated 12/2/1990 determines the goal of the commercial bank credit institution activity as making profits. In terms of the banking system, the aggregate profit of its constituents is more likely an important stability and competitiveness condition than the goal of the activity, at least not the main one. The target focus of the system of banks is determined by their role in the economy, the functions they perform. In these terms, the national banking system accumulates and mobilizes funds, mediates in lending and settlements between economic entities, arranges the issuance and placement of securities, etc. But herewith, cumulative profit obtained by the banking system is the most important condition for its stability, the opportunity of self-development, and the solution of permanent issues [11, 12].

The banking system has features not inherent in an individual financial and credit institution. The banking system *emergence* is expressed in its comprehensive interaction with the entire national economy and participation in the global banking market, the unity of transformational changes under the effect of the regulatory body, which manifests itself in different ways in individual banks, and the environment.

The *multiplicativity* of the national banking system actively participating in world banking transactions significantly increases its efficiency. Attracting funds from individuals and legal entities, the banking system offers credits in volumes many times higher than that performed through its created multiplier.

The approximate multiplier effect may be calculated as follows:

$$m = 1/R,$$

where

- m is the maximum amount of new credit funds,
 R is the reservation rate.

That is, the banking system generates an increased supply of funds in the economy, which depends, among other things, on the funds borrowed by it in foreign markets.

Thereat, profit obtained by each bank included in the system depends on the degree of achieving the set of goals formed by the price and quality features of banking products, which is determined, inter alia, by interbank competition.

86.3 Results

The activity of central banks is regulated by law, and the degree of their dependence on the state authorities varies. In the Russian Federation, the main legislative act regulating banking activities is the Federal Law “On Banks and Banking Activity” determining the basic conditions for the operation of banks and the banking system of Russia.

According to Article 2 of the above law, the banking system of Russia includes the Bank of Russia, credit institutions, as well as branches and representative offices of foreign banks (the activity of the foreign bank branches is still prohibited in Russia). The effective legislation formulates the fundamental principles of the banking system of the Russian Federation: a two-tier arrangement of structure and banking supervision, the functions of which are entrusted to the Central Bank. Germany has a three-tier banking system. The State Bank of Germany pursues a monetary policy, targets the rate of inflation, and exercises control and supervision over the bank activity. Nine state banks control the operation of the so-called savings banks and provide lending and settlement-and-cash services to large corporations. In Canada, the functions related to the jurisdiction of the Central Bank in the Russian Federation are distributed between the Central Bank of Issue, the Committee for Clearing and Information Centers, and the Association of Canadian Bankers. Variable diversity is also typical for the Canadian commercial banks distinguished by their specialization (trust, mortgage, etc.) and a variety of legal forms of organization (cooperative, credit unions, etc.).

The Federal Law “On the Central Bank (Bank of Russia)” formulates the objectives of the Bank of Russia: protecting and ensuring the ruble stability, developing and strengthening the banking system of the Russian Federation, and ensuring the efficiency and smooth functioning of the payment system. The central banks (or several structures performing similar functions) of the countries considered have similar objectives.

In the Russian Federation, most banks are universal and restricted in transactions by their licenses issued by the Central Bank of the Russian Federation. To one degree or another, all Russian banks deal with foreign currency, directly or indirectly participating in foreign economic activity.

The global world crises of 1998 and 2008 and the local Russian crisis of 2014 have shown the dependence of the Russian banking system on actions and support from the Central Bank of the Russian Federation and the state as a whole. Without stabilization loans from the CB RF, the largest Russian banks (including those with a predominance of state capital) would have ceased to exist in 1998–1999, and after the 2008 crisis, the national banking system would not have recovered in pre-crisis parameters by the fall of 2009 without obtaining loans for the amount of RUB 18,212,792.70 mln (more than half of the total assets of the Russian banking system) to maintain liquidity.

Three crises of the past years and the current one have raised some issues on the reliability and integrity of the Russian banking system, its ability to retain the stability of its internal relations and coordinate actions to maintain an internal dynamic balance in interaction with the national economic environment and the global banking market. The homeostasis of the national banking system is confirmed by the preservation of its ability to perform payments between economic entities during crises, the transformation of accumulated funds not only into short- and medium-term loans but also long-term investments and the retained presence in world markets. It is noteworthy that from crisis to crisis, the national banking system features are manifested more and more clearly. If during the 1998 crisis, clearing payments had been performed by mainly large banks with a predominance of the state capital, then in 2008, the payment system was not virtually affected. At the acute crisis stage, a small number of banks with low asset quality left the market, while the total number of banks did not change. During the period of recovery from the 2008 crisis, the main volume of loans has been issued to the real economy sector by the largest banks with state participation.

After the Russian crisis in 2014, intra-system transformations in the banking sector intensified; it was promoted by the policy of the Central Bank of the Russian Federation aimed at removing banks violating the effective legislation and regulatory requirements of the regulatory body. Thereat, the Russian banking sector consistency has been transformed but has preserved.

Consideration of the Russian banking sector from the standpoint of a systems analysis allows concluding its *stability*, despite the global and internal crises causing significant qualitative and quantitative changes. The growth and strengthening of domestic banks allow them to operate in the global banking market. Herewith, the increase in the share of banks with state participation occurring against the background of a decrease in their total number (more than twofold since 2008) and their preferential financing by the Central Bank of the Russian Federation, as well as supervisory indulgences, violate the communicativeness of the Russian banking system with the environment and deform the feedback principle and market regulation of the entire banking sector. In fact, the adaptive striving for a stable balance, inherent in the banking system is ensured, to a large extent, by administrative methods. In general, the Russian banking system is developing progressively, while experiencing crises structurally and changing qualitatively.

An analysis of the results of scientific and statistical research and the practice of Russian banks has shown that national banking system constituents do not perform

Table 86.1 Analysis of the international activity of national banks

Bank	Countries of Operation	Forms of operation
Sberbank	Belarus, Kazakhstan, Ukraine, Turkey, countries of Central and Eastern Europe, India	Representative offices, branches
VTB Bank	Germany, Great Britain, Armenia, Belarus, Kazakhstan, Azerbaijan, Georgia, Angola, Italy, China, India, Singapore, Austria, Cyprus, Bulgaria	Representative offices, subsidiary banks, branches, investment banking subdivision
Gazprombank	China (Beijing), Mongolia (Ulan Bator), India (Malcha Marg, New Delhi), Kazakhstan (Astana)	Representative Offices
Alfa-Bank	Belarus (Minsk), Kazakhstan, Ukraine	Representative offices
Rosselkhozbank	Belarus, Kazakhstan, Armenia, China	Representative offices
Promsvyazbank	Cyprus, China	Branches, representative offices

mass expansion to other countries. Entering international markets is among the strategic priorities of the largest Russian banks. One of the reasons for the inactive expansion in international markets is quantitative restrictions primarily determined by the bank's capitalization level. The largest national banks open branches and representative offices abroad and introduce their services in the international financial market. Table 86.1 represents an analysis of national banks from the international activity point of view.

The variety of the product range of banking services and their price depend on the operating conditions of each bank, its economy, the availability of resources, including borrowing in foreign markets, and other circumstances that collectively affect the development of the entire national banking system, including the CB RF policy.

Sberbank is the largest national bank performing an intense international activity. The product lines provided by this bank may differ in their contents depending on the country of operation, e.g., loans to individuals (see Table 86.2). Herewith, regardless of the country of operation, the bank has a diversified customer portfolio and, as a rule, offers an appropriate range of banking products for individuals and legal entities.

86.4 Discussion

Considering the operating efficiency and the prospects for ensuring the competitiveness of commercial banks in international financial markets, researchers of this subject matter, as a rule, consider such opportunities in the context of the originality of the banking system constituents, i.e., individual commercial banks themselves.

Table 86.2 Comparative characteristics of the product line of consumer loans for individuals in the CIS countries

Item No.	Subsidiary bank	Consumer loan type	%	Amount
	Sberbank PJSC (in Russia)	Loan for any purpose	From 12.9	up to RUB 5,000,000
		Loan with a guarantor	From 12.9	up to RUB 30,000
		Refinancing loans	From 12.9	up to RUB 3,000,000
		Loan for customers with a private subsidiary plot	17	up to RUB 1,500,000
		Education loan with state support	8.6	
	SB Sberbank JSC	Loan without collateral	1	6,000,000 tenge
		Urgent loan	18–21.6	
		Loan secured by a deposit without commissions	8–9	
		Loan secured by a deposit with commissions	3–4	
	BPS—Sberbank OJSC	Consumer loan “Without Borders!”	23.8	guarantee of 1 individual (applied for loans from 15,000 BYN to 20,000 BYN, guarantees of 2 individuals (applied for loans from 20,000 to 100,000 BYN
		For education	12.32	

Often, it seems appropriate to analyze and develop such strategies, considering the individualism of corporate governance and the intellectual and financial opportunities of the bank. Such a vision is shared by authors such as O. V. Nikulina, A. V. Chalik, and T. V. Chadaeva.

It should be recognized that there are various banks in the world, differing in both economic parameters and specialization, product range, and other features that are often determined by historical transformations of credit institutions (investment, savings, commercial, universal, and other banks). Herewith, commercial banks act as subsystems or elements of higher-level systems, which are national banking systems and economies. The development level and operating efficiency of national commercial banks directly depend on the mode of operation of national banking systems in domestic markets and to a large extent determine their positions in world markets, which, however, is a necessary but by no means sufficient condition for sustainable

positioning and competitiveness in the global banking market. There are also differences in the actual legal area of international transaction activity of banks and the impact of the totality of political and economic interstate relations.

86.5 Conclusion

The Russian national banking system is a subject of international economic relations, in the course of which it realizes its systemic features and systematically responds to the economic environment changes. Herewith, there is a fundamental similarity between the banking systems of the Russian Federation and other large countries.

International expansion acts as one of the diversification types. Herewith, this strategy is not common for domestic banks, and the national banking system constituents do not perform mass expansion in other countries. Sberbank, VTB Bank, and Gazprombank are the leaders in entering the international financial market. The product line of these banks on the international market has its peculiarities but may vary significantly by the composition: for most banks operating at the international level, the variability is determined by the customization of offers, including when performing export-import transactions; it is promising and supposes using innovative techniques.

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Chapter 87

Digital and Institutional Methods for Technological Development Acceleration



V. N. Yusim, V. G. Merzlikin, and A. M. Kaloshin

Abstract The article considers a digital method for dynamical optimization of technological development. It provides the results of its field and imitative trials. It is validated that the use of the method results in doubling of the economic development rate at all other conditions being equal. The opportunity for the dynamic optimization of development under total uncertainty of the future is shown. Reference points for such development are rationalized. The theoretical base of the method for dynamic optimization of technological development is considered. The authors demonstrate that it is based upon the quantitative value of the technological quality of man-machine systems. Its use has helped to diagnose one hundred percent of the US domestic crises for the last 47 years 1–2 years before their outbreak. The article gives reasons for the growth of the technological development rate should be supported by the most important economic institution—its monetary system. Further, it is proved that the modern institution of money circulation has depleted its opportunities. It is shown that the transition to the dual currency monetary system will facilitate its positive transformation. The authors provide reasoning that money with the permanent purchasing power should be used in such systems alongside the traditional fiduciary money. They should be used in place of gold but without the disadvantages of the latter. The improved institution of monetary circulation is considered as the method for acceleration of technological development. The article points out that the use of digital methods will allow eliminating weak, faulty, and self-interested human solutions at the selection of innovative development projects.

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87.1 Introduction

It is generally agreed that the technical progress basis is formed at the level of the fundamental research. The innovations in economic and technological areas are born in a similar manner. However, only the experiment may validate the fundamental research.

However, the results of the direct experimental evaluation of the long-term technological development method would require decades which is obviously unacceptable. The issue is solved either by the use of indirect inspection methods or by the simulation modeling of the development process.

The article discusses the results of two experiments. The first experiment proves the correctness of the theoretical background for the method of dynamic optimization of technological development. The second method compares the results of dynamic optimizations for four consecutive steps in the technological upgrade of ten manufacturing sites. Its result is further compared with the results of selecting upgrade projects by the methods known today using simulation modeling.

The theoretical background for technological development solutions is the symbiosis of “Theory for Formation and Development of Technological Systems” [1], “Principle of Dynamic Optimization” [2] and new studies in this area [3, 4].

Moreover, nowadays it is clear [5, 6] that the social and technological development cannot be effective unless social institutions develop at the same time. All the history of civilization shows their interconnection. Moreover, each step of development has always been resisted by skeptics and the influential minority for keeping the status quo is beneficial.

The article shows how new digital technologies will facilitate the transformation of not only the institution of technological development but the most important economic institution—the monetary system.

87.2 The Theoretical Background of Technological Development

The following models of economic growth are popular: Cobb–Douglas, Solow, Mankiw–Romer. Solow’s exogenous growth model is the most popular one.

However, none of the model’s feasibility was backed by strong facts. Even R. Solow’s Nobel Prize (1987) did not prevent researchers from proving its inadequacy, at least, in some cases. Thus, the test of the model by the example of the Japanese crisis in 1959 showed the error in modeling results almost in 1000% [7].

Moreover, the literature does not contain any experimental proof that the Cobb–Douglas model is correct. It is not a coincidence. The analysis of its theoretical backgrounds makes the authors consider the model not correct enough [8].

The studied model for technological development management uses the endogenous model. It has been substantiated in the monograph mentioned above [1].

Table 87.1 Dynamics of ELT and GDP changes in the USA, 1970–2017 [13]

Characteristics of projects selected on NPV and ELT values	Selection by NPV	Selection by ELT	Relation of results
	mln RUB	mln RUB	ELT / NPV
Added value	4,723	8,357	1.77
Profits	4,647	8,320	1.79

The dynamics of the exponentially increasing acceleration in the global technological development for 2000 years has complied with the logics of the endogenous technological development [9, 10].

The suggested model is universal. It allows acceleration the business development (a microlevel), industrial development (a meso-level), and the economy as a whole (a macro level).

The model is based upon the quantitative value of man–machine systems' quality. It has been entitled “the economic level of technology”, abbreviated as ELT. Experiments have shown the ELT effectiveness. Thus, its use has allowed diagnosing 100% of the US domestic crises 1–2 years before their outbreak for the last 47 years [11]. More detail of the experiment with crisis forecast is provided below.

The crises forecast using the ELT value has proved that degradation of man–machine systems (a crisis) is characterized by its decreased quality expressed in the ELT value.

Moreover, the simulation modeling of the procedure for a consecutive selection of innovative development projects showed that selection of investment projects according to the quality criterion (ELT) increases the economic effectiveness of the final result.

Table 87.1 shows the results of simulation modeling for four consecutive steps in the innovative development of an industrial company. Three most popular methods for the selection of development projects on the investment effectiveness values such as NPV (Net Present Value), IRR (*Internal Rate of Return*), PI (*Profitability Index*) were compared with the ELT value (*Economic Level of Technology*) suggested by the authors.

The conclusion was drawn upon four steps taken for the upgrade of enterprises by various methods. The method for selecting development projects on the NPV value (Net Present Value) was proved to be the best of all traditional methods. But the ELT value allowed selecting a much more effective project than those picked up by the NPV value.

Table 87.1 shows the relations between the annual profits and the added value of two final selected variants. As the table data show, the effectiveness of selection by the ELT was almost twice higher than by the NPV value [12].

The model of economic and technological development where the ELT value has emerged is as follows:

$$L = \sqrt{U \cdot B} \quad (87.1)$$

where L —labor efficiency upon the added value; U —the economic level of technologies; B —technological equipment of a worker by the capital.

If both parts of the model (87.1) are squared, obtain that the ELT may be determined as:

$$U = \frac{L^2}{B} \quad (87.2)$$

The economic contents of the model parameters:

$$L = \frac{Q}{n} \quad (87.3)$$

where Q is the annual added value; n is the number of workers.

$$B = \frac{A}{n} \quad (87.4)$$

where A is the main funds spent for a year, in other words, depreciation.

After simple algebraic transformations with the model (87.1) obtain:

$$\frac{Q}{n} = \sqrt{U \cdot \frac{A}{n}} \text{ or } \left(\frac{Q}{n} \right)^2 = U \cdot \frac{A}{n} \quad (87.5)$$

Then the ELT may be determined using the formula:

$$U = \left(\frac{Q}{n} \right) \cdot \left(\frac{Q}{n} \right) : \left(\frac{A}{n} \right) \text{ or } U = \left(\frac{Q}{n} \right) \cdot \left(\frac{Q}{A} \right) \quad (87.6)$$

The expression used to calculate the ELT or U is the human efficiency product, i.e. the quality of human productive opportunities multiplied by capital efficiency, i.e. the quality of capital productive opportunities.

87.3 Dynamic Optimization of Development

The evidence confirming the existence of the quantitative characteristics of the quality of man-machine systems using the ELT value opens up surprising horizons. In particular, it makes it possible to use the “Bellman’s principle of dynamic optimization” for maximizing the economic development rate. The principle may be expressed as follows: “each current development solution must provide for the system condition optimal for the next development steps regardless the prehistory” [2].

However, it stands to reason that it is impossible to validate the solution that is “optimal for further development steps” under the absolutely uncertain future. In fact,

the next development steps are unknown in this situation. It means that the principle of dynamic optimization generally does not cover economic systems.

However, if the method of its use is justified, the rate of technological development will be accelerated without any additional costs. Actually, it is not about financial investments but only about the selection of the best development project from existing ones.

The problem is solved by the quantitative value of the quality of manufacturing systems.

Some Russian researchers, independently of each other and by different methods, validated the quantitative value of the quality of man-machine systems which meaning is similar [14–16].

The research [1] resolved the methodical problems preventing its effective use. It resulted in the opportunity to prove its efficiency experimentally.

Figure 87.1 shows the dynamics of changes of the US ELT and GDP for one employed person for 25 years. The diagrams show that domestic crises occur one or two years after the emergence of negative ELT values. Domestic crises are crises that outbreak inside the economic system. The ELT diagnoses them because it characterizes the generalized quality of such systems [17].

The same result is obtained according to the data of Japan and the United Kingdom (a macro-level) as well as at the microlevel (the data of Volkswagen and the Stavropol machine-building factory).

Table 87.2 visually shows that all crises have been forecast for 47 years, except for two cases.

But those are the exceptions that only confirm the rule.

In 1974 the crisis was not domestic but international one, related to the oil embargo of Arabic countries.

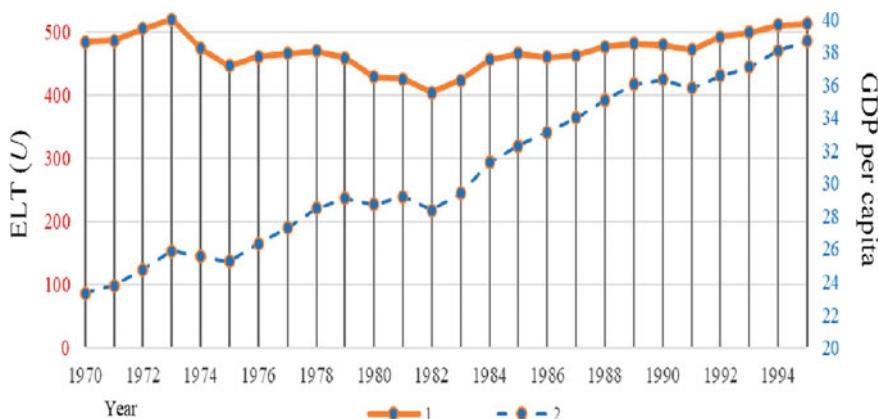


Fig. 87.1 Dynamics of ELT and specific GDP/per capita in the USA 1—ELT thousand \$/man·year; 2—GDP/people, thousand \$/man·year

Table 87.2 Dynamics of changes of the US ELT and specific GDP, 1970–2017 [18]

Year	GDP/person, thousand \$/man·year	Change in the GDP, %	Signal	ELT, thousand \$/man·year	Change in the ELT, %	Signal
1970	23.31	0.00		483.94	0.00	
1971	23.78	1.99		486.66	0.56	
1972	24.76	4.14		505.15	3.66	
1973	25.91	4.64		519.45	2.75	
1974	25.54	-1.42		473.54	-9.70	
1975	25.24	-1.18		445.91	-6.20	
1976	26.35	4.39		461.02	3.28	
1977	27.29	3.56		465.45	0.95	
1978	28.5	4.45		469.75	0.92	
1979	29.08	2.05		458.71	-2.41	
1980	28.73	-1.20		428.31	-7.10	
1981	29.19	1.59		425.01	-0.78	
1982	28.36	-2.84		403.53	-5.32	
1983	29.41	3.68		423.03	4.61	
1984	31.27	6.34		456.04	7.24	
1985	32.31	3.32		465.18	1.97	
1986	33.13	2.56		460.14	-1.10	
1987	33.98	2.54		462.21	0.45	
1988	35.08	3.26		476.63	3.02	
1989	36.03	2.70		481.11	0.93	
1990	36.31	0.77		479.41	-0.35	
1991	35.8	-1.40		471.59	-1.66	
1992	36.57	2.13		492.02	4.15	
1993	37.08	1.40		498.64	1.33	
1994	38.11	2.77		510.27	2.28	
1995	38.68	1.50		513.01	0.54	
1996	39.68	2.60		530.63	3.32	
1997	40.97	3.24		568.36	6.64	
1998	42.29	3.24		583.73	2.63	
1999	43.77	3.49		599.12	2.57	
2000	45.06	2.94		598.15	-0.16	
2001	45.05	-0.02		589.73	-1.43	
2002	45.43	0.85		599.75	1.67	
2003	46.3	1.93		615.19	2.51	
2004	47.61	2.83		632.94	2.80	
2005	48.76	2.40		633.3	0.06	
2006	49.58	1.68		626.1	-1.15	
2007	49.98	0.82		620.39	-0.92	
2008	49.37	-1.23		604.24	-2.67	
2009	47.58	-3.62		599.69	-0.76	
2010	48.37	1.68		635.66	5.66	
2011	48.78	0.85		645.27	1.49	
2012	49.50	1.47		650.02	0.73	
2013	49.98	0.97		650.71	0.11	
2014	50.78	1.61		652.6	0.29	
2015	51.86	2.11		661.58	1.36	
2016	52.86	1.94		681.69	2.95	
2017	53.22	0.68		711.24	4.16	

1986 saw the greatest financial crisis but the annual national GDP did not fall because the crisis was overcome in a timely manner.

Therefore, the use of the ELT value helps to predict 100% of domestic economic and financial crises [18].

87.4 Development Reference Points

The modern research has shown that it is most reasonable to assess the current level of technological development using the GDP acceleration per person. Specify that the GDP is the amount of wealth created for one year, i.e. it is the rate of wealth creation. Then, the GDP growth is acceleration. Recent studies [19] have shown that the GDP acceleration for one employed person is the statistical development macroconstant for most of the countries across the world [20].

Figures 87.2 and 87.3 show, as exemplified by two countries – global technological leaders, the absolute growth (decelerations) of their GDP per capita, or, according to the terminology of the International System of Units SI, its annual accelerations and decelerations.

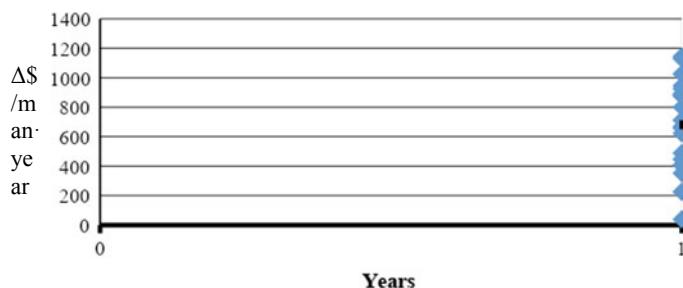


Fig. 87.2 Growth of GDP per capita per year in the USA. 1987–2011 (Apart from years of economic crises)

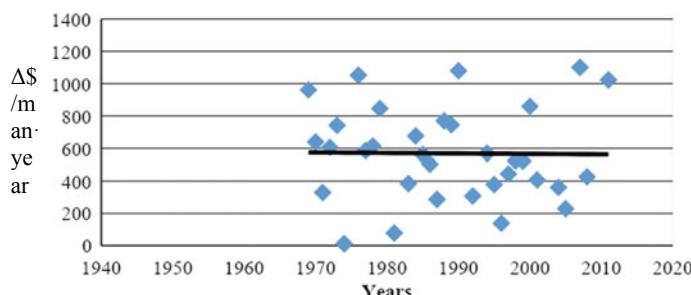


Fig. 87.3 GDP growth per capita in Germany. 1969–2011 yy (apart from the periods of economic crises)

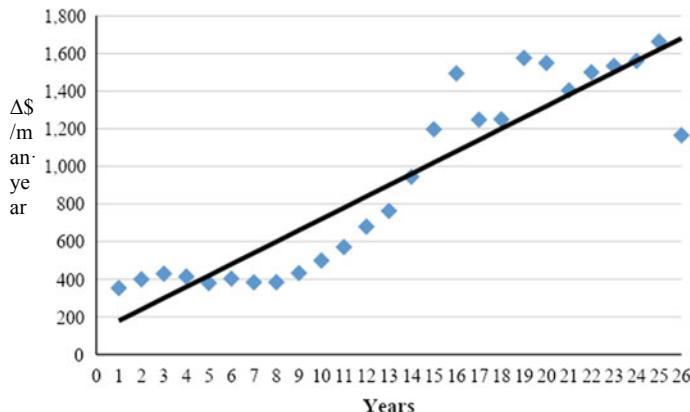


Fig. 87.4 Change in the GDP growth (the jerk for one employed person in the Chinese economy) 1991–2017

The linear dependency of acceleration on the time is characterized by the correlation ratio R . As the information shown in the figures confirms, its value is close to zero. But it means that: the GDP acceleration does not depend on the time. In this case, acceleration is the statistical constant $\Delta \$/\text{man-year}$ [21].

This reference point shows the average acceleration required for the country to develop in order not to increase a gap with advanced countries of the world. But such issue may not be principal for large countries seeking to provide their economic safety. They need to provide for the annual growth of the development rate which is called “a jerk” in kinetics.

It is the only way all countries were able to overcome their technological lagging; these include Japan, South Korea, and China used to develop.

Figure 87.4 shows the dynamics of acceleration of the specific GDP in China. Thus, this is the same dependency as given in Figs. 87.2 and 87.3. However, unlike the situation in the countries of technological leadership, the acceleration (rate of change) of the specific GDP in China grows over time. It means that the country develops with a jerk. Moreover, the dependency is confirmed by a high determination value $R^2 = 0.843$.

As calculations have shown, the meaning of the “jerk” in the Chinese economy does not depend on time nor does the development rate of the developed countries. It means that the jerk in development of the Chinese economy is the macro constant. Point out that it is not for acceleration but for a jerk.

Russia will be able to catch up with the US economy at the GDP level for one employed person approximately within 30–35 years if it provides the jerk in the development amounting to 180 const. international \$ 2011.

87.5 Financial System Resistance to Technological Development

One of the main issues of the economic transfer to the development boosting is the resistance of the existing financial system. It is explained by a range of reasons.

In fact, stimuli for the acceleration of technological development ultimately resulted in the desire of owners to keep and to increase the source of income. But there is always a risk of profit loss as a result of the degraded monetary system (inflation or crisis).

As a result, entrepreneurs are seeking to convert weak national money into a more stable currency. It results in the fall of the national currency rate and the money in the foreign currency outflows from the country. It means that the growth of the annual GDP is only partially used for the growth of the volume of demand and, as a result, the volume of the GDP. Within the limit, if all annual growth of GDP is converted into the currency, the income of the majority of population will stop growing and the social stress will increase.

Moreover, the entrepreneur also has to take into account the risk of the decreased purchasing power of global currencies [22]. For example, experts believe [23] that the financial crisis of 2008 could result in considerably greater losses for the USA and the world than it actually was.

Why does it happen? The monetary system makes crises develop or causes them [22, 23]. But it has not been always a case. At the golden standard application the economy was significantly more stable, money savings of the population and manufacturers were not depreciated, all national currencies were equal.

Nevertheless, the golden standard cannot provide for the need of the economy in money at the intensive technical progress. Gold extraction lags behind the rates of the sales growth. What is to be done?

Since Adam Smith's times economists have been taught that the gold cannot be considered as the cost model. They are also taught that money is the measure of cost. But it is impossible to create many similar cost measures if there is no single model. This is the axiom of the modern metrology.

It means that the weight unit of the gold was the model of the cost. Of course, this was the model with a great error if compared with physical models. Still, it does not change the conclusion: the gold used to be the model.

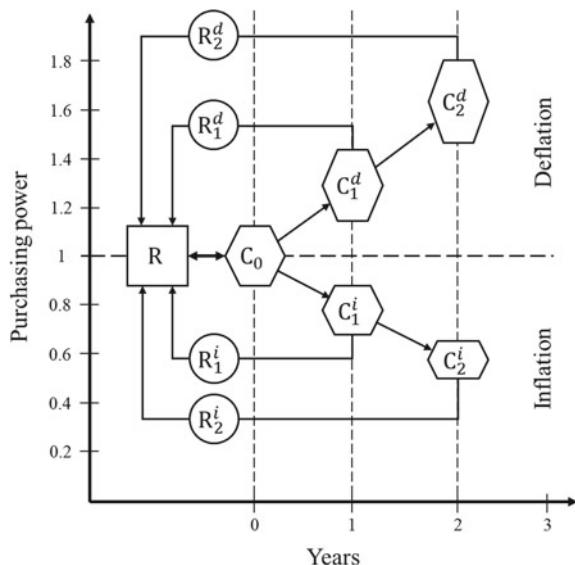
Demonstrate that the issues of the stability of monetary system and, as a result, the economy of savings of the population as well as equality of national currency are solved by creation of the money with a constant purchasing power.

The plan for “the virtual gold” introduction is given on Fig. 87.5.

The letter R indicates the model of purchasing power. Its value is always one. At the moment of the model's emergence, its purchasing power is equal to the purchasing power of the national monetary unit. At this moment, purchasing powers of all monetary units can be expressed by the equation:

$$A_1 = A_2 = A_3 = \dots = A_n = 1 = R \quad (87.7)$$

Fig. 87.5 The diagram of fixation of the constant purchasing power of the model for the cost and evaluation of fiduciary money in the model value



In course of time, the purchasing power of any national monetary unit falls or grows. To preserve it, one needs to know only the scope of the national currency's inflation (deflation).

For example, if annual inflation is 10%, the purchasing power of the monetary unit will be equal to $C_1^i = 1 \cdot 0.9 = 0.9$ of the model value. Then the purchasing power of the model will be $R = 1 : 0.9 = 1.11$ of the purchasing power of the unit of fiduciary monetary units used by the population (Fig. 87.5).

R —cost model—cost measure—unit of the purchasing power.

C_0 —value of the purchasing power of a monetary unit at the moment when the model of the cost is created.

C_1^i —values of the purchasing power of a monetary unit during 10% inflation
 $C_1^i = C_0 \cdot 0.9 = 0.9 \cdot R$.

C_2^i —values of the purchasing power of a monetary unit during 10% inflation for two years $C_2^i = C_0 \cdot 0.9 \cdot 0.9 = 0.81 \cdot R$.

C_1^d —values of the purchasing power of a monetary unit during 10% deflation
 $C_1^d = C_0 \cdot 1.1 = 1.1 \cdot R$.

C_2^d —values of the purchasing power of a monetary unit during 10% deflation for two years $C_2^d = C_0 \cdot 1.1 \cdot 1.1 = 1.23 \cdot R$.

For the second year, with the same value of inflation, the purchasing power of the operating monetary unit shall be equal to $C_2^i = C_0 \cdot 0.9 \cdot 0.9 = 0.81$ from the value of the model. Then the purchasing power of the model expressed in this monetary unit shall be equal to $R = 1 : 0.81 = 1.23$.

Thus, there is an opportunity to express the purchasing power of the model in the value of the operating monetary unit and vice versa any time. All that is left is only to introduce digital money with a constant (model) purchasing power in the existing

monetary system. It will lead to the occurrence of the “virtual gold”-based monetary system. Such a system will have all the advantages of the “golden standard” but having none of its faults.

In case dual currency monetary systems with the “virtual golden standard” come into existence in two countries, the once unthinkable opportunities for productive interaction will be available for us.

87.6 Conclusion

Innovative development management without any human involvement is one of alternatives suggested by the artificial intelligence. The novelty and uniqueness of suggested solutions indeed evoke some caution but seemingly, it's high time such solutions were introduced. It is important that the reviewed methods of innovative development management relate to enterprises, corporations, industries, and the economy as a whole [24].

The successful in some cases, yet mostly unsuccessful, experience of transformation of large economic systems makes one believe that the technology of reformation must take into account the resistance of the backward technological and institutional environment [5, 25]. Technological gap can be closed only in the process of improving both the technical and institutional quality.

The options of the quantitative evaluation of the quality of complex man-machine systems are not easy even to comprehend now. But the results that have already been obtained, the diagnostics of economic crises and dynamic optimization of the technological development process, speak volumes.

The suggested concept of the digital model for the purchasing power has nothing common with either bitcoin-like securities or vulgar searches for the natural model of the purchasing power. Officially, it contradicts with the most popular current concepts of the economic theory that there is no natural model and it is impossible to create the artificial one. However, the fact that it is used as a temporary model of the purchasing power of international dollars proves that the practice is already ahead of the theory.

Changes of the most important business institution—the monetary system—is especially significant for the countries overtaking the leaders. Beyond all question that its implementation is an extremely difficult task. But the solution is to use new digital opportunities to eliminate the non-compliance of this or that institution with the requirements of the time.

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Chapter 88

Criteria for Auditing

Telecommunications Equipment Suppliers



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Abstract This paper considers the theory and practice of devising the criteria for supplier audit. It analyzes the provisions of national and international standards that regulate the principles and criteria of audit, other papers on the topic, and customers' requirements to the quality of the product. This analysis has produced criteria for auditing telecommunications equipment suppliers. The author presents a classification of criteria grouped into six areas of audit that correspond to the most important aspects of a company's production process affecting the quality of the finished product. These include product development, procurement, quality control, infrastructure management, production facility management, and HR management. The paper details upon these criteria and shows what kind of evidence could be collected for such audit.

88.1 Introduction

A company's business depends on the availability of raw materials, products, and services supplied by other companies [1]. Procurement accounts for 40% to 60% of the finished product's costs. This is why choosing the right supplier of material resources is one of the most important tasks of the procurement office. A company must choose the right supplier capable of supplying products in sufficient quantities and of sufficient quality at a reasonable price, and with reasonable service to the specified location within specified deadlines, if the company is to perform.

In today's business, suppliers and customers often become partners whose cooperation can lower the costs and improve the quality [2, 3].

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88.2 Relevance

This paper dwells upon the procurement of telecommunications equipment whose production rates are skyrocketing thanks to technological advancement, upgraded instruments, and novel data communication solutions [4]. All of this is further facilitated by outstanding demand for such products on the part of many industrial companies, carriers, state, and municipal organizations.

Telecommunications equipment is marketed by many international and Russian companies including well-known brands such as D-Link, Cisco, Ericsson, Siemens, Marconi, and Alcatel-Lucent. Choosing a reliable supplier in this diverse market might be challenging.

On the one hand, there are well-established companies that have been in the market for a long time, and time has proven them reliable partners. On the other hand, some companies offer similar products but are largely unknown (yet), and they are trying to lure customers with better pricing and delivery times.

88.3 Problem Statement

Industrial customers have a variety of methods for evaluating real and potential suppliers. The most common methods are: factor ranking; cost evaluation; evaluation of the dominant characteristics; evaluation of the preference categories; etc.

Most methods are based on analyzing the suppliers' performance indicators: the quality of the finished products, the timing and timeliness of delivery, the reliability, the quality of service, the price, the payment conditions, etc. This so-called performance evaluation does not require the supplier's consent [1].

However, long-term and mutually beneficial cooperation requires more than performance scores; it also becomes imperative to know the inner processes of the supplier, i.e., what kind of pipeline results in that performance. To provide such details so as to give insight of production stability and prospects, the supplier may report what technology and infrastructure it has in place, what management systems and software are in use, how many people are employed, etc. This information can be collected by internal audit that the supplier carries out following the customer-provided checklist, or by second-party audit the customer carries out by inspecting the supplier's production sites under a bilateral agreement. Below is an analysis of the aspects the second party should bear in mind to devise audit criteria so as to draw up an effective program, schedule, and checklists for such audit.

88.4 Theory

Audit is a systematic, independent, and documented process of collecting objective data and an objective evaluation thereof to see to which extent the audit criteria are met [5]. Audit criteria are in turn defined as a set of requirements used as reference to compare the audit-collected evidence against.

Second-party audit seeks to make sure the external supplier will keep up, to see whether the supplier is capable of supplying its products in compliance with all of the customer's requirements, and to optimize the terms and conditions of the contract with such supplier.

As for the legal audit regulations, let us highlight standards that describe the requirements to, the principles and the procedures of, management system audit. There are also standards concerned with supplier audit as such.

Thus, ISO 9001, Cl. 8.4 *Control of externally provided processes, products and services* states that an organization needs to define and apply criteria for the evaluation, selection, monitoring the performance of, and re-auditing external suppliers [6]. This requirement is relevant for any customer; however, it is crucial for those companies that have implemented and maintain a quality management system.

Second-party audit standards define the scope of evaluation.

For instance, GOST R 57194.3 [7] specifies the following aspects of evaluation for technological audit of an organizations: strategic planning, personnel training level, availability of resources, use of innovation in the production process ('the process'), the experience of adopting process innovations, product marketing channels, product promotion, and quality assurance. In light of these aspects, the standard specifies audit criteria any organization can choose for its audit purposes.

GOST R 54501 [8] enumerates the following subjects matter that can be audited: incoming quality control; storage of raw and other materials; the condition of production equipment, tooling, tools, and instrumentation; actual implementation of the process; laboratory activities; whether product quality is consistently in line with the regulations.

As part of second-party audits, procurement and quality managers evaluate the technology and facilities available to the suppliers, how the process is set up, and the quality control system [9].

In addition to the audit regulations above, one needs to take into account whether the supplier is a sectoral member, the quality of the products the supplier procures, and the customer's own requirements to optimize the audit criteria.

First, speaking of the telecommunications equipment industry, it is safe to say this industry is on the rise, and the products and solutions it offers are being updated quite frequently. This is why one needs to analyze the technology, the software, the equipment, and the human resources the supplier uses to manufacture better products.

Second, the specifications of telecommunications equipment, whether active or passive, have an important role to play. Active equipment comprises adapters, switches, hubs, routers, and print servers. These devices are involved in transmitting data via a specific channel, for sorting and grouping information, which subjects them

to a high load. Active equipment is able to protect the user's appliances from overloads and prevent its failures, to which end the incoming data is distributed according to how loaded each receiver is. Passive equipment includes sockets, cables and cable trays, patch cords, and connectors. This is networking equipment that creates the physical data transmission route.

Whether active or passive, equipment quality indicators are many [10]: bandwidth, data transmission rate, reliability, safety, material composition and structure, operating conditions, etc. This equipment is expected to help maintain integral, stable, and secure information and communication systems. These characteristics are what development, product, and quality control criteria are based on.

Third, the customer might have its own requirements to the process. These mostly pertain to the quality, pricing, delivery time, product positioning, etc. In this case, the auditing party relies on the criteria that are most relevant to the customer's priorities.

Therefore, the following critical aspects of telecommunications equipment supplier audit can be singled out:

1. Product lifecycle processes: development, procurement, manufacture, and quality control. These processes affect the quality assurance and the cost of products the most.
2. Management processes: infrastructure and production facility management, HR management. These processes are what enables the manufacturer to make products in compliance with the regulations.

88.5 Results

Once the scope and aspects of audit have been defined, the auditor can define the criteria. When devising such criteria, the auditor wants to make sure they will cover the supplier's activities as fully as possible, and the audit-collected information will help improve the supplier's processes, technologies, and products if necessary.

Tables 88.1, 88.2, 88.3, 88.4, 88.5, and 88.6 present supplier audit criteria based on the analyzed national and international standards, research in the area, and the specifics of the telecommunications equipment industry. Evidence to be collected for audit is described for each criterion.

Find the audit aspects and criteria below.

- (1) Product development is an important part of the lifecycle, as it determines the product quality, operating conditions, and control methods.

Evaluation by these criteria informs the customer on the technologies and methods used to develop the product. Compliance with the customer's requirements and regulations is important.

- (2) Procurement is the process of purchasing material resources for production, which directly affects the quality and cost of the finished products.

Table 88.1 Audit criteria for product development

Criterion	Description	Evidence
1.1 Software	The availability and quality of software used for product development	Software licenses Development logs
1.2 Process documentation	The availability and adequacy of process documentation pertaining to product development	Standards Technical regulations Codes
1.3 Equipment testing	The availability and use of a test bench in development	Test bench Test bench guidelines Development logs
1.4 Customer's contract requirements	Describes compliance with the customer's requirements in development	Supply contracts Product specifications Customer requirement analysis reports

Table 88.2 Audit criteria for procurement

Criterion	Description	Evidence
2.1 Procurement regulations	This criterion shows if procurement is carried out under controlled conditions	Process map (process organization standard or regulations) Classification of noncompliance in procurement
2.2 Supplier selection guidelines	This criterion shows if the company has guidelines on supplier selection and the pertaining criteria	Supplier evaluation method Supplier evaluation and selection logs List of approved suppliers
2.3. Supplier audit practices	This criterion shows if the company audits its suppliers	Supplier audit program Validation plans Audit reports List of approved suppliers
2.4. Product regulations	This criterion shows if the company has clearly worded requirements to the quality of products it procures, and whether the suppliers are aware of such	Product requirements Product specifications for procurement

When evaluating procurement, the customer shall be informed of how procurements are made and how suppliers are selected, what kind of relations the company has with its suppliers and what requirements to the products are in place.

- (3) Production is a process that determines the actual product quality as affected by technology, infrastructure, and the production facilities, all regulated by the design documentation [11].

Table 88.3 Audit criteria for production

Criterion	Description	Evidence
3.1 Production chart	This criterion shows how all the operations are regulated and which checkpoints are used in the process	Process map (process organization standard or regulations)
3.2 Process documentation	This criterion shows if all the workstations have the necessary documentation in place, and staff has access to it	Instructions Methods Process flowcharts Internal audit reports
3.3 Process parameters	This criterion shows if there are approved requirements to the process	Process map (process organization standard or regulations)
3.4 Properties of the finished product	This shows if there are established requirements to the quality of the finished products	Lists of finished products with specifications Manufacturing organization standards
3.5 Process or product parameter deviation guidelines for personnel	This criterion shows if there is a Response Plan that guides personnel on how to address deviations in the process parameters or product characteristics, and if this Plan is adequate	Personnel response plan Work logs
3.6 Error prevention system	This criterion shows if there is a process management system	Alarms Blocking Automatic controls Process organization standards
3.7 Statistical control methods	This criterion shows if statistical methods are used in the process	Statistical method guidelines Control maps Quality logs
3.8 Product testing	This criterion shows if there is a test bench used in the production process	Test bench Test bench guidelines Quality logs

Evaluation by these criteria informs the customer on the technology used in production, on how stable the process parameters are, and whether all the agents in the process comply with the technological guidelines.

(4) Quality control: product quality testing

Audit criteria for this aspect are based on GOST R 55753 [12], which formulates the requirements to quality assurance for electronics.

The customer uses these criteria to gain insight of what material resource and finished product quality control methods are used, to see whether the company has enough instrumentation and if the test results are objective.

Table 88.4 Audit criteria for quality control

Criterion	Description	Evidence
4.1 Product quality control planning	This criterion shows if there are plans on all kinds of quality control and approved lists of products subject to such control	Plants for incoming quality control, operational control, and acceptance testing Quality control guidelines Lists of products subject to quality control (controlled parameters and required values)
4.2 Instrumentation	This criterion shows if the company has sufficient instrumentation in place with specified accuracy requirements	Quality control guidelines Verification and/or calibration certificates Instrumentation
4.3 Quality control	This criterion shows if the quality control department has enough specialists, the tests comply with instructions, and there is all the necessary documentation in place; it also indicates the scope and frequency of testing	Quality control guidelines Quality control logs Test protocols Reports
4.4 Control of nonconforming outputs	This criterion shows if there is control of nonconforming outputs in place	Organization standard (process regulations) Nonconforming product handling logs Nonconformance cause analysis (reports)

- (5) Infrastructure and production facility management: a process for equipment, technology, and facility organization and management.

Information gained by auditing on these criteria gives the customer insight of how production and warehousing space is distributed, what are the working conditions on the site, and whether the supplier is capable of manufacturing and storing its products in compliance with applicable technological and sanitary regulations.

- (6) HR management is a complex process that seeks to maximize the daily performance at work by assuring that personnel qualifications, morale, discipline, and productivity are maxed out [13].

HR management evaluation informs the customer whether the supplier has sufficient well-qualified manpower, whether staff is informed of the customers' demands and requirements, and whether continuous training is provided to the staff.

Thus, by auditing using these criteria, the customer can focus on the aspects that pertain directly to the supplier's ability to stably deliver high-quality products.

The following managerial decisions can be made from such analysis: extend the contract, help devise corrective and preventive measures, or find another supplier.

Table 88.5 Audit criteria for infrastructure and production facility management

Criterion	Description	Evidence
5.1 Production and warehouse facilities	This criterion shows if the company has enough production and warehousing space	SNiP (construction standards in Russia) Core and auxiliary facility operation plan
5.2 Production and warehouse facility condition	This criterion shows if products and warehousing processes comply with standards	Technological standards Instructions Internal audit reports Facilities
5.3 Equipment and tooling	This criterion shows if the process uses sufficient equipment and tooling	Instructions Process flowcharts Internal audit reports Equipment
5.4 Equipment condition	This criterion describes the condition of the equipment used in the process	Operating documentation for equipment Work logs Internal audit reports
5.5 Equipment maintenance	This criterion shows if the equipment manuals are complied with	Troubleshooting, maintenance, and repair schedules Troubleshooting, maintenance, and repair logs Operating documentation for equipment
5.6 Workstations	This criterion shows if workstations are set up in compliance with applicable standards	SanPiN (sanitary regulations in Russia) Work logs Internal audit reports

88.6 Conclusions

Audit criteria are based on specific aspects of audit and should be used to find out whether this or that requirement is complied with based on the purposes of such audit.

Second-party audit is an effective customer–supplier interaction tool that reduces procurement-related risks.

For suppliers, such audit is a strong incentive to improve.

It helps cooperate to address nonconformance and attain the required quality that both parties need.

Table 88.6 Audit criteria for HR management

Criterion	Description	Evidence
6.1 Informing the staff on the customers' demands	This criterion shows if the personnel at all levels of management is being informed of what the customer wants or requires	Product requirements Minutes of meetings Work logs
6.2 Manpower involved in production	This criterion shows if the manpower involved in development, production, and quality control suffices	HR structure and staffing Workstations
6.3 Staff competence	This criterion shows if the staff is qualified to work in such production	Qualification files kept at the HR department (sampled for the core processes)
6.4 Staff responsibility for product quality	This criterion shows if responsibility for product quality and outputs is well-distributed between the staff	Organization standards (process regulations) Responsibility and authorization matrices Job instructions
6.5 Staff training system	This criterion shows if there is a staff training system in place	Staff training plan Staff qualifications records

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Chapter 89

Evaluation of Public Satisfaction with the Availability and Quality of Medical Services in Primorsky Krai



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Abstract According to state programs for social development, the health of the population is a priority task for Russian health care. In this report, the problem is discussed of the gap between the declared priorities of the values of health in Russian healthcare and the inaccessibility of quality medical care for the majority of the Russian population. The subject of this research is the quality of medical services in the healthcare sector. The purpose of the study is to examine the opinion of the population regarding the degree of satisfaction with the availability of high-quality medical services in state budgetary organizations of the healthcare system of Primorsky Krai. The hypothesis put forward is that the budgetary organizations of the healthcare system in the region are experiencing serious material and personnel difficulties that affect the quality of medical services provided and the level of public health. The commercialization of medicine and the consolidation of medical enterprises due to the disappearance of district polyclinics and outpatient clinics make medical services inaccessible to a significant portion of the population. The research methodology is based on the sociological survey method to identify the public's assessment of the government's observance of citizens' rights to accessible quality medical care. The reliability of the results is checked by mathematical analysis. The scientific novelty and significance of the work is defined by its contribution to regional studies of the healthcare system. The practical significance of the work consists in developing part of the overall picture of the state of health care in Primorsky Krai and identifying the actual public opinion of the population regarding the availability of medical services.

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89.1 Introduction

In the Russian Federation, the availability and quality of medical care for the population are invariably declared as the most important priorities of state policy in the field of public health protection. In the past few years, the government has undertaken a set of measures designed to implement these priorities. Since 2011, all constituent entities of the Russian Federation have been implementing healthcare modernization programs, including large-scale outfitting of hospitals and polyclinics with medical equipment. The implementation of these programs should increase the availability of diagnostic tests for the population and contribute to an increase in the quality of medical care through the introduction of new medical technologies.

Since 2013, a state program for the development of health care has been implemented, which includes, in addition to new investments, a large-scale expansion of preventive measures, among which is a leading role being assigned to the prophylactic medical examination of the population [1].

All constituent entities of the Russian Federation are implementing action plans (roadmaps) aimed at improving the efficiency of health care, including restructuring organizations that provide medical care, reducing excess bed capacity and moving part of the volume of medical care provided in hospitals to the outpatient level, in addition to routing patient flows, increasing salaries of medical workers, and introducing new biomedical technologies. These activities should also contribute to improving the quality of medical care [2–6]. Do these various activities have a real effect? In this report, we will try to answer this question.

89.2 Theoretical Part

Public assessments of the quality and availability of medical care are important indicators of the effectiveness of government measures in the field of health care. The World Health Organization defines access to health care as “the timely use of personal health care to achieve the best possible health outcomes” [7], p. 7. Eliciting such assessments is the purpose of the monitoring carried out annually by order of the Ministry of Health in budgetary outpatient and inpatient organizations. Surveys of the populations in each constituent entity of the Russian Federation are conducted based on criteria developed in accordance with decrees, federal laws, and standards of treatment [8, 9] on the website of the Russian Ministry of Health. They are conducted through a unified questionnaire, which makes it possible to design a system of indicators showing satisfaction with the availability and quality of medical research, which differs from region to region. The consolidated results of monitoring are presented on the website of the RF Ministry of Health [10].

Independent private studies are aimed at analyzing the dynamics of general assessments of the population’s satisfaction with the overall health situation and the quality

of medical care, as well as comparing the indicators of various territorial entities and medical organizations [11–16].

The study of such differences in assessments by various socio-demographic groups is widespread [17–21]. Another subject of research is the differences in the assessments of satisfaction with the quality of care in public and private medical institutions.

In spite of the complexity and variety of structural ambiguity in the satisfaction indicator of health care, researchers developed certain approaches to the methodological resolution of these issues, which the authors have used in this work.

89.3 Statement of Tasks and Research Methods

Using these indicators as a basis, the authors of this article carried out their own research “Satisfaction of the population with the medical services provided in outpatient facilities of the health care system in Primorsky Krai.”

The purpose of the study was to analyze the population’s assessed satisfaction with the quality and availability of medical care in the outpatient-polyclinic component of budgetary healthcare organizations in Vladivostok and Artyom cities.

Achieving the intended goal includes resolution of the following issues:

1. Determining the population’s general assessment of the state of the healthcare system and the possibility of receiving quality medical care.
2. Determining the attitude of the public toward the introduction of new information technologies for making appointments with doctors.
3. Analyzing the level of public satisfaction with the quality of medical care.

The goal has been achieved through sample research. The research method was a public survey carried out in 2019–20.

The subjects of the study were patients of the cities’ polyclinics. Development of the aggregate sample was carried out through the sociological survey among people using the services of various clinics in Vladivostok and Artyom cities. The sample size is 510 people.

The survey involved 242 women (52%) and 224 men (48%). A random sample was used, comprised of five groups of respondents. The first group—respondents aged 18 to 30 (48 people), the second group—respondents from 31 to 45 years old (154 people), the third group—respondents aged 46 to 55 years (118 people), the fourth group—respondents aged 56 to 65 (102 people), the fifth group—respondents aged over 65 (88 people).

89.4 Results of Empirical Research

The questionnaire consisted of 20 closed and semi-closed questions. Processing the questionnaires revealed the following respondent perspectives:

Of those surveyed, 17% of the respondents consider themselves to be essentially healthy, but for the sake of prevention or at the request of their employer or for other reasons they call upon doctors. All respondents over 65 consider themselves to be chronically ill; some of the respondents from the third group and all respondents from the fourth group (24%) consider themselves chronically ill.

The question about the frequency of visits to the polyclinic showed a general average of half-year intervals, although people of the fourth and partially the third group visit the polyclinic every three months on average.

When contacting state-owned outpatient clinics in the service area, 92% of respondents noted that they faced various difficulties.

The majority of the surveyed citizens (80.3%) experienced difficulties with the availability of visits to general practitioners and specialists. 33.5% of respondents said that they had waited more than a week to visit a specialist; 21.1% had waited about a month for an appointment; more than a month—6%; about the same number of respondents—4.3%—got an appointment with the necessary specialist within 3–4 days; 15.4% were unable to get specialized help at the place of their polyclinic; 19.7% did not use this service.

According to respondents, the key problems of access to doctors' visits are the long waiting time from the day of contacting the polyclinic to the day of the appointment (69.7%) and the insufficient staffing of polyclinics with doctors (65.9%).

In second place in terms of importance to the respondents is the problem of the availability of clinical and diagnostic measures (71%). 32.4% of respondents noted that they experienced difficulties due to the long waiting time from the day of contacting the clinic until the day of the scheduled clinical and diagnostic laboratory tests. These are mainly respondents aged 46 to 65. This indicator is of the least significance for young people who are healthy and do not seek diagnostic procedures. This same group generally does not use the services of narrowly focused specialists. The average waiting time for clinical and diagnostic measures is 8–9 days, and the average time for completing analysis to obtain the results of those studies is 2–3 days.

The low level of technical equipment at medical institutions was indicated by 40.6% of respondents.

Further, in terms of importance, the answers of survey participants were distributed as follows: In third place, respondents noted long wait times at the clinic's registration (57.8%), in fourth—the need to pay for examination and treatment (41.5%), fifth—the lack of choice of a doctor, medical institution (31.7%), sixth—poor quality of doctors' performance (19.6), seventh—ill will or carelessness of medical personnel (16.1%).

Satisfaction with medical care and encounter with a doctor was assessed by respondents on a 5-point scale, where 1 is extremely poor and 5 is excellent. The distribution of answers is shown in Table 89.1.

Table 89.1 Scale of satisfaction with medical care, encounter with doctor

Answers	Points				
	1 Extremely bad	2 Poor	3 Satisfactory	4 Good	5 Excellent
Politeness and attentiveness of the doctor	0	41.1	43.2	15.7	0
Nurses' courtesy and attentiveness	0.0	14.9	71.4	13.7	0.0
Explanation by the doctor of prescribed studies, the studies performed and the prescribed treatment	0.0	4.3	86.2	9.5	0.0
The doctor's identification of changes in the state of health, taking into account the patient's complaints of pain, malaise and other sensations	0.0	6.6	72.5	19.5	1.4

On the question of satisfaction with the results of medical care, respondent opinions divided into the following answers: yes completely—4.0%, more yes than no—70.7%, more no than yes—23.0%, not satisfied—2.3%.

In budgetary organizations where free services are supposed to be provided, 62% of the respondents nevertheless had to pay for various types of medical care and diagnostics; 29.7% (people over 65 and youth from the group under 24) refused to pay for such services, and 13.3% did not apply for those services.

The use of paid services was due to a number of reasons, among them: Respondents of working age prefer to pay for services rather than sit in queues—35%; believe that paid services are higher quality—8.5%; believe that paid services offer greater comfort to the patient—20%. The experience of the majority of respondents (53.7%) has suggested to them that it is practically impossible to get necessary medical service free of charge.

To be sure, the itemized answers to the questionnaire reveal respondents' dissatisfaction with the quality and availability of medical services. The following answers were received to a direct question about what did not satisfy the respondents in polyclinics (Fig. 9): low qualification of doctors—41.7%; low qualification of nurses—25.1%; low quality of diagnostic tests—24%; insufficient attention from medical personnel—69.1%; the duration of waiting for medical assistance—35.4%; the cost of medical services—61.1%.

These results indicate that when applying to state outpatient and polyclinic institutions in the districts of service by place of residence, an absolute majority of respondents note limited options for obtaining medical care.

In general, patient satisfaction with the quality of outpatient services is very low. An analysis of the data of the sociological survey of the population using the example of clinics in the city of Vladivostok showed a low level of public satisfaction with

polyclinic services. A particularly important result of these studies was to draw attention to the shortcomings in how the work of health institutions is organized.

89.5 Checking the Confidence Level of Results

Verification of the scientific validity of the results of this mode of study was performed using the χ^2 criterion [22]. To test the level of satisfaction of the population with the quality and availability of medical care in the outpatient-polyclinic sector of budgetary healthcare organizations in Vladivostok, we put forward two hypotheses—the fundamental hypothesis H_0 , which is that the level of public satisfaction with the organization of work in clinics of Vladivostok, as well as the qualifications of doctors and medical staff, is low. An alternative hypothesis H_1 comes down to the assumption that the level of public satisfaction with how the work of the clinics in Vladivostok is organized, as well as the qualifications of doctors and medical personnel, is high. The basic hypothesis was tested in MS Excel using the χ^2 test.

Table 89.2 shows the frequency of the results of the survey of the population using the services of various clinics in Vladivostok and Artyom. There were 20 questions in the survey, so the figure shows 20 frequencies. The column “observed frequencies” presents the quantitative results of low satisfaction of the population with the organization of work of the clinics in Vladivostok and Artyom, as well as with the qualifications of doctors and medical staff. Thus, it is necessary to check if the observed frequencies fit within the naturally random deviations from the expected frequencies if the level of satisfaction of the population is low.

For a visual representation of the data, a diagram was constructed on which the expected frequency, which is the same for each category of question and is represented by a solid line, is shown; the actual frequencies are presented in the form of a histogram (Fig. 89.1).

In order to draw the statistical conclusion to reject or not reject a hypothesis for goodness-of-fit of the frequency ratio, it is necessary to find the limit. Knowing the distribution of the criterion when H_0 is valid, one can find its limit, i.e., the critical level that will separate rare values. Rare values for a single study are unlikely; therefore, if an actual criterion falls into the critical zone, in the zone of rare events, then base data contradicts H_0 and the null hypothesis is rejected; otherwise, it is not rejected. Criterion $\chi^2 = 18.69$ and has a degrees of freedom parameter of 19. It is necessary to find the limit (level of significance) up to which the calculated value of the criterion still fits into random fluctuations, i.e., where H_0 does not deviate and which indicates either the onset of a very rare event or that the frequencies are not correlated and have a different nature of origin, in which case H_0 should be rejected. To specify the significance level that determines the critical point beyond which the area of rejection of the null hypothesis begins, the function = CHI².OBR.PH [22] was used.

Accordingly, an exact value of 30.14 for the critical level was obtained. The observed value turned out to be less than the critical value, $18.69 < 30.14$, so the value

Table 89.2 Results of survey of the population using the services of various clinics in Vladivostok and Artyom

Number of questions	Frequency		Measure of Pearson's deviation
	Observed	Expected	
1	20	16.25	0.865384615
2	22	16.25	2.034615385
3	12	16.25	1.111538462
4	15	16.25	0.096153846
5	16	16.25	0.003846154
6	10	16.25	2.403846154
7	18	16.25	0.188461538
8	18	16.25	0.188461538
9	20	16.25	0.865384615
10	22	16.25	2.034615385
11	11	16.25	1.696153846
12	15	16.25	0.096153846
13	20	16.25	0.865384615
14	20	16.25	0.865384615
15	10	16.25	2.403846154
16	18	16.25	0.188461538
17	19	16.25	0.465384615
18	12	16.25	1.111538462
19	12	16.25	1.111538462
20	15	16.25	0.096153846
Totals	325		18.69230769

does not fall into the critical region. Thus, the probability of obtaining a value of 18.69, or an even higher value of the criterion, is greater than the established significance level of 5%, i.e., the null hypothesis is not rejected. For the reliability of the results, we calculated the probability of p-value using the function = CHI².DIST.RT since the p-value turned out to be greater than the established significance level of 0.05, the null hypothesis is not rejected, $0.48 > 0.05$. In summary, the null hypothesis is tested; observed and expected frequencies are consistent. Based on the results of the calculations, the null hypothesis was not rejected.

89.6 Discussion of Results

Based on the data obtained, brief recommendations are proposed for the administrative staff of the healthcare system in Primorsky Krai to increase public satisfaction with medical services:

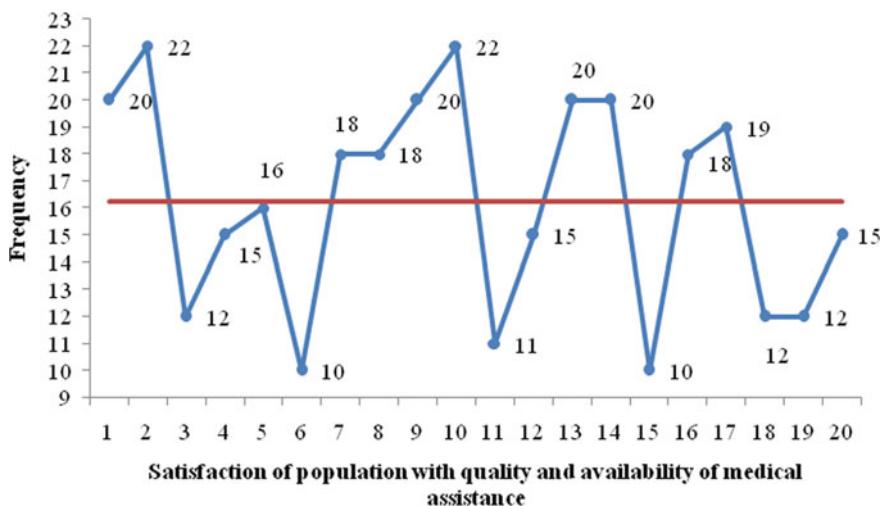


Fig. 89.1 Results of a survey of the population using the services of various clinics in Vladivostok and Artyom in the observed and expected frequencies

- (1) systematize the procedures for making an appointment with a doctor in a polyclinic in order to reduce wait time and eliminate queues;
- (2) improve the everyday amenities in outpatient departments;
- (3) systematically load the websites of medical institutions with relevant information;
- (4) look for new ways of working with the electronic registry to coordinate agreement of doctor appointment times;
- (5) create emergency rooms in polyclinics, since the waiting time for a doctor's appointment or consultation is often associated with the so-called priority of admission of patients with acute pain;
- (6) intensify work with doctors, nurses, and junior medical personnel on medical ethics and deontology;
- (7) conduct a large-scale project to study the determinants of satisfaction, which will make it possible to more competently interpret the results of measuring satisfaction with the quality of medical care.

89.7 Conclusions

The results of this work show that the component of satisfaction associated with the current availability of quality medicine consists of two indicators: the application of standards for the provision of medical care and the compliance of its provision with quality criteria. In both areas, many questions constantly arise that are related to the lack of precise definitions of “quality of medical services” and “quality of medical care.” Criteria proposed by legislation, instructions, and regulations of the

healthcare system are often contradictory and therefore do not give an objective picture of satisfaction with health care.

Empirical study, confirmed by mathematical calculations, showed low public satisfaction with the organization of work in Vladivostok polyclinics, the qualifications of doctors and medical personnel, and the increasing commercialization of medical services. Based on the surveys, it was revealed that the greatest dissatisfaction of the population is caused by such indicators as dissatisfaction with organizational measures in medical institutions, long wait times for a specialist, shortage of medical personnel, and weak material and technical base of the organizations.

A focus on improving the consumer-related quality of services provided and managing consumer demand will largely determine the health of the population and the credibility of healthcare institutions, as well as their economic well-being and the further increase in the competitive advantages of those organizations.

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Chapter 90

Differences in the Economic Development of Civilizations from the Middle of the Twentieth Century



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Abstract This article deals with the study of the economic development of the main civilizations of the world since 1930 in terms of growth and risks. We used the root-mean-square deviation of the annual expansion rates of real GDP as a means of measuring the development risk. We suggested a definition of balanced development and determined its conservative and aggressive policies that demonstrate the minimum risks and maximum growth. We analyzed the development level of 62 countries over the last 10 global economy development cycles. For each period, we identified balanced development models. Balanced development cases were identified by groups, and their models were described as the most authentic for the respective cultures. The existence of a large economic cycle of 1930–1992 was proved. We determined that the next large economy cycle also began from the domination of the socialist institution development model. None of the civilizations featured market models of aggressive balanced development. We came to the following conclusions: institutions that facilitate balanced development vary across different civilization; culture is a criterion determining the selection of the most authentic institutional development model; the institutions of the global West are only successful if other countries use the institutional models that are not authentic for their cultures.

90.1 Introduction

This research work tackles the following **problem**: are there any features of economic development that are determined by the associated civilization? If yes, what are they?

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90.2 Relevance

This problem is ***relevant*** because it is necessary to obtain verified evidence of the existence of the multipolar world. If there is no such evidence, then the development model built around the global West is the only possible option, and the current global conflicts are not the tools facilitating the authentic development of large groups of people but rather just competition of essentially similar organizations for resources and products.

The subject-matter of this research is the main contemporary human civilizations.

90.2.1 *Scientific Merit of the Problem, Short Literature Review*

The literature features various views of civilizations (see Table 90.1).

Table 90.1 Civilization criteria

Author	Civilization criteria
Danilevskiy [1]	Similar mentality, common spiritual values, and ideals
Spengler [2]	social and economic conditions of people's lives; the aggregate of spiritual, ethnic, and religious bases of society; specific historical period
Toynbee [3]	Religion and its organization form; territorial parameter, the remoteness from the place where the given society appeared
Gumilev [4]	Historical destiny, traditions, culture, everyday practices, the unity of territory and language
Huntington [5]	Language, history, religion, customs, social institutions, subjective self-identity of people
Yakovets and Akayev [6]	Innovative technologies
Ageyev [7, 8]	Common values, historical destiny
Trofimova [9]	Development level, common territory, dominating mentality features
Savylyev [10–15]	Social values, institutions authentic to the culture Traditional management technologies (economic management)
Civilization criteria summary	Time (history, destiny, period) Space (territory, landscape) Culture (language, religion, values, ideals) Customs (mentality, identity, traditions, routine practices) Institutions (religious organizations, social institutions) Social and economic conditions (landscape, development level, innovation, and management technology)

90.3 Statement of Problem

To solve the problem of determining the social and economic features of civilizations, we tried to identify differences in the social and economic development of communities within a limited historical period, i.e., we tried to identify these communities in the context of their social and economic destiny. If significant differences are found, it will prove the necessity of promoting specific civilization development institutions rooted in the respective cultures, traditions, and mentalities.

To address this problem, we will *focus on* the economic development of countries that are conventionally associated with the main modern civilizations since the mid-XXth century.

Research goal: determining the features of the economic development of contemporary civilizations.

90.3.1 *Scientific Merit of the Problem, Short Literature Review*

Today's economic theory lacks a universally accepted definition of 'economic development'. The literature features various interpretations of this notion (see Table 90.2).

90.4 Theory

According to the systemic approach, any system is manageable (it is possible to achieve its goal state), sustainable (it can maintain its state under negative impacts), structure (comprises a set of elements), and integrity (the type of links between the elements). The first two parameters deal with external communications, and the other two—with the internal structure of the system. In economics, these parameters are usually referred to as efficiency, risk, integrity, and coordination.

Of the four economic development types, sustainability receives the least attention from researchers (see Table 90.2). The Marxist parameter of institutional development stands for the identification of controversies between the institutional and production elements of the economic system to relieve these controversies by changing institutional elements in the context of changing social and economic paradigms during revolutions, i.e., the sustainable and non-sustainable development are only discerned qualitatively. Unlike the efficient development, the features of sustainable development are virtually not studied.

The studies of microeconomic systems show a different picture. Many indicators characterize a company's ability to maintain its state if adverse situations arise: liquidity, solvency, financial resilience in fundamental analysis, and risk indicators

Table 90.2 Approaches to defining ‘economic development’

Author	Economic development parameters
Smith [16]	Competition, efficient use of resources, labor productivity increase
Marx and Engels [17]	The change of social and economic paradigms: institutional development, redistribution institutions first of all
Rostow [18]	Economic growth
Schumpeter [19]	Resource release to facilitate their more efficient use (creative destruction)
Mürdal [20]	Satisfaction of needs
Akoff [21]	Changes in production, exchange, and consumption
Bulatov et al. [22]	Economic growth, structural changes, reduction of inequalities, quality of life improvement
Todaro [23]	Satisfaction of needs, economic growth
Charikova [24]	Economic growth, welfare gain (the increase in production and consumption wealth)
Tamashevich [25]	The increase in average per capita income, indeterminate effects (social, demographic, and environmental)
Economic development parameter summary	Efficiency: efficient use of resources, labor productivity increase, economic growth, per capita income increase, welfare gain (production and consumption wealth increase); Sustainability: institutional development; Integrity: competition, resource release for their more efficient use, structural changes; Coordination: satisfaction of needs, quality of life improvement, reduction of inequalities, environmental conditions

in technical analysis. To assess sustainability, we used the root-mean-square deviation of profitability over the period in question, which is a risk management assessment method widely used in technical analysis. We used this figure across the real GDP growth rates of the countries in question.

For the purposes of this research, we decided to primarily focus on the parameters of efficient and sustainable development. The parameters of integrated and coordinated development shall be reviewed in the future. This is mostly due to the more complicated collection, processing, and comparison procedures for international empirical data characterizing structures and coordination. Among the economic development parameters, we selected the economic growth and its sustainability as those characterizing efficiency and sustainability of the real GDP increase rates and its root-mean-square deviation.

Within the scope of this research, we understand balanced development policy as a combination of risk and growth indicators that allows for either the lack of reduced development risks at a constant growth rate or the lack of higher growth rates at a constant risk level among the countries in question. The points of balanced policy in the growth and risk chart are located along the right bottom edge of the actual value area (see Figs. 90.1, 90.2, 90.3, 90.4 and 90.5). If the risks are at the minimum, the policy is conservative, if the growth is at its maximum, the policy is aggressive. These are represented by the bottom and the top edges of the balanced policy line, respectively.

90.5 Statement of Problem

The research sampling includes economic growth data about 62 countries representing the world's main cultures for the period between 1951 and 2019. For some countries (Europe, America, southern and eastern Asia, 35 countries in total), the data since 1930 were analyzed. The data were obtained from Angus Maddison Historical Statistics, Total economy database, WorldBank [26–28]. The first source is the largest database on the real GDP up to 2008, and it was used as the main source for the research. The data for the last ten years and the data on some of the USSR republics were retrieved from the second source. The data from these sources are the same for most countries. The rare exceptions include, for instance, the data on China for 1951–1958 where the average annual growth rates amounted to 11.2% in the second source (according to the official statistics), and 7.9% in the first source. The data from the third source differ significantly from the first two because these are not research data. They were obtained from a financial organization and adjusted for conservative purposes. They feature growth rates that are on average 1% lower than those in the first two sources. This source was only used from 2009 to 2018 and for the countries that were not represented in the second source (Chad, Cuba, global figures). The third source was also used to analyze the period of 1992–2018 as a whole. It is presented in Figs. 90.6 and 90.7 to facilitate the data comparison for all of the countries in question over this period.

Due to the lack of data for all of the years in question in the databases used, the growth rates were occasionally linearized either in the sources or by us based on data from the nearest years available. These data reduce the estimated risk values to the actual achievable minimum. All of these cases are commented on in the research.

In this research, we analyzed 10 periods that generally coincide with global economic cycles: 1930–38, 1939–47, 1948–58, 1959–67, 1968–75, 1976–82, 1983–91, 1992–1998, 1999–2009, 2010–2019. Apart from these periods, we made some generalizations for longer periods: 1930–1991, 1930–1958, 1945–1991, 1951–2019, 1959–1991, 1992–2018.

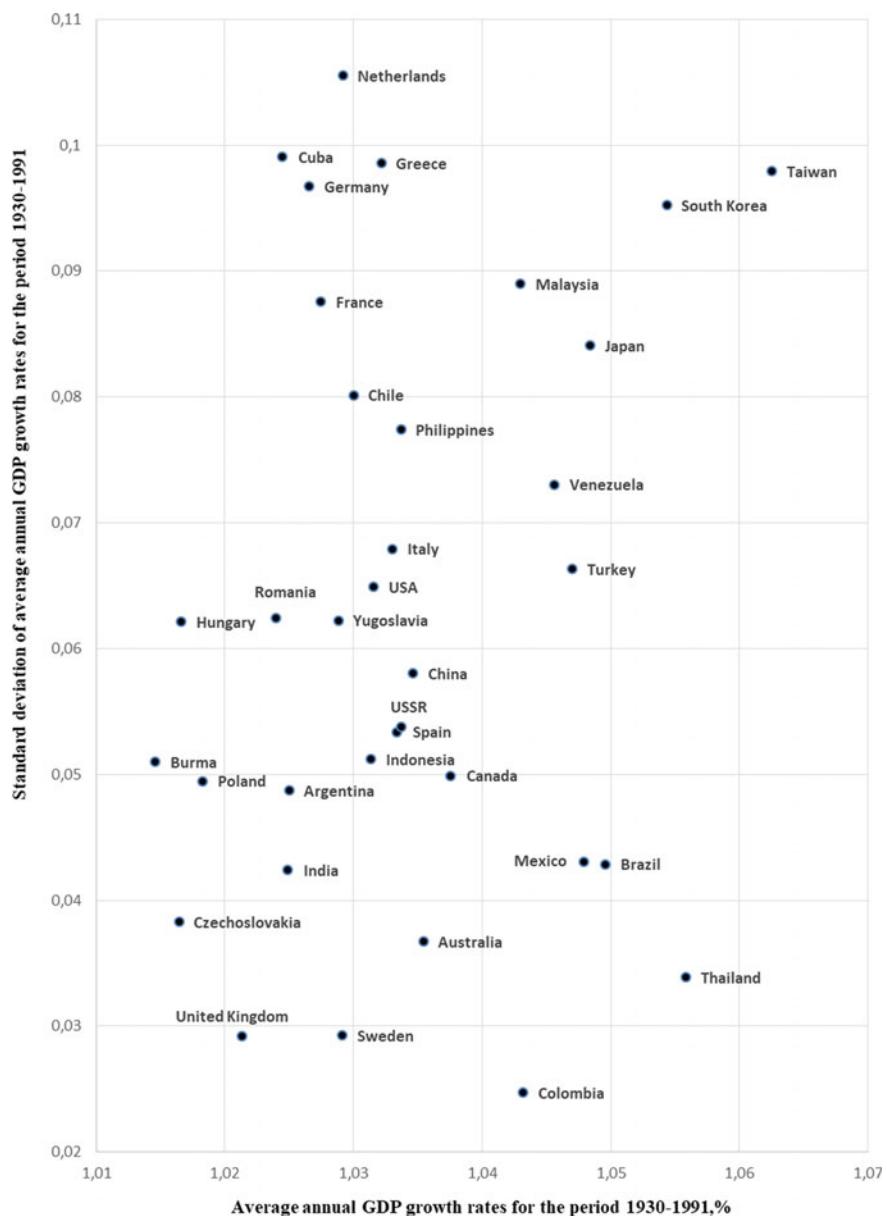


Fig. 90.1 The economic development of the countries of the world in the period 1930–1991

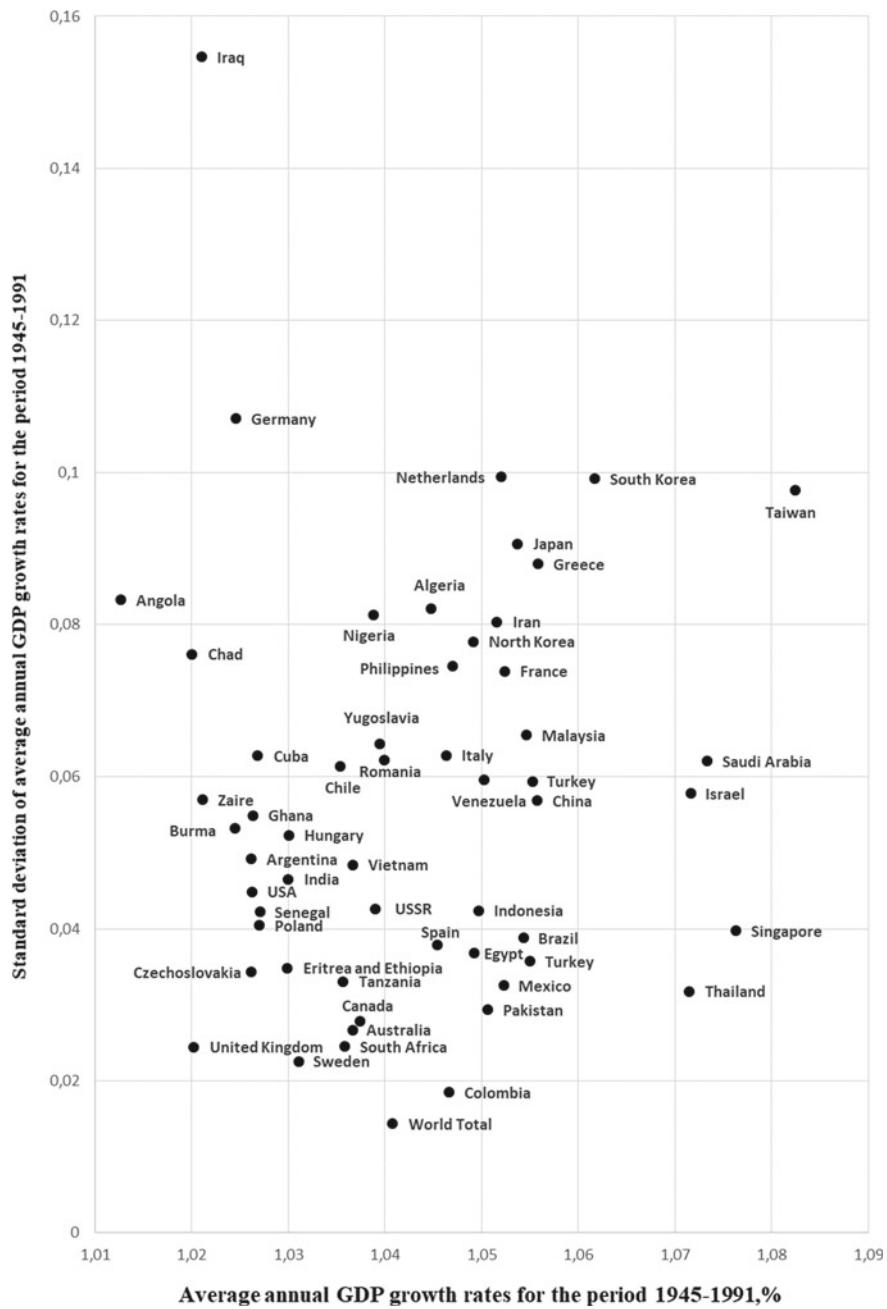


Fig. 90.2 The economic development of the countries of the world in the period 1945–1991

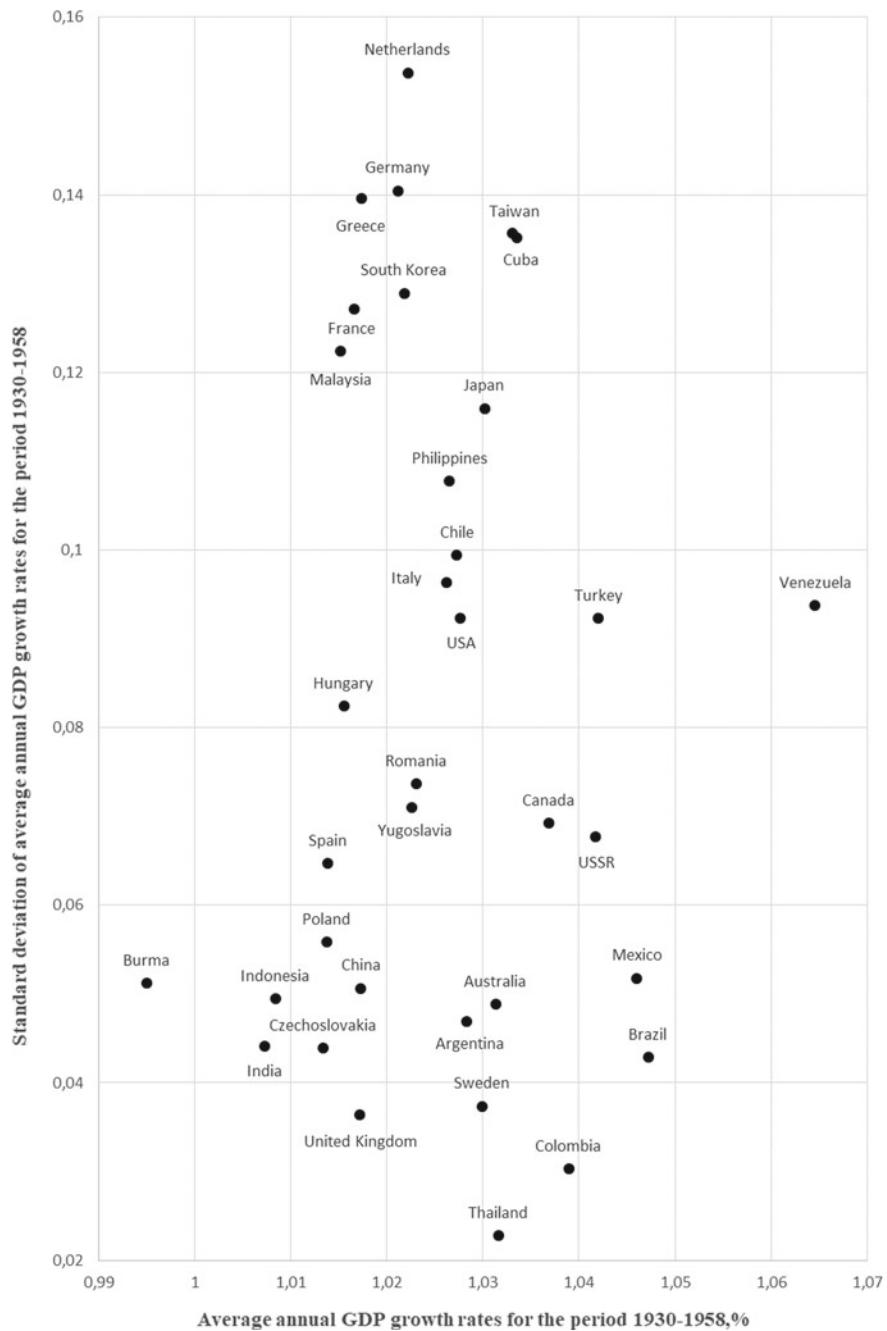


Fig. 90.3 The economic development of the countries of the world in the period 1930–1958

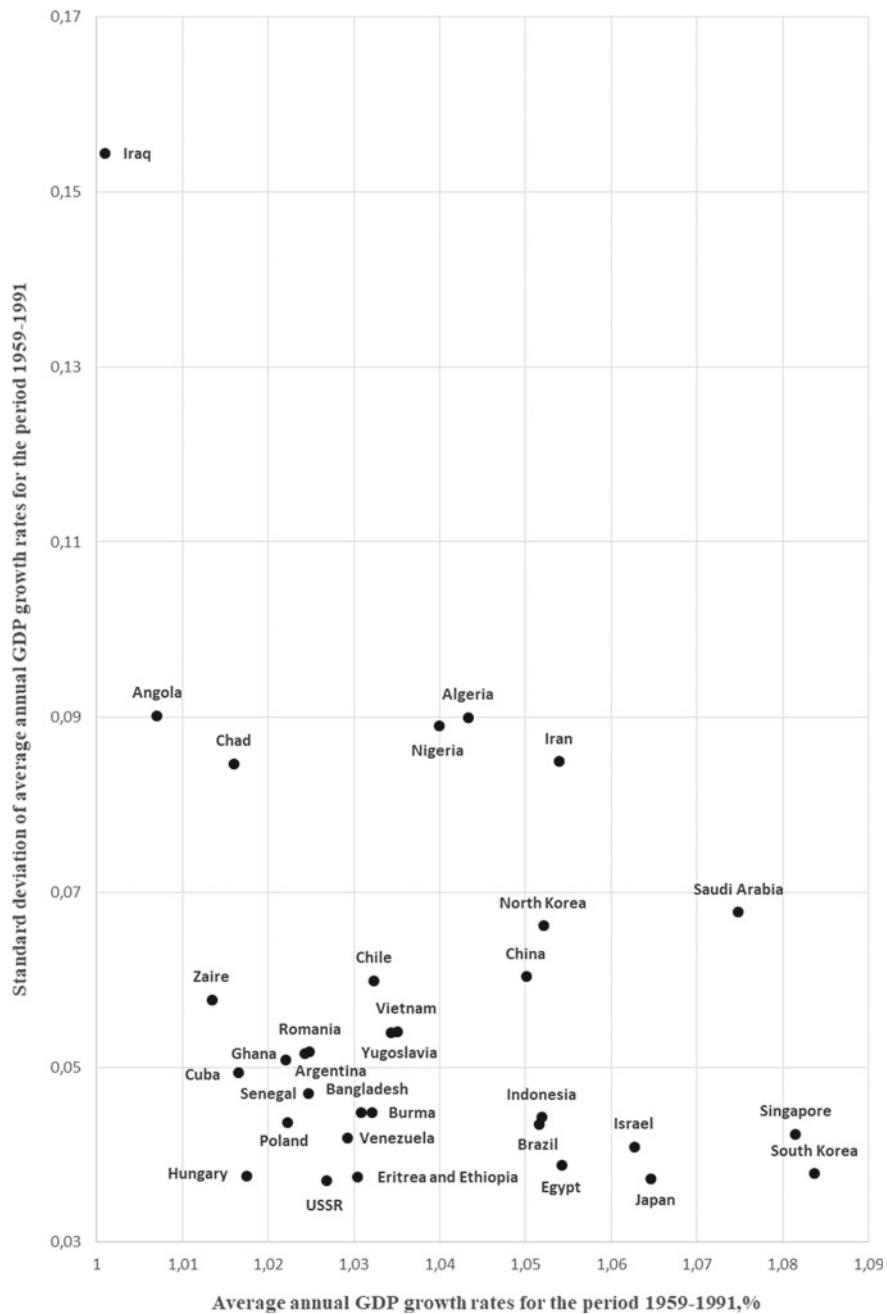


Fig. 90.4 The economic development of the countries of the world in the period 1959–1991 (Part 1)

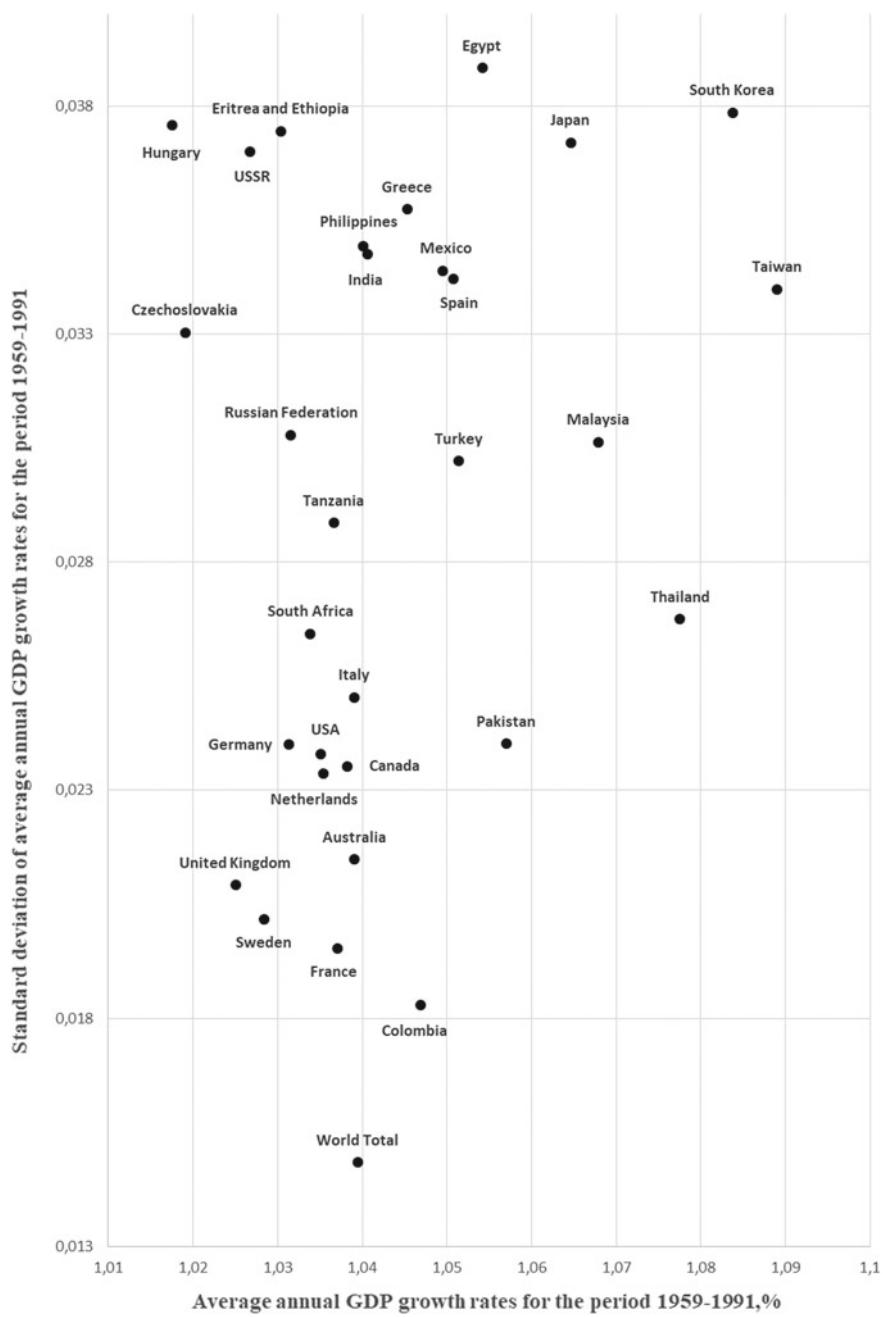


Fig. 90.5 The economic development of the countries of the world in the period 1959–1991 (Part 2)

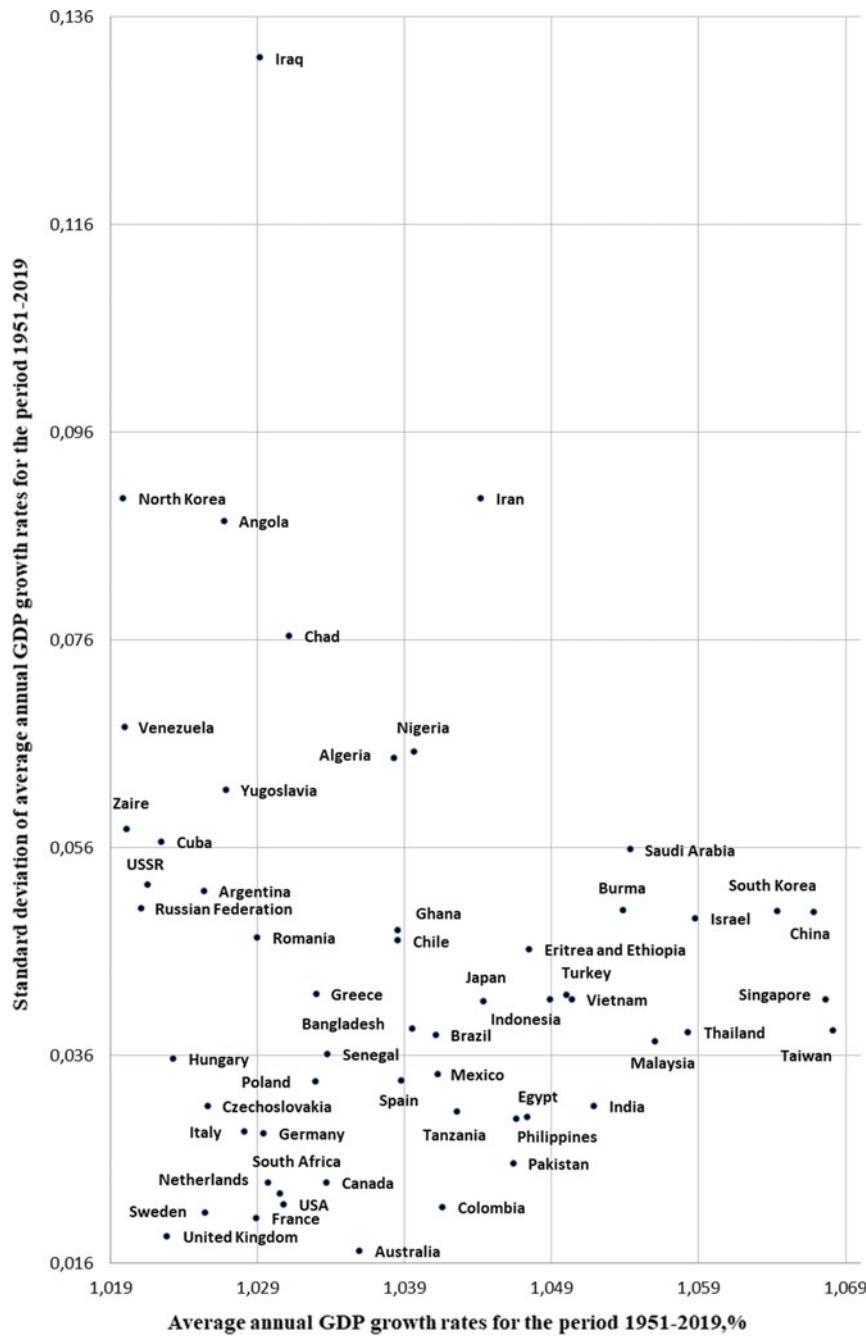


Fig. 90.6 The economic development of the countries of the world in the period 1951–2019

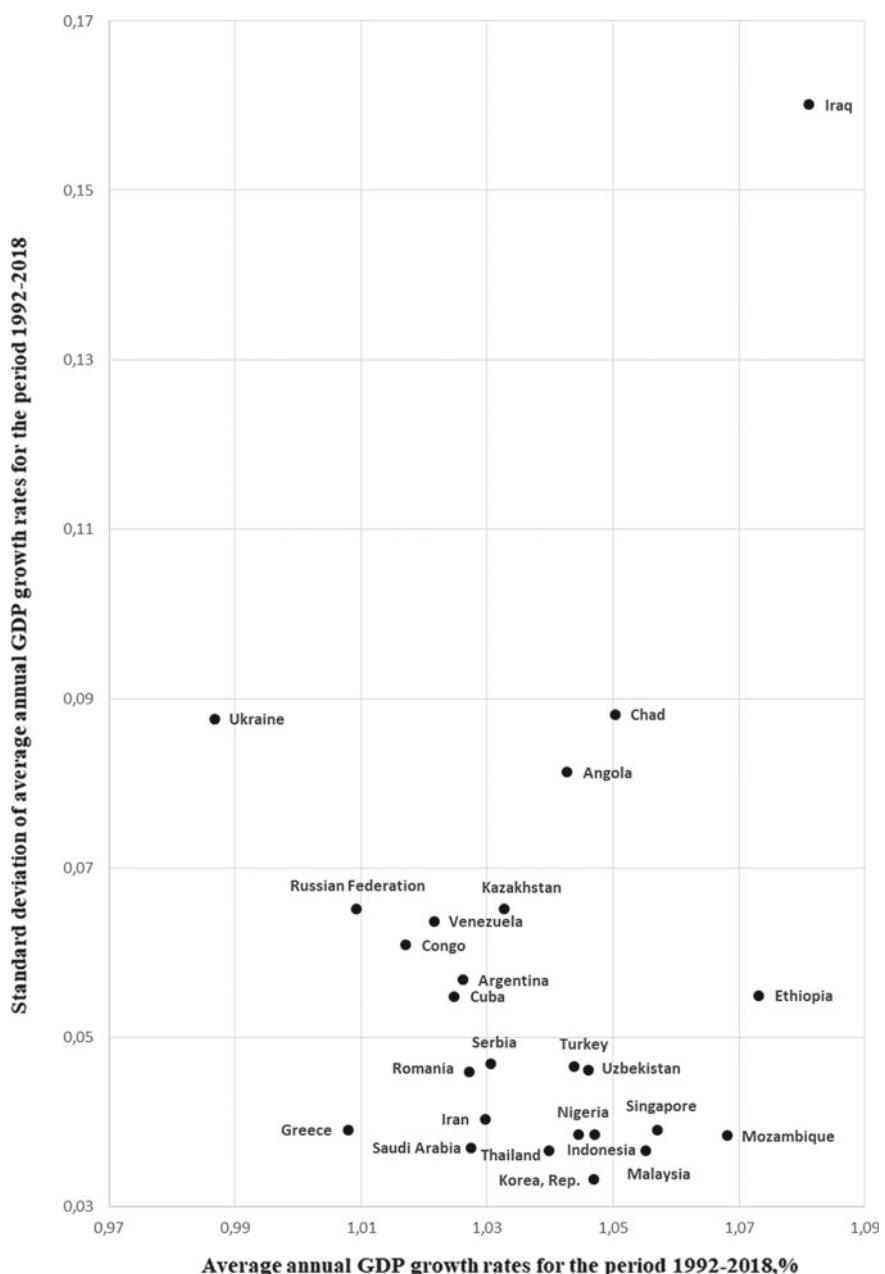


Fig. 90.7 The economic development of the countries of the world in the period 1992–2018 (Part 1)

90.6 Results

Development period analysis 1930–1938.

The most dynamic economy of this period was the USSR. It featured newly launched planned economy institutions and focused on the increase of labor productivity and internal development resources. Turkey was developing a little slower and with higher risks. Taiwan and South Korea were developing rapidly due to the colonial policy of Japan that relocated its manufacturers away from the metropolis. The actual risks in Burma and Thailand were significantly higher because of the growth rate linearization due to the incomplete annual data. Apart from the USSR, Sweden and the British Empire (India and the UK) also featured a balanced development policy with average and minimum growth, i.e., conservative development policies. The highest risks and minimum growth rates were observed in Cuba (maximum risks), Spain (largest drop), and the USA (significant risks and moderate drop) (see Fig. 90.7).

1939–1947

The free economic resources of the countries of North America and the Caribbean were loaded with military contracts and were not hit by war. They featured an aggressive balanced development policy. Balanced conservative policies were observed in the countries that were not affected by war efforts. The risk values for Eastern Europe, USSR, China, and South-East Asia were underrated due to data linearization. The countries where the world war activities ended or civil wars ensued (China, Greece) demonstrated the worst figures (see Fig. 90.8).

1948–1958

The highest growth rates were typical of the countries that suffered the most damages during the war. They can be classified into two groups: the countries of Western Europe and Eastern Asia that received aid from the USA, and the socialist countries. The countries that preserved balanced policies include Taiwan (PRC as well, according to the official data), Germany, the Philippines, Japan, and Italy, i.e., the countries that lost the war and began recovering later than the other ones. The second line of the balanced development policies includes socialist countries (Romania and the USSR featured aggressive policies), Latin American countries (Venezuela, Mexico, Brazil, and Colombia features moderate policies), and Western European countries (Sweden—conservative policy) (see Fig. 90.9).

1959–1967

The highest growth rates in this period are typical of export-oriented economies: Japan and Taiwan exported consumer goods, Thailand and Greece engaged in tourism, and Saudi Arabia and Iran traded energy resources. These countries have aggressive balanced development policies. The data on the USSR and RSFSR retrieved from Angus Maddison Historical Statistics and Total economy database respectively [26–28] have significant differences. This might be due to the different methods of researching planned socialist economies employed by the developer

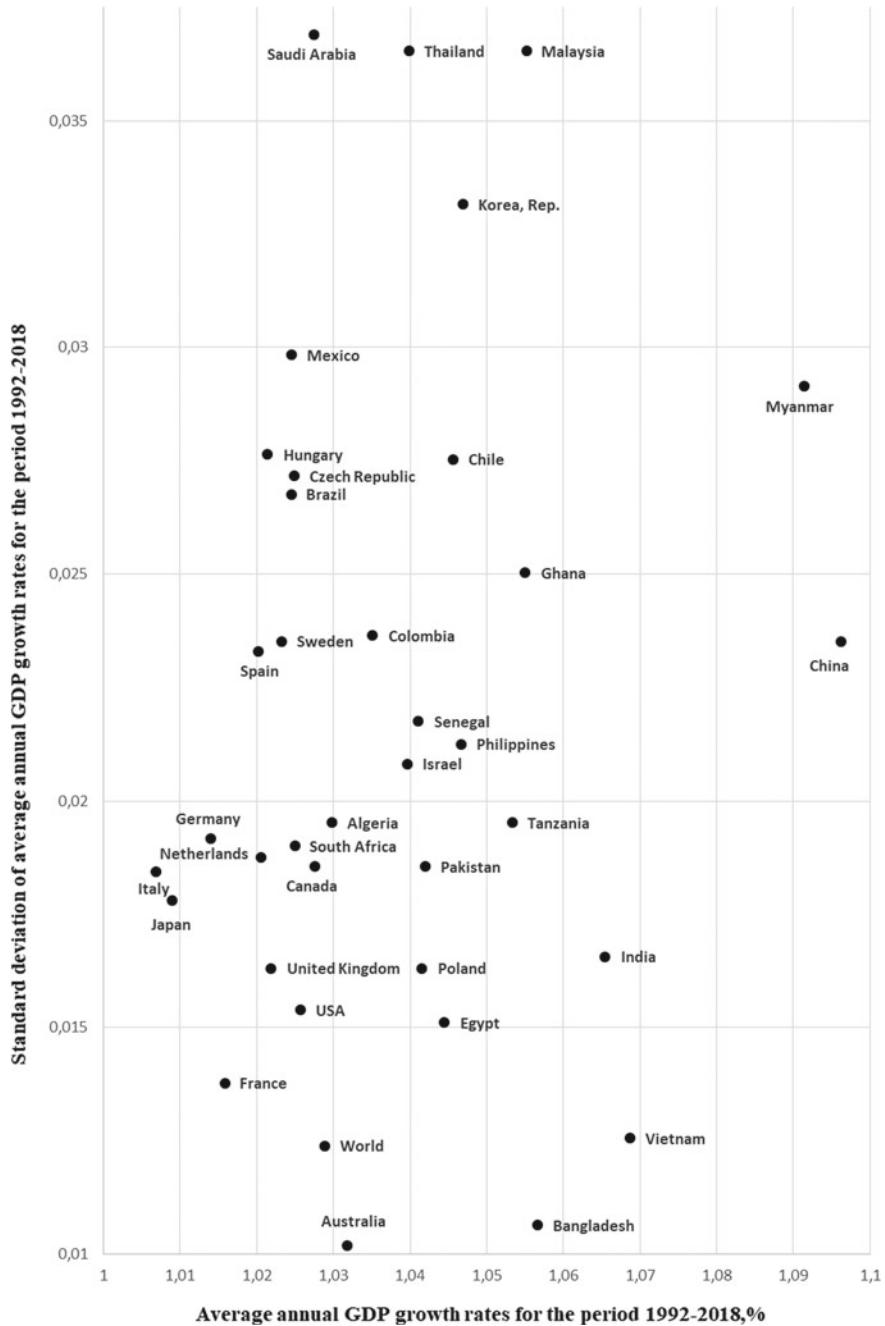


Fig. 90.8 The economic development of the countries of the world in the period 1992–2018 (Part 2)

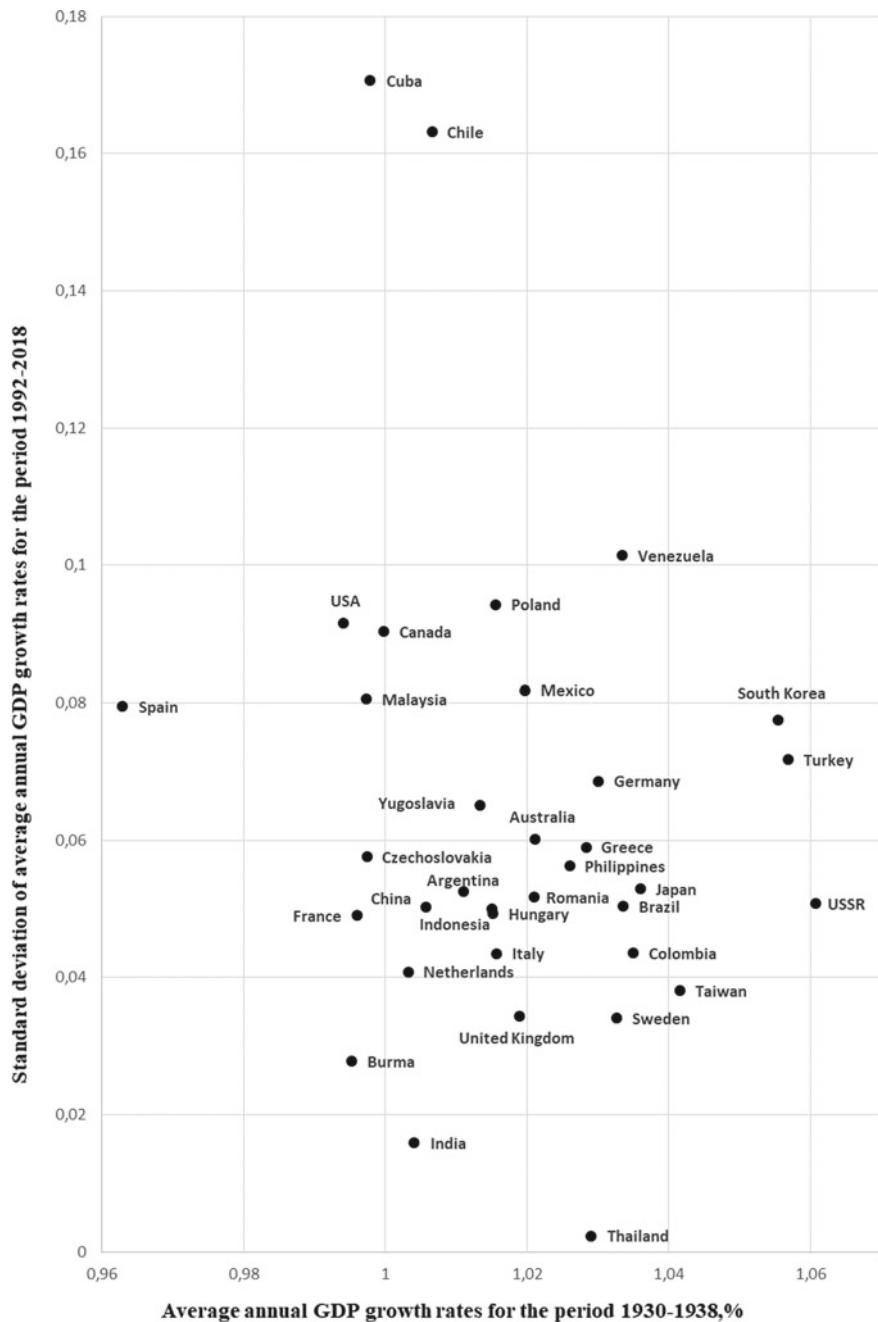


Fig. 90.9 The economic development of the countries of the world in the period 1930–1938

of these databases. According to TED, RSFSR and Sweden featured moderate and conservative balanced development policies respectively. It is important that Sweden in this and the previous periods cannot be classified as a country with the market development model: the redistribution function of its state budget was comparable with the direct interference typical of plan models (see Fig. 90.10).

1968–1975

The rapidly developing countries in this period are even more diverse. They include those relying on import substitution models within the market (Brazil, Indonesia) and planned (North Korea) economy models, export-oriented models relying on energy sources (Saudi Arabia, Iran, Iraq, Nigeria, Algeria), and consumer goods (South Korea, Singapore, Taiwan, Japan, Malaysia). Israel is a second-line aggressive balanced policy country in this group. Countries developing through tourism featured moderate policies (Spain, Turkey, Mexico). Czechoslovakia, where the attempt to reform the socialist model was quelled by external forces, became a leader among the countries using balanced conservative policies. The roughly equal growth rates of industrialized Sweden and Czechoslovakia demonstrate that the directive socialism model has significantly lower risks as compared to the Swedish state redistribution model (see Fig. 90.11).

1976–1982

The diversity of rapidly developing economies reduced by large: only some of the Eastern Asia countries specializing in consumer exports, some energy exporters (Saudi Arabia), and some tourist destination countries (Egypt, Thailand) preserved their leadership. The leaders among those using conservative policies include RSFSR, France, and Japan. Singapore stands out as a specific phenomenon because it features both conservative risks and aggressive growth rates that resulted from the famous reforms (see Fig. 90.12).

1983–1991

This period is the last in the 60-year global economy development cycle. None of the countries examined reached its economic development peak during this economic cycle. The highest growth rates are typical of the slowly fading “economic miracles”, “East Asian tigers”, and China that features increasing internal consumption and export capacities. The conservative development leaders included Pakistan, Japan, the Netherlands, and Italy. The collapse of the CMEA led to the collapse of the economic growth in the socialist block countries (see Fig. 90.13).

1992–1999

The economic reinvigoration following the global crisis of the bipolar world was observed in Chile, Singapore, China, Vietnam, and Taiwan. Bangladesh became a conservative leader. The USA reaps the benefits of a monopolar world and demonstrates higher growth rates and lower development risks as the global economy (see Fig. 90.14).

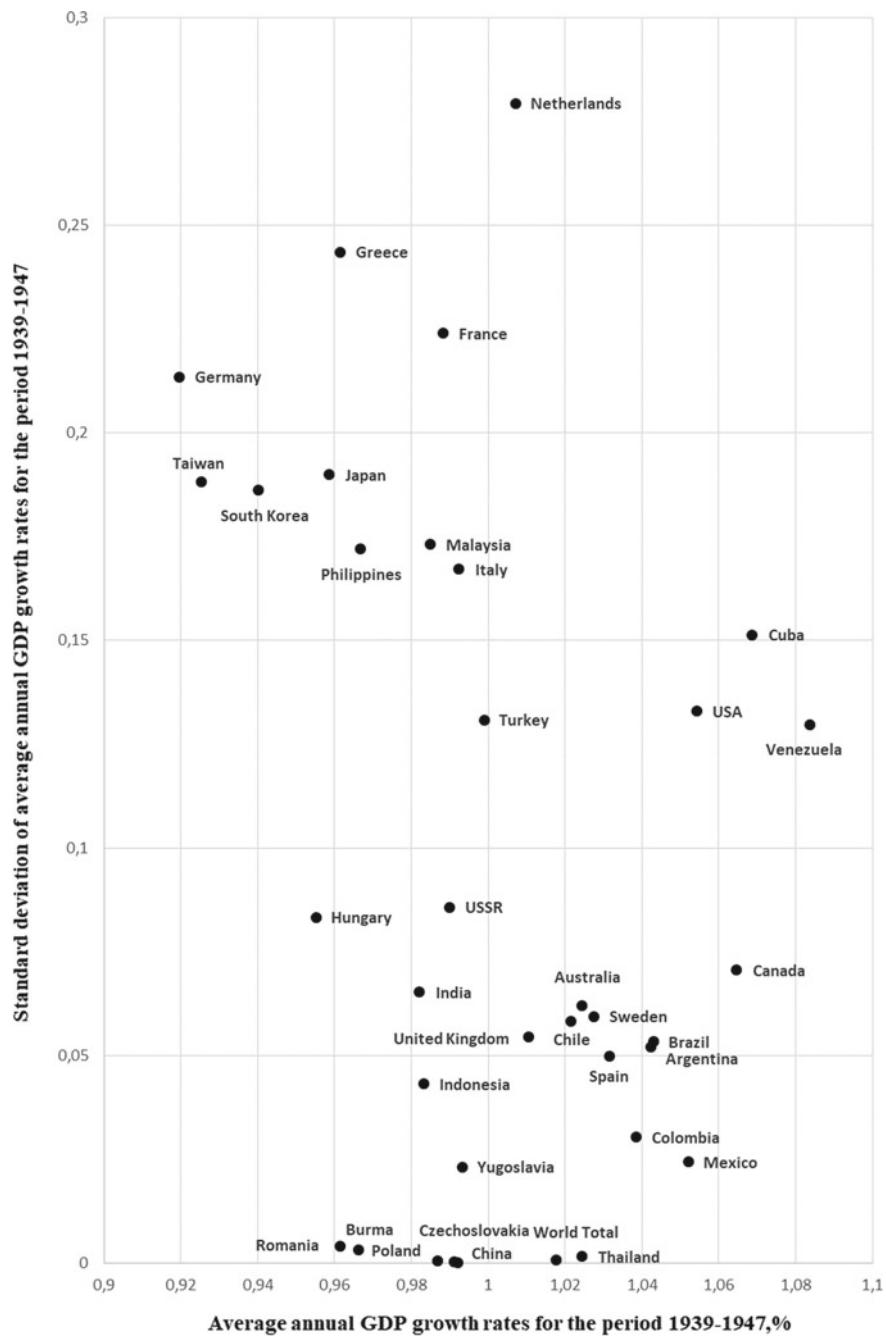


Fig. 90.10 The economic development of the countries of the world in the period 1939–1947

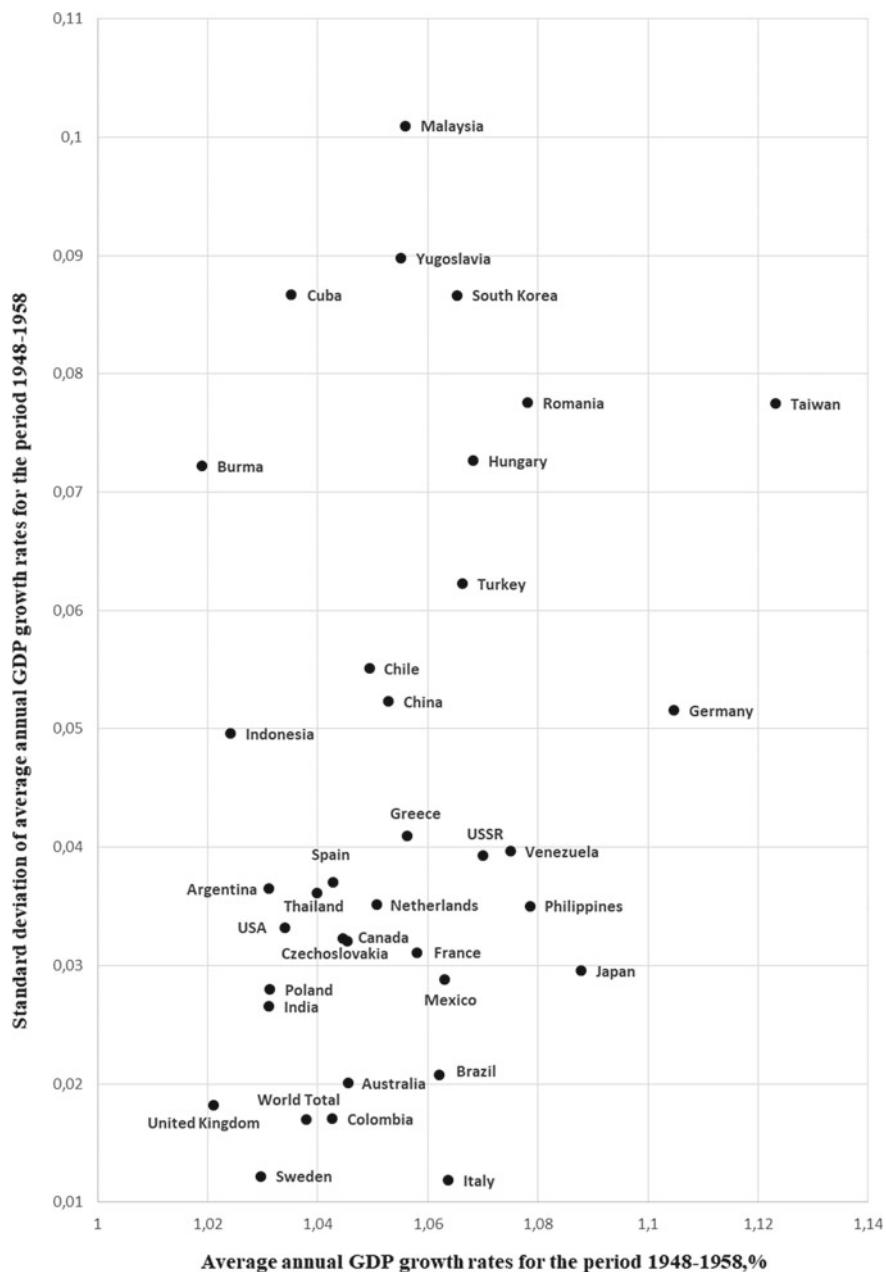


Fig. 90.11 The economic development of the countries of the world in the period 1948–1958

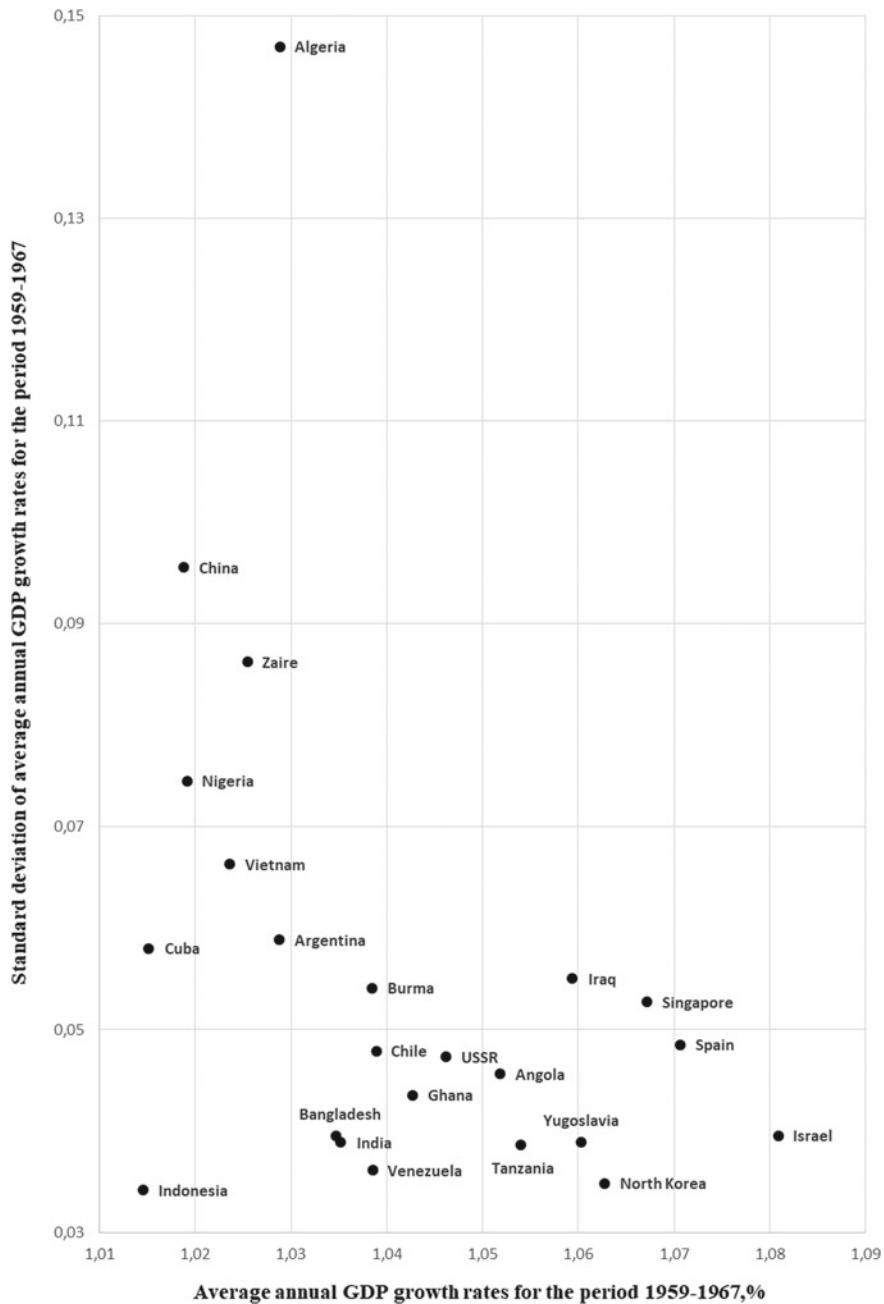


Fig. 90.12 The economic development of the countries of the world in the period 1959–1967 (Part 1)

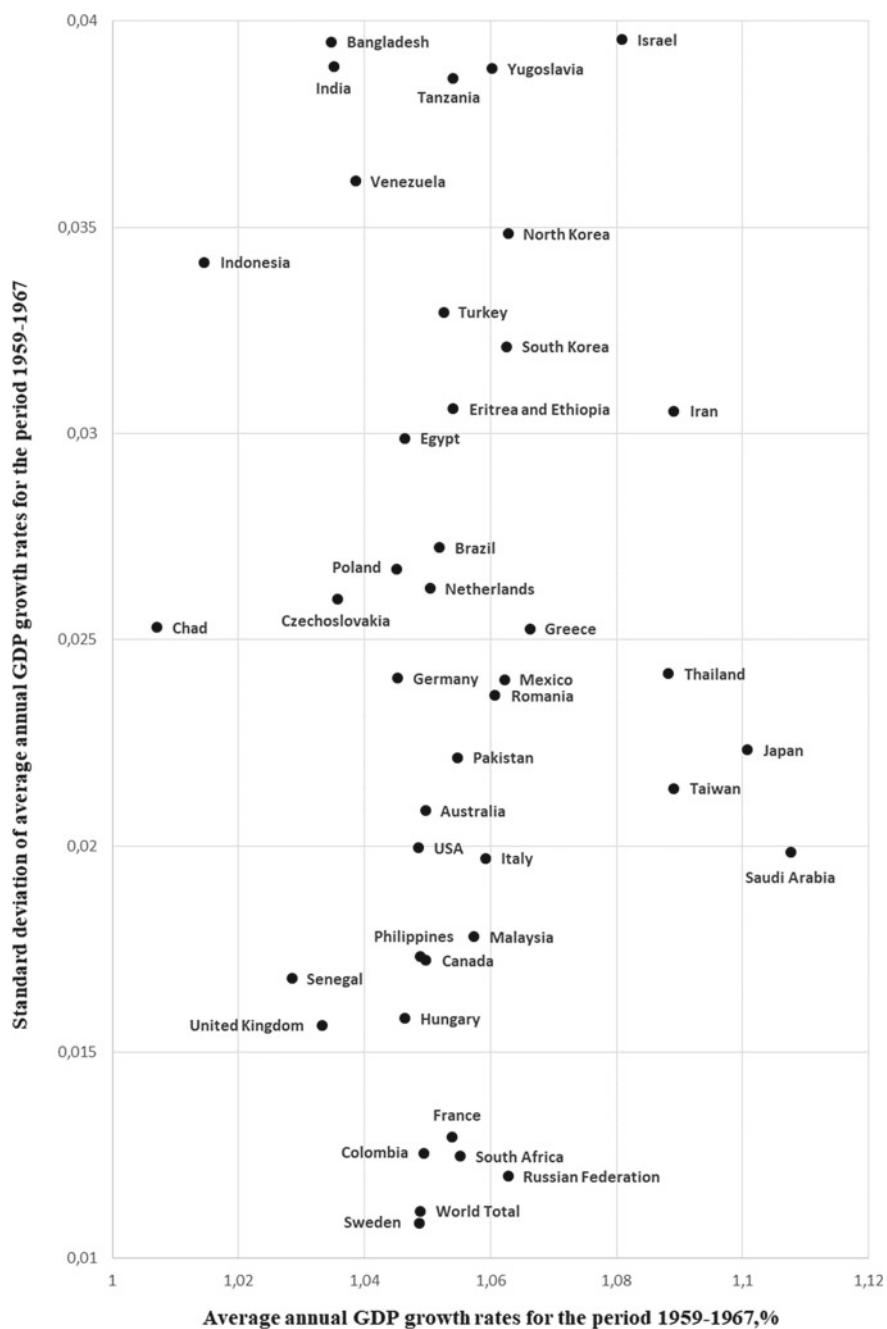


Fig. 90.13 The economic development of the countries of the world in the period 1959–1967 (Part 2)

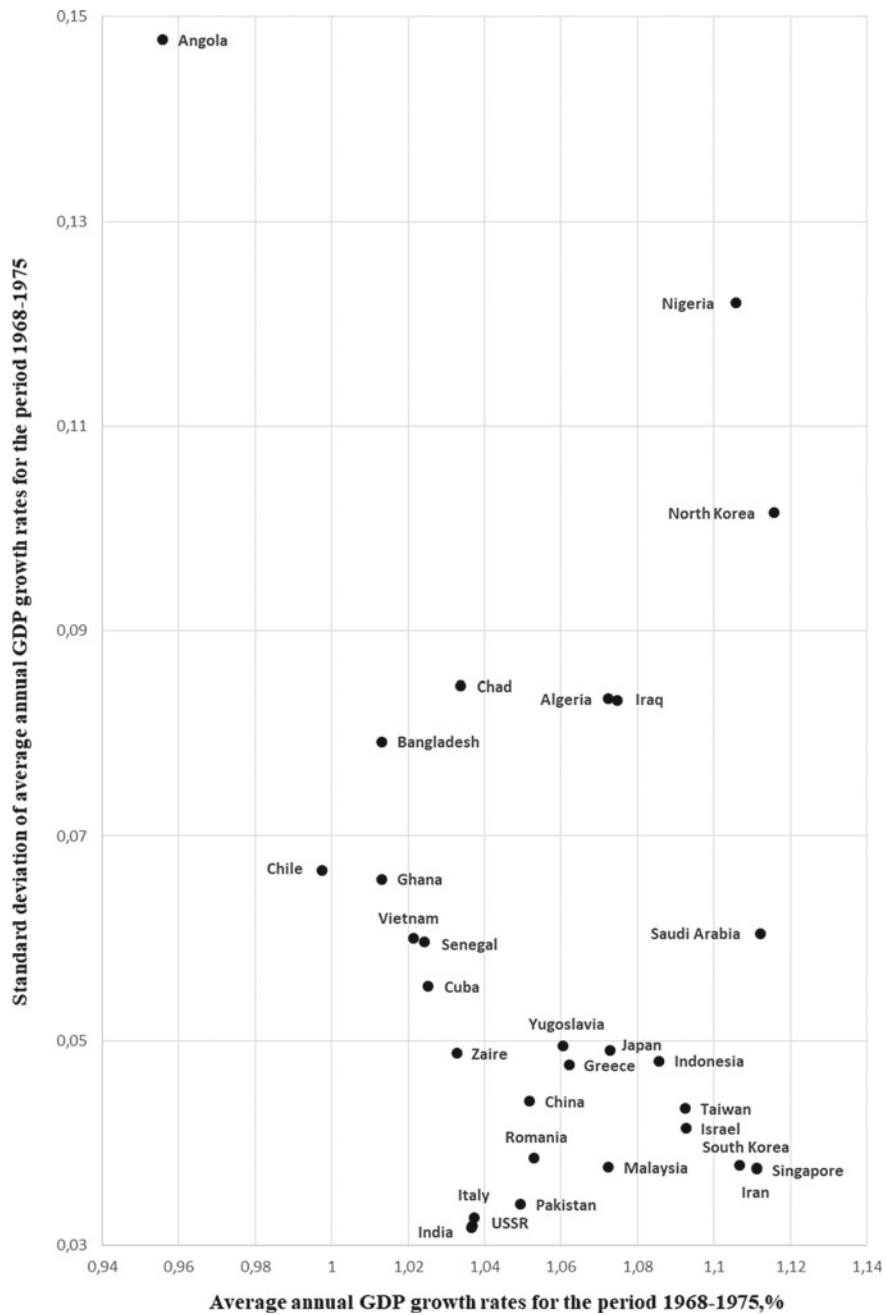


Fig. 90.14 The economic development of the countries of the world in the period 1968–1975 (Part 1)

1999–2009

China and Vietnam are joined by Myanmar, India, post-soviet and African countries. Bangladesh remains a conservative leader. The data on North Korea were linearized by the source developers, which leads to their exclusion from the analysis (see Fig. 90.15).

2010–2019

In this period, China, Southern, and South-Eastern Asia, and African countries to the south of the Sahara showed outstripping growth. The USA features a conservative balanced policy (see Fig. 90.16). Since the data on the economic downturn of 2020 are absent from the research, we cannot make any conclusions about the balanced nature of development in this period.

The analysis of large periods shows that Taiwan, Thailand, and Colombia featured the best development policies from 1930 to 1991 (see Fig. 90.1). In 1945–1991, they were joined by Singapore and Pakistan (see Fig. 90.2). These countries had balanced development policies throughout the large economic cycle. During its first half, 1930–1958, Venezuela, Brazil, Colombia, and Thailand had the best figures (see Fig. 90.3). We must note that the USSR demonstrated the highest growth of all the countries that were affected by war and it was close to balancing growth and risks. Thailand's risk data are somewhat underrated. The leaders of the second half of the cycle, 1959–1991, include Taiwan, Thailand, Pakistan, and Colombia (see Fig. 90.4).

Over the entire period of 1951–2019, Taiwan, Thailand, Malaysia, India, Egypt, the Philippines, Pakistan, Colombia, and Australia featured balanced policies (see Fig. 90.5). According to the World Bank, China and Vietnam (aggressive policies), as well as Bangladesh and Australia (conservative) featured balanced development throughout 1992–2018, i.e., the first half of the current large economic cycle (see Fig. 90.6).

Having analyzed the periods, we can make the following conclusions: The existence of a large economic cycle lasting from 1930 to 1992 is proved; we also defined its stages: only one institutional model facilitates the economic growth (in this case, it is the socialist model), the middle of the cycle features diverse balanced models, and the end of the cycle does not feature any best growth and risk figures. The big economic cycle of 1990–2050 also began with the domination of just one—socialist again—institutional development model. The institutional diversity of the models in the following classic economic cycles is increasing (Figs. 90.17, 90.18, 90.19, 90.20, 90.21, 90.22, 90.23, 90.24 and 90.25).

90.7 Country Group Analysis

The development analysis of the USSR economy speaks of several radically different models. The 1930–1958 period demonstrates the lowest risks and the highest economic growth figures obtained due to labor productivity improvement and the preservation of a mixed economy to some extent. The 1959–1967 period featured an

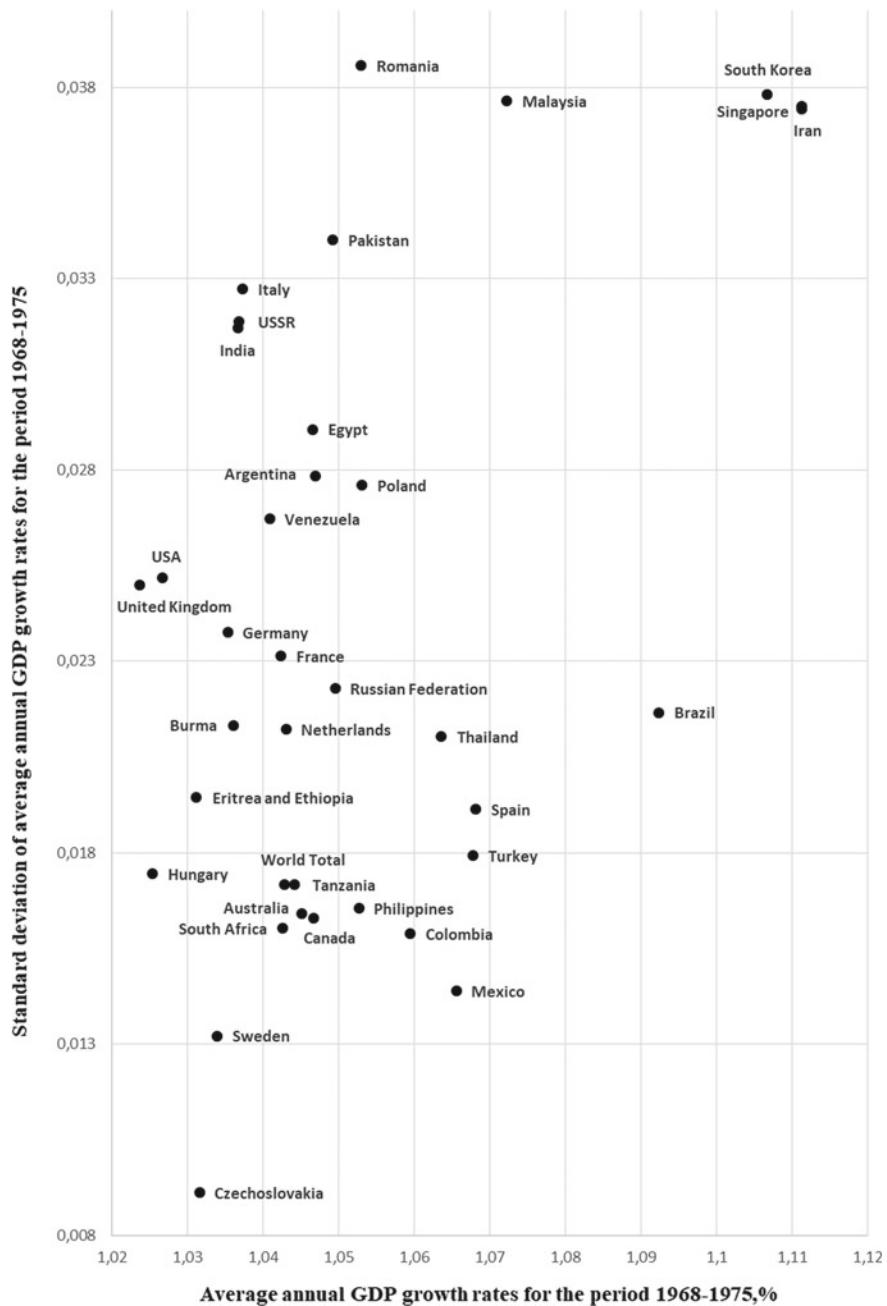


Fig. 90.15 The economic development of the countries of the world in the period 1968–1975 (Part 2)

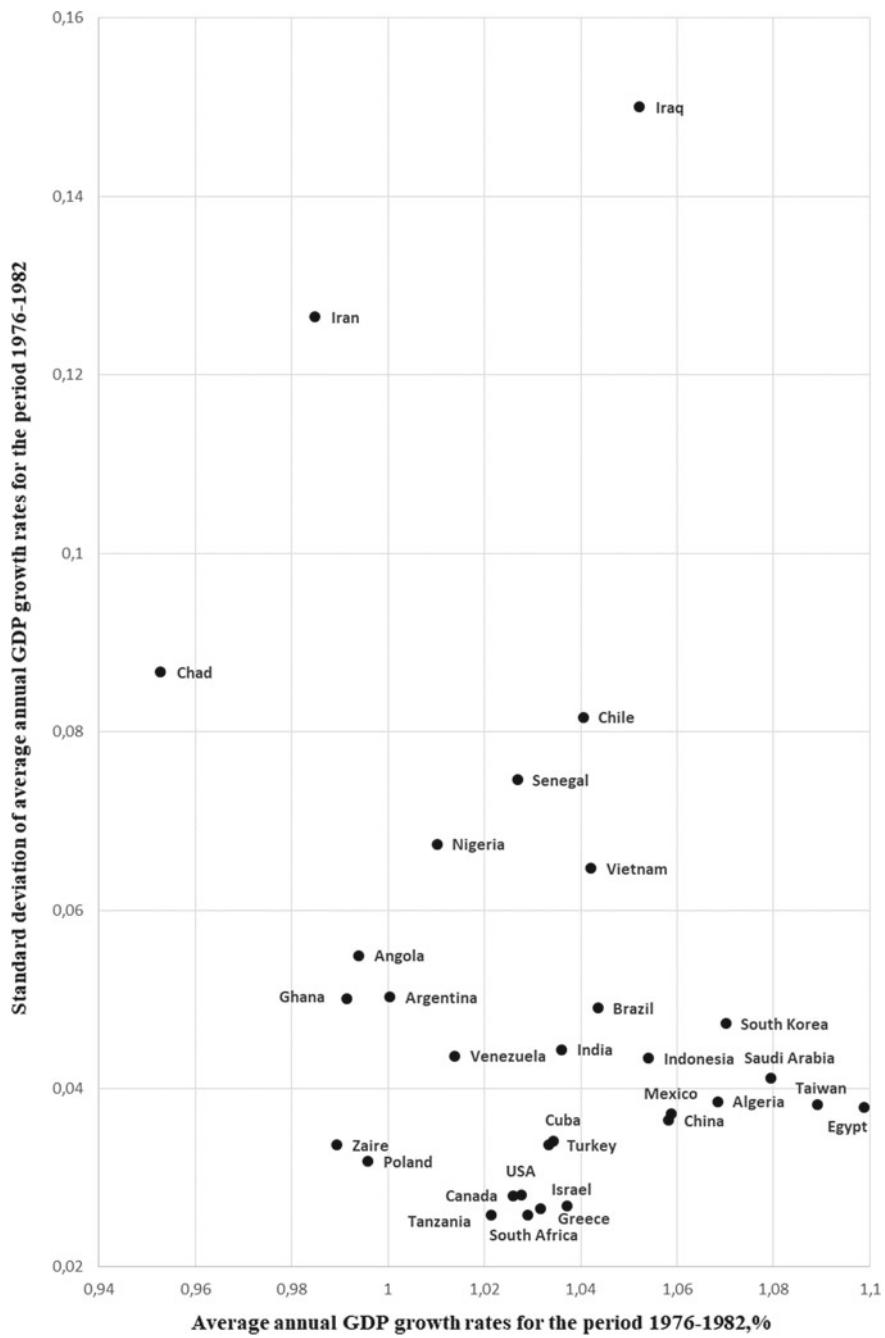


Fig. 90.16 The economic development of the countries of the world in the period 1976–1982 (Part 1)

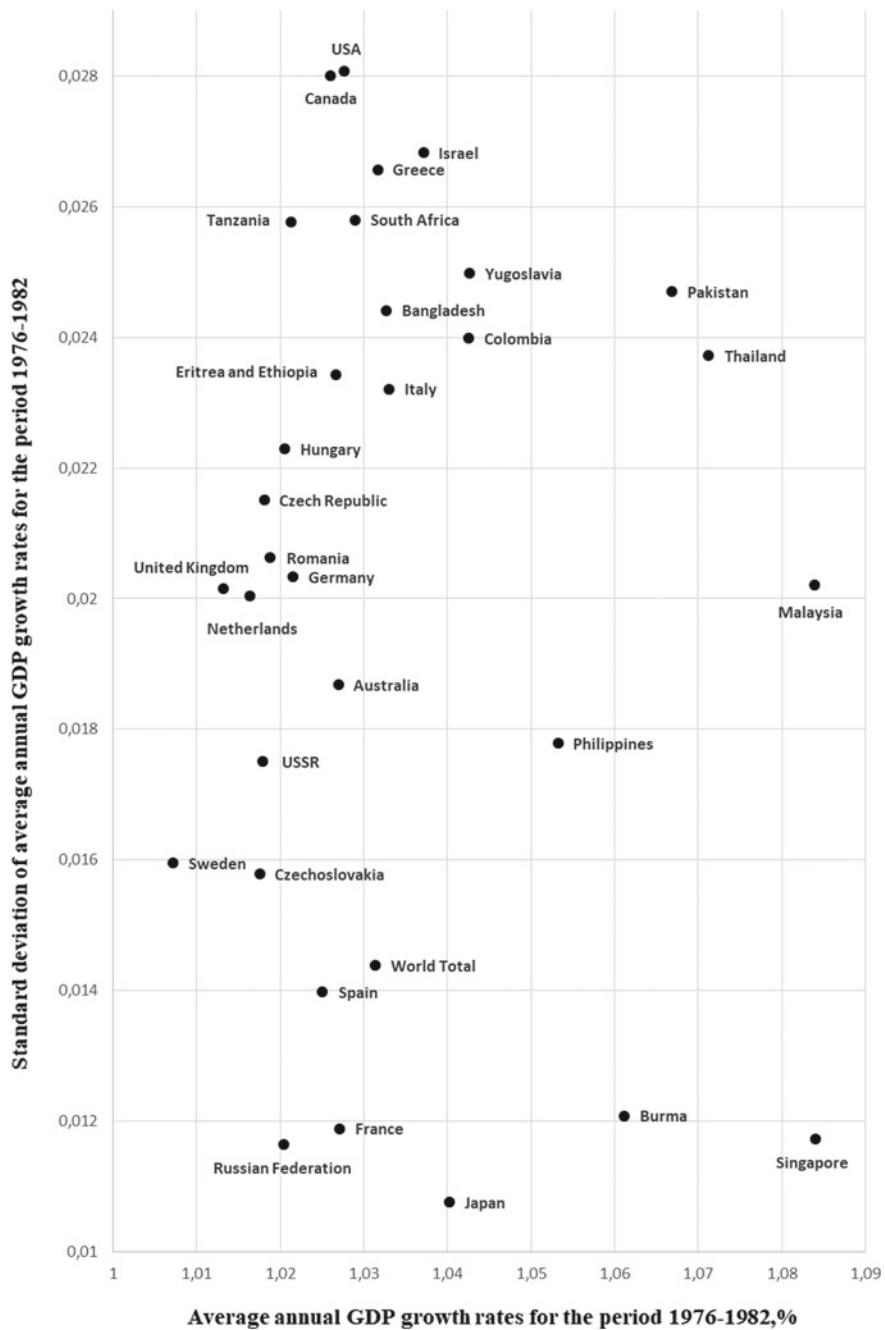


Fig. 90.17 The economic development of the countries of the world in the period 1976–1982 (Part 2)

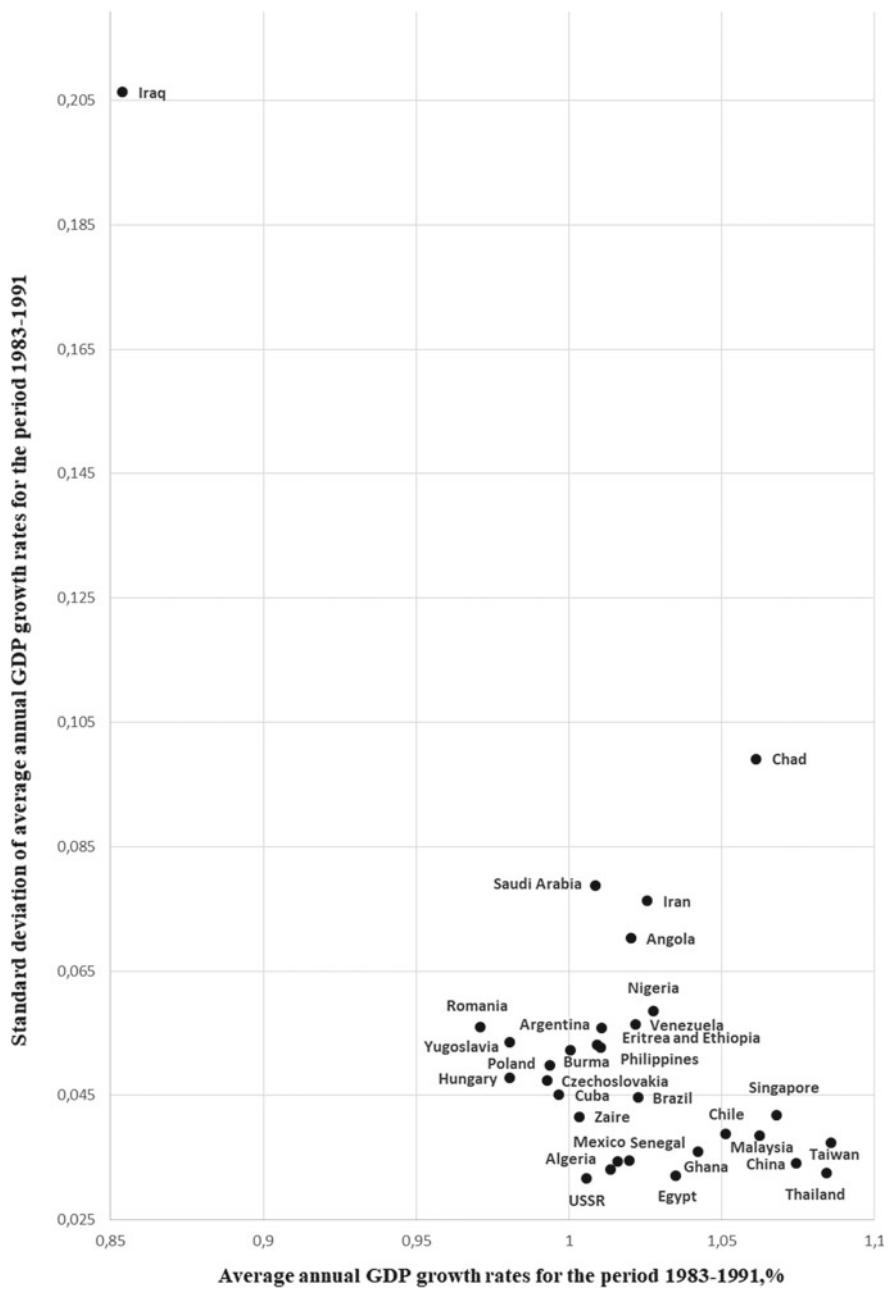


Fig. 90.18 The economic development of the countries of the world in the period 1983–1991 (Part 1)

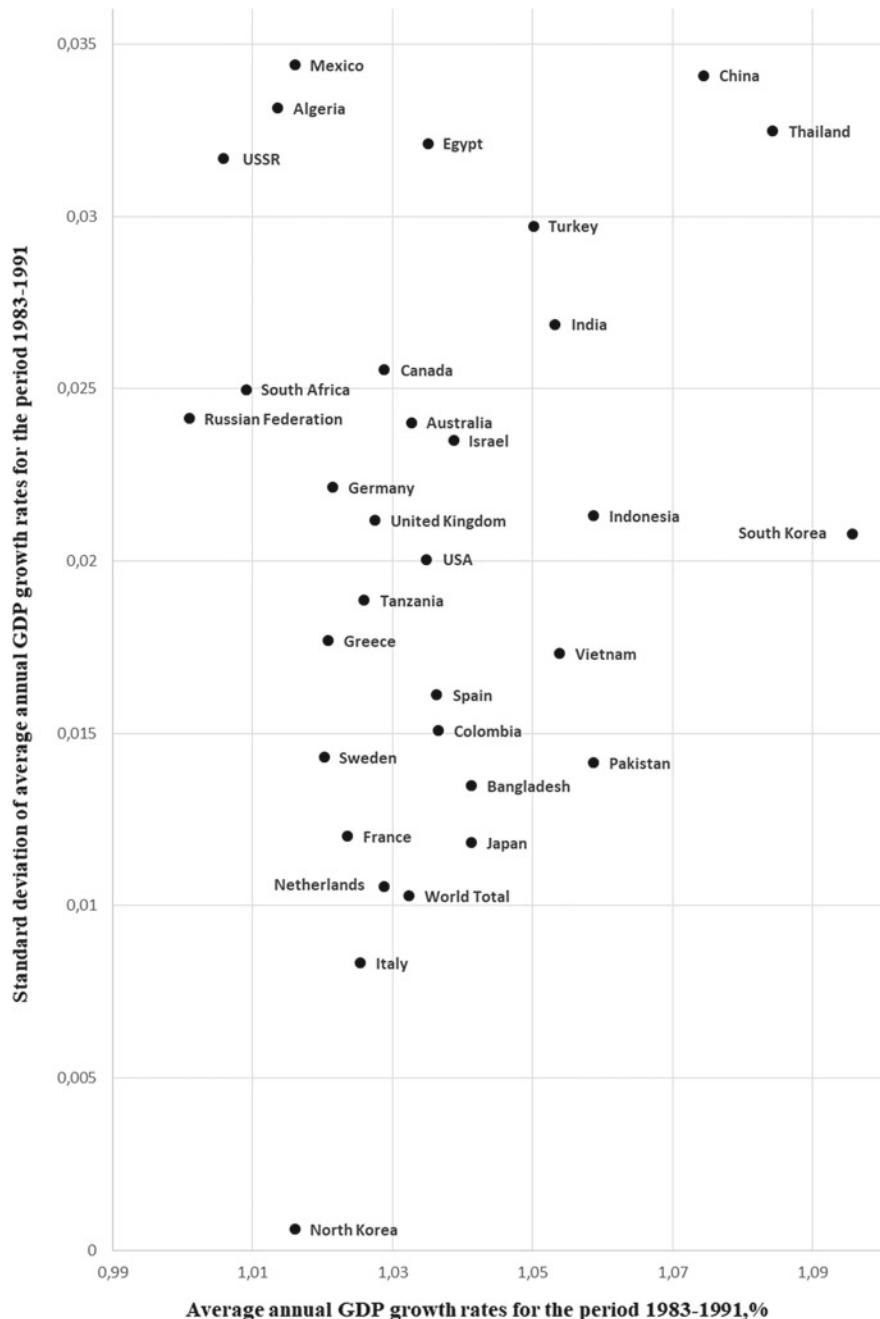


Fig. 90.19 The economic development of the countries of the world in the period 1983–1991 (Part 2)

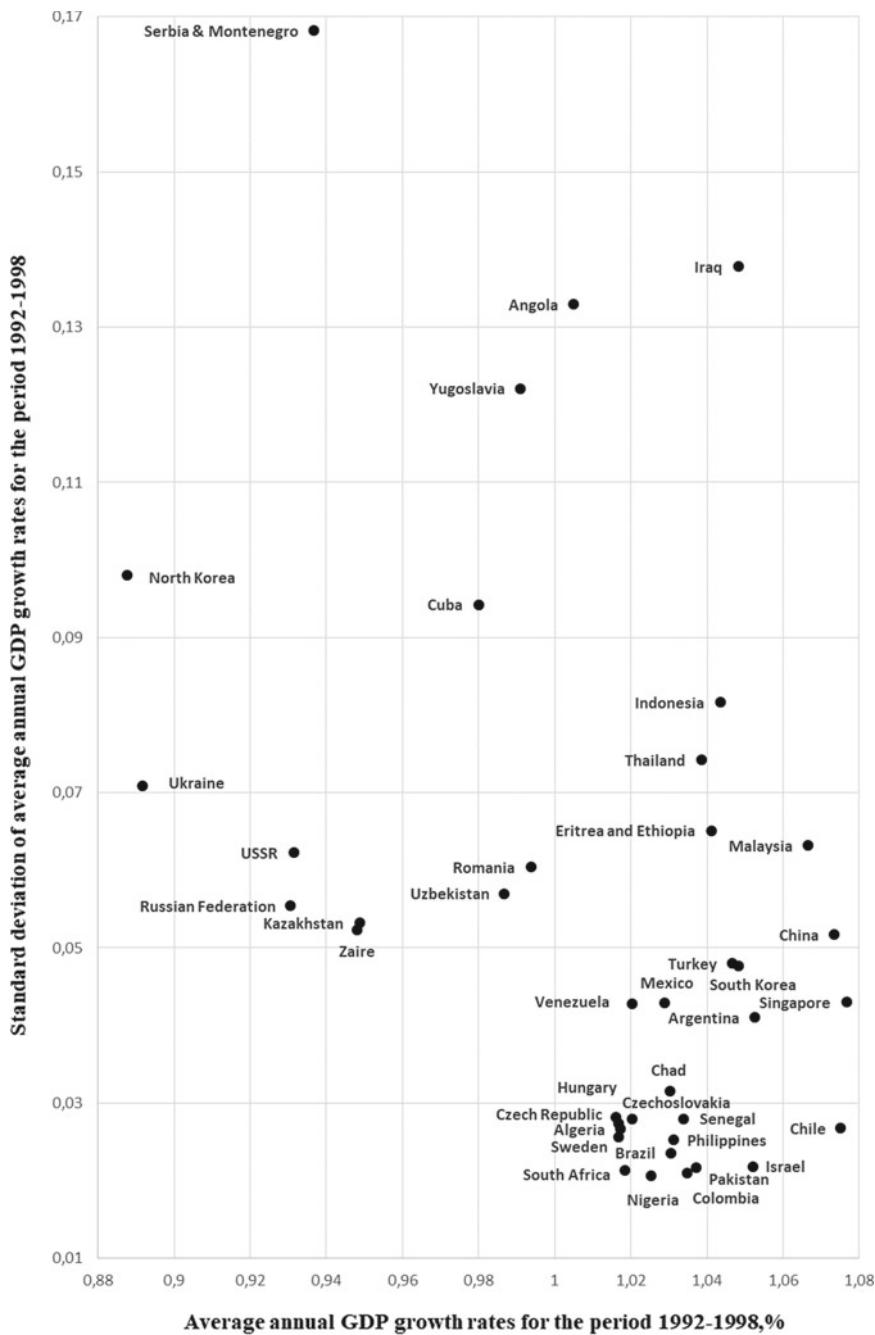


Fig. 90.20 The economic development of the countries of the world in the period 1992–1998 (Part 1)

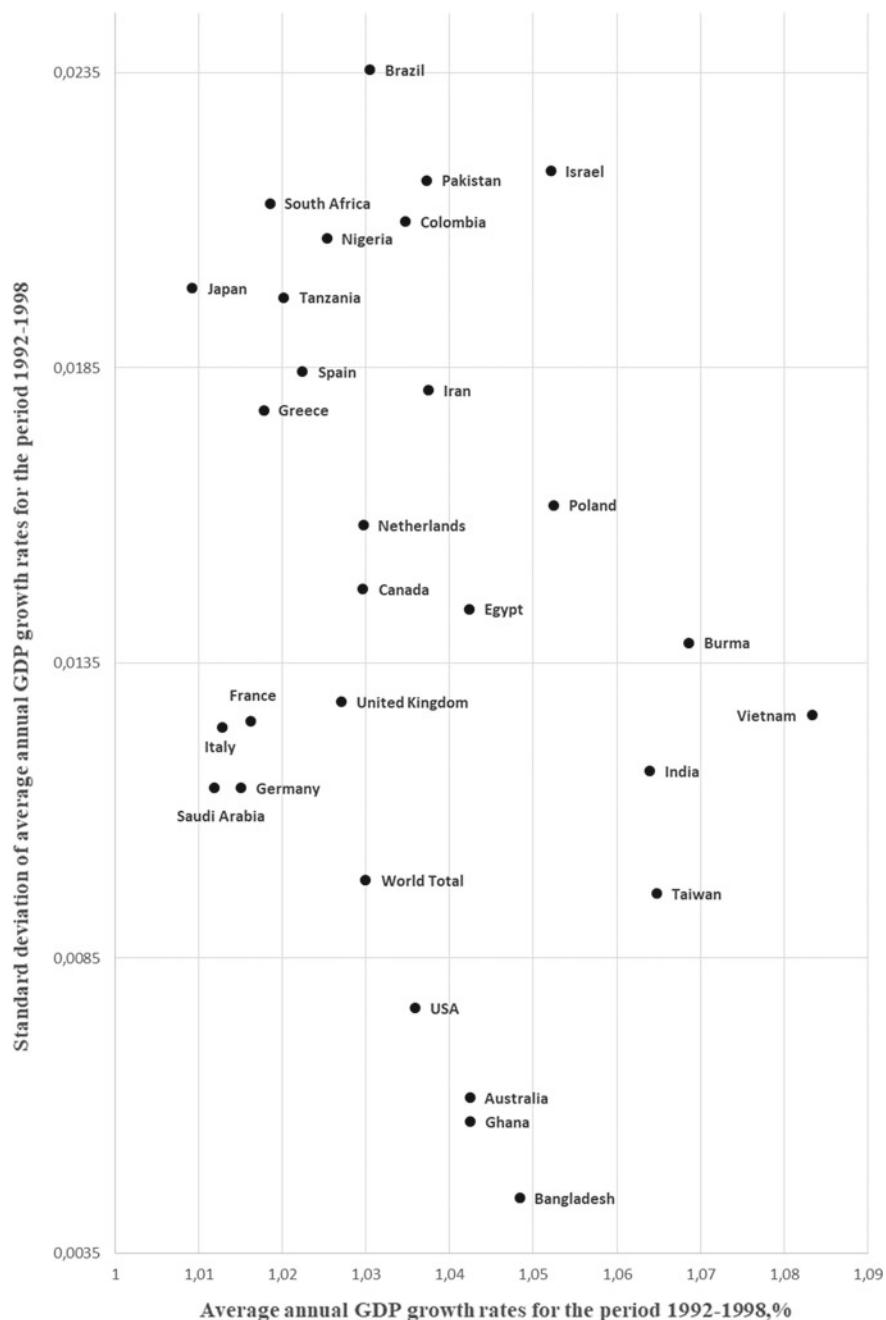


Fig. 90.21 The economic development of the countries of the world in the period 1992–1998 (Part 2)

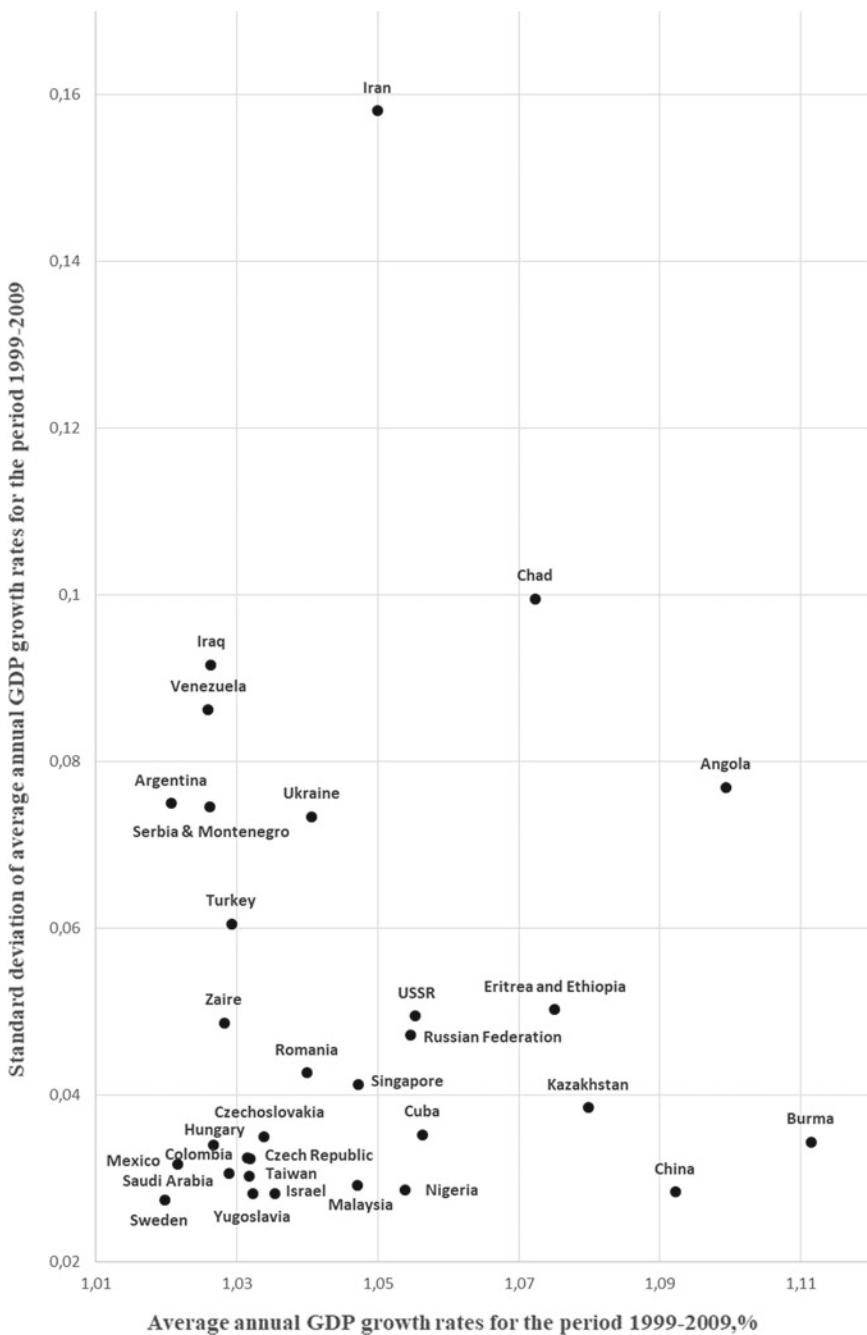


Fig. 90.22 The economic development of the countries of the world in the period 1999–2009 (Part 1)

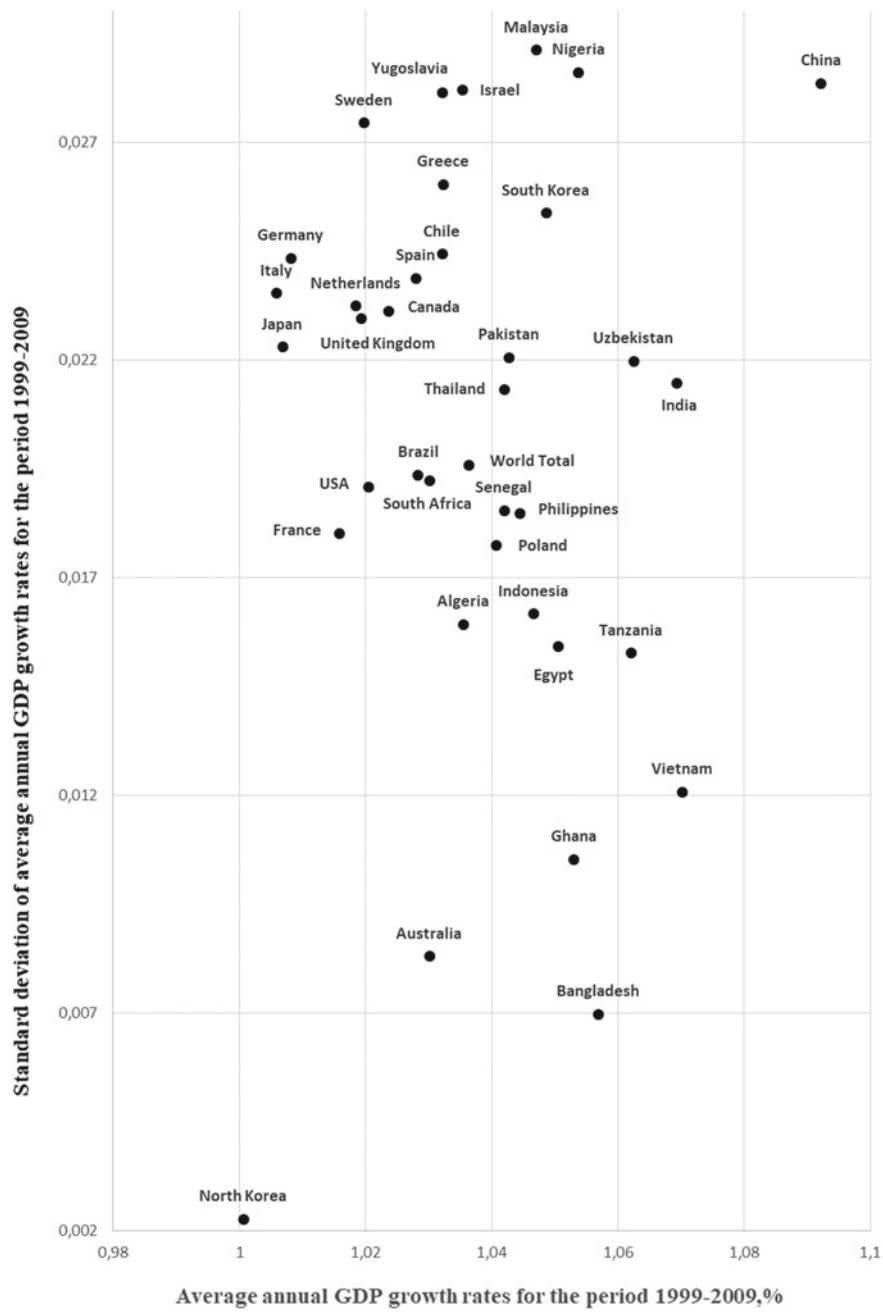


Fig. 90.23 The economic development of the countries of the world in the period 1999–2009 (Part 2)

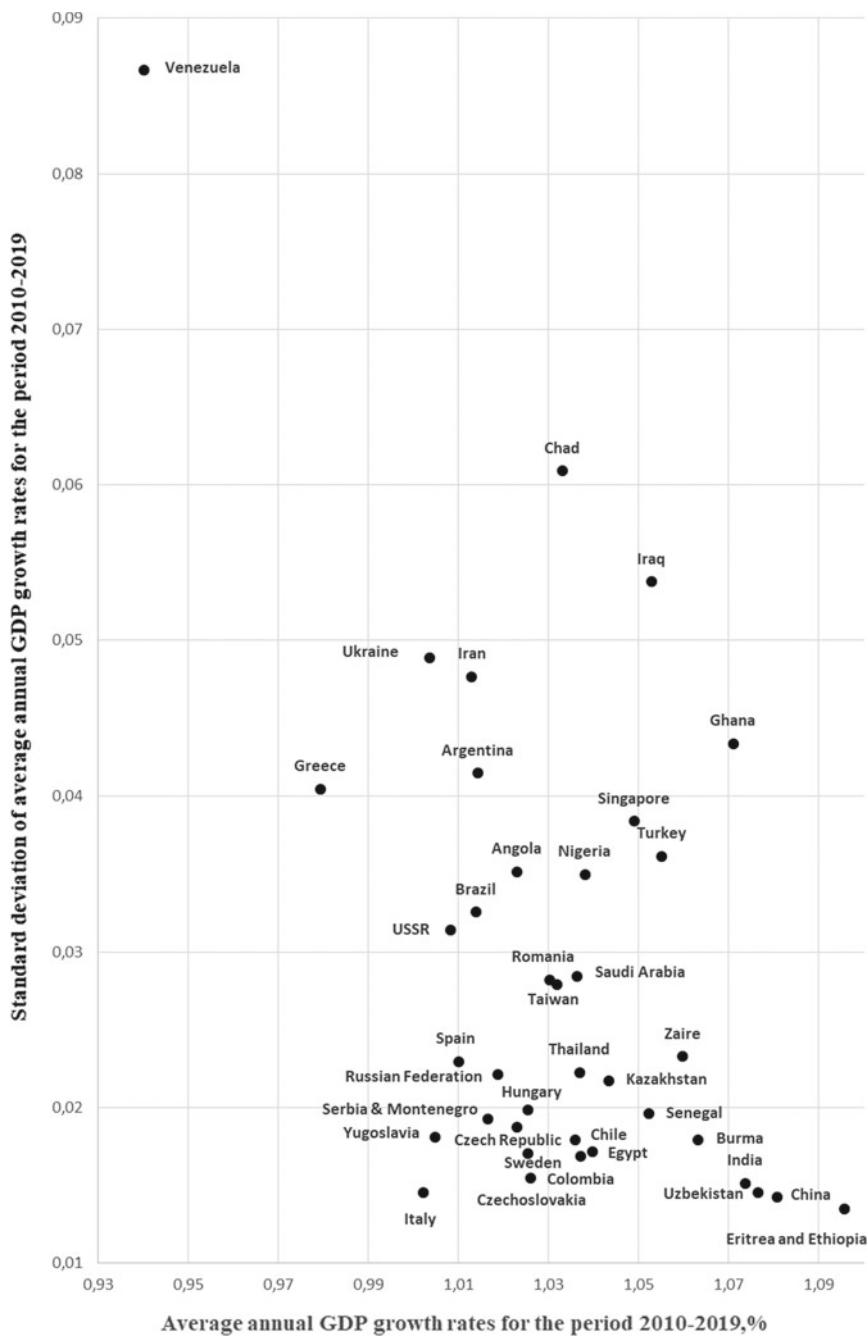


Fig. 90.24 The economic development of the countries of the world in the period 2010–2019 (Part 1)

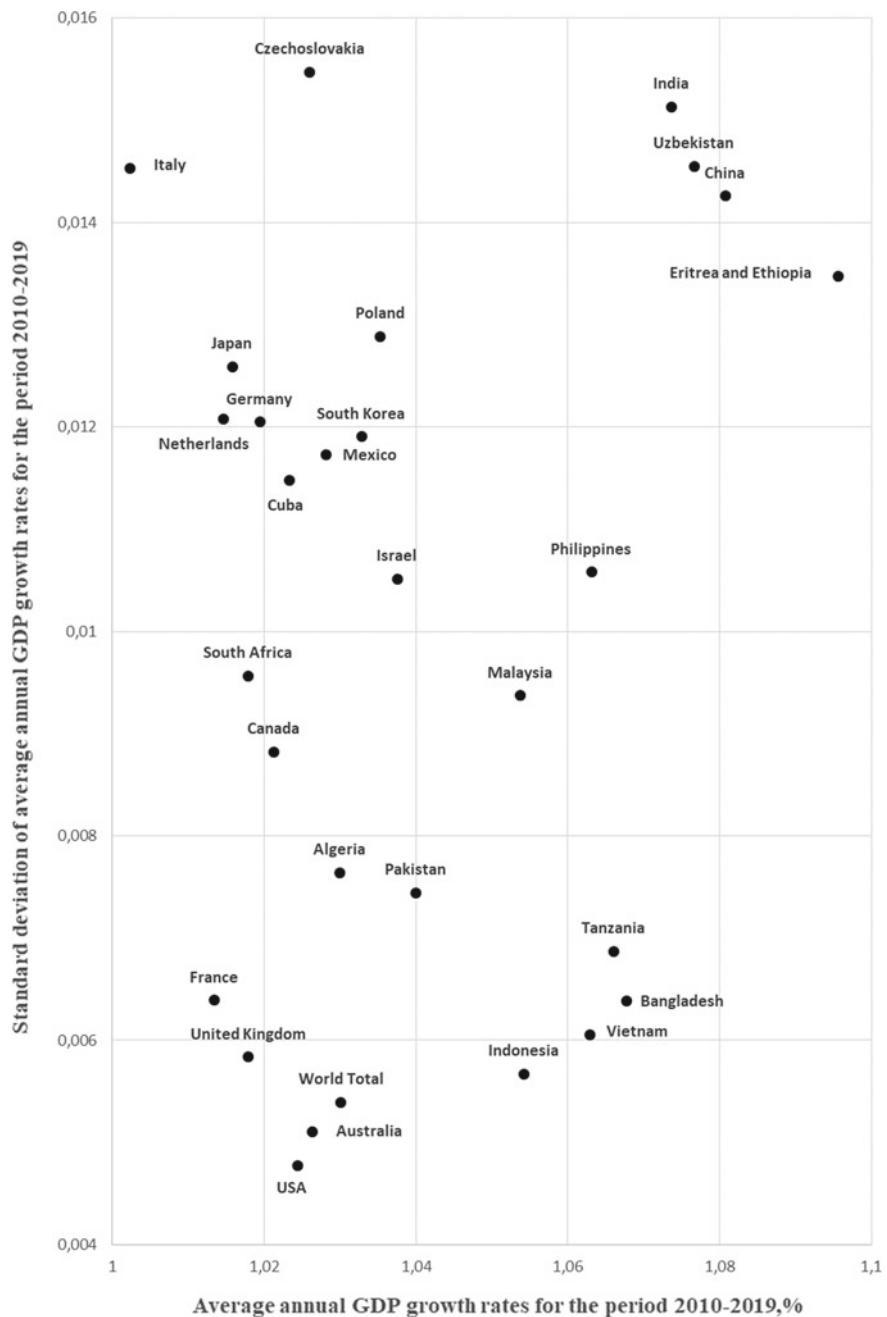


Fig. 90.25 The economic development of the countries of the world in the period 2010–2019 (Part 2)

attempt to top production volumes through the elimination of the mixed economy, which led to significant disproportions in the economy and the increase of risks with a significant reduction of growth rates. The economic system of outstripping development broke down during this period. The 1968–1982 period restored the balance of risks and growth in the economy but the further development dynamics were reduced. The economy aimed at increasing efficiency rather than productivity, which led to the proportional decrease of both growth and risks and the transition from the aggressive to the conservative development policy. The 1983–1991 period is characterized by increase in risks and a new growth rate drop. The attempt to restore the multisector character of the economy while preserving the cost efficiency of the public sector led to the institutional uncompetitiveness of the latter, which resulted in the collapse of the socialist development project. The market economy model of 1992–1999 was not authentic for the Russian culture and led to the shrinkage of the economy, the dramatic increase of risks, and the formation of a resource export economy. The construction of ‘power vertical’ in 2000–2009 decelerated the disintegration, and the attempt to ‘nationalize the elite’ led to another increase in risks and growth drop. The outcomes of the 2010–2020 period will show zero growth due to the crisis of 2020, although the risks during this period were significantly higher than during the previous one. Therefore, only the period of 1930–1958 featured the institutions that were authentic to the Russian culture, as made evident by the outstripping development in that period.

Eastern European countries do not have the resources for independent development and thus cannot be considered a specific civilization: the highest growth rates occurred during the socialist period and they were dependent on the demand in the SMEA leader. Poland and Yugoslavia managed to maintain economic growth due to the external borrowings but they also suffered from the economic crisis earlier because of that. They entered the European Union during a depression period and were unable to approach the development results they had during the socialist era. To sum up, Huntington’s hypothesis that there is a specific Eastern European civilization distinct from Russia is not confirmed by this research.

The economic development of the current leader of Western civilization does not feature a specific period of authentic development. The outstripping development was observed in 1939–1946 but this period also features the highest risks. Besides, this period compensated for the previous economic cycle of the 1930-es which was the worst one in the history of the US. The periods of 1959–1967 and 1993–1999 are other balanced development spells in the history of the USA but during these periods, the country could not outmatch other countries. Canada has the same historical destiny as the USA and can be considered the nearest periphery of the latter. Australia also belongs to this group but its development figures are closed to the world’s averages.

Western European countries like Germany, France, the UK, the Netherlands, and Sweden developed rapidly in the post-war regeneration period with significant economic support from the leader of the Western civilization. Later on, they show fading development shifting towards depression. The South African Republic repeats this historical destiny.

Greece, Spain, and Turkey, as the shards of the Mediterranean civilization and the southern periphery of the West, demonstrate development peaks corresponding to nationalist dictatorship periods and the periods of preparation for EU integration. After the successful or unsuccessful (Turkey) integration, their growth decelerated and even turned into a deep depression.

Other remnants of the Mediterranean civilization (Egypt and Pakistan) have a similar development trajectory but they trail by two economic cycles and do not attempt to integrate with the global West. Their development peaked during the beginning of active external investment of petrodollar from the Arabic oil exporters. Algeria, Saudi Arabia, Iraq, and Iran are the largest Muslim countries of the OPEC. Their growth peaked during the oil crisis of the early 1970-es but they could not maintain the growth rate. The Middle Eastern civilization in general demonstrates the migration of investments from the oil-producing countries to the countries with excessive working populations in the economic cycle following the oil boom.

Israel features both Western and Middle Eastern development characteristics: the general fading of economic development typical of the former is compensated by the investment of the newly-arrived emigrants into the economy, providing a kind of labor response on the investment of petrodollars in the hostile Muslim surroundings.

The disintegration of Pakistan in the early 1970-es extended India's influence over Bangladesh. This civilization continues to improve its development figures over the last 70 years. The figures improve along with the reduction of the post-colonial institution and the increasing influence of the authentic national culture expressed in the policies of Hindu conservators. Myanmar has a similar development path: this country is a buffer between the Indian and Chinese civilizations.

The end of the civil war in China led to a significant and dramatic increase in growth rates in all of its regions. The growth rate data for 1951–1958 on mainland China vary across different sources by 1.5 times. The most optimistic official appraisal shows that the economic growth of the PRC and the remnants of the Chinese Republic in Taiwan were essentially the same. Their further development diverged. Taiwan became an export-oriented country whose development is fading as the internal resources of the country are fading. Their end market is decelerating, while the number of competitors is increasing. Japan and Thailand took the same trajectory one cycle later, South Korea, Indonesia, and Singapore—two cycles later, and Malaysia—three cycles later. The stable economic growth in these countries depended on internal or external investments. The development of the Philippines peaked in the post-war recovery period and when the country gained independence. It only achieved stable development in the last economic cycle, which makes this country's development model similar to that of the African countries.

The socialist countries of the Far Eastern civilization chose other development paths. North Korea peak in its development in 1968–1975, after which it depleted its internal development resources and entered the stagnation trajectory. Vietnam selected the export-oriented development strategy after a series of wars and the loss of allies. The PRC experienced a rapid increase in risks during the 'Great Leap' and the 'Cultural Revolution' and also selected the export-oriented strategy. Both of these countries preserve mixed economies dominated by the public sector, which reduces

the risks they face, especially in comparison with the pro-West countries of the Far East. The crisis of 2020 will apparently finish the economic boom in the Far Eastern civilization countries, and the outstripping development center will relocate to South Asia.

Despite the seeming cultural similarity, Latin American countries are very different in terms of their institutional and economic structures. This might be due to the historical youth of these nations and the lack of settled traditions for institutional development. The success of import substitution policies depends on the depth of the internal market: if we compare Argentina and Brazil, we will see that the latter normally has higher growth rates and lower risks. Brazil's development peaked in 1968–1975 and Argentina in the early twentieth century. These and other less prominent development peaks were not long or sustainable due to the reliance on external borrowings to stimulate economic growth.

The success of the export development strategy in Latin America depends on diversification and institutional stability. Venezuela specializes in just one product, oil. Its development peaked in 1939–1958 and then the country gradually went into the institutional crisis of nowadays. Despite the embargo, Cuba preserved its specialization in food and managed to recover the recreation and tourism sector over the last decades, which helps support institutional stability.

Mexico has the second-largest internal market in Latin America and rather diverse exports including food and consumer goods, metals, and energy resources, complemented by drug traffic and tourism, which ensured stable growth over several periods in 1939–1982 with the lowest risks during the oil boom of 1968–1975.

Chile specializes in resources and food, and its development peaked in 1992–1998. The fall of the dictatorship resulted in a relatively favorable institutional situation complemented by the high global prices for copper and the opportunity to diversify the economy.

Despite the long civil war and the war on drug lords, Colombia did not tackle the outstripping development problems using external borrowings. It had the most diverse export and the highest institutional stability in the history of Latin America, which resulted in its growth and risk figures being close to those of Western Europe.

The main conditions for sustainable or outstripping development in Latin America include institutional stability and diversification. Any radical reforms, as well as external borrowings and interventions, destabilize these countries.

The governmental institutions in African countries are even younger, so their economies have been accelerating over the last decade only. Before that, there were only accidental development leaps associated exclusively with the development of new resources. Nigeria peaked in 1968–1975 and Angola in 1999–2009 but nothing more than that.

90.8 Conclusions

Thus, we cannot say that market institutions facilitated rapid development anywhere in the world over the 90 years we analyzed. On the contrary, the countries that developed rapidly featured active governmental interventions (see Table 90.3). Even the development peaks of the USA and Western Europe coincide with the periods when the governments interfered with the respective economies most.

The analysis of Table 90.3 shows that the authentic development model for the Western civilization is implemented in the context of non-authentic development models in other civilizations, which is the cause of the majority of the conflicts between the civilizations of today. This point confirms the necessity of a multipolar world and the necessity of forming authentic development institutions in all of the civilizations. The market development model imposed on the world by the global West conditions the sustainable development of the West and the instability of other countries and civilizations because nowadays only market institutions can help outsiders control countries' strategic resources. The market development model is the most sophisticated model of neo-colonialism that never facilitates the sustainable development of the regions.

Table 90.3 The comparison of institutional models of civilizations

Civilization	The most authentic institutional economic climate for the culture	The least authentic institutional economic climate for the culture
Russia (Eastern Europe, Eurasia)	Planned economy maximizing labor productivity with multiple sectors and the domination of the public sector, import substitution (including the arms race)	A market economy with external borrowings and resource export specialization
Western	A market economy with active interventions from the government in the form of public contracts and state redistribution or the seizure of foreign resources	Internal demand-oriented free market economy
Middle East	National resource monopolies with the possibility of capital exports	The loss of end markets due to external interventions
Far East	An export-oriented and mixed economy with the domination of the public sector or active government intervention	The depletion of key development resources including the end markets
India	Forming national development institutions and growth centers	Domination of post-colonial institutions
Latin America	Institutional stability and diversification of the economy	Reforms, external borrowings, and interventions
Africa	Developing new resources	Internal and external conflicts

Russia and other non-western civilizations require authentic development institutions that would be natural to their cultures. It is especially true for post-industrial development in the context of a settled industrial urban culture. To this end, we suggest a model of network society based on the domination of consumers' property rights on the means of production and the institutions of direct democracy [12, 29, 30].

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Chapter 91

Conceptual Principles of Socialization in the Coordinates of Innovative Macroeconomic Style of Development



E. A. Gasanov

Abstract Social changes and social reforms require measures that actually expand the base of the innovative macroeconomic style of development. This is the main trend of the current stage of socialization of the economy. At the same time, in the future, the innovative macroeconomic style of development will depend on achieving a certain level in the “quality of living” or creating a “social infrastructure” (development of education, medical care, etc.). Their solution assumes the implementation of radical social transformations for the benefit of the entire population, that is, implementation of a set of measures, objectively accelerating the socialization of the economy. The success of the socialization of the economy depends on the pace of innovative macroeconomic style of development. From our point of view, the uniqueness of the innovative macroeconomic style of development lies in the fact that it largely based on endogenous factors, primarily human capital. The innovative macroeconomic style of development has a significant absorption capacity of skilled labor, contributes to employment growth in the advanced industries of the economy. The development of advanced modern industry provides a powerful impetus for the growth of macroeconomic productivity, savings, and the rate of reproduction of human capital that creates a reliable material base for socialization of the economy in the future.

91.1 Introduction

The socialization of the whole economic system, the content of which acts as a specific essential feature of the emerging innovative macroeconomic style of development in the conditions of digital revolution, is inextricably linked with the drastic change in the position of the employee in production. The activation of human capital is manifested in the intellectual participation of the employee in knowledge-intensive production. Here, human capital acts mainly as the main production factor and the

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subject of economic relations. The level of socialization of the economic system determined by the extent to which it, a highly skilled employee, stands out among the dominant production factors of economic development [1]. The practical significance is how the employee develops, how fully disclosed his intellectual, moral, aesthetic, and creative abilities. The dominant feature is how he masters the process of knowledge-intensive production, gets over it, acting not as an agent of production, but as its main goal.

91.2 Problem Statement

The currently emerging innovative macroeconomic style of development raises new theoretical and methodological problems in the process of socialization of the economy. Here, the problem is setting in revealing the essence, causes, regularities of manifestation, identifying factors, and analyzing trends in the socialization of the economy. In general, the economic literature has accumulated enough constructive material to justify theoretical and methodological approaches to the analysis of the principles of socialization of the economy. At the same time, it should be noted that in economic theory, insufficient attention is paid to the study of socialization of the economy in the conditions of innovative macroeconomic style of development. Traditional theories usually neglect a comprehensive analysis of the impact of innovative macroeconomic style of development on the socialization of the economy, considering only some individual aspects. The reason for this is that clearly existing criteria and signs of innovative macroeconomic style of development as a new phenomenon are not identified.

Insufficient theoretical attention to the problem of socialization of the economy in the conditions of innovative macroeconomic style of development, its methodological incompleteness, determined the choice of the research topic.

91.3 Research Questions

General trends in the innovative macroeconomic style of development, the need for a deeper study of the laws of its functioning in the conditions of digital revolution, and the practical needs of society bring to the forefront the problems associated with the study of socialization of the economy. In the Russian economic literature, the problems of socialization are poorly posed. However, despite the intensity of research, there are a number of unresolved issues. These problems have been raised in the economic literature, but there are still no special comprehensive researches on this topic. According to this, the following questions raises:

- why is the interrelation between the problems of innovative macroeconomic style of development and socialization of the economy becoming relevant?

- (b) is it necessary to study the interconditionality of innovative macroeconomic style of development and socialization of the economy?

91.4 Purpose of the Study

The purpose of the study is to expand the range of social choice and, based on rationalist considerations, to determine what conditions for an innovative macroeconomic style of development exist that would provide favorable opportunities for socialization of the economy within the framework of the digital revolution. To do this, it is necessary to study the problems in details, find options acceptable to the society, and identify innovations in social life.

91.5 Research Methods

In order to identify trends in the socialization of the economy, a methodological approach developed within the concepts of postindustrial society is used. The methodological feature of the early concepts of postindustrial society was a systematic approach that allowed us to consider the emergence of a qualitatively new whole on the base of a single systematizing cause. In the concepts of postindustrial society of the late period, the processes of socialization methodologically explained based on multifactoriality. The pluralistic method allows us to reflect both the continuity of the historical process and its polyvariance. Among the methodological principles used to analyze trends in the socialization of the economy, it should be noted the principles of the institutional approach. This approach combines the ideas of different social sciences and a broad view of economic and social problems. A socioteleological approach also used, considering the impact of new social goals on the nature of economic development.

91.6 Research Results

The innovative macroeconomic style of development fits seamlessly into the concept of a postindustrial economy [2]. Opportunities for practical implementation of this style of development based on investment in innovations, mobilization of endogenous resources, and growth momentum diffusion arising in innovative industries and throughout the economy. In this case, what is the “innovative macroeconomic style of development”? Under the term “style,” we understand the form of activity characterizing the features of economic relations, behavior and thinking patterns of producers and consumers. We use this term even more widely as a combination of endogenous factors that determine the positive activation of the entire economy, the

innovative manner of production (a qualitative form of industrial development) and professional singularity (a qualitative change in the activities of workers. It is in such broad sense, approaching the concept of “innovation-oriented economy,” and filling it with a certain unambiguous content, we use the term “innovative macroeconomic style of development.” This is a special form of farming focusing primarily on innovation. This refers to innovations in all areas of the economic system. Consequently, the innovative macroeconomic style of development is mass innovation in all areas of the economic system. The uniqueness of the innovative macroeconomic development style is also evident in the fact that it is greatly influenced by the processes of socialization of the economy and the digital revolution.

Innovative macroeconomic development style leads the economic system to a stage where socialization becomes the main and dominant feature. In the Russian economic literature, the category “socialization of the economy” used in the early twentieth century [3].

In the Western economic literature, the problem of socialization in the context of the development of productive forces and the production method (macroeconomic style of development) is considered in the works of Eklund [4]. The foundations of social welfare growth are studied in the work of Erhard [5]. The nature of the social market economy is revealed by Lampert [6]. In the works of J. Galbraith, the idea of “socialization” of the economy is presented most fully [7]. Galbraith proceeds from the principle that the totality of social, including economic, relations should change not from formation to formation, but constantly as the productive forces of society develop.

J. Keynes focused on the socialization of the economy, including investments, which he perceived as a path to state socialism. He assumed that the necessary measures of socialization can be introduced gradually, without breaking the established traditions of society [8]. J. Schumpeter also pays a lot of attention to socialization, and he called it an objective historical trend of movement to socialism [9].

The development of productive forces of the economic system as a whole in the conditions of the digital revolution inevitably develops and its social side. New technologies “are increasingly becoming the principal determinants of social change, altering the mores, the social structure, the values, and the global outlook of society” [10, p. XiV]. The emerging innovative macroeconomic style of development in the leading countries of the world is increasingly proving the interrelation of economic and social problems and the impossibility of solving the first without taking into account the second one [11].

The increasing use of digital technologies, fundamentally radical technologies, and anthropocentric organization of production brings the social side of work to the fore. It is worthy of note that the innovative macroeconomic style of development is a form of socioeconomic life and activity that characterizes the features of social and economic communication, behavior, and thinking. Here, development is not aimed at increasing the mass production of goods, but at maximizing the development and use of the innovative potential of human capital. In the new conditions, it becomes necessary to focus on flexibility and stimulating “creative work styles” [12, p. 34].

At the same time, social values and priorities become dominant, and this process is observed at all levels of the economy. Intensive qualitative changes generate a whole range of new problems. The development of innovative needs requires a radical restructuring of the economy, focused on traditional physical needs. The fundamental consequence of indicated changes is embodied in a new innovative macroeconomic style of development, which process of formation proceeds nonlinearly and periodically interrupted by bifurcations. Innovative macroeconomics balances on the edge between chaos (the principle of decentralization) and self-organization (the principle of non-equilibrium stability), which implies permanent involvement of new economic entities and new forms of their organization. In such conditions, the scope of new development options and the range of choice of social and economic goals is expanding. In an innovative macroeconomic style of development, the source of productivity is theoretical knowledge as a “production factor.” “What has become crucial for society that is the central role of theoretical knowledge, the predominance of theory over empiricism, and the codification of knowledge into abstract systems of symbols that can be transmitted in various ways” [13, p. 28]. In this case, information and knowledge that specific people possess becomes the objects of property [14, p. 12].

With the use of new technologies, people are constantly “eliminated” from direct production. Human labor is increasingly being replaced in production by technologies. Druker P claimed, “What is called “automation” today is nothing more than the rapid replacement of labor with knowledge” [15, p. 236]. In the new conditions, labor is replaced by knowledge, and workers are employed only where intellectual assessments, judgments, and creativity are needed. Here, intellectual strength and the ability to innovate are crucial.

The neediness to “eliminate” a worker from production is determined by the fact that the main stage of the digital revolution has arrived. This is a technological stage, which consists in the practical implementation of innovative technologies, automation, robotization of production, use of digital devices, and providing huge savings in all resources. Firstly, digital technologies are the basis of technological innovations, and secondly, they are the technology of social changes. The base of macroeconomics infrastructure is new intelligent technologies. They “grow into” the human body (cybernetic substitutes for individual organs, performing individual mental operations by technologies, etc.). At the same time, social processes become programmable.

However, in the socioeconomic literature, this topic is considered mainly from the side of changes in the content of labor, industrialization and intellectualization of labor [16, p. 31]. Gradually, the term “means of production” is replaced by the term “models of communication” that is adequate to the specifics of the coming era [17, p. 141].

So far, in our opinion, the necessary and clear emphasis has not been placed on the fact that these processes take place in the context of an innovative macroeconomic style of development.

All previous technological methods of production (technological style of production) were based on the technological connection of man and the work equipment

by their direct connection. At all stages of technology development prior to automation, a person was rigidly included in the technological process as a performer of technological functions. The production process was carried out only while man himself remained a direct participant in it. In the machine mode of production, man supplemented and supplements the machine by performing the partial so-called machine functions [18]. Technological subordination of the worker to the machine is completed by complex mechanization and partial automation. The division of man into physical labor and intellectual labor is completed.

The worker becomes a living appendage of an extensively developed machine system of the economy. The machine is the materialized power of knowledge, becomes the dominant element of the productive forces, and subordinates man in the immediate process of labor. The technological element of the productive forces subordinates the human productive force in the direct act of production. This state remains unchanged for a very long time.

The functional content of labor is determined by a certain type of technology, the degree of mechanization, automation, robotization, and informatization of production, with which a person in the process of labor has a direct technological connection.

The content of labor is characterized by a set of those technological functions that a person performs in the process of labor in interaction with technology. These functions can prescribe the creative operations execution that require the strain of the intellectual abilities of a person, and not creative, as well as monotonous work—physical and intellectual.

Man, being the only source of development of large-scale machine production, is at the same time its obstacle. This is due to the fact that the machine method of production, more than any other method of production, technologically subordinates, exploits, plunders, and exhausts the subjective productive force—man, reduced to the level of simple labor.

The solution to the problem of technological liberation of the aggregate worker from the condition of an appendage of an extensively developed machine device is seen in a deep qualitative transformation of the productive forces. This is the deep social meaning of the digital revolution, innovative macroeconomic development, and technologies of ensure the continuous well-being of society [19].

The functional purpose of equipment and man on the basis of materialized achievements of the digital revolution in the conditions of the formation of an innovative macroeconomic style of development is fundamentally modified and transformed. The place and role of man in production, the content and character of his work, and all physical and intellectual activity become different.

Any changes in the means and objects of labor acquire a deep social and historical meaning only when they are measured on a human scale, when the principle of “integral human personality and its capabilities” is implemented [20], when a person is razed to a new trajectory of social development. The “human revolution,” about which the neo-humanist theorists wrote as an imperative, takes place in the form of a change in the “economized principle” of “sociologizing principle” (“sociologizing

mode") that proceeded out of the interests of society development as whole and the individual.

The approach to the analysis of technology through the process of work, in which they are in an inseparable functional unity, has great methodological importance. It allows scientifically reveal both the laws of technology evolution, nodal points and major historical stages of this development, and the content of labor, which is qualitatively transformed depending on the level and state of technology. The qualitative changes in technology that have emerged in the course of the digital revolution mean the beginning of a new major historical period in the development of productive forces. Note that the technological characteristic of this revolution is a digitalized technological method of production. Its essence is that instead of a working machine, a digital technical device appears that qualitatively transforms the functional content of labor, the method of production, thereby becoming the technological basis for the socialization of national production. In the conditions of complex digitalization of production, the technological process is usually proceed autonomous, without the direct person integration in it. The employee only provides the production target, and according to it, equipment work program, as well as, if it is necessary, performs its adjustment and control.

A qualitative watershed between mechanization and digitalization, between the existing traditional working machine (e.g., a universal lathe). and the existing digital device (e.g., a machine with numerical control) are, first of all, the various functionality implemented in them. In other words, a "fundamentally new" device in comparison with a working machine can be considered one in which it was possible to implement a new "labor function." In the production process, it is necessary to ensure that certain operations that were previously performed by a person would be transferred to a digitalized technical device and then implemented in it.

The essence of qualitative changes in modern production technology is the transition to use of non-mechanical principles in production, penetration into the depth of matter, the involvement of the molecular, atomic, and subatomic levels of matter. This leads to the development of the so-called basic technologies that will form the material basis of the modern economy

The application of innovative technological principles is very effective in creating flexible automated production facilities. Using these principles, it is possible to combine in one technological process mechanical operations for processing parts with automatic welding, thermal hardening, changing the crystal structure of the substance, automatic control, automatic change of processing modes, etc. Due to this, greater economic, technological, social, and environmental efficiency is quickly achieved.

The features of the latest production technologies are that they expand the sphere of humanization of the economy based on digital technologies. The method of mechanical action on objects of nature is replaced by the using of physical, chemical, biological (biotechnology), and other properties of the substance and the body. Trends in the humanization of the economy confirm that an objectification of intellectual functions proceeds, which facilitates and stimulates creative activity [21]. All these facts

of the growing process of replacing old tools by using natural processes carried out on the base of the latest technologies indicate an increase in free time in society [22].

Concluding the analysis of the essence of digitalized means of labor and deep qualitative transformations based on them in production, it is necessary to emphasize that under the influence of these processes, a new technological style of action that is adequate to the new relationship between man and nature is formed. The socioeconomic model that illustrates the harmonization between humans and the natural environment is known as the “sustainable development” model. The content of “sustainable development” is more accurately explained in terms of “input–output” [23, p. 5]. The goals of economic, environmental, and social stability are recognized as priority goals of sustainable development [24]. Sustainable development corrects the postindustrial transformation of the economy [25]. At the same time, there is a need to justify the fundamental principle of social policy [26].

Without digital transformation of the economic and environmental sphere, growth slows down, and without them, socialization is impossible. Therefore, digital transformation prepares the material basis for the socialization of the economy.

91.7 Conclusion

In general, the study allows us to conclude that:

- (1) the criterion of a qualitatively new state of technology is its impact on the qualitative change in the functions of labor content;
- (2) automation cannot be reduced only to this functional aspect—in addition to automating the functions of labor, it provides all the main directions leading to the technological liberation of the worker from the state of appendage of traditional machines;
- (3) in order to be qualitatively new and ensure the technological liberation of the worker, automated equipment is freed either partially or completely from the structure of traditional equipment.

In fact, a system of production is being created, meaning of that goes beyond the use of just new types of technologies and begins the transition to the knowledge society in which employment is predominantly shifted to the service sector.

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Chapter 92

“Non-places” as a Concept of Military-Historical Anthropology



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Abstract This paper analyzes the current state of military-historical anthropology and the methodology of its development and outlines the areas for further research in this field. One of the most important problems facing military-historical anthropology today is the development of a new scientific vision. The new system of methodological principles will update the military-anthropological discourse and generate specific (military-anthropological) knowledge to achieve a more comprehensive understanding of a human as a special bio-psycho-socio-cultural phenomenon. The authors of the work believe that military-historical anthropology has the potential to overcome the limitations imposed by its “predecessor discipline”—historical anthropology and gain its own theoretical and methodological status. An important condition for achieving these goals is the integration of the modern philosophical anthropology and other philosophical disciplines into the system of military-anthropological research. Currently, there is a need for improvement of the methodology of military-historical anthropology. Having taken shape in the late 1990s as an independent branch of humanitarian knowledge, military-historical anthropology combined various aspects of military and “near-military” knowledge (corresponding sections of psychology—psychology of post-traumatic conditions, sociology, and ethnology/cultural anthropology—ethnological foundations of military culture). This integrative-synthetic stage is now completed. This paper analyzes the validity of some concepts of philosophical anthropology such as the concept of “non-places”. It also describes the features and heuristic prospects of applying this concept in the field of military-anthropological knowledge and determines the areas for further development of the methodology of military-historical anthropology.

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92.1 Introduction

Military anthropology developed as a scientific field less than four decades ago. During this time, researchers working in this scientific field proved its relevance. Nevertheless, military anthropology is still in the state of development and search for its essence, which means that some methodological aspects of military anthropology need to be further developed. It is especially important to develop a new scientific vision, a fundamentally new approach to formulating and solving scientific problems. Like any developing scientific branch, this area is now experiencing a kind of “growing pains”, when the previously accepted vector of development is gradually losing its relevance.

One of the theoretical and methodological problems that have emerged recently is the weak connection between military/military-historical anthropology and philosophical anthropology. In other words, there is a significant gap between the knowledge of perception of war and its consequences in human life (military anthropology) and the understanding of human as a specific being opposed to nature (philosophical anthropology).

Any anthropological knowledge ought to answer the questions about the specifics of human existence, at least, in an abstract form. For all the controversy of the concept of historical anthropology (French ethnologist Marc Augé suggested renaming this discipline into “anthropologized history” [1]), it sets the ultimate task of defining the specifics of “human nature”. This position is also an implicit philosophical basis for the method of “historical synthesis” [2]. The authors of this work believe that setting the goals for military anthropologists in terms of philosophical and anthropological knowledge will allow this science to acquire methodological integrity.

The purpose of this paper is to substantiate the use of the developments of philosophical anthropology and to strengthen the connection between modern philosophical disciplines and military anthropology. This goal is achieved by demonstrating the validity of the concept of modern philosophical anthropology—“non-place” and highlighting the heuristic possibilities of its use in the framework of military anthropology.

92.2 Military-Historical Anthropologies as an Open System of Knowledge

92.2.1 *The Philosophical Turn in Military-Historical Anthropology*

The term “non-places” was first introduced into science and philosophy by Michel de Certeau, the French philosopher, social anthropologist, and historian, in the 1970s. De Certeau outlined the boundaries of this concept. The key concept described by the

researcher was the concept of “place”, understood generally, in the style of French philosophical anthropology. In his work “The Invention of Everyday Life”, “places” were described as “the order (whatever it may be) in accordance with which the elements are distributed in terms of existence” [3, p. 218]. “Non-places” in this sense are adjacent and blurred sections of “places” that coincide with other places and are partially deleted by them. However, his paper “Walking around the city” gives a new understanding of the concept “place”. “Places”, in this work, are fragments of spaces, taken from the totality of the latter by practices [4, p. 31].

Both concepts (“place” and “non-place”) were further developed after the death of de Certeau, in the works of his student Marc Augé [5, pp. 48–82]. M. Augé perceived the concept of “non-place” in the socio-/cultural-anthropological sense. In his interpretation, “place” (he often uses the term “anthropological place”) is the “loci of identity”, i.e., places of residence of the group or community. In other words, the “anthropological place” is a place in which the very way of living leads us to constructing and reconstructing our identities.

92.2.2 *The Heuristic Potential of the “Non-place” Concept*

According to M. Augé, the concept of “anthropological place” directly opposes the concept of “place of memory” by Nora [6], since the latter uses an existential fragment of space (“place of memory”) to enhance the feeling of “otherness”. Staying in places of memory, we experience the feeling that we are members of the community, that we are no longer heroes of the past.

M. Augé concludes: “If the “place” can be defined as something creating an identity, forming connections and related to history” [5, p. 85], then the space that cannot be defined by these parameters and does not form socio-psychological connections will be referred to as the “non-place”.

Following the works of M. Augé, modern philosophy of space and urbanism refers to “non-places” as abandoned or uninhabited places, i.e., loci without the direct social influence [7, 8]. However, we can use the example of abandoned places to grasp the essence of the very phenomenon of “non-place” as a social singularity. Thus, “non-places”, like “places”, imply sociality, but in a special way. In these loci, sociality exists in a concentrated and super-dense state. “Non-place” is a locus of socio-cultural potentials, where the transition from “strong sociality” to “weak sociality” becomes possible. In this respect, the authors of this paper tend to agree with E.S. Cayce. In his book “Between philosophy and geography. What does it mean: to be in the world of places?” he states that, since the era of Antiquity, European philosophy has opposed the place to the individual (“I”), referring each of them to completely different levels of reality [9]. The objective world, of which “place” was a part, could only be the source of the individual subjective experience. Nevertheless, since the end of the nineteenth and the beginning of the twentieth century, the nature of the “Place-I” relationship has been revised.

92.3 Military-Historical Anthropology: Constructing a New Discourse

92.3.1 *Philosophical and Military Anthropology: Toward Synthetic Knowledge of War*

The reason for the gap between philosophical and military anthropology should be sought in the history of the development of the latter. Initially, this scientific area developed as a response to specific scientific and methodological requests. In the late 1980s and early 1990s, there was an urgent need for an integrated approach to the concept of war as a special, integral phenomenon [10]. At the turn of the 1980s–1990s, the principles of understanding the phenomenon of war were revised, and the war was studied as a psychosocial-cultural phenomenon [11].

A significant breakthrough in this area became possible thanks to the works of E.S. Sinyavskaya. A whole series of her papers and monographs laid the foundation for further development of this special field of anthropological knowledge—military anthropology [12]. In her paper published in 2002, E.S. Sinyavskaya identified several primary tasks to be solved, and one of them was to delineate the boundaries of the theoretical and methodological field of military and military-historical anthropology. E.S. Sinyavskaya gave the priority to the following tasks: the definition of the subject-thematic framework of the new meta-discipline, the crystallization of new problem areas, the intensification of the study of the issues that had previously been abandoned, and the integration of methods of related disciplines [13, p. 12].

At that time, “military-historical anthropology” was a special field of historical anthropology. This can be seen in the areas of research proposed by E.S. Sinyavskaya in her paper. They include the impact of war on society and the army; analysis of military values, ideas, beliefs, traditions, and customs; study of the mutual influence of the ideology and psychology of armed conflicts and the ideological frame of war; mechanisms for creating war symbols and their relationship with military-political mythology; reflection of wars in the mass consciousness [14, c. 14].

For comparison, the paper written by the same author in 2015 under the title “Military anthropology: the development of a new scientific field (based on the results of the first fifteen years)” highlights 16 main areas and key problems. The dichotomy “friend or foe”, the formation of heroic symbols, the patterns of the enemy image in wars, and the problem of historical memory are mentioned there as important, but not crucial for the development of new areas. The researcher also draws our attention to the “psychological component” (in the list of key areas, nine areas deal with various aspects of the psychology of war) [15].

The next stage of military anthropology is associated with the work of V.I. Bazhukov. He follows the concept of the military anthropology proposed by E.S. Sinyavskaya, i.e., the system “man-society”, but in the extreme conditions of armed conflicts. The aspects of socio-cultural life associated with preparing for war and getting out of it are in the center of attention of the researcher as well [16, p. 39; 17,

pp. 12–13]. However, in another work, the same author notes that philosophical and military anthropology differ significantly in terms of the method and subject [18].

In the paper published in 2014, L.L. Gazieva points out that the first, generalizing stage in the development of military-historical anthropology as an independent discipline, has already been completed [19].

92.3.2 Prospects for Military History Research

In the wild (among the great apes), there are some rudiments of the so-called “military” behavior [20], but war as a developed organizational-behavioral phenomenon (including preparation, organization, planning, etc.) is definitely a distinctive feature of human communities. War is a product of the historical development of human society, being the manifestation of hyper-power. The power is concentrated and manifested in direct actions (power over the body, minds, existential capabilities of subordinates, associates, enemies, civilians). A war without power is impossible. In turn, power calls for war and realizes itself in it. In this way, war is the form of power manifestation. However, power is not able to realize itself outside space (in this case, space is understood as a special characteristic of being, as a pre-property of objects to be located relative to each other). According to M. Foucault, the power-knowledge continuum is completed only in space [21]. The facts of the axiological perception of space by a human and the rule of the three-dimensional space, according to which one object can occupy one place in space, create the “energy potential” of war. Thus, we can conclude that space is not just an important condition for war, but it is the only possibility of war.

One of the features of military-anthropological knowledge at this stage is the perception of the “space of war” and “space as an event background”. Today, for a military anthropologist, space is only a “shell of events”, and its study ends with a simple “binding” of an event to the world of three-dimensional forms [22]. Is space as it is accessible to our perception? For modern science and philosophy, the answer is neither short nor simple. We do not live in physical space, but only reside in it [23]. Within the framework of military-anthropological studies, this statement can become the foundation for the development of a new approach. Such attempts have been undertaken already [24–27]. Physical space is rather a reference point, condition or stimulus that generates “other places” in our consciousness (other in relation to the physical world and physical places). Considering the fact that M. Foucault unambiguously insisted that there is no homotopy, and the world is always a multitude of subjectively experienced heterotopies [28], it is possible to interpret his concept of “other places” as mentioned above.

This suggests a provocative conclusion that space is imaginary, which means that the “space of war” is a phenomenon of the same kind. It would be incorrect to claim that the imaginary is opposed to the real or separated from it. It is more appropriate to present the imaginary as part of the perceived reality, and many researchers have already demonstrated it in their works [29].

92.4 Conclusion

In this paper, we dwelt on the interaction of philosophical and historical knowledge, with the view of expanding the theoretical and methodological boundaries of military-historical anthropology. The review of the philosophical-anthropological concept of “non-places” allows us to expand the boundaries of anthropological knowledge. The concept of “non-place” is used now mainly as a reference point for “urban exploration”. However, such approach limits the scope of this concept. The use of the concept of “non-place” within the framework of military-historical anthropology allows us to revise the problem “human”—“space of war” and develop new methods and areas of research.

“Non-place” can be understood as part of the space where the transformation of sociality takes place with the inevitable “weakening” of habitual identities. In this respect, the “field of war” including the front line, the battlefield, the location of regular troops, or partisan detachments are the classic “places” of war. “Non-places” are associated with the relocation of soldiers, but most importantly, with the psychosocial experience of movement (both “horizontal” movement—from one location to another, for example, the experience of retreat by the soldiers, and “hyperspace” movement—the transition from peaceful life to war).

The use of the concept “non-place” (understood as a locus of contraction/collapse of peaceful sociality, suspension of peaceful rules of life, and acceptance/incorporation of the rules of wartime) makes it possible to outline the patterns and limitations of variability of the human nature. We believe that the proposed approach entails many new prospects for military anthropology.

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Chapter 93

Inclusive Education Experiment in Smolensk in the Early Twentieth Century



G. Mezhentseva

Abstract The clarification of the current priorities in the state policy on inclusive education caused the revision of the existing experience of co-education and co-upbringing. The work of the Smolensk regional school for the blind during 1925–1927 is of special importance in this context. In this article, the author analyzes the inclusive education experiment conducted by Boris Ignatiyevich Kovalenko, one of the pioneers in Russian tiflopedagogics. The Smolensk inclusion experiment comprised the practical training at the brush and sewing workshops and the classroom work at the school for the blind and visually impaired. The author presents the key conclusions made based upon the results of the experiment. These include the therapeutical education training for teachers, vocational training with the opportunity to sell the products at the market, material motivation for students, differentiated load for students with various degrees of the disability, limited numbers of students in classes, and monetary support from the government. The experiment took place almost a hundred years ago, but its results are relevant up to this date. The author provides evidence that the co-education was useful for both the healthy students who got the vocational training and learned about the education of the blind and the blind students who received help from their sighted peers. The archive materials are published for the first time.

93.1 Introduction

Today inclusive practices keep spreading across Russia. Smolensk has some unique historical experience of co-education obtained by Boris Ignatiyevich Kovalenko, one of the pioneers in the Russian tiflopedagogics and the headmaster of Smolensk regional school for the blind during the mid-1920s. The experiment comprised the practical training at the brush and sewing workshops and the classroom work at the school for the blind and visually impaired. Thus, the purpose of this article is to

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analyze the experimental work in co-education of the blind and the healthy and to determine its influence on the inclusive education development.

93.2 Research Materials and Methods

The State Archive of Smolensk Oblast (SASO) holds the documents on the establishment of the Smolensk school for the blind of 1891, the reports on the activities of the Smolensk branch of Empress Maria Aleksandrovna's guardianship for the blind over the pre-revolutionary period, and the soviet-era materials on the school for the blind and visually impaired work. Today, the minutes of the school for the blind and visually impaired council meetings are especially relevant as they reflect the course and the results of co-education (or inclusive education, as stated in the Russian Law on Education of 2012) of blind and healthy children implemented by the headmaster and his subordinate teachers, mentors, and group leaders. The author studied and analyzed the archive data and compared them with the complimentary documents.

93.3 Discussion

The co-education experience of blind and healthy children was discussed at several teachers' meetings and pedagogical council meetings. The annual report of the Smolensk regional school for the blind and visually impaired for the academic year of 1924–1925 stated: "We aim to involve the sighted children into the school routines, including their systematic presence at workshop lessons in the school for the blind and visually impaired. We assume that this may help combat the inactive attitude of blind children. As for the reverse, i.e., sending blind children to work in the conventional school, we had several combined trips and believe that there will be huge, probably unsolvable difficulties. The sighted adapt a lot faster and using various methods. We have no experience of combined work, which could be useful for our school because it is easier to arrange individual tasks when there are a few students in the school for the blind and visually impaired groups. In a conventional school, where each group has 35–45 students, both the blind and the healthy will suffer. However, if the school for the blind and visually impaired people, for some reason, fails to attract the sighted students, next year we will try to partially unite and align the program for the blind and the sighted students in a conventional school [1].

This quotation dates back to late August of 1925. The issue was raised in the Department for the Social and Legal Security of the Minors of the People's Commissariat of Education and met with sympathy. When discussing this problem in the Smolensk Provincial Board of Education, its members had some doubts hesitations. Some feared that the sighted students will suffer: They would become less active and mobile and lag behind their sighted peers in studying because of living with the blind since their interests will be sacrificed in favor of the interests of the visually

impaired children. There was also the opposite view expressed: Active and mobile sighted children could exclude the blind from self-organization and other social work and thus create some extra problems for teachers working with the blind, so the latter would suffer. Besides, some claimed that the admittance of sighted students will destroy the blind students' opportunity to study in the school for the blind. Today, many inclusive education practitioners voice the same doubts and fears.

B. I. Kovalenko, the principal of the school for the blind and visually impaired, advocated his suggestion concerning the acceptance of the blind children and rejected the objections. He believed that the sighted in a school for the blind will be in a very favorable position since all of their surroundings will encourage them to be more active than in any other children's home, and thus, they will have better opportunities. When preparing the individual classroom tasks for the school for the blind and visually impaired, it is obvious that the methods of getting acquainted with objects and phenomena, as well as the reading and writing skills, the blind students are different from those of the sighted students.

The Smolensk school for the blind has already had an extensive pre-revolutionary experience of vocational education at the brush and knitwear workshop. That is why the arguments in favor of inclusive vocational education were impossible to reject. The report states that in the children's homes for the sighted, the students did not receive any vocational training. In the school for the blind and visually impaired, they will have to work in shops, and apart from the trades, they may acquire useful skills of teaching the blind. Blind children will not be excluded from school organizations, and they will not trust the sighted and keep their positions. This will be complemented by the fact that nowadays they have sufficient organizational skills and a strive to be involved in the organizational work. The sighted, as a minority, will have to consider the blind, and the blind will learn to coexist with the sighted. The presence of the sighted students in the classroom or the workshop will help the teachers since they will be able to carry out tasks that are very hard or impossible to perform by the blind. For instance, the sighted can help to find and distribute the material during the work or when moving from one location to another. The positions will be provided to the sighted students to properly arrange the work with the blind who are systematically excluded from living and working together with the sighted. Thus, B. I. Kovalenko provided evidence that the co-education was useful for both the healthy students who got the vocational training along with the classroom and the blind students who received help from their healthy peers.

Notice that the school also accepted poorly-sighted children. "At the beginning of 1925–1926, we accepted several poorly-sighted students who could orientate themselves using their vision and read letters—some did better, some worse. The blind children who tolerated the poorly sighted initially treated the sighted ones with hostility. Gradually, their relationships improved and in the first term of 1925–26, the clash between the sighted and the blind became less acute. The sighted got elected for all elective offices, but sometimes the hostility toward them recurred. These outbreaks became few and far between and less sharp. Initially, the sighted and the poorly sighted felt suppressed, but in a month or two they adapted to the blind better than the blind could adapt to them. The segregation of the sighted and the poorly

sighted was not observed. They gradually intermixed with the smaller groups of the blind” [2].

According to the annual report for the 1925–1926 academic year, the general atmosphere at the school changed drastically after some sighted students were admitted. The school stopped to feel like a specialized organization for the blind. Several sighted students and a relatively large number of the poorly sighted helped lift the previously normal suppressed and gloomy mood of the blind children. Lessons with the poorly sighted went the same way as with the sighted students, which did not disrupt the lessons and did not create difficulties for the teachers. The poorly sighted learned how to read and write the Braille. All of the sighted and poorly-sighted students were trained at the shops. They acted as valuable assistants to teachers and instructors in the classrooms and especially in the shops. No negative influences from the blind were observed. The mood and the personalities of the sighted children only displayed a more conscientious attitude and greater interest in work. In the autumn of 1925, i.e., at the same time, as sighted and poorly-sighted students were accepted in the school for the blind, two schools for the blind and visually impaired girls were referred to the conventional school. That year’s experience showed that it is a lot easier to educate the blind together with the sighted at a school for the blind. However, blind senior students can be educated at conventional schools notwithstanding the technical and formal complications [3].

The experience of co-education of the blind and the sighted continued in the 1926–1927 academic year. The records of school life, thoroughly taken by B. I. Kovalenko and his associates, demonstrate all the difficulties of co-education, and yet confirm that it is possible to create the conditions for its positive influence on the students and achieve good results. Sighted students were accepted in the school not only to help the blind. The girls were also supposed to be trained as future knitwear instructors.

This inclusion experiment shows that almost a hundred years ago the teachers had the same worries related to insufficient therapeutic pedagogic training. The teachers at the conventional school spoke against the acceptance of the blind students arguing that they do not know how to work with them. In particular, they could not read the braille and thus could not check their students’ works. A month after the admission, the conventional school teachers’ attitude to the co-education of the sighted and the blind improved because the blind students, who had extra classes at the school for the blind and visually impaired, achieved some unexpected success. The extra lessons with the blind students were held by a mentor from the school for the blind and visually impaired who gave three classes every day. The mentor’s work centered around reading and explaining the sighted textbooks, creating excerpts and notes together with the students, and remedying loopholes in arithmetics, especially the written one.

Almost all of the teachers at the conventional school noticed that the blind students were eager to learn and demonstrated good memory and attention that helped them succeed in almost all subjects. “The resolution of the school council claims that the blind students master the theoretical material quite well, while the laboratory work and demonstrations do not make much difference to them. The school cannot refuse

the co-education plan for the sighted and the blind within the existing class system. Under the laboratory system, the blind students will have to struggle” [4].

To record the two-year co-education experience for the blind and the sighted, the teachers and the students were polled. The council meeting minutes of the Smolensk regional school for the blind named after A. I. Rykov of November 11, 1927, confirms that before discussing his information report on the co-education of the blind and the sighted B. I. Kovalenko, the principal, provided a relevant evidence analysis [5]. The poll led to the following conclusions.

When the blind and the sighted study together at a school for the blind and visually impaired, the activity, mobility, cheerfulness, and confidence improve among the blind, they do not deteriorate among the sighted. However, there is some evidence that the company of the blind is a little depressing for the sighted. This was mentioned by the sighted students of the teenage home who came to work at the knitwear workshop. Bitterness, mistrust toward people, secrecy, and closedness reduce both among the blind and the sighted according to the majority of the respondents.

“Everybody mentioned the positive impact of co-education on the results of workshop activities of both the blind and the sighted. Some noticed the competition between the blind and the sighted, which conditioned the success of both groups. The co-education at the conventional school did not influence the results. The results of the blind reduce slightly because of the large number of the students in the group and the fact that some teachers were not acquainted with some of the specialized methods for teaching the blind. In the school for the blind and visually impaired experiment, the blind got the skills necessary to live and work together with the sighted. The blind students who went to the conventional school also learned to live and work together with the sighted but this was not easy for them and hurt their self-esteem” [6].

At the school for the blind and visually impaired, almost everybody said that the sighted students were a significant help to the blind in terms of orientating themselves and also during the work and at rest at the school and outside. The sighted helped quickly find or deliver the necessary things and carried out the tasks that the blind could do very slowly, if at all. Upon receiving the tasks from mentors and teachers, the sighted students arranged walks, games, swimming, gymnastics, and work for the blind and helped them during these activities. During the acquaintance with the objects and phenomena during trips and at the school, the sighted students mastered the necessary skills and helped the blind students. They told the blind about the things they saw, including films, read newspapers and books for the sighted, wrote letters, and helped at the tachygraphy lessons. The sighted provided the most significant assistance at the handicraft classes and in workshops, which everybody noticed without reserve, as well as in mastering independent living skills, especially in the kitchen and in the laundry. To a lesser extent, the blind helped the sighted. Some students mentioned that the advanced blind students helped the blind to understand the material, ignited the interest in reading, taught them the braille type, and helped with calculations. During the handicraft and workshop classes, they worked with the beginner-level sighted students and those lagging behind. The presence of the blind in a sighted group did not help the teachers. The majority of the students learned

about the life and work of the blind and discovered the braille. Occasionally, the blind helped the sighted with the German language. The sighted helped the blind navigate the school building and find their jackets.

The use of different textbooks for the blind and the sighted did not complicate the work but made it more diverse and interesting. The sighted students enrolled at the school for the blind noted that their interests were not always considered (there were no skis or skates), the blind blamed the sighted on their failures and disrupted the work because of their whims. These problems could be solved. Both the sighted and the blind could go skiing and skating, and the quarrelsome or whimsy could be called to order irrespective of their being blind or sighted.

The more serious problems included, for example, the increased pace when sighted students worked in the school for the blind, which was often too difficult for the latter. Thus, the school for the blind and visually impaired required the involvement of tutors, especially in maths, physics, environmental studies, and geography. “To arrange tutors’ assistance at the school for the blind and visually impaired, we will have to assign a teacher to every student. One tutor cannot provide the necessary support to senior students. The teachers from the conventional school stress that the blind students cannot make the most of the school trips, demonstrations, laboratory activities, and independent work. This is due to the lack of skills necessary to work with the blind among the teachers at the conventional school. The teachers from the conventional school also see this as a problem. They also claim that they do not know the methods of working with the blind including the braille script. Mastering these skills is difficult for the teachers at conventional schools because it implies extra work for them. If no such efforts were taken, the educators from the school for the blind and visually impaired have to act as translators who might cover the mistakes in their students’ work.

In this case, the teachers of the sighted students cannot directly monitor the work of their blind students. These problems are partially mitigated if the blind students know tachography, and they can be eliminated only if the teachers at the conventional schools become visual impairment specialists to some extent, which cannot be commonplace. Therefore, one may wonder would it be better to invite tutors and organize co-education at the school for the blind. At the workshops and at leisure times, the teachers and mentors noticed that the blind may feel uncomfortable doing their work in the presence of the sighted. There are also observations that the sighted are uncomfortable working in the presence of the blind. This is observed at the start of co-education programs. Some teachers observed the excessive helpfulness of the sighted toward the blind, which was easily eliminated” [7].

All of the teachers save teacher Makarevskiy noticed the improvement of diligence and perseverance among both sighted and blind students during the co-education. These observations were confirmed by the students. Only five of them said their diligence and perseverance decreased but some of them provided different reasons. Seven students claimed the co-education did not influence them anyhow. Co-education at the conventional school stipulates that blind students will be forced to work more and thus learn diligence and perseverance. However, it might have negative results

because systemic failures may break the students' spirits. The diligence and perseverance of the sighted in a conventional school are not influenced by the presence of the blind.

Everybody admits that the attitude of the blind to the sighted at the school for the blind and visually impaired was very bad at the beginning of co-education, but then it quickly improved. The majority of the respondents said that the blind did not just make up with the sighted, but also started to find them useful. Each of the sighted students gained some influence among the blind for some time, but they also lost it quickly and easily. This influence recovered over time. It is beyond any doubt that the blind bullied the sighted because they were more numerous and they admitted it. Sometimes the blind "crowded" and "nightmarised" the sighted. The bullies attacked the serious faults of the sighted and those had to "align." Not all of the sighted were bullied. Usually, one or two students were picked on, and the bullying did not last long. The bitterness and the mistrust of the sighted became weaker, which was confirmed by almost everybody, including the students. Sometimes, the bitterness and the mistrust were ignited by the personal traits of the sighted students. There were outbreaks of bitterness and mistrust caused by the actions of some of the sighted, or the acceptance of the new students into the school, especially in the workshops. It is important that the previously displayed and inflated hatred toward the sighted were now either nonexistent or concealed because it was deemed a flaw that must be overcome. "The blind can get used to the sighted faster if they live with them at the school. It takes a lot more time when the sighted come to the school for the blind and visually impaired or when the blind go to the conventional school. Several conventional school students said that blind children became more trustful but it takes so long that many just do not notice it. At the school for the blind and visually impaired, some teachers observed that groups of blind and sighted students came out against each other during the co-education. Both the blind and the sighted admit that they took part in these rallying. Collective bullying of the sighted by the blind is because of the vision occurred when the first sighted students were admitted at the school. Organized groups of the blind accused the sighted of their real and imagined flaws at meetings. The blind was especially opposed to the sighted students being accepted in the knitwear workshop in the spring of the current year. They claimed directly that the workshop does not need so many sighted workers, and the current two were enough. The first rally involved almost all of the students, and the second involved the blind working in the knitwear workshop. There were also group rallies of the sighted against the blind. When our students were accepted in the conventional school, they were first ignored because of blindness, and other children felt uncomfortable sitting at one desk with them" [8].

All these rallies were settled via the careful and systemic approach of the teachers and school administration. According to eight teachers of the school for the blind and visually impaired, the relationships between the students improved, and two mentors claimed and they remained the same. Half of the schoolchildren said the relationships among them improved and the rest said they remained the same, but among the latter were many who claimed that the attitudes toward each other were good from the very beginning. Only two students noticed that the relationships among them aggravated.

As for the attitudes in the conventional school that accepted blind students, many students there said that their relationships improved.

93.4 Results

As a result of co-education, “the blind do not form a special breed of people but gradually integrate into the labor environment of the sighted, they acquire the habits and inclinations of the sighted, they feel less isolated from the lives of the sighted, and do not turn into a closed type of blind people only interested in the world of the blind where they can exist. The sighted in the workshops perform the tasks that are inaccessible for the blind, while the differentiation of labor makes the efforts of the blind and the sighted equally valued. They run the sales of the products. They help the handicraft instructors, explain the operation methods to the blind, and join their world as friends in the fight for life in work associations or as teachers and mentors in schools for the blind. We are now more certain that co-education is beneficial than we were at the beginning of the experiment. Many of our hopes came to life” [9].

B. I. Kovalenko in his report mentioned several achievements brought about by co-education. The most significant one is the co-education breaks the isolation of the world of the blind. Instead of cultivating isolation in a specialized school for the blind and visually impaired, inclusive schools aim to adapt the blind to living among the sighted. The majority of the mentors did not expect a complete integration, but the hope for convergence came true. It is important that we achieved the expected improvement of the personal qualities of the blind without any harm to the sighted students, especially in terms of activity and mobility. We assumed that co-education would be easier than there would be fewer obstacles and problems. However, the blind who faced the sighted in the context of co-education was always painfully reminded of their blindness. Things like this cannot be eradicated quickly, if at all, but this was not considered. The hope that gutter teens will become handicraft instructors at the schools for the blind and visually impaired in 2 years has not yet come true because these students lack a general education. While the sighted students were in the school, they helped the teachers and the students in the classroom and workshops beyond our expectations.

To expand our experience, the authors suggested attracting the non-resident sighted students into the school for the blind and visually impaired. There was also an opposite suggestion: the sighted students living in the boarding school for the blind could be sent to study at conventional schools. All of the school for the blind and visually impaired teachers and students except two felt it was necessary to continue the co-education of the blind and the sighted. On November 11, 1927, the second meeting of the school for the blind and visually impaired council was held where the results of the poll were presented. The school council supported the opinion expressed by the majority of the respondents [10].

93.5 Conclusions

The experience of two-year co-education of the blind and sighted children was summarized after the polling of the teachers, mentors, and the blind and sighted students. It was presented, discussed, and generally approved at several teacher meetings. The authors should admit that the positive outcomes of the co-education of the blind and the sighted significantly outnumber the negative ones. The experiment was deemed a success, and the authors decided to proceed with this practice.

Many ideas of B. I. Kovalenko and his associates became the theoretical and methodological backbone of the modern inclusive practices. They include the compulsory therapeutic pedagogic training for the teaching staff, efficient vocational training in correctional educational establishments with a possibility to sell the products, the limited number of students in pre-school and school groups with students that have sensory impairments, limiting the number of such students in larger classes or groups, individualized approach, the differentiated pace of work, as well as other specific methods, techniques, and means of education and upbringing. Interestingly, the authors view inclusion today as integrating disabled children into the mass education system and not the other way around, which was successfully implemented almost a hundred years ago. This gives some food for thought.

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Chapter 94

The Analysis of the Online Platforms for Evaluating the Students' Supra-Professional Competencies



M. Shavrovskaya and A. Pesha

Abstract Due to the active development of the digital technologies and automation, the changes are taking place in many areas of the human resources management, including the partial transfer of the personnel training and evaluation. Business technologies of the human resources management are beginning to be used by the educational organizations. It is getting obviously that it is important for the students to develop their supra-professional competencies at the very first stages, embedding them in each discipline. In this paper, the authors analyze the Russian language online platforms for assessing competencies, which are designed for business, but could be used by the universities to assess the level of the students' supra-professional competencies. We are supposed that it is important to assess and develop them to active citizenship, personal self-realization, and employment opportunities in a knowledge-based society.

94.1 Introduction

Recently, more and more scientists talk about the importance of developing the supra-professional competencies, pointing out that they are often much more important than the professional ones. B. Cimatti writes that “it is evident that school must provide students with soft skills not only to find a job, but to flourish as human beings and citizens” [1, p. 103]. In the business environment, the assessment of the employees’ supra-professional competencies has been carried out for a long time. In addition, there are companies that attempt to evaluate these competencies using an online platform. Few of them go even further in the application of the modern information technologies and integrate the results of the assessment into the employees’ individual development plans. In the educational environment, it is difficult to find such projects for evaluating students. Although there is no doubt that possibility of conducting an assessment in the first year of study to determine

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the growth zones of the students' supra-professional competencies followed by the preparation of a training plan for four years (including activities conducted by the department; speaking at conferences, internships) would be an undisputed advantage for both the university and the student. These can be supplemented by creation of "a compass of training and development," which includes recommended literature for each students' supra-professional competencies, video lectures, films, etc.

The purpose of the paper is to analyze the Russian language online platforms for assessing the students' supra-professional competencies.

Each platform was analyzed in terms of four characteristics:

1. The tools used for assessing the supra-professional competencies.
2. The competencies that can be evaluated using this platform (is the competence set fixed or is it possible to use a constructor of the competencies).
3. The ability to integrate the results into the learning resources.

In total, the authors analyzed seven online platforms. The authors used the information that is presented on the sites where they are described. In some cases, to clarify the details additional questions were asked to the companies' representatives that offer them.

94.2 Literature Review

The main settlement of the competence approach in the education system was formulated in the 1970s by such American researchers as D. McClelland, R. Boyatsis, L., and S. Spenser. They looked at the development of competencies in the framework of modernization of the education system, emphasized that it is a fundamental factor in the effectiveness of a particular employee's professional activity [2, 3].

There is no single definition of the supra-professional competencies in the science as well as in the business environment. There are many names to them such as "basic skills," "meta competencies," "multidimensional competencies," "soft-competencies," "trans professional competencies," "interpersonal skills" [4–11].

The authors identify supra-professional competencies as a wide range of skills and behaviors, interpersonal relationships, and personality traits that allow a person to quickly navigate and adapt to the tasks and challenges of the environment, establish relationships and establish contacts, show high work efficiency, and achieve goals and objectives [12].

The formation of supra-professional competencies in universities is devoted to the work of scientists from various fields of knowledge, including teachers: Khayrullina [13]; Shilova [14] and others, sociologists: Pryamikova [15, 16], and economists: Gorevaya [17] and others.

As it was written earlier in business the supra-professional competencies are evaluated and the great efforts are invested to develop them in employees. So it becomes obvious that they need to be developed even earlier with the professional competencies (and ideally from the earliest childhood). The scientist point out that

it is important to change the higher education system and to focus on the supra-professional competencies which can help students to be more successful in the labor market [18, 19]. Some scientist tells that today there is a long-felt need in modernization of the practice of specialists professional training which formed in Russia by now and is important develop such skills as to socio-professional and virtual mobility, communicativeness, practical intellect, responsibility, collectivism, workability, corporative approach, innovativeness [11]. The list of competencies suggested by these authors is not the only one, there are different approaches to what to include in the supra-professional competencies in the scientific literature. The authors of this paper suppose that they include

- thinking and intelligence,
- communication,
- digital competencies,
- self-monitoring,
- entrepreneurial [12].

To develop the students' supra-professional competencies, it is important to integrate them in the objectives, learning outcomes, and teaching strategies of the programs [20]. D. Beard, D. Schweiger, K. Surendran share the case concerning the development of students' supra-professional competencies throw integrating it into classroom activities and assessments of student performance, case studies, special projects, group work, and oral and written presentations [21]. At the same time, it is worth to mention that teachers must have a sufficiently high level of the development of these competencies themselves.

In business, to understand which supra-professional competencies are required to develop the assessment is made and after training or during it, the dynamics of changes are evaluated. It is also important to evaluate the effectiveness of this work at least at the level of changes in the students' behavior (or at the level of behavioral indicators). Many teacher and trainers refer to the fact that the supra-professional competencies are very difficult to be thought in an online course. Conducting an assessment of them via online platforms is also not such an easy issue; however, some attempts are being made to do this.

There is three years longitudinal research project focusing on representing soft skills in the European Union the main aim of which is to establish mechanisms that allow educators to continuously support, observe, assess, and acknowledge the development of students' soft skills using the digital badges [22]. It is interesting the experience of scientists who build machines able to automatically detect personality traits from simple acoustic and visual nonverbal signals, extracted from short (30–120 s) self-presentations [23]. G. Pisoni, L. Gaio, A. Rossi describe their experience of how the technical graduate students have developed an online peer assessment training system in which students submit assignments and evaluate other assignments completed by their colleagues, they discuss how to promote students' assessment of the supra-professional competencies development [24]. Anyway it is quite difficult to find many cases of evaluating the students' supra-professional competencies using online platforms in the literature. This direction is still being formed and even those

who offer such an assessment, they do not fully satisfy the customer's requests and also confuse competence with the assessment of knowledge, skills, and attitudes of the individual.

94.3 The Results of the Analysis of Online Platforms

94.3.1 *The Advantages of Online Platforms for Assessing*

The site with a description of each platform describes the advantages that its use gives. Based on content analysis, we have obtained a tag cloud (Fig. 94.1) that shows us that the most frequently repeated words are training, employees, personnel, fast, optimization, costs.

All these words are related to the most important advantages of online assessment:

- reducing the financial costs and time,
- a formation of the personnel reserve,
- an optimization of the training programs.

To these advantages in terms of students' assessment, it can be added the ability to repeat the assessment with a certain frequency, track the dynamics of their development, and store the data in a single database.



Fig. 94.1 Tag cloud: the advantages of online platforms for evaluating competencies

94.3.2 *The Unified Platform for the Staff Assessment, Training, and Development jetskills.ru*

The tools used for assessing The online platform offers two tools: the test of the professional competence and the psychological test. The last one is supposed to assess the supra-professional competencies and also called the adaptive testing. In the process of evaluating the knowledge and the skills, the different levels' questions are selected (the platform offers four of them according to the employee's position).

The competencies It can be used the ready-made competencies (15 areas, 13 job profiles, and 12 the supra-professional competencies) or design your own ones.

The integration the results of assessment with the learning resources The platform analyzes the test results and forms an individual trajectory of the employee's training and development. The platform has more than 1300 micro-courses (video lectures, simulators, slide courses, etc.), and each of them is marked by knowledge, skills and competencies.

94.3.3 *Online Assessment Tools “THALENTO” <https://hrsolutions.ru/instrumenti-onlajn-ocenki/>*

The tools used for assessing A professional personal motivational questionnaire, cognitive tests, and aptitude tests are used for assessment. However, the platform assumes that a number of competencies can only be evaluated by an assessment center or by self-assessment, so this online platform offers such tools as Periscope (360°) and I-Rater (self-assessment) in addition to the questionnaires.

The competencies The competence model consists of the six main competence clusters (management, information processing, communication, efficiency, personal characteristics, and interaction) and includes 52 competencies. These competencies can be compiled on the basis of the customer's competence model and on the basis of the online platform's competence model.

The integration the results of assessment with the learning resources. At the time of the analysis of online platforms for assessing the supra-professional competencies, there was no functional possibility to integrate the assessment results into individual learning paths.

94.3.4 *Online Assessment Tools <https://proaction.pro/>*

The tools used for assessing The tools are developed in accordance with the Russian personnel testing standard and are tested on a sample of more than 100,000 candidates

and employees of the Russian companies aged 18–65 years in the various business areas (trade, manufacturing, finance, construction, tourism, etc.). There are several tools which are used among them are a test (the questions with the ready-made answers), a mini-interview with open question, a case study (an example of a work situation and a request to describe the actions). Additionally, it can be evaluated the level of social desirability using the lie's scale.

The competencies This online platform involves the assessment of knowledge and personal qualities, but not the competence of employees.

The integration the results of assessment with the learning resources This online platform for assessing has no functional possibility to integrate the assessment results into individual learning paths.

94.3.5 Online Assessment Tools Used by «Beeline» <https://www.oblakogroup.ru/projects/beeline-online-assessment>

The tools used for assessing The evaluator creates the exercises which can allow to evaluate an employee. Among them are a role play, tests, an essay, simulators, in-baskets, etc. Using these exercises, the online platform can compile an assessment for a specific position or a special situation. The employee's responses are accepted as a text, tests, or a personal presentation via Skype. The online testing process is controlled by an evaluator. It can also be monitored by one or more observers.

The competencies The OBLAKO Group team has developed a portal for Beeline with a unique assessment functionality. This is a convenient platform for remote the employees' assessment of knowledge and skills, which has become a part of the Corporate University. It is interesting that the platform has a mail correspondence simulator that allows to check and evaluate the correspondence skills. What is worth to mention that it is possible to develop an online platform for the other companies that need it using their competencies.

The integration the results of assessment with the learning resources The received responses are analyzed according to the competencies' list. The evaluation results can be exported to Excel or to the company's distance learning system. All the written responses from employees are stored in the system so they can be studied and analyzed at any time.

94.3.6 *Online Assessment Tools <https://151eye.ru/>*

The tools used for assessing In this platform you have to select the test topics for evaluating the competencies, write a full name and a phone number of a person you want to assess, date, and time of testing. The chatbot will test during 30 min, and then you can look at the results and, if necessary, listen to the answers.

The competencies The platform allows to test various supra-professional competencies, including teamwork, self-organization, and influencing other people.

The integration the results of assessment with the learning resources This online platform for assessing has no functional possibility to integrate the assessment results into individual learning paths.

94.3.7 *Online Assessment Tools <https://webtutor.ru/>*

The tools used for assessing There is a special module for automating assessment processes for the library of competencies, knowledge and skills, and behavioral indicators in this online platform.

The competencies The competencies' list is developed depending on the company's needs.

The integration the results of assessment with the learning resources The evaluation results can be integrated into the individual development plans and the specific learning tools. There is another module devoted to learning and development in this online platform.

94.3.8 *Online Assessment Tools <https://ht-lab.ru/>*

The tools used for assessing Tools are selected from the test catalog, the analysis of which shows that they are more aimed at evaluating not the competencies, but such psychological characteristics of the individual as the motivation factors, a type of temperament, a level of intelligence, etc.

The competencies The constructor of the competency (called CONCOM) allows to translate the test scores into the language of the other assessment criteria. It can work with a universal basic set of competencies which can be adjusted or if you need you can build your own system of the relationships.

The integration the results of assessment with the learning resources The results are stored in a user-friendly database, and if necessary it can be integrated with such information resources as a Web site, a portal, a system of the distance learning.

94.3.9 *The Ability to Evaluate the Student's Supra-Professional Competencies Using the Online Platform jetskills.ru*

One of the most suitable online platforms for assessing the student's supra-professional competencies to our mind is jetskills.ru. It has a model of competencies that partly echo them (Table 94.1).

The initial analysis shows that it allows to evaluate almost all the competencies (5 from 6) and we have allocated (with the exception of "thinking and intelligence"). However, it is certainly necessary to conduct a pilot evaluation using this online platform to assess how it will allow to implement the tasks that the authors set for themselves. Developing the own online platform (as suggested <https://www.oblakogroup.ru/projects/beeline-online-assessment>; <https://webtutor.ru>) requires a much larger investment than using a ready-made solution. And all the other platforms that were analyzed offer either a rather fragmentary assessment, or they identify competencies with psychological characteristics of the individual.

The next step may be an evaluation a group of the students using this online platform and assessment if it can be used to determine the level of development of the supra-professional competencies and create the students' individual development plans.

94.4 Conclusion

A choice of a platform depends on the tasks at hand, whether it is necessary to assess the compliance of the existing competency model, or whether it is possible to use the constructors offered by the platforms. To evaluate students' supra-professional competencies, it can be choosing a platform that already has competencies which are close to the list of the supra-professional competencies. It is also worth to note that many platforms decline that the competencies are evaluated; in fact (judging by the description of the methods), they can help to assess knowledge, skills, or psychological characteristics (such as temperament, willpower, etc.). In addition, not all the online platforms offer integration of the assessment results with the students' development plans. And if they do, they do not take into account the characteristics of the younger generation as a rule. The authors would like to emphasize that integrating the assessment results with individual development plans it is important to consider the interests of today's students. The teachers have to use the social networking tools, blogs, etc. Additionally, it is important to integrate in each discipline the development of them using project work, simulation, case study, learning game, seminars, and workshops focusing this topic.

Table 94.1 Analysis of the ability to evaluate the student's supra-professional competencies through online platform jetskills.ru

The competencies offered an online platform	Supra-professional competencies	Social competencies	Thinking and intelligence	Communication	Digital competencies	Self-monitoring	Entrepreneurial
Client orientation	X		X				
Orderliness				X			
Result orientation					X		
Team work	X		X				
Development orientation						X	
Following ethical principles	X						
Adapting to changes						X	
Communication			X				
Negotiations			X				
Managerial efficiency					X		
Strategic thinking						X	

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Chapter 95

Improving the Methodology for Assessing the Business Climate at Small Companies in the Region



S. I. Volodkevich

Abstract Currently, the problems of small business development can be seen as one of the priorities of the national policy in the Russian Federation. Over a long time, the small business sector has been the most vulnerable element of social and economic space. To create comfortable conditions for business in Russia, several basic documents were put in force to regulate the development of this economic sector mostly through support measures at the regional and municipal levels. The business climate in a given region depends on the local conditions and factors associated with business activities. The review of methods and approaches to evaluating business climate shows that none of the approaches is universally accepted, and all of the existing theoretical and practical methods have their drawbacks. The goal of this research is to analyze one of the approaches to evaluate the business climate at small companies on the regional level. This approach stipulates composing two ratings that would reflect the state of the business climate. The objectives and hypotheses in this work were determined accordingly. The hypotheses were verified using the methods of nonparametric statistics, which allows for high adequacy of the evaluations obtained. Research results and more specific questions can be used as the basis for rational decisions concerning small business development conditions within a given territory (municipal entity) to be taken by authorities.

95.1 Introduction

The small business sector determines the social stability and sustainable development of any country. Currently, the contribution of small businesses in the Russian economy is quite low as compared with developed and developing countries. The key development problems include low investment and innovation activity, off-the-books employment, administrative barriers, etc. These problems largely depend on

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business conditions or the business climate. The development of the small business sector in Russia is characterized by orientation on regional and local markets. The government policies of Russia stipulate measures to support small businesses on the federal, regional, and municipal levels [1, 2]. The national project for Small and Medium Business and Business Initiative Support led to the change of small business support format used by regional and local authorities [3].

The small business sector is the subject-matter of this article. The research focuses on the business climate typical of a given territory.

The majority of small business entities (31%) are located within the Central Federal District, while 6% are located in Moscow Oblast. This region is one of the most favorable for business activities. The proportion of small and medium businesses in the gross regional product is over 30%. The analysis of favorable business climate factors was presented by the authors of this article in previous publications [4, 5].

Moscow Oblast employs two complementary approaches to the efficiency assessment for the actions taken by the authorities to develop small businesses. According to those, we formulated our objectives:

- (1) Describing the small business climate assessment methods used in Moscow Oblast;
- (2) Verifying the hypotheses on the regional correlations reflecting the business climate conditions in the region;
- (3) Evaluating integrated assessment opportunities and prospects for the business climate.

The research objectives identified are very practical.

The list of administrative territories in Moscow Oblast of June 23rd, 2020 includes 55 oblast cities, 3 oblast townships, and 5 restricted administrative territories [6].

The assessment of the business climate in Moscow Oblast is conducted on a quarterly basis for all municipal entities (hereinafter referred to as Rating 1) [7]. The assessment is based on 3 criteria (Table 95.1).

These indicators are based on federal and regional statistics. The resulting municipality rating is calculated by summing up the scores of three criteria.

Another rating describing business conditions for small companies in the region is based on the municipal entity websites (hereinafter referred to as Rating 2) [8]. The rating is based on the expert assessment of 15 parameters reflecting the completeness and accessibility of information, the openness of local administration towards businesses. The resulting rating evaluation is calculated by summing up each parameter's score, which, in their turn, are assessed by experts on the scale from 0 (minimum value) to 5 (maximum value). Essentially, Rating 2 is a reflection of authorities' openness towards small businesses and it does not consider the influence of digital technologies and platforms on the development of the small business sector. However, the concept of digital entrepreneurship is becoming increasingly popular and it is perceived as the basis of digital economy development [9, 10]. Rating 2 is a reflection of authorities' openness towards small businesses.

Table 95.1 Business climate assessment criteria for Moscow oblast

Criterion	Title	Rationale
Business density	The number of small business entities per 10,000 residents of a municipality	The objective criterion reflecting the density of small and medium businesses in a given region
Startups	The number of new small business entities per 10,000 residents of a municipality	The objective indicator of the municipality's attractiveness to the small business sector, the availability of favorable conditions for new businesses
Municipal support	The amount of money from the municipal budget spent on supporting one small business entity in rubles	The indicator reflecting the priority of small business support problems in the formation of the municipal budget

95.2 Materials and Methods

The research relied on system analysis, comparative analysis, as well as the analogy, generalization, and nonparametric statistical methods.

The input data are represented by ratings (order variables). Thus, we used the following methods to identify correlations between them:

- (1) Spearman's correlation coefficient for two variables (ρ);
- (2) Kendall's coefficient of concordance for several variables (W).

The result validity is 95%. This means that the conclusions about the correlation of variables have a 5% probability of error and thus signify that the research results are reliable. This work has the following hypotheses:

- (1) ratings of the same type are correlated;
- (2) Rating 1 and Rating 2 are correlated;
- (3) Rating 2 and specific criteria of Rating 1 are correlated;

Hypothesis validation results represent specific stages of the research.

The input data reflect different periods. To improve the relevance and comparability of the research, we used the data from January 1st, 2019. The ratings feature discrepancies in observed entities (in number and title). Thus, the final calculations only feature the municipal entities of Moscow Oblast that were represented in both of the ratings. The overall sampling volume is 58 people.

Table 95.2 Kendall's coefficients of concordance (W) for Rating 1 values

W	01.10.2019	01.12.2019	01.04.2020	01.07.2020
01.10.2019	1.000	–	–	–
01.12.2019	0.920	1.000	–	–
01.04.2020	0.855	0.844	1.000	–
01.07.2020	0.863	0.862	0.979	1.000

95.3 Results

95.3.1 Establishing Correlations Between Ratings of the Same Type

To establish the correlations for Rating 2 values, we calculated Spearman's correlation coefficients ρ . In the calculations, we used rating data of 01.01.2019 and 01.07.2019 (reporting dates). The coefficient $\rho = 0.677$. Therefore, the correlations between Rating 2 instances are statistically significant.

For Rating 1, we calculated Kendall's coefficients of concordance. We based on the ratings describing the business climate in the region of 01.10.2019, 01.12.2019, 01.04.2020, and 01.07.2020 (Table 95.2).

The correlation between Rating 1 instances is statistically significant. The closest correlation was found between the 01.04.2020 and 01.07.2020 ratings.

95.3.2 Establishing Correlations Between Rating 1 and Rating 2

We calculated Spearman's correlation coefficients for Rating 1 and Rating 2 for every moment (Table 95.3).

The correlation between Rating 1 and Rating 2 can be seen as statistically insignificant. The closest correlation was found between Rating 1 of 01.04.2020 and Rating 2 of 01.07.2019, Rating 1 of 01.07.2020, and Rating 2 of 01.07.2019. The coefficients are negative. Therefore, higher positions in one rating correlate with lower positions in another. This is well illustrated by Naro-Fominsk and Zaraysk ranked

Table 95.3 Spearman's coefficients (ρ) for Rating 1 and Rating 2 values

ρ	Rating 1 01.10.2019	Rating 1 01.12.2019	Rating 1 01.04.2020	Rating 1 01.07.2020
Rating 2 01.01.2019	0.098	0.032	0.004	-0.002
Rating 2 01.07.2020	-0.059	-0.087	-0.156	-0.146

Table 95.4 Spearman's coefficients (ρ) for Rating 1 and Rating 2 values

ρ	Rating 1 01.12.2019 (crit. 1)	Rating 1 01.12.2019 (crit. 2)	Rating 1 01.12.2019 (crit. 3)	Rating 1 01.07.2020 (crit. 1)	Rating 1 01.07.2020 (crit. 2)	Rating 1 01.07.2020 (crit. 3)
Rating 2 01.01.2019	0.042	0.110	-0.068	0.081	0.049	-0.098
Rating 2 01.07.2019	-0.150	-0.060	-0.024	-0.042	-0.085	-0.224

47–50 in Rating 1 and found among the best ones in Rating 2. There are, however, some exceptions: Solnechnogorsk municipal district holds the first place in both of the ratings.

These results can be explained by the specific features of Rating 2 that is based on the numerical score of websites. As of the last reporting date, 16 municipalities reach the best values (75 points) and thus have the same (best) rank. Besides, 36 municipalities (62%) got between 70 and 75 points, while the rest got from 1 to 69 points. This means that Rating 2 requires criteria adjustment, a more rigorous expert assessment of websites, and the extension of the evaluation scale from 5 to 10 points.

95.3.3 Establishing Correlations Between Rating 2 and Specific Criteria of Rating 1

Rating 1 features three specific criteria represented by two dates 01.12.2019 and 01.07.2020. In this research, we calculated Spearman's correlation coefficients for Rating 1 and Rating 2 for every moment (Table 95.4).

The correlation between Rating 2 and specific criteria of Rating 1 is statistically insignificant; Let us note an important feature: The closest correlation was found between Rating 1 (Criterion 3) of 01.07.2020 and Rating 2 of 01.07.2019 ($\rho = -0.224$). If we accept the significance point of 10%, then the correlation has a 90% probability to become statistically significant. The correlation here is negative: the more municipal support is provided, the lower the assessment of the regional small and medium business websites.

95.4 Discussion

The previous research shows that there is a direct correlation between the business climate and the quantitative small business development parameters [11–13].

The assessment of the business climate on the regional level receives sufficient attention from Russian and foreign researchers. In the context of this research, we were interested in works dealing with the methods and approaches to the efficiency

assessment for small business support and development actions. The current transformation of the economic space and the real situation in this sector requires special attention to the development of the business climate.

Generally, the business climate assessment includes the following key stages [14]:

- (1) the assessment of local authorities' activities aimed at supporting small and medium businesses (the analytical part). In this research, the assessment is based on the rating of municipalities in Moscow Oblast;
- (2) assessment data treatment (the calculation part). This research relies on the statistical methods in this respect;
- (3) the analysis of assessment results (conclusions and suggestions).

The theoretical and methodological framework of the research comprises various approaches to studying such categories as the business climate, entrepreneurship climate, administrative climate, etc., as well as the mechanisms that can improve the quality of the business environment and the interactions of authorities and small businesses. The assessment of the administrative climate in small business operations is presented in a work by Kremina [15]. It states that the change trends in administrative climate promote the formation of an efficient interaction model for small businesses and authorities. The overall administrative load on small business entities, as well as administrative barriers, are described based on the results of surveying entrepreneurs from Vologda Oblast. This research can be applied to the regional and local programs tackling regional development and mitigating the adverse effects of administrative interventions in business operations. The comparative analysis of methods used to determine the quality of the business environment using a meso-level axiological approach is presented in [16]. Some of them are only applied to small and medium companies. The authors identified the main restrictions associated with modern methods, including the following:

- (1) The current state of national statistics restricts the selection of available indicators;
- (2) The incorrect expert group justification of the indicator set leads to the distortion of end-results;
- (3) The imperfect expert competence selection and assessment mechanisms result in biased evaluations;
- (4) A large number of concerned parties and various assessment goals complicate the development of the indicator system.

The most balanced business climate assessment can be found in [17]. A comprehensive description based on a group of coefficients determines the contribution of the small business sector in the social and economic development of the region.

The problems related to the development of the business climate for small companies and state support efficiency were covered by many Russian researchers including Uskova [18], Imayeva [12], Belousova, Tsiklauri, Khardikova [19], Polyanina, Soboleva, Tarnovskiy [20].

95.5 Conclusion

The verification results for the hypotheses set out in this work show that Rating 1 and Rating 2 do not correlate on a statistically significant level. Thus, it seems rational to combine them into a uniform municipality rating that could provide a comprehensive efficiency assessment for small business support in Moscow Oblast. We would like to note that if Rating 1 and Rating 2 correlated, combining them would not be necessary.

This research has both theoretical and practical merits. On one hand, this article can serve as the basis for the methodological research of the business climate in a given region and the justification of the new ‘ecosystem’ approaches to its assessment. On the other hand, each of the ratings can take into consideration several significant parameters that would extend the current influence of digital technologies on the business climate, etc.

Research results and more specific questions can be used as the basis for rational decisions concerning small business development conditions within a given territory (municipal entity) to be taken by authorities.

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Chapter 96

The Nature of Investment Activity as a Criterion for Typologizing Russian Regions



A. E. Panyagina

Abstract Typologization of Russian regions is carried out with different goals and, accordingly, according to criteria that meet these goals. In the study of investment activity, a typology of regions based on the nature of investment activity can be very useful. On its basis, it is possible to choose the optimal model for financing investment activities for a particular region, develop an investment strategy and program, and form the investment policy of the territory. The paper presents the author's typology of the Russian Federation subjects, which is based on the study of patterns in the dynamic and structural characteristics of investment activity and the identification of relatively homogeneous groups of regions that are similar in two main criteria—the prevailing types of sources of investment resources and the achieved level of average per capita investment in fixed assets. An additional criterion that allows us to make an assumption about the availability of targeted investments that meet the priorities of investment development of the regional economy was the structure of investments by types of economic activity and manufacturing industries. The proposed typology is intended for use by regional authorities in investment practice, and it can also serve as a guide for decision-making by investors and recipients of investment.

96.1 Introduction

Management of investment activities at the regional level cannot be carried out according to a universal scenario, since there are very significant differences between the regions, both territorial–geographical and socioeconomic. Therefore, despite the need to comply with the general principles of investment management, there is a need to develop special mechanisms that are adequate to the conditions for the development of the territory. In the context of this paper, such mechanisms mean, first of all, the investment strategy and policy of the region. When developing them, a constituent entity of the Federation can take as a basis one or another basic option that most

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closely meets its specifics. To form a set of basic options, you first need to build a typology of regions based on the study of their investment activities. Investment activity mediates the conditions for conducting investment activities in the region, and its results play the role of a processor in the investment process. This category covers a wide range of characteristics—the volume and dynamics of investments, their structure by sources of funding, forms of ownership, areas of investment. The study of investment activity makes it possible to identify the prevailing financing model and the correspondence of the actual dynamics of investments to existing priorities, and on this basis—to outline a target model, develop an investment policy and strategy. Therefore, the characteristics of investment activity serve as the best criterion for building a typological grouping of regions.

96.2 Formulation of the Problem

Burtseva T. A., Bystrov O.F., Valinurova L.S., Grishina I.V., Gubanova E.S., Endovitsky D.A., Kazakova O.B., Klimova N.I., Kruglyakova V.M., Lakhmetkina N.I., Malyshев D.P., Makhotaeva M.Yu., Nikolaev M.A., Risin I. E., Roizman I.I., Salimov L.N., Samogorodskaya M.I., Suspitsyn S.A., Tatarkin A.I., Tatevosyan G.M., Treshchevsky Yu.I., Shakhnazarov A.G., Shvakov E.E. studied the issues of investment management, assessment of the investment climate and attractiveness, development and implementation of the regional investment strategy and policy. Various approaches to the typology of regional socioeconomic systems are implemented in the studies of V.A. Andreev, M.K. Bandman, A.G. Granberg, E.V. Gorshenina, A.M. Lavrov, B.L. Lavrovsky, and V.M. A.A., Novoselova A.S., Prokopova F.T., Suspitsyna S.A., Shvakova E.E., Yaroshchukha A.B.

Annual ratings of the regions by the state of the investment climate are compiled by RA Expert, the Agency for Strategic Initiatives to Promote New Projects, but these ratings cover only the first stage of the investment cycle. In addition, the methodology of the RA EX rating does not make it possible to level the known disproportions in the positions of Moscow, the Moscow region and St. Petersburg, on the one hand, and the rest of the regions, on the other. Grishina M. V., Roizman I. I., Shakhnazarov A.G. proposed a methodology for assessing the investment climate, taking into account investment activity in the region, but this methodology is not aimed at identifying typological groups. V.M. Kruglyakova developed a typology of regions according to two groups of criteria, the first—conditions and factors, the second—the results of investment activities, on the other hand, the entry and exit of the investment cycle, with the exception of the functional stage, which seems to be the most important. In addition, in the typology of V.M. Kruglyakova was unable to exclude “empty groups,” which indicates a lack of methodological verification.

E.E. Shvakov substantiated the typology of regional investment mechanisms according to two most important characteristics of investment activity—the average per capita investment in fixed assets and sources of financing. The advantages of the proposed typology are its suitability for the development of the investment policy

of the region, an adequate reflection of the characteristics of investment activity, the “fullness” of the matrix fields. However, from the standpoint of the approach to understanding investment activity, implemented in our study, it is necessary to take into account one more feature—the sectoral focus of investments. It is also imperative to focus on the dynamic characteristics, not just compare two separate years, but more fully take into account the nature and intensity of the dynamics. Thus, typologization of regions for the development of regional investment policy and strategy is an urgent task of scientific research in this subject area, and the best criterion that can be applied here is investment activity.

96.3 Methods of Analysis

The information base of the study was made up of the data of official statistics [1–3] for 83 constituent entities of the Russian Federation for 15 years, as well as for three time frames, for every five years of the main analytical period; investment portal of the regions of Russia [4], investment portals of the constituent entities of the Russian Federation; investment strategies of the constituent entities of the Russian Federation.

The analysis of investment activity is divided into two stages. At the first stage, the presence of statistically significant upward trends in the dynamics of investments in fixed assets and the determination of the boundaries of groups of regions by the level of investment were assessed. Analytical leveling of the series levels was carried out, and the presence of statistically significant linear trends was assessed with checking the significance of the coefficients of the regression equation by the student's criterion, the equation as a whole—by the Fisher test, the absence of autocorrelation of residuals—by the Durbin–Watson test. For the grouping of regions, the indicator of the volume of investments in fixed assets per capita was chosen, which ensures the greatest comparability. When compiling the classification of regions, the grouping of statistical data and the construction of an interval series were carried out. The optimal number of groups was established using Sturges's formula, a primary interval series was constructed, and hypotheses about the type of distribution (normal, Poisson, exponential) were tested. It was found that these samples are not distributed according to the normal law, there are few frequencies in the primary series. Their elimination, carried out in accordance with the principles of constructing statistical groupings, made it possible to avoid “empty groups” and the concentration of most of the regions in the first (last) groups of the interval series, without exception from consideration of individual subjects of the Russian Federation with maximum and (or) minimum indicators. The formed interval series forms the basis for the classification of regions according to the level of per capita investment in fixed assets.

At the second stage, the structural characteristics of investment activity were studied, the results were generalized, and a typology of regions was formed.

The typological grouping of regions is presented in a matrix form, compiled by combining the results of ranking the subjects of the Russian Federation by the level

of per capita investment and typical financing models identified in the course of the study. Typical models are determined on the basis of an analysis of the distribution of investments in fixed assets by sources of financing and forms of ownership. The simultaneous combination of two different features made it possible to establish the influence of the prevailing sources of financing on the ownership structure in the region, and in many cases—and to identify the type of source from which the investment resources came. A relationship was found between the type of model and the dynamics of the region's positions in the ranking. The analysis of the actual distribution of investments by types of economic activity and manufacturing industries in dynamics was carried out, on the one hand, from the point of view of its compliance with the sectoral investment priorities of the region, fixed in its Investment strategy, and, on the other hand, from the point of view of the relationship with the applied model financing.

96.4 Distribution of Regions by Level of Per Capita Investment

The task of the analysis consisted in building a grouping of regions according to indicators characterizing the volume of investments not in individual years, but for a certain period of time. It was logical to make an assumption that high investment activity would allow the region to improve its position in the overall rating. Therefore, before compiling the classification, the dynamics of investments in fixed assets was studied.

Most regions are experiencing steady growth in absolute and relative terms. So, there is a positive trend and a statistically significant upward trend is revealed, the coefficients a and b are significant according to the t -criterion, $R^2 \geq 0.7$, $F_p \geq F_{kp}$, there is no autocorrelation of residuals according to the DW criterion, in 30 regions. Such regions are conventionally referred to as the “green zone.” It includes, in particular, the Belgorod region, St. Petersburg, Tatarstan, Sakhalin region.

With positive dynamics, a trend was revealed, but there are signs that reduce the quality of the equation, namely, at $R^2 \geq 0.7$, the significance of the coefficient a or (u) is not confirmed, there is an autocorrelation of residuals in 36 regions. These are regions of the “yellow zone,” including Vladimir, Murmansk, Nizhny Novgorod regions, Krasnodar Territory, Yakutia. In 16 regions, no statistically significant upward trend was revealed—the regions of the “white zone.” To draw up a typology, the regions had to be divided into classification groups according to the level of per capita investment in accordance with the rules of statistical grouping of data. For a fifteen-year analytical period and for three five-year time slices, interval series with the number of observations of a discrete quantity $N = 83$. The hypotheses about the form of the distribution of the random variable are tested. To determine the optimal number of groups, Sturges’s formula was used (96.1):

$$n = 1 + 3.322 \times \log N \quad (96.1)$$

k —number of groups,

n —the number of units in the population.

For a set of 83 regions (96.2):

$$n = 1 + 3.322 \times \log(83) = 7 \quad (96.2)$$

Thus, the optimal number of groups in this case is seven. The interval width is determined by the formula (96.3):

$$h = \frac{x_{\max} - x_{\min}}{n} \quad (96.3)$$

x_{\max} —maximum value,

x_{\min} —the minimum value of the grouping attribute.

Within the general analytical period for seven groups, with the maximum and minimum values of the indicator of investment in fixed assets per capita, RUB 1,150,167.3 and 16,562.4 rubles, the width of the interval is:

$$h = \frac{1,150,167.3 - 16,562.4}{7} = 161,943.56 \text{ rubles}$$

Group boundaries are shown in Table 96.1.

Based on the results of the grouping, classification categories were determined:

- category “A”—ultra-high level, groups 1 and 2;
- category “B”—high level (3, 4 groups) and above average (5 group);
- category “C”—intermediate level, group 6;
- category “D”—low level, group 7.

Table 96.1 Groups of regions by the level of per capita investment in fixed assets

Region groups	Interval	Amount	Frequency
1	178,505.96–1,150,167.32	4	0.05
2	97,534.18–178,505.96	4	0.05
3	65,145.47–97,534.18	8	0.10
4	52,999.7–65,145.47	7	0.08
5	40,853.94–52,999.7	16	0.19
6	28,708.17–40,853.94	28	0.34
7	16,562.4–27,108.17	16	0.19
		83	1

Category "A", the first and second groups, is defined as regions with a super-high level of investment in fixed assets per capita. The composition of the category is practically unchanged throughout all three time slices, 8–9 regions, of which 7 remain in it permanently. For the Nenets and Chukotka Autonomous Okrugs, the position in the overall rating in terms of per capita investment is partly explained by the low population density; no trend has been identified in the dynamics of investments in fixed assets. The rest of the regions and republics classified as "A" are classified either as "yellow" or "green zones." The retention of rating positions for them is due to both the high initial level and the rapid growth of investments with a pronounced upward trend.

Category "B" includes three groups of regions with a high level of investment. This category is most densely filled and can be detailed into two subcategories, "B-1" and "B-2", respectively, groups 3 and 4—high level, and group 5—above average. The third and fourth groups include 15, the fifth group—16 regions. The Republic of Tatarstan, Krasnodar and Krasnoyarsk, Khabarovsk and Kamchatka krais, Amurskaya, Tomsk, Lipetsk and Astrakhan regions are steadily included in category "B". The Novgorod, Nizhny Novgorod, Orenburg, Kemerovo, and Sverdlovsk regions maintain a level above the average.

Category C, which includes the sixth group of regions with an average level of investment, unites 26–28 republics, territories and regions of the Russian Federation. Typical representatives are: the Republics of Mordovia and Khakassia, the Republic of Altai and the Udmurt Republic, the Trans-Baikal Territory, Novosibirsk, Kursk, Smolensk, Rostov, Tula, Volgograd, Omsk, Saratov, and Vladimir regions.

Typical representatives of category "D" are Kirovskaya, Bryanskaya, Ivanovskaya, Pskovskaya oblasts, Tyva Republics, Ingushetia, North Ossetia–Alania, Kabardino-Balkarian Republics, Altai Krai.

In general, despite the presence of upward trends, there is a negative balance of movements between the categories—10 improving and 16 worsening transitions. Most of the dynamic regions are located in the "green" and "yellow" zones. Of the regions of the "white zone," only Primorsky Krai demonstrates growth, in five regions a worsening transition took place, the situation in two more is unstable.

96.5 Typologization of Regions by the Nature of Investment Activity

The study of the structural characteristics of investment activity at the second stage of the analysis showed that the dominance of one source of investment financing is not typical for the constituent entities of the Russian Federation. For the overwhelming majority of them, it is typical to choose one or another financing model, and a significant part is characterized by the complete absence of any model, spontaneous financing, which has also become a typical phenomenon. Note that the financing

model here means the choice of one or more specific sources of investment resources, with a consistently high share of each in the total volume over a long period.

During the study, six models were identified. The first model is latent investing, in which a source prevails that is not directly disclosed in statistical decryptions, but is identified when studying the structure of investments by ownership. Latent investing can be called an independent model with a large degree of convention, since it is rarely observed in its pure form and has not been preserved in any of the regions over a fifteen-year period. Nevertheless, within one or two time slices, this phenomenon is common, and in mixed models, one of the main sources in many cases is precisely latent investments, which indirectly indicates the hidden presence of foreign investors in the region. In addition, the so-called funds of higher organizations can act as latent ones. In these cases, private Russian property prevails in the structure of investments by type of ownership, which indicates the presence of external Russian investors.

In recent years, latent investment has been observed only in three regions, with ultra-high and high levels (Yamalo-Nenets Autonomous Okrug, Sakhalin Region, Astrakhan Region), the investment concept of which is resource-based. The first priority of the investment policy is, accordingly: processing of hydrocarbons; the development of the mining industry; extraction and processing of minerals (DPI); development of the oil and gas industry. The share of investments concentrated in DPI is: 69%; 55–76%; 55–58%. At the same time, investments in private Russian property prevail in the Yamalo-Nenets Autonomous Okrug and the Astrakhan Region, and in the Sakhalin Region—in foreign property.

The second model, self-financing, assumes the predominance of private Russian investment and is typical for twelve constituent entities of the Russian Federation, in one of which the level of per capita investment in fixed assets is extremely high, in eight it is high, and in four it is medium. An extremely high level of investments with financing from own sources was achieved in the Khanty-Mansiysk Autonomous Okrug. The main area of investment is the extraction of minerals (MTR)—80%. Investments in production and investment prevail in other resource regions with a high level of investment, Tyumen and Kemerovo regions.

The self-financing model is also used by regions with a diversified economic structure and a high share of investments in the manufacturing industry (32–42%), in particular, in the Republic of Tatarstan and the Lipetsk region.

The use of own funds as the only source is not preferable, as it constrains the growth potential and may indicate a lack of incentives for the inflow of foreign investment. At the same time, the widest possible range of sources, without being systemic, also does not guarantee growth. An example is the third model—spontaneous financing, in which there is no regularity either in the composition or in the volume of attracted resources. Their structure develops spontaneously, which often determines the absence of trends in the dynamics of investments and low values of their value. This model was defined for 23 subjects of the Russian Federation (in categories D—8, C—11, B—2, A—2). The widespread occurrence of spontaneous financing indicates the shortcomings of regional investment policy.

The distribution of investment in fixed assets in the regions of spontaneous financing is not consistent with the priorities stated in their investment strategies. The

share of investments in manufacturing is very low and ranges from 7–10% (Kalin-ingrad and Tver regions, Trans-Baikal Territory, Buryatia) to 16–17% (Smolensk, Kursk, Rostov, Ivanovo regions). At the same time, up to 40–60% of investments are directed to transport and communications, production and distribution of electricity, gas and water.

The fourth model is blended financing with a consistently high share of two sources, one of which is often latent: 20 regions, three in category A, eight and seven in categories B and C, two in category D. Composition of regions in which funding investment in fixed assets is mixed, heterogeneous. The upper tier in it is represented by resource regions with an ultra-high level of average per capita investment, in two of which the priority area of investment policy is the mineral resource complex. At the same time, investments in DPI in the Komi Republic vary significantly over the years, from 15 to 50%, and in the Nenets Autonomous Okrug, they are stable and reach 96%. The second tier is formed by eight regions with developed industry and high scientific potential: Leningrad, Moscow, Belgorod regions, Krasnoyarsk Territory, Sverdlovsk and Tomsk regions. Some of them, in addition, have serious basic advantages, natural resources, favorable conditions for farming. The two regions are closely integrated with the economies of federal centers. In other words, the strongest regions are represented here, attractive for investors of various types.

The third tier consists of regions with an average level of investment: Yaroslavl, Ryazan, Vladimir, Penza, Saratov, Arkhangelsk, Omsk, Chelyabinsk regions. Almost all of them are focused on the development of the manufacturing industry, the share of investments in it is 30–50%. The absolute value of these investments is insufficient. It is also noted that the sectoral distribution of investments does not correspond to the stated priorities. In many areas of this group, there are favorable conditions for diversifying the economy, associated either with the availability of resources, the volumes of which are significant, but incomparable with the leading resource regions, or with good natural and climatic conditions conducive to the development of the agro-industrial complex, or with the possibilities for the development of the territory as a tourist destination. The problem is that these advantages are significantly weaker compared to investment priorities defined as “inevitable.”

The fifth model is diversification of investment resources. Development is carried out on the basis of a wide range of sources, but unlike spontaneous funding, their absolute and relative value is more sustainable. Of the 19 constituent entities of the Russian Federation in categories A, B, C, and D, 1, 11, 4, and 4 regions are respectively, in the “white zone”—only two, four moved to a higher category.

The only region with a super-high level of investment in fixed assets is the Republic of Sakha, the investment attractiveness of which is determined by resource availability, investment in production and investment is 30–45%, which is fully consistent with the sectoral priorities of the investment strategy of Yakutia.

The group with a high level of investment includes 11 regions, including Moscow and St. Petersburg. The main focus of investments here is the development of transport and communications, but other sectors are also important.

In Moscow, where foreign investment flows are astronomical, they are in third place in the diversified model. The first component is own funds, the second—budget funds. Investments are directed to the development of the transport sector, trade, financial services, and real estate transactions.

In St. Petersburg, the main areas of investment are also infrastructure, trade and services, and industry. At the same time, in accordance with the adopted innovative scenario for the development of St. Petersburg, the main thing should be the development of high-tech and science-intensive industries.

The diversified model of investment financing sources in the Kaluga region, which provides an example of the highest concentration of resources in priority sectors. In particular, the share of investments in the industry of the first priority, the production of vehicles, increased from 10 to 40%, the share of investments in the manufacturing industry is higher than the national average (60%). This is largely the result of an effective investment policy. There are two more regions in the group, where targeted investments in the development of agriculture and the food industry (Oryol and Tambov regions) became the source of growth in the context of import substitution.

In regions with a low level of per capita investment, the diversification of funding sources is due to their deficit, and the low efficiency of investment policy is obvious. A diversified model of financing investment in fixed assets seems to be optimal, but, not being a systematic part of investment policy, it does not guarantee that investment activity is in line with strategic guidelines.

The sixth model is budget financing, in which 70–90% of investments are made from the federal and regional budgets and observed in five regions with low and medium investments. The application of this model is due to noneconomic factors.

The generalization of the results of the analysis makes it possible to distinguish nine types of regions, of which two are extreme, borderline cases, as shown in the Fig. 96.1.

Resource regions are in the zone of inevitable priority. According to the determining source of investments, they should be divided into two types. The first includes the subjects of the Russian Federation with a predominance of latent investments, the danger of which is associated with the redistribution of property in favor of an

Category	Latent financing	Self-financing	Blended finance	Diversification	Spontaneous funding	Budget financing
A	Type 1. Non-systemic (latent) 3 regions	Type 2. Regions of "inevitable priority" 5 regions			Type 6. Unstable 15 regions	—
B	Type 3. Self-sufficient 8 regions	Type 4. Balanced 8 regions	Type 5. Stable 11 regions	—		
C	—	Type 7. Problematic 15 regions			Type 9. Non-system (budget) 5 regions	
D	—	—	Type 8. Crisis 13 regions			

Fig. 96.1 Typology of regions by the nature of investment activity

external investor. Here a variant of the policy of legalizing investment resources is possible.

The second type—regions of inevitable priority, in which at least one of the key sources of investment is their own funds, investments in private and mixed Russian property prevail. For such regions, a compromise type of investment policy aimed at achieving a balance of interests of investors focused on the area of investment and the need for structural restructuring of the raw material economy can become the basic one.

The third type is self-sufficient regions capable of providing a high level of investment through the use of internal sources, with the structure of the regional economy, in which the investment priority is manufacturing.

The fourth type is balanced regions, the investment attractiveness of which is determined by the presence of a number of strong advantages and has an integrated basis, which ensures a high level of investment and sustainable development of a diversified regional economy.

Regions of the third and fourth types, as the most stable and provided with investment resources, are able to implement the investment policy of modernization, which ensures the technological and innovative renewal of the economy.

The fifth type is stable regions. This includes, firstly, the constituent entities of the Russian Federation that have a very high investment attractiveness, the basis of which is different, but provides an increasing inflow of investment from all or most of the possible sources. It should be pointed out that a significant part of such regions have imbalances in the sectoral distribution of investments in fixed assets, namely their excessive concentration in the field of transport and communications with a simultaneous shortage of investments in high- and medium-tech industries. Secondly, this group includes the constituent entities of the Russian Federation, in which the increase in investment attractiveness was the result of systematic work to attract target investors to priority sectors. However, they are also characterized by a relatively narrow sectoral concentration of investments. Therefore, for regions of this type as a whole, such a policy of diversifying the regional economy can be recommended, aimed at eliminating imbalances in the directions of investment.

The sixth type is unstable. The level of per capita investments is medium and low, financing of investment activities is characterized by high uncertainty, and there is a discrepancy between the real structure of investments and the declared investment priorities. Regions with a spontaneous financing model need, first of all, to systematize the work on the management of investment activities, in connection with which the most relevant option for them is a system-oriented RIP.

The seventh type is problem regions. This includes the constituent entities of the Russian Federation that have favorable conditions for attracting investments and developing the economy, but not strong and significant enough to ensure a steady inflow of investments and overcome the border of their average level. At the same time, in the ratings of the Agency for Strategic Initiatives, the efforts of regional authorities to create a favorable investment climate received high marks, and there are positive trends in the dynamics of investments. In this case, traditional investment mechanisms do not provide the desired effect; for this type of regions, a goal-oriented

investment policy is optimal, aimed at creating a target investment attractiveness of a territory, taking into account its special properties and assuming targeted work with target investors.

The eighth type—crisis regions with an unfavorable state of the investment sphere, a low level of per capita investment, which nevertheless use one of the market financing models. Regional investment policy should be focused on creating favorable investment conditions. The specific content of the measures required to implement such a policy is detailed in the provisions of the Regional Investment Standard.

Finally, the ninth, non-systemic type is formed by five regions with a low and medium level of average per capita investment, where investment activity is financed from the federal and regional budgets. This position has an objective basis and is conditioned by the geopolitical interests of Russia. It should be noted that during the analyzed period, the number of regions—"state employees" decreased as their internal political and socioeconomic conditions stabilized. Therefore, for regions of this type, a basic version of the RIP can be defined, which is called, with a certain degree of convention, public–private partnership and assumes the gradual formation of a market mechanism for financing investment activities based on a mixed model with budget and private Russian investments.

96.6 Conclusions

The application of the principles of constructing statistical groupings for ranking regions according to the level of per capita investment made it possible to level the existing gap in the absolute values of indicators. There are no "empty groups" in the compiled classification, which makes it possible with sufficient clarity to trace the change in the positions of the regions and compare it with the results of assessing the presence of trends in the dynamics of investment activity.

Comparison of the results of analytical alignment and structural grouping of data showed that the presence of a stable upward trend is a necessary, but not sufficient condition for maintaining and increasing rating positions. Outpacing investment growth is crucial. The results of the analysis as a whole provide a basis for typologizing regions by the nature of their investment activity.

There is a connection between the applied model of financing investments in fixed assets and the rating positions of the region, in which the investment attractiveness of the territory is the determining factor. The higher it is, the wider the circle of potential investors. The leading regions mainly use a mixed or diversified model. However, this does not guarantee sustainable development if the work on attracting and using investment resources is not systematized.

The typology compiled covers nine groups of regions: two non-systemic (latent and budgetary types) and seven main (regions of inevitable priority, self-sufficient, balanced, stable, unstable, problematic and crisis regions). Depending on the typological characteristics, the basic variants of the regional investment policy are indicated,

namely: the policy of legalization of investment resources, the policy of public-private partnership, the compromise policy, the policy of modernization, the policy of diversification of the regional economy, the system-oriented and goal-oriented investment policy, the policy of creating conditions for investment.

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Chapter 97

Implementation of Regional Social and Economic Development Strategy Based on Use Middle-Class Potential



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Abstract This paper investigates the possibilities of using the middle-class potential in a region to facilitate the implementation of the regional development strategy. The authors demonstrate how the middle-class potential can help achieve the indicators set in the social and economic development strategy of the Vologda Oblast until 2030, as well as implement its main goal, population saving. The authors found out that the middle-class potential includes a lot of useful characteristics to facilitate the successful implementation of the social and economic development of Vologda Oblast until 2030, which makes it one of the key development factors in the territory. Thus, the authors conclude that it is feasible to develop and implement a regional social and economic development strategy based on the middle-class potential. For the convenience of the middle-class characteristics analysis, the authors suggest classifying it according to the areas of life. The analysis of middle-class characteristics showed that they currently do not comply with the desired or optimal level and tend to deteriorate due to the forecast economic downturn in the context of the COVID-19 pandemic. The optimization of middle-class parameters can be seen as a priority in the regional social and economic development strategy based on the middle-class potential. Creating a list of actions to transform the middle-class characteristics from their current state to the optimal state will be the final stage of developing the regional strategy based on the improvement of resource potential. This paper also analyzes the components of middle-class potential and, apart from the two existing components, the ‘traditional’ and the ‘new’ middle class, a third component was suggested, i.e., the retirees. These components shall be seen as a key factor in the social, economic, spiritual, and political development of the territory.

To build a strategy, one needs a dream

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97.1 Introduction

Although the necessity of developing regional social and economic development strategies was challenged in the recent past, today it is an objective necessity supported by federal legislation. Such strategies cover extensive periods and are key factors in the successful social and economic development of the country and its regions. The proper use of the resources available to the territories in the implementation of their strategies is necessary to achieve the goals set on time. It is crucial to use both the usual and the previously unexploited resources to solve specific regional development issues. The authors believe the middle class is one of such resources.

97.2 Relevance, Scientific Merit of the Problem, Short Literature Review

According to the scientific references in economics, regional development is supported by raw material, territorial, demographic, economic, innovative, infrastructural, financial, environmental, geographical, administrative, intellectual resources, etc. [1, p. 24]. Today, the potential of these resources is studied by academics and practitioners to support the implementation of development strategies for territories. For example, A.A. Pshunetlev studies the potential of the combination of the aforementioned resources [2, p. 30–38]. Many researchers study the potential of specific resources as regional development factors. For instance, human capital remains a prominent research object [3, p. 15–21] since its study began by T. Schultz [4, p. 68–74]. There is still some interest in scientific research [5, p. 51–73], innovative [6, p. 289–308], environmental [7, p. 21–22], labor [2, p. 30–38], and other types of resources. The results of these and other similar research by Russian and foreign academics are currently used to rationalize the development strategies of the country and its regions.

However, none of the contemporary researchers sees the middle class as a resource for regional development. As a result, the territorial development opportunities it may provide are neglected and unused. The authors think this gap in the classification and use of regional resources must be filled. Thus, the authors justify approaching the middle class as a specific resource in the regional social and economic development in the paper entitled *The Middle Class as a Specific Resource in the Social and Economic Development of a Region* [8, p. 93–110]. Further, the authors suggest introducing the notion of ‘middle-class potential as a specific economic resource of the region,’ which stands for the opportunities and capacities of the middle class to influence the social and economic development of territories.

The academic literature typically identifies two components of the middle class: a ‘traditional’ and a ‘new’ middle class.

The ‘traditional’ middle class is represented by small and medium businesses [8, p. 93–110; 9, p. 147–156]. Business as a factor of territorial development is analyzed

by many Russian and foreign specialists in management and economics. Good examples include the papers of J. Schumpeter [9, p. 189] and the ISODT RAS monograph [10]; they stress that small and medium business development indicators play a crucial role in solving the problems of social and economic development of territories. The authors discovered that these and other well-known research approach business as an institution, a production factor, or a region result indicator. However, business people are not considered as the middle class, a part of social strata influencing the social and economic development of territories.

The ‘new’ middle class comprises hired employees whose jobs require higher education degrees according to the all-Russian job classificatory. This component comprises the following professions: mathematicians; engineers, designers; doctors; educators; accountants, financial and investment advisors, financial analysts, recruiting and staff deployment specialists; government authority specialists; marketing and public relations specialists; IT and communications specialists; artists; performers and other workers provided that their income is at least 6 times over the minimum wage [11, p. 147–156; 12, p. 20].

Both the ‘traditional’ and the ‘new’ middle-class subgroups are studied by sociologists and political analysts. Over a long time, the studies of foreign researchers, e.g., E. Wright [13, p. 1–29], were focused on the structure of the ‘new’ middle class. Russian researchers also analyze the composition and size of this middle-class component. E.V. Odintsova’s thesis was dedicated to the analysis of the ‘new’ middle-class identity criteria and the calculation of its size in Russia [12]. Russian researchers analyze the functions and the problems typical of the specific ‘new’ middle-class jobs, e.g., teachers [14, p. 1135–1145].

97.3 Problem Statement

The papers of sociologists, economists, and political analysts dedicated to the middle class generally focus on its structure, the analysis of external factors influencing its size, or the debates around its identity criteria. The analysis conducted shows that these papers do not consider the middle-class potential as a development factor for the country’s regions.

Moreover, some researchers and practitioners studying the structure of the middle class do not classify the retirees as the representatives of this social stratum. The authors believe that this approach significantly restricts the scope of researching the middle-class potential and its impact on the development of territories. This omission calls for a deeper study of this problem, and the justification of leveraging the potential of retirees is middle-class representatives.

American gerontologists B. Beugarten and E. Shanas discovered that the classical age group sequence of childhood–adulthood–senility now features a fourth component, the Young Old [15] or the people of the ‘third age’ [16]. This term describes a part of people’s lives that begin after retirement and precede the less active senility when a person cannot get by without assistance.

Leaping ahead, retirees have the crucial characteristics of the middle class in all areas of social life. This is confirmed by the results of the recent studies of this age group by ISODT RAS. In particular, the researchers found out that the retirees' level of education has increased. They also joint interest groups to socialize more often than other groups of people because they have the time for it [17, p. 39]. The retirees continue to function as the media of community values, cultural and ethnic traditions and they transfer their cultural potential to the younger generation [17, p. 28–35]. Thus, they feature all of the middle-class characteristics in the spiritual sense.

People of the third age have more free time, and thus a greater political potential for those who work, they interact more actively with the authorities and local governments in protecting their interests and the interests of their group. This category of citizens is less prone to protesting: the protest moods level among the elderly in 2000–2015 was stable, and it did not depend on the political or economical situation in the country, while the average protest level across the country varied [17, p. 34–39].

The economic potential of the working people of the retirement age is close to the benchmark one [17, p. 40–45]. Many of them were able to save up and buy property over their lives. People of the third age are often at the peak of their carrier, and they educate the younger generation. Thus, the authors can assume that the pensioners who continue working as entrepreneurs or highly qualified employers, and they can be safely classified as both the 'traditional' or the 'new' middle class.

The economic potential of the non-working retirees is a little lower. They lack the characteristics related to the labor function, such as the labor market activity and relevance, or the quaternary economic sector employment. However, they can still own properties and have some savings. If their income levels correspond with the middle-class criteria (at least 6 times more than the minimum wage), this group of retirees will have one of the key economic potential parameters; i.e., they will create the mass demand. Non-working retirees are exempt from the personal property tax and the income tax. However, they have to pay all of the collateral taxes and some of the direct taxes like the transport tax (if the engine of their vehicle is more powerful than 150 horsepowers) or the land tax (if the plot size is over 6 ares).

Thus, the authors found out that some retirees have the key characteristics of the middle class in all areas of social life, which makes it possible to classify them as such. They can influence the implementation of development strategies in the country's regions. Taking into consideration that the number of pensioners in the social structure of the regions increases every year [18, p. 34–39], the expansion of the middle class through senior citizens will help expand the middle-class potential in terms of both quality and quantity. The authors believe that the extended interpretation of the middle-class composition, whose components are shown in Fig. 97.1, can facilitate the analysis and use of its impact potential for the social and economic development of the region.

The international practice lacks an independent evaluation system for the characteristics and potential indicators of the middle class as a specific resource in territorial development.

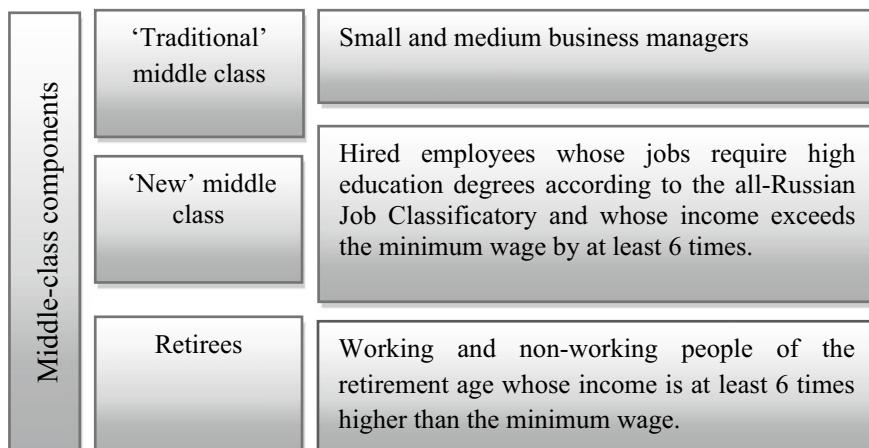


Fig. 97.1 Middle-class components

Summing up the aforementioned, one can formulate the purpose of this paper: exposing and demonstrating the middle-class potential as a specific economic resource in regional development as exemplified by the implementation of the social and economic development strategy of Vologda Oblast until 2030.

97.4 Theory

In the research, the authors study the static and dynamic middle-class potential as an economic resource. The static potential component represents its real opportunities and capacities to achieve goals and solve problems of the social and economic development of the region at the current moment. The dynamic component of the middle-class potential stands for its development prospects that are determined by the desire to achieve the required (perfect) qualitative and quantitative characteristics.

Having researched the specialized literature, the authors identified the following middle-class characteristics that determine the social and economic development of the region both in statics [19, 20] and in dynamics [21–25].

Throughout the research, the authors discovered that the perfect state of the qualitative characteristics of the middle class has not been met (Fig. 97.2). Moreover, the RAS monograph notes that the size of the middle class is reducing, as well as its incomes, as a result of the 2014 crisis [20, p. 14–20]. The authors can assume that the forthcoming economic crisis caused by the COVID-19 pandemic, and its consequences will also lead to the reduction of the middle-class potential in the social sector and other areas of life.

The insufficient proportion of the middle class in the social structure is the main discrepancy between the current situation and the desired middle-class potential.

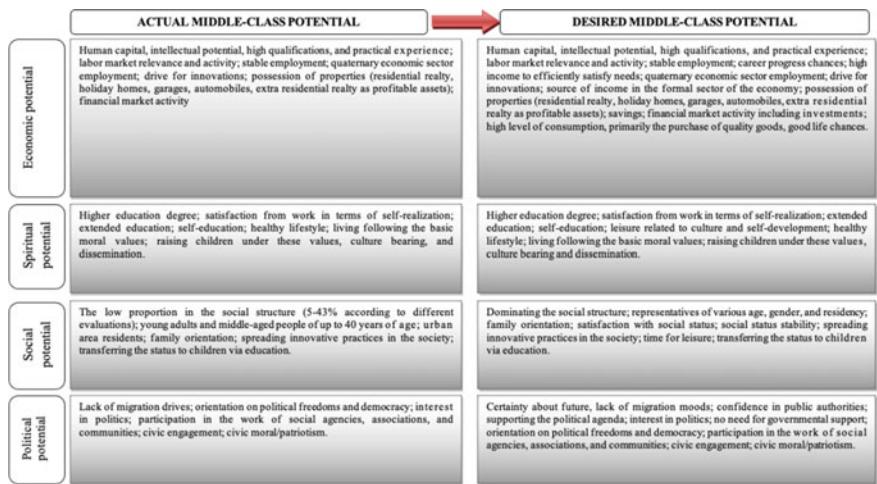


Fig. 97.2 Middle-class potential parameters in statics and dynamics

None of the research works conducted by Russian scientists and authorities shows that it dominates over other social strata irrespective of the identity criteria used [19, p. 69–81; 20].

The second discrepancy and the degradation of the middle-class potential parameters are due to the insufficient incomes of its representatives. During the crisis, the incomes of the middle class are reducing. It can cause a chain reaction and deteriorate other middle-class potential parameters in the economic sphere, including the quality of life, the level of consumption, investment activity, and the savings index [20, p. 14–20].

The analysis of some other research also show that the situation of the middle class has largely aggravated over recent years. Previously, e.g., in 2003, research showed that the economic and spiritual situation of the middle class was significantly better and squinted to grow [23, p. 230]. In terms of the research, the statistics for the middle-class potential were closer to the desired level (see Fig. 97.2). Today, the growth trend reverted.

The reduction of the economic capacities of the middle class in the context of the pandemic may lead to the reduction of its potential in other areas of social life, like during the crisis of 2014. Thus, the middle class requires support from public authorities, which is reflected in its social potential.

The reduction of the spiritual potential of the middle class in the context of the crisis and recession is caused by the forced extra labor activity leading to the lack of free time for leisure, self-development, and sports.

The third discrepancy between the desired and the actual middle-class parameters lies in the disproportion of its structure. Currently, the middle class is represented by young adults and middle-aged people (up to 40 years of age) living in cities [19,

p. 10]. The desired situation, however, is when the middle-class representatives can be found across various demographic and territorial groups.

The political potential of the middle-class squints to reduce because the social and economic problems make some of its representatives retire from social life and the value of a stable political course for the middle class is reduced. On the other hand, the middle class becomes more politically active, its interest in political life is increasing, as well as the level of involvement with social agencies and the requests for political freedoms. They also start to have some objections to the authorities and their policies [20, p. 37]. All of that increases the potential of other important characteristics of the middle class in politics.

The authors believe that in the current situation, the relevant governmental agencies must take adequate action to develop the middle-class potential. Some efforts in this area have already been taken. For example, the development forecast for the county and the development strategy for Vologda Oblast state that it is necessary to increase the size of the middle class to increase its social life potential. However, it is also necessary to develop the economic, spiritual, and political capacities of the middle class. Otherwise, one might have a situation when the increase of the middle-class size will not help support the government authority, and the middle-class representatives will not be oriented on self-development and self-education enough due to the lack of free time restricted by the labor function. With that, the incomes of the middle class will not be sufficient to significantly increase the aggregate demand in the region, and the sources of income might transfer to the shadow economy. The authors shall note that such negative trends are evident in the developed countries where the dominant middle class has been reducing in recent times [26, p. 6–12]. Therefore, in Russia, it is important to predict the consequences and to take preventive actions.

Since the dynamic potential of the middle class represents its development opportunities, it is necessary to condition the improvement of the current parameters to meet the goals set. The dynamic middle-class potential parameters shown in Fig. 97.2 represent the benchmarks for various areas of life, and their achievement is the goal of the social development in the nearest future, which requires a development strategy to be formulated by the regional authorities.

The formation of a development strategy for the middle-class potential stipulates for elaborating a set of interrelated and interdependent actions aimed at the development of the potential middle-class parameters, their transition from the current (static) to the desired state, and the search for the best ways and methods of their achievement for each of the areas of social life. The authors believe that a strategy like this can and must be an integral part and an effective factor in the implementation of a social and economic development strategy for each of the country's regions in the context of recovering the Russian economy and incomes after the COVID-19 pandemic and its consequences.

The subject matter of this paper is the middle-class potential as a key factor in the implementation of goals and objectives of the social and economic development strategy for Vologda Oblast until 2030 (hereinafter VO 2030 Strategy). Increasing the proportion of the middle class in the social structure of the region within this

strategy is no longer perceived as a factor of social and economic development, and it is now seen as its result.

The formation of the middle class in the region is set as one of the local goals in the conservative and the basic scenarios of the VO 2030 Strategy and in clause 4.5.4.11 Providing the Quality of Life for Residents. In addition, revision 1 of the VO 2030 Strategy stipulated the implementation of 30 strategic projects, and the Middle-Class project was No 21 in this list. The approved VO 2030 Strategy featured only 21 strategic projects, and the Middle-Class project was excluded from the list. Thus, the VO 2030 Strategy states that it is necessary to form the middle class but since the associated strategic project is absent, the middle class cannot be considered as a development factor for the territory. That is why there are no planned middle-class size values for the region, no specific action plan to facilitate this, and no goals to improve the composition and characteristics of the middle class.

The authors believe that the exclusion of the Middle-Class strategic project from the official VO 2030 Strategy cannot be deemed rational because this territorial development resource must be leveraged fully and not restrictedly, irrespective of the arguments that influenced the decision made.

The authors would like to quote a very bright and imaginative idea of Radislav Gandapas, a famous Russian leadership expert: To build a strategy, one needs a dream.

This is a starting point in the analysis of the middle-class potential characteristics. It is important to develop this resource and formulate a relevant leveraging strategy to efficiently achieve the goals and objectives of the VO 2030 Strategy. There are many obstacles to the development of the middle class. However, as claimed by R. Gandapas, if one has a dream, external obstacles are easy to bypass, it is easy to find solutions.

The goal of the social and economic development of Vologda Oblast until 2030 is the implementation of the population saving policy through the preservation of the demographic potential and the development of human capital by increasing the region's competitive properties and forming the development space for residents. Within the VO 2030 Strategy, the implementation of three priority projects must lead to the achievement of the goal set: Forming the Space for Life, Forming the Space for Development, and Forming the Space of Efficiency. Each of these projects, in its turn, comprises a number of specific actions.

The Forming the Space for Life project must provide for the sustainable reproduction of the region's residents through active demographic policy, family potential development, residents' health, and longevity improvement, promoting fitness and sports, providing safety and protection of residents, providing quality social services.

The expected results and the actions associated with the Forming the Space for Life projects are shown in Fig. 97.3.

The second priority project, Forming the Space for Development, stipulates that industries and agriculture will develop within the proactive import substitution paradigm. The space development stipulates the influx of investment, the development of competition and business climate, as well as small and medium businesses, civil responsibility, and full employment.

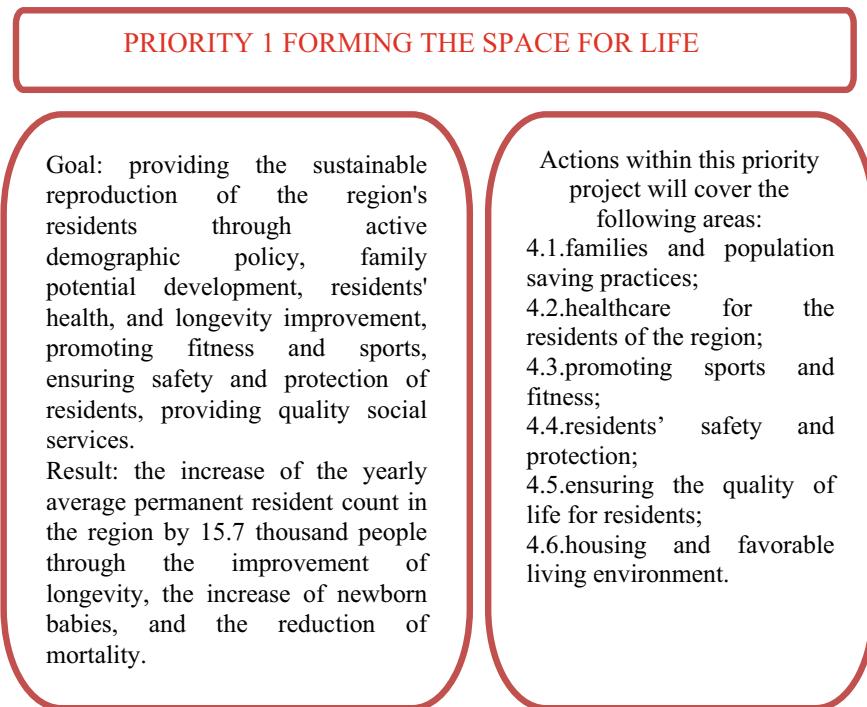


Fig. 97.3 Expected results and action within the scope of the Forming the Space for Life priority project. Composed following The strategy for the social and economic development of Vologda Oblast until 2030, p. 11–23

The high quality of the space for development is required to preserve and improve the regional capacities in terms of qualified labor resources and attract professionals from other regions.

The main actions and their expected results within the scope of the second priority project can be seen in Fig. 97.4.

Finally, the third priority project, Forming the Space for Efficiency combines the two spaces by creating conditions for efficient resource management in the territory.

The main actions and their expected results within the scope of the third priority project can be seen in Fig. 97.5.

The actions within the scope of each of the mentioned priority development projects in Vologda Oblast are based on the competitive advantages of the region, and they aim at solving the key problems to achieve the expected indicators and results.

PRIORITY 2 FORMING THE SPACE FOR DEVELOPMENT

Goal: creating a condition where the human as the biggest value in the new economy is relevant and can develop successfully to unlock their personal and labor potential.

Results:

- net migration;
- increasing the GRP of Vologda Oblast per 1 resident;
- increasing labor productivity;
- increasing the share of products from small and medium businesses within the entire GRP;
- increasing the share of high-tech and deep-tech industries in the GRP, etc.

Actions within this priority project will cover the following areas:

- 5.1. developing general and extended education;
- 5.2. developing vocational education and personnel training;
- 5.3 providing efficient labor resources to the economy and social sector;
- 5.4. developing scientific, research, engineering, and innovative activities;
- 5.5. diversifying the structure of the region's economy and developing high-tech production facilities (industries; agriculture and fishery; trade and consumer market; tourism and creative industries; information technologies);
- 5.6. developing business and competition;
- 5.7. investment strategy;
- 5.8. developing competitive exports and proactive import substitution;
- 5.9. political consciousness, civic engagement, and self-realization of residents;
- 5.10. culture, and cultural and historical heritage.

Fig. 97.4 Expected results and action within the scope of the forming the space for development priority project. Composed following the strategy for the social and economic development of Vologda Oblast until 2030, p. 23–65

97.5 Practical Significance, Proposals and Implementation Results, Experiment Results

The results of studying the static and dynamic middle-class components and parameters show that the public authorities of Vologda Oblast can facilitate the achievement of the goals and objectives of the 2030 Strategy with all its priority projects using the existing opportunities associated with the middle class and developing its potential

PRIORITY 3 FORMING THE SPACE FOR EFFICIENCY

Goal: efficient resource management in the territory.

Objectives:

- building new institutions;
- forming favorable conditions and environment to develop the residents of the region;
- improving the system of public and municipal administration;
- providing the financial stability of the budget system.

Result: proper resource management in the region

Actions within this priority project will cover the following areas:

- 6.1. transport and road network;
- 6.2. developing fuel and energy infrastructure;
- 6.3. communications and data transmission;
- 6.4. natural resources and mineral resource base;
- 6.5. ensuring the ecological well-being and creating the basis of a ‘green’ region;
- 6.6. comprehensive spatial development of the region’s territory;
- 6.7. public and municipal administration;
- 6.8. efficient management of land and property in the region;
- 6.9. ensuring the financial stability of the region

Fig. 97.5 Composed following the strategy for the social and economic development of Vologda Oblast until 2030, p. 65–84

through the formation and implementation of an eponymous strategy. The conclusion about how the use of the middle-class characteristics in political, social, and spiritual life will support the implementation of the VO 2030 Strategy was detailed and illustrated in the previously published research [27, p. 60–67]. In this paper, the authors will only dwell upon one of the middle-class economic characteristics, the income level. The middle-class identity stipulates a high level of income (more than 6 times the minimum wage), that is enough to satisfy people’s needs.

Within the implementation of the first priority project of the VO 2030 Strategy, Forming the Space for Life (Fig. 97.3), the improvement of the aforementioned parameter will facilitate the solution of the problems listed in cl. 4.6 Housing and Favorable Living Environment that reflects the increase in utility costs within the resident revenue structure. As incomes increase, the proportion of utility bills reduces, and the share of funds spent on savings and durable goods grows.

Within the implementation of the second priority of the VO 2030 Strategy, Forming the Space for Development (Fig. 97.4), the improvement of middle-class parameters related to the growth of the incomes of its representatives must help mitigate the following problems:

Firstly, cl. 5.3 on Providing Efficient Labor Resources to the Economy and Social Sector: increasing resident differentiation based on the salary level; the structural imbalance in salaries (the highest wages are currently paid in finance and public administration); increasing negative migration of labor force in the context of the increasing competition for human resources between the regions of Russia.

Secondly, cl. 5.5. on Diversifying the Structure of the Region's Economy and Developing High-Tech Production Facilities: High incomes of the middle class will facilitate the solution of problems associated with residents' low salaries in trade and consumer market as compared to other regions; the loss of sought-after and highly qualified specialists in IT to the regions with higher levels of life.

Thirdly, cl. 5.6 of the VO 2030 Strategy in Business and Business Climate: The growth of the middle-class well-being can solve the problems with the insufficient internal demand for the products (works, services) of small and medium companies and the lack of local resources required for the technical and technological modernization of small and medium businesses.

It should be noted that the increase of the 'new' middle-class incomes will help increase the demand for small and medium business services, which will have a positive impact on their funds for the technical and technological modernization.

Fourthly, cl. 5.7 Investment Strategy: problems with limited investment funds.

Fifthly, cl. 5.8 on Developing Competitive Exports and Proactive Import Substitution: problems with the insufficient loading of production facilities due to the low internal demand.

Within the implementation of the third priority project, Forming the Space for Efficiency (Fig. 97.5), the improvement of the economic potential of the middle class is crucial in solving the problem of high differentiation of the cities in the region and its rural territories in terms of their social and economic development, as provided in cl. 6.6. on the Comprehensive Spatial Development of the Region's Territories.

Middle-class representatives have sufficient income to satisfy their needs, they are employed in the formal sector of the economy, they own property, and thus, they pay the most taxes to the budgets of all levels [28, p. 320]. These parameters of the middle class will help solve the problem of the lower-than-average growth rate of tax and non-tax revenues to the regional budget, which is caused by the low growth rate of the income tax revenues (cl. 6.9. on Providing the Financial Stability of the Region. This problem might have been an indirect cause of the increase in the public debt of Vologda Oblast (cl. 7.9. of the VO 2030 Strategy).

Thus, the analysis of one of the many economic parameters of the middle class shows that its potential is significant and can be used to implement all of the priority projects within the scope of the VO 2030. In the previous research, it was discovered that the spiritual, social, and political of the middle class will be relevant to the implementation of all of the three priority projects set out in the VO 2030 Strategy [29, p. 60–67].

The authors' strategy stipulates for the narrowing of the gap between the static and the dynamic parameters of the middle class (Fig. 97.2), which can help determine the priorities for each area of social life:

- the middle-class development priority for the economic sector is facilitating the growth of the middle-class incomes to boost the consumption and combat unreported employment;
- social sector: increasing the numbers of middle-class representatives; increasing the size of the middle class in rural areas; increasing the amount of free time among the middle class;
- spiritual life: providing opportunities for doing sports and self-development;
- political life: increasing the confidence in public authorities; formulating a political course aligned with the needs of various middle-class groups; improving the well-being of the middle class.

The full use of the middle-class parameters shown in Fig. 97.2 in Russia and its regions is associated with identifying priority projects and finding the best ways to achieve the goals set for the middle-class potential. The analysis of the resources required to implement the VO 2030 Strategy helps determine the development priorities of middle-class potential that can provide the region with great development opportunities and develop actions that can facilitate the realization of the existing potential.

The specific action plan for the implementation of the identified priorities must contain target values and objectives, along with the allocated resources and times for their implementation. This plant must stipulate the development of both the traditional and the new middle class, and retirees as middle-class representatives.

The authors suggest developing the new middle class and retirees as middle-class representatives in the first place. The actions to develop the traditional middle class may be postponed. The state has to increase the incomes of the new middle class and the retirees and business as a system with little regulation will develop following the growth of residents' incomes quickly and automatically. It has been proved that the level of residents' income in a region drives the development of the qualitative and quantitative parameters of business, not the other way around [29, p. 70–80].

The development of a specific action plant to develop the middle class from its current state to the benchmark state is the final stage of developing a strategy for the social and economic development of the region based on using the potential of the middle class.

Each of the priority projects stipulates the formulation of specific proposals for its development, which requires further research.

97.6 Conclusion

The research conducted shows that the middle class can be safely considered an efficient attractor. Since its potential is currently decreasing in the context of the COVID-19 pandemic, it needs to be developed. The optimal leveraging of the middle-class potential will result in a synergistic effect facilitating the comprehensive development of regions and the improvement of their social and economic parameters.

This article explains that the formulation of a strategy for the social and economic development of a region using the middle-class potential as a specific economic resource will facilitate the achievement of the main goal of the 2030 Strategy of Vologda Oblast, i.e., population saving, and solve many problems listed in the strategy. The authors specify which problems exactly can be solved during the implementation of specific strategic priorities based on the use of the middle-class parameters.

The article elaborates on the theoretical concepts that characterize the middle-class potential as a specific economic resource in the development of a region. The authors justified the consideration of retirement-age people as a third middle-class component, analyzed this component's potential in the implementation of the goals of the VO 2030 Strategy, and confirmed its importance for the social and economic development of the region. Further, the authors determined the static and dynamic parameters of the middle class and evaluated the middle-class potential concerning the achievement of the VO 2030 goals as exemplified by one economic parameter, i.e., the high level of income that helps efficiently satisfy people's needs.

The authors present the methods to determine the priorities of a 'strategy for the social and economic development of a region using the middle-class potential' based on the achievement of the desired middle-class parameters.

The authors believe that since Vologda Oblast is a typical region of Russia with a typical population structure, social, economic, and demographic trends [30, p. 100–116; 31, p. 62–77], and therefore, the evaluation method for the middle-class potential can be used by the authorities of other regions of Russia to determine the priorities of the middle-class development.

The research confirms that the formation of the middle class in the regions shall be seen as a driver of territorial development and not just its result. The authors suggest that the government should take this idea into account when developing a national plan for economic recovery, and that VO authorities shall use it in revising their 2030 Strategy which is scheduled for this year. They should also complement the Strategy with the Middle-Class priority project, which was present in the first version of the VO 2030 Strategy but was not included in the authorized version.

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Chapter 98

Economic and Legal Determinants of Strike Actions



I. R. Akhmadullin and L. Z. Fatkhullina

Abstract In today's world, labor disputes are an integral part of social and labor relations. Official statistics record only that part of them that turned into strikes, taking into account the number of workers who took part in it and the loss of working time. Scientific institutes and research centers dealing with this issue, considering the issue more broadly, collect more detailed data. The paper analyzes various sources of information on labor conflicts in Russia over the past few years. Today in Russia, a strike in the classic sense as a form of workers' struggle for their rights is practically impossible due to the bureaucratic nature of reconciliation procedures. On the basis of the study, we show the economic and legal reasons that popularize strike actions, and conclude about the need to institutionalize these forms of protest.

98.1 Introduction

Labor legislation of the Russian Federation has a lot of requirements for the strike procedure, which when violated may constitute a basis for declaring the strike illegal. Thus, "more than 70% of strikes are recognized by courts illegal, mainly due to organizational reasons: non-observance of the procedure and time frame of reconciliation" [1; page 63]. Therefore, heavy strike regulation renders impossible its implementation, and the right to strike turns into a declarative right, not supported by the current implementation mechanism. This is why today such measures of struggle for workers' rights as strike actions deserve close attention. Protest actions can be insidious, for which reason the employer reveals them only after a certain time, when there is a visible decline in production. Among all possible methods of pressure on the employer, the so-called work-to-rule should be specially mentioned,

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when workers continue to perform their duties while strictly adhering to job descriptions, especially those in labor safety, which results in a slow down or complete stop of work. The striking thing about the phenomenon is the effectiveness of this method without violating existing legal norms, which undoubtedly actualizes the problem under consideration.

98.2 Relevance, Scientific Significance of the Subject with a Brief Literature Review

In the mid-twentieth century, with the activation of trade unions and a large-scale strike movement, the problem of industrial conflict was the focus of attention of Western sociology. In assessing the role and significance of strikes, there is no and there was no unequivocal understanding among labor relations researchers. The opinions on the role of the labor conflict for the harmonious development of social relations system varied from positive to hostile [2, 3]. By the early 1990s, due to a decrease in the level of strike activity, the attention to study of labor conflicts in market economy countries decreased, remaining, however, one of the central topics, at present, industrial conflicts are constantly closely monitored and analyzed [4]. Strikes are actively studied by modern researchers [5–13]. For the former socialist country, on the contrary, this topic was only actualized, and numerous forms of the protest movement, having no counterbalance in the form of historically established cultural traditions and regulatory and legislative framework to control these processes, provide a wide scope for research practices.

On the contrary, Russian social scientists hardly ever refer to this topic of the strike movement (including Italian strikes): there is not a single thesis on this topic; in Russian scientific literature, this problem is presented mainly fragmentarily, by individual case studies. As a matter of fact, the problems of strike movements (including work-to-rules) are dealt with in sufficient detail in the studies of the Center for Social and Labor Rights, in a joint project of the Federation of Independent Trade Unions of Russia and St. Petersburg Humanitarian University of Trade Unions and some others [see, for example, 13, 14], but mainly only as part of the study of general issues of labor conflicts. The strike movement in Russia in the 2010s, therefore, remains for researchers in many ways an under-investigated phenomenon.

98.3 Target Setting

The paper aims at analyzing the opportunities and prospects of work-to-rule as a means of resolving collective labor disputes in modern Russian realities. To achieve this goal, it is necessary to solve the following problems: analyze the baseline conditions of labor legislation in strike regulation; investigate various aspects of strike

actions; explore the prospects for work-to-rules in Russia as a way to protect workers' rights; analyze the economic and legal reasons of work-to-rule in connection with the growth of the latter in Russia.

The hypothesis of the study is that such form of strike as work-to-rule will be increasingly on the march in Russia due to the effectiveness of this method, since it does not violate the current legal framework.

98.4 Theoretical Part

General scientific methods of cognition (analysis, synthesis, induction, deduction, historical and logical methods) were used as a methodological basis for the study. We also used the comparative legal and some other legal methods. The theoretical basis of the research was based on the works of modern scientists, and the regulatory framework included the legislation of the Russian Federation, the regulatory provisions of foreign countries on the problem under study.

98.5 Practical Relevance, Proposals and Results of Implementation, Experimental Findings

The most significant factor contributing to the reduction of strikes in Russia in the 2000s was political tightening. "He who gets on a sit strike will be imprisoned"—this is how Vladimir Putin defined his attitude to the struggle for workers' rights at the beginning of his first presidential term. The sharp decrease in the number of officially registered strikes is also due to the fact that after the entry into force in 2002 of the new Labor Code, the right to strike was severely curtailed. The amendments to the law made the already difficult procedure for going on strike so complicated that workers began to strike without any procedure or organize other protests. In any case, they were not considered strikes, so the indicators improved dramatically [15].

The last surge in the number of strikes recorded by Rosstat in 2004–2005 was associated with the adoption of Federal Law No. 122 (benefits monetization) and the associated budgetary reforms. Since 2006, Rosstat has annually recorded no more than a dozen strikes, and in 2010 not a single one was recorded, in 2015 only five, despite the crisis processes in the economy and employee discontent [16: p. 56]. At the same time, according to a study by the Institute of Globalization and Social Relations (IGSR), in recent years, practically not a single strike in Russia has been recognized by the court as legal. There is a variety of courts' arguments in this case: for example, the strike at Ford (Leningrad Oblast) was recognized by the regional court as illegal due to the fact that the minutes of the staff meeting did not indicate the number of participants [17: p. 27]. A question requiring separate consideration: the important role of trade unions in the constructive resolution of conflicts through

negotiations and mechanisms of social dialogue and partnership is evidenced by the fact that unorganized workers participate in protest actions more often. Thus, in strikes and hunger strikes 5 times more often, in pickets—2.1 times, in rallies—1.7 times [18].

However, the official indicators of strike activity are incomplete (sharply underestimated), since they do not take into account non-standard forms of strikes, as well as those strikes that are recognized as illegal. Rosstat registered only 2 strikes in January-November 2018, however, according to other data, in 2018 workers went on strike 166 times during social and labor conflicts. This is shown by the results of the automated data system which permanently maintains updated information about various aspects of social and labor relations by systematizing, verifying, summarizing and processing data for more than 50 requests and 480 information sources, measurements have been carried out since 2012. This institute was created with assistance from the Federation of Independent Trade Unions of Russia (FITUR) as part of a project on monitoring and analyzing labor conflicts at the Scientific and Monitoring Center Labor Conflicts of St. Petersburg Humanitarian University of Trade Unions.

Similar research has also been carried out in Russia since 2008 by the Center for Social and Labor Rights (CSLR) and since 2016 by the Center for Economic and Political Reforms (CEPR). The number of labor conflicts verified by these organizations is measured in tens and hundreds of episodes per year. According to the Supreme Court, dozens of cases of employers' complaints about illegal strikes by workers are considered annually, and many of them are recognized by court as legal [19]. This, of course, is also incomplete data. For example, work-to-rules are often not included in the statistics, as they are "quiet" and do not receive media coverage.

The main cause of social and labor conflicts in Russia throughout the entire period under consideration is wages—the issues of complete non-payment and general low level (see Fig. 98.1).

As can be seen from the above, the use of methods of pressure on the employer, alternative to a strike, can help employees achieve results in formally desperate situations when their rights are violated, and there are not enough forces and means to conduct a legally competent strike procedure [20]. They are less formalized, do not require much organization and legal knowledge. And most importantly, they are completely legal and comply with Russian legislation [21–23].

In recent years, there has been a decrease in the activity of collective struggle for rights within the framework of official statistics. In fact, the number of social and labor conflicts in Russia is growing (and the current world crisis only contributes to this), but this is happening due to the growth of other strike actions. This was facilitated by the adoption of the new Labor Code of the Russian Federation and a number of normative legal acts in labor that make it difficult to conduct collective strikes. Today, in connection with all the above, the mechanism for declaring and conducting a strike in the Russian Federation needs to be transformed. In addition to streamlining the strike procedure, changes should be made to the term "strike". This employee's individual right exercised through collective actions, is understood within the framework of the legislation of the Russian Federation only as a temporary voluntary refusal to work. The concept of strike does not cover other actions

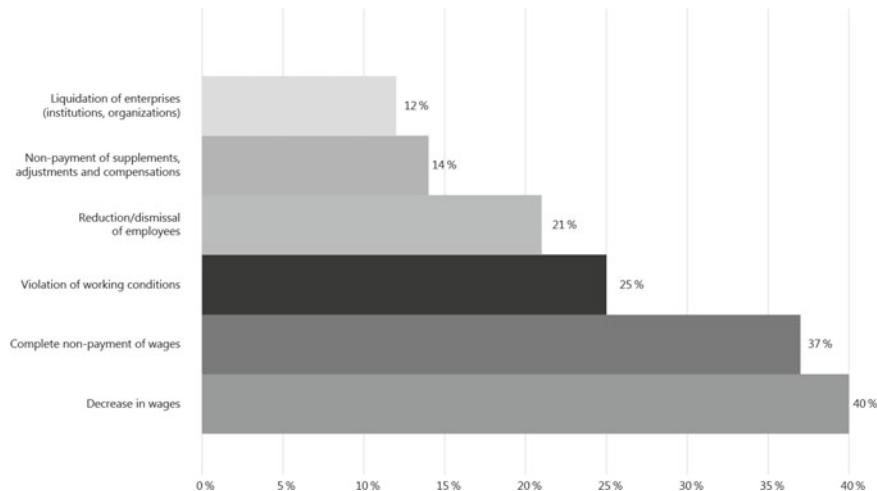


Fig. 98.1 Causes of social and labor conflicts in Russia in 2019 (According to the data of the Joint Project of the Federation of Independent Trade Unions of Russia and St. Petersburg Humanitarian University of Trade Unions (URL: <https://industrialconflicts.ru/lib/?s=3> (data extracted on 24.07.2020))

of employees that may be strike actions and sometimes cause more harm to the employer than stopping work. Therefore, the definition of strike needs to be broadened to include strike actions (for example, “work-to-rule”) that may interfere with the normal economic activities of the employer.

In general, the study data indicate that the depth and the essence of conflict contradictions require constant monitoring and management. Some of the conflicts remain exclusively within the organization, and therefore there is reason to believe that the real scale and depth of this problem space in Russia can be much wider due to the specificity of this phenomenon and the specifics of statistical recording.

As a measure to equalize the rights of the opposing sides (on the part of employers and business owners), we can talk about permitting a lockout as a suspension of an employment contract with striking workers, which at the moment is not consistently reflected in Russian labor legislation. Therefore, Russian legislator will need to answer the following questions in order to make appropriate changes to labor legislation: what strike actions should be statutorily regulated; what guarantees and obligations are to be assigned to the parties to the dispute; how the procedure for announcing and holding protest actions should be regulated. This study can be used in practice to amend current Russian legislation regarding the concept of the right to strike and the procedure for exercising this right, as well as strike actions, the employer's right to lockout.

98.6 Conclusions

Using socio-economic statistics, the results of sociological surveys, mathematical methods and analysis of labor legislation, we showed that the classical strike as a form of struggle to uphold the rights of workers is practically impossible due to the bureaucratic forms of reconciliation procedures in modern Russia.

Our study made it possible to make some conclusions about the economic and legal reasons for the growth of various forms of the strike movement and, in particular, the prospects for organizing work-to-rule in Russia. First, there has been a steady increase in labor protests, contrary to official statistics. Secondly, from recent trends, with a steady, but rather slow growth of protests, there is a disproportionate increase in their duration and downtime. Thirdly, strike actions are triggered by economic motives, primarily those related to delays/non-payment and reduction of wages. Fourthly, strike actions, as well as work-to-rule, falls out of sight of today's legal norms, which is inconvenient for employers as well, since it interferes with a meaningful dialogue between business owners and hired labor. Fifthly, the current norms contribute to the protraction of the conflict, create many bureaucratic obstacles, and non-observance of seemingly insignificant points leads to the illegality of mass actions, and the organizers face at least colossal fines. Hence the predicted growth of strike actions. The case study of a work-to-rule convinces of its prospects in modern Russian realities.

The form of work-to-rules differs favorably from the classic strike, which suggests a further growth of such forms of protest in Russian society. A work-to-rule is an effective means of putting pressure on the employer, while the legislation of the Russian Federation does not contain any provisions regarding such actions of employees. At the same time, if there are conditions for disciplinary punishment, including dismissal, in case of strike actions, employees do not have the guarantees that are provided to them in the event of a legalized strike. Therefore, as long as there is no regulation of strike actions in Russian legislation, such protest actions of workers will remain beyond law.

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Chapter 99

Transnational Corporations as the Newest Subject of Political Relations



A. Nikolenko and A. Tushkov

Abstract Modern changes in the political structure of society, as well as social changes, sharply raise the question of the emergence and development of new actors in politics. Multinational corporations are becoming one of these actors. The traditional dependence of power on the availability of certain resources, including human resources, takes on a completely different context due to the existence of independent, large economic entities that are not tied to national states. The issue of corporatism and the balance of interests of national states, that is, traditional political actors and modern ones, such as corporations and independent organizations once existed in the legal field of individual states. The transnationalization of markets and the expansion of the influence of non-governmental organizations blur the image of public administration, as well as the presence of private armies that depend on such organizations, raise questions about the new security architecture around the world. Modern globalization processes are more unstable than ever, the value framework of local civilizations is blurred, but at the same time, there is a problem of localization of individual societies, nevertheless permeated by economic, commercial, and social institutions associated with transnational corporations. All this indicates the research problem of transnational corporations as the newest subject of politics.

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99.1 Introduction

Due to the fact that transnational corporations are a relatively new actor in the modern political space, the terminological study of this topic is insufficient. In the most general form, this phenomenon can be defined as follows: a financial and industrial association, regardless of the country of origin and ownership, including private, public, or mixed, which owns (controls) production or service complexes located outside the home country of the head office, operating in a decision-making system that allows for a coordinated policy and general strategy that can have a significant impact on the activities of others [1, p.66]. Most often, their sheer economic influence in the form of mergers and acquisitions of external firms and industries that are not tied to the corporation leads, among other things, to mergers in legal and political terms, and also raises the question of the sovereignty of the economy of a particular country. But, as you know, economic, technological, and industrial sovereignty are the main elements of political sovereignty. Such an invasion by an external actor can also become a serious threat to the security of individual states. At the same time, high capital intensity allows TNCs not only to compete effectively with local industries, but also to completely displace them from the market, as well as to change the quality of human resources and influence employment in the recipient country [2, p.11]. At the same time, the issue of the legal status of TNCs remains uncertain, as there are no more important actors that can influence the behavior of a particular corporation. The legal regulation of individual countries in this regard is often insufficient. The system of legal relations itself does not provide for such situations.

The relevance and scientific significance of the issue lie in the need to identify and study the change in the status of political subjects, to review the properties and traditional ideas about the political system and the place of the subject in it. The largest subject in the world of politics is an atypical organization or network of organizations or industries that have changed political goals that are not typical for classical actors, as well as principles of action that do not fit into traditional political ideas and models.

The theoretical significance of the article is due to the consideration of a lot of research papers on the above-mentioned issues, a new look at the problems of relations between transnational corporations and national states. The material presented in the article can be used to analyze the international political and economic situation, as well as its changes.

Most of the authors such as V. A. Vinogradov, Zh. N. Komissarova, N.Y. Konina, and N. S. Khrustaleva considered mainly European TNCs and their legal relations with state institutions. Modern problems related to TNCs are addressed by such authors as Yu. S. Andreeva, A. S. Vasilyeva, E. A. Vinogradova, N. A. Vorobyova, V. E. Emelyanova, S. V. Karpova, A. V. Kartashova, O. V. Klimovets, N. Yu. Konina, A. V. Kuznetsova, E. A. Kuleshova, M. A. Luchko, K. V. Titova, et al.

The purpose of this article is to outline the specifics of the problems of studying transnational corporations and to approach the understanding of processes in a

changing world, including the identification of the range of issues related to new political actors and their specifics.

According to some researchers, efficient placement and export of capital are the basic principles by which TNCs extend their economic influence [3, p.164].

The problem with most approaches is that they consider a corporation solely as an economic player and an object of effective placement and export of capital. This problem also has a political background, and it is important to understand the processes of merging state institutions with corporate elements. In order to effectively carry out expansion, no matter what plan it is, it is important that the corporation, which most often represents the economic power of its country of origin, which is important, would not just have material capabilities and information about the structure of the market it enters, and the most important element is branding, as one of the levels of “soft power” [4, p.19].

The fact that a trademark is a symbol, the value of a particular product is an instrument of expansion, including economic expansion, through “soft power” technologies, confirms a completely different level of political influence of TNCs. Practically blurred boundaries between corporations and states are becoming a trend in the development of the modern global society. The corporate principle of building states and the adoption of political methods by corporations become the moment that reveals not just the essence of these conditionally separated phenomena, but what gives an understanding of the entire social, cultural, and political context of modern political relations. A number of logical questions arise: Can TNCs be analogs of national states, or their substitutes at a different, higher level of the organization of human society? Are national states organized on principles similar to corporate ones?

The basis for the development of society as a whole and its individual elements consists of innovation processes and scientific developments. At the present stage, TNCs are ahead of other actors in terms of R&D consumption and are also sources of the latest developments [5], which put corporations on a par with states. As a result, there is a situation of competition between states and corporations in the scientific field. Due to the development of the network principle of building relationships within corporations and beyond, the impact on scientific development of such organizations is becoming more and more important, and this puts many scientific developments at the service of the sole purpose of such enterprises, namely profit. Such a scheme is naturally a threat to the ecology of individual territories and the basic safety of the environment. It is quite problematic to control such behavior of large corporations, especially if the country whose territories are being exploited is the recipient country for the corporation.

The second most important factor determining the role of a particular structure in politics is military technology and the ability to use force. The problem of the legal status of PMCs is also related to their interaction with TNCs and the defense of private interests of corporations by military force. On the one hand, being also large companies that provide security and military services, PMCs are increasingly becoming part of higher-order corporate systems [6].

Political steps of TNCs to strengthen their positions with the help of military corporations, as well as conditions of internal conflicts of recipient societies can be

used by external competitors of the country, with the support of “incoming” TNCs. Political regimes are often conflict with the commercial interests of corporations, especially in authoritarian political regimes. In a democracy or a transitional society, mutual problems are smoothed out and do not require the use of “hard” technologies to implement in a particular country or conduct corporate economic policy there [7, p. 39]. The influence on the foreign and domestic policy of the home country, as well as the competition of corporations outside the “source” country in the territories of the “host” countries shifts the understanding of such relationships. Traditional nation-states in this case become a kind of springboard for larger economic players. This situation is not new, and it has historical examples in the past, such as the relationship of the first ever large corporation of the Dutch East India company with the country of origin and the British Empire [8], as well as the influence of major magnates and merchants in Poland and the Transylvania region on the policy of the Balkans in the 15–seventeenth centuries [9].

The interaction of authoritarian political regimes with transnational corporations often reveals problems that are hidden in democratic societies. Often, the result of interaction between a specific authoritarian regime and a large economic entity is a violation of human rights, numerous violations in the field of labor relations and safety. The spread of corruption and the threat of nationalization of enterprises and property of TNCs when interacting with authoritarian countries and their leaders are higher for them than when introducing them to a country with “basic” democratic institutions. It is also not uncommon for “basic” institutions to be introduced from outside in the interests of corporations, while PMCs or “soft power” agents become the agent for introducing institutions that are not typical in a traditional society. Corruption relations are also an important component when lobbying for their interests in the base country, or the “source” of the corporation.

At the moment, corporate activities are subject to rather outdated attempts at regulation, such as the “Tripartite Declaration of principles on multinational corporations and social policy.” Forty-three years have passed since the adoption of this document in 1977. The declaration adopted at the initiative of the ILO established standard working conditions that were adequate in the conditions of the 1980s. During this time, technologies, consumption standards, and methods of exploitation of resources, including human resources, have changed. But it is in the interests of companies not to change the concept of the declaration in its main features, since its obsolescence gives them a significant advantage. The regulations were reviewed several more times. In particular, in 1980 and 1994, an amendment was made on the need for more transparent reporting on the activities of enterprises. An important development was the adoption in 2003 of The Convention of the Commission on Human Rights “Norms on the responsibilities of transnational corporations” that encourages similar obligations for TNCs as for states, but, however, this convention did not have much effect [10].

At the moment, the main issues related to TNCs are controlled by national legislation, which has a rather serious difference in approaches. Individual areas are regulated by TRIMs (Agreement on Trade-Related Investment Measures) and TRIPs

(Agreement on Trade-Related Aspects of Intellectual Property Rights) of 1994, adopted in Uruguay.

However, the idea of P. Jessup's idea of the transnationalization of law and legal institutions was announced in 1956. According to the scientist's definition, transnational law is "all law that regulates actions or events that transcend national frontiers. This includes both private and public international law, as well as other rules that do not fully fit into these standard categories" [11]. In other words, the subjects of such law remain classical individuals, states, and organizations, but the norms of such law are created according to a new methodology, the tools of which include international organizations, treaties, and acts that expand the scope of law as such. In part, this model looks like a globalist one and is not suitable at first glance for protecting the interests of national states. But it should be borne in mind that TNCs are also a global phenomenon and require close attention on a large scale. The complexity of the system also implies increased management complexity. So, the main problems of any large corporations are such as the problem of "transparency" of various operations in the company, the complexity of effective management due to the large number of connections within the organization, the speed of information transfer, the complexity of internal reporting and branch management, the problems of planning, and implementing planning elements in absolutely new production [12]. These questions raise another important aspect of the legal status of TNCs and systemic approaches to this problem, which can be formulated as follows: to what extent is a transnational corporation an integral mechanism and what are the disadvantages of such an organization of industrial production that are most dangerous in the public sense? Despite the important advantages of such businesses over medium and small ones, the processes inside it are intensified, which becomes another pole of tension. Sooner or later, the internal competition of collaboration companies can lead to "overheating" management systems and decline, which also has consequences in the international security space.

The issue of the legal status of large corporations, as well as related international security issues, reveals the lack of a clear understanding of the boundaries of corporate and state in the global political process, as well as the presence of more influential political actors than national states, which inevitably becomes the basis for comparing the two players and raising the question of the primacy of one over the other. Since the category "subject" has a vague definition in international law, it is safe to say that any large structure that has influence on the economy, military organizations, has its own strategy for introducing "soft power," sufficient technologies in the field of human capital, and has a corresponding legal status can be designated as a subject of politics, and therefore international law, and is also a direct actor of political relations at different levels [13–20].

The practical significance of the article is related to the attempt of marking and including subjectivity of transnational corporations in the discourse of contemporary scientific problems, attempts at understanding potential security threats in various countries, including economic ones, as well as abstracts regarding short-term shift in world politics and economics.

99.2 Findings

The current geopolitical trend clearly indicates that national states of the classical type are gradually being replaced by block associations with a single control center, including economic processes that are closely related to big business. Such changes can lead to the fact that an unformed center or leader of forces may shift to transnational corporations that already have both sufficient influence and a certain organizational structure that can replace the institutions of traditional states. In this regard, it can be noted that the emergence of the so-called “large regions” is due, among other things, to the economic influence of corporations in order to more easily classify the territories of their influence. As a result, it changes not only the cultural and political landscape, but also the whole idea of the “inhabited world.”

The changing international situation, the crisis, the epidemic, and the ever-increasing chaos lead to the fact that the position of the leading power, the leading state, which would set the ideological tone for all events, at least in Europe, is shaky, or even none of the states can cope with the role of hegemon. In this case, the role of a common leader can be played by a large concern or corporation, whose only difference will be the principle of narrow specialization for all states in the region, as, for example, happened with the European Union. The international system is not coping with the latest crises. Issues from a century ago are on the agenda and are again relevant, and it is not possible to solve these problems using traditional means of democracy, to resolve their contradictions in a standard way.

99.3 Conclusion

States are not exclusive holders of the status of a subject and are not the only bearers of legal personality [7, p.1]. Since states and large corporate entities in the form of transnational corporations coincide in terms of their influence on the economic, political, spiritual, ideological, military, legal, and resource spheres, and also have opportunities for one or another type of expansion, we can designate these two phenomena as similar structures, in which relations more and more space and resources are beginning to be occupied by TNCs and independent public organizations that are increasingly competing with state structures. If national states in the course of historical development have acquired properties that unite societies on the basis of collective values, their preservation, as well as relative balance, then TNCs have no other values based on their actions other than the values of profit, the development of corporate structures, and the spread of their influence, which also calls into question the need to develop new systems, including legal ones in the field of international security.

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Chapter 100

Economic Dynamics of Russia: Approach Based on the Solow-Swan Model



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Abstract The article discusses the construction of a macroeconomic growth model of the Russian economy, which is a modification of the classical Solow-Swan model. Our model comprises four discrete-time econometric equations. Its two key features are the relationship between capital services and GDP growth rate and phenomenological dependence of capital services on the growth rate of the capital stock. Labor dynamics are described by the Beverton-Holt model. The data used are from the Penn World Table version 9.1 (up to 2017). Based on the model, a forecast of the development of the Russian economy up to 2025 is constructed which was found rather realistic. The constructed model allowed to reach several general conclusions concerning the growth path of the Russian economy, including the limited role of large infrastructure projects as growth “drivers”, while the all-important role of human capital was confirmed.

100.1 Introduction

The slowdown in the economic growth of the Russian Federation, which occurred in the recent past, and, undoubtedly, the associated decrease in real incomes of the population, induces an increased interest in the issues of economic growth and the factors causing it (let us clarify that in this paper we do not consider the issues of sustainable growth).

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The questions about the impact of Western sanctions and counter-sanctions on the growth of the Russian economy, the recent decisions of the Russian Government to raise the retirement age and the value added tax rate, and related questions about the prospects for the economic growth of the Russian economy in the medium term are of considerable interest. Note that the current (quarterly) economic information of Rosstat, the forecasts of economic growth of the Ministry of Economic Development and Foreign Trade and foreign analysts (in particular, the World Bank), which are repeatedly updated throughout the year, do not answer these key questions and, to a certain extent, distract from them, since for a “representative” resident of the country and businesses, only forecasts with a horizon of one and several years are of importance.

100.2 Research Questions

The objectives of the work are:

- a. construction of a macroeconomic model of the growth of the Russian economy, which is a modification of the classical Solow-Swan model;
- b. using the model to forecast the development of the Russian economy until 2025.

100.3 Research Methods

100.3.1 Methodology

The methodology is based on a modification of the Solow-Swan economic model and data from the Penn World Table up to 2017 [1]—a source of the highest quality statistical data on the economic growth of most countries of the world.

Key features of the model are the following:

- (1) Time is discrete;
- (2) The relationship between the services of capital and the rate of its growth has been developed;
- (3) The Beverton-Holt model is used to describe the dynamics of labor;
- (4) Penn World Table version 9.1 was used as the observed data.

100.3.2 The Solow-Swan Neoclassical Growth Model

The Solow-Swan Neoclassical Growth Model is a standard model for theoretical analysis of national economic growth, independently developed by Robert Solow and Trevor Swan and published in 1956 [2, 3].

There are variants of the Solow-Swan model both with continuous and discrete-time (we use the latter). A generalized version of the model [4] is based on the following assumptions:

- (1) the economy produces one consumer and one investment goods, the volume of output of the economy in year t is denoted by Y_t ;
- (2) the gross output of the economy (GDP) is determined by the capital stock K_t , labor volume L_t and technological progress A_t :

$$Y_t = F(K_t, L_t, A_t), \quad (100.1)$$

where $F(K_t, L_t, A_t)$ is a production function, linearly homogeneous in K and L , satisfying several restrictions on partial derivatives and the so-called Inada conditions;

- (1) capital dynamics is given by the equation:

$$K_t + 1 = s Y_t + (1 - \delta) K_t, \quad (100.2)$$

where s is the investment rate, assumed to be constant, δ is the capital depreciation rate;

- (2) the amount of labor is specified as an exponential function of time:

$$L_t = L_0 r^t. \quad (100.3)$$

The main advantage of the Solow-Swan model is the simplicity of its theoretical analysis (the continuous-time version is especially convenient), which allows one to draw various meaningful conclusions about the growth of the national economy. The richness of the model stipulates the desire to estimate it on real data, however, on this path, the researcher encounters several difficulties:

- (1) the heterogeneity of the output of the economy and the presence of many investment assets;
- (2) variability and endogeneity of the investment rate;
- (3) deviation of the dynamics of L_t from the exponential law and its endogeneity;
- (4) lack of linear homogeneity of the production function.

Let's consider these in more detail.

There is a standard method for characterizing the gross output of a multi-product economy—using the gross domestic product; we use real GDP for Y_t .

As an estimate of labor costs, the number of employees or hours worked is considered. As a first approximation, it is assumed that labor costs are proportional to the stock of labor resources. A more accurate indicator reflecting the cost of labor is

the total cost of working time. Based on sample surveys on employment, Rosstat calculates the total number of hours worked for all types of labor for the production of goods and services (in the main, supplementary work, as well as in production in households) in the country.

Capital heterogeneity is a more serious obstacle. In the Solow-Swan model, it is implicitly assumed that capital is homogeneous in its composition. In reality, this is not the case—different types of capital are characterized by different levels of marginal productivity. As noted in [5], the use of capital estimates based only on national accounts data leads to an underestimation of the role of capital. It also notes that countries with high levels of economic development tend to invest more in short-term assets such as computers and software, and less in “long-term” assets such as office buildings or roads. In the mentioned work, a methodology for evaluating capital services based on the costs of acquiring/renting elements of capital is considered, although, as the authors note, this work is not pioneering in this direction. Using econometric methods, the authors confirm that countries with high per capita incomes invest more in assets with a short life span.

The service capital flow approach is also mentioned in [6] as a means of improving the accuracy of the production function. Estimating capital costs is the most difficult when constructing a production function. When assessing it, several questions arise regarding the methodology of the costs themselves and the assessment of changes in their quality. Assessment of fixed assets should be an aggregate indicator taking into account their quality, wear, technological level, the level of equipment use. To construct an aggregate estimate, information is needed on the supply of fixed assets, their comparative productivity, service life, and equipment repair costs [7]. Difficulties associated with estimating the capital stock are noted in [8, 9] and arise when trying to calculate the so-called Solow residual—in fact, several residuals of the production function, including ones for the regional economy [10].

The Solow residual also called total factor productivity (TFP), and the first method for calculating it was proposed by Solow in 1957 [11]. The study of the factors of economic growth was developed in the works of E. Denison [12, 13], D. Jorgenson, and Z. Griliches [14]. Following Solow approach, TFP measures the effective level of technology that allows transforming factors of production into final products, i.e. the approach is based on the concept of a production function [15].

Methods for constructing production functions have been well tested for developed economies, and there is an extensive literature devoted to them. At the same time, significant problems arise in the construction of production functions for the Russian economy. The main difficulties arise with the assessment of the costs of production factors—fixed assets and labor. In the context of intense structural changes, the indices of traditional factors of production may not reflect reliably the information necessary to build a production function. For example, during 1995–2010 in agricultural organizations, the number of employees decreased almost four-fold, the cost of fixed assets in comparable prices —by a quarter, and production increased by 9.3%. Thus, the question arises—to what extent is it appropriate in the Russian economy to use these particular factors of production and functional dependencies, which are classical production functions? [16, 17]. The TFP studies for Russia analyze the main

factors that determine the dynamics of aggregate output and how they are measured. Intensive aggregate output dynamics after the 1990s was accompanied by a rather inert dynamics of capital and labor. As a result, the output is weakly connected with the dynamics of the corresponding factors of production [18–20].

The Ministry of Economic Development of Russia identifies the factors of the country's development, i.e. uses a macroeconomic production function; an increase in TFP is also recommended by A. Kudrin as one of the most effective factors in increasing the GDP [21].

Some macroeconomic growth models describe the investment rate as variable and endogenous. At the same time, the microeconomic theory of making investment decisions by firms and households is used [4]. In [22], a mathematical analysis of the sensitivity of one of these models is carried out, as well as the results of (the partial) estimation of the model according to data from three EU countries, where the capital depreciation rate is assessed expertly. We do not consider these possibilities, assuming the investment rate is constant (estimated by econometric methods, see below).

Since the aim of this work is to build a model of Russia's economic growth, the exponential dynamics of the volume of the employed labor force (3) is not adequate. Instead, we use the Beverton-Holt dynamics model [23].

The assessment of the macroeconomic production function for Russia has a degree of homogeneity close to 2 (see below).

100.3.3 Observational Data and Indicators Used

The Penn World Table, version 9.1 [1], was used as a source of initial data. The range of data used (with annual frequency) was limited to 2000–2017 (the last one in the table). The following six indicators were used:

- *rgdpna*—real GDP of Russia, million US dollars in 2011;
- *emp*—number of people employed, millions;
- *avh*—average number of hours worked by one employee per year;
- *hc*—human capital index;
- *rnna*—real capital stock, million US dollars in 2011;
- *rkna*—capital services index, at constant 2011 national prices.

On their basis, the following model indicators were constructed:

- real GDP, trillion US dollars 2011: $Y = rgdpna/10^6$;
- labor volume taking into account human capital, million man-hours: $L = emp * avh * hc$;
- real capital stock, trillion US dollars 2011: $K = rnna/10^6$;
- capital services index based 2011: $KS = rkna$.

The methodology for calculating the human capital index KS_t in the Penn world table is described in [24] and based on [25].

100.4 Model Construction

The model (ignoring possible contemporaneous relationships between random perturbations) is a recursive system of four equations, which can be estimated separately. All equations of the model were estimated using the Gretl package. All coefficients of the equations are statistically significant at the 5% level.

- (1) Dynamics of the volume of used labor L_t . Let us denote $t_0 = t - 2000$ (t is time in years). We assume that the dynamics of L_t obeys the Beverton-Holt model [23]:

$$L_{t+1} = \frac{n_1 L_\infty L_t}{L_\infty + (n_1 - 1)L_t} \quad (100.4)$$

This model has an explicit solution [23]:

$$L_t = \frac{L_\infty L_0}{L_0 + (L_\infty - L_0)n_1^{-t_0}} + \varepsilon_t \quad (100.5)$$

with the following parameter estimates: $\hat{L}_0 = 404,300 \pm 2600$, $\hat{L}_\infty = 486,000 \pm 16,000$, $\hat{n}_1 = 1.079 \pm 0.025$ (hereinafter, past the “ \pm ” symbol are standard errors). The average approximation error of L_t is 0.63%.

- (2) Neoclassical production function (estimated in logarithmic form, with MA(1) random perturbations):

$$Y_t = e^{\beta_0 + \beta_1 t_0} \times (KS_t)^{\beta_2} \times L_t^{\beta_3} \times e^{\varepsilon_t + \theta \varepsilon_{t-1}} \quad (100.6)$$

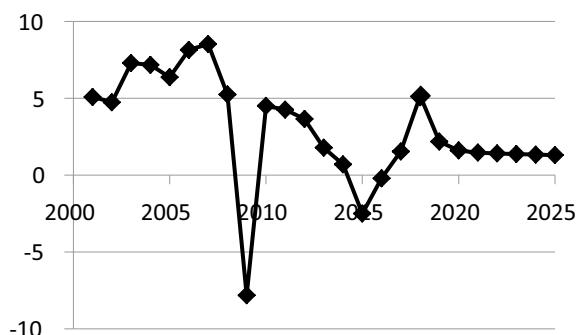
$\hat{\beta}_0 = -17.244 \pm 0.016$, $\hat{\theta} = 0.59 \pm 0.21$, $\hat{\beta}_1 = 0.0091 \pm 0.0018$, $\hat{\beta}_2 = 0.414 \pm 0.046$, $\hat{\beta}_3 = 1.4157 \pm 0.0012$.

The average approximation error of Y_t is 1.7%.

- (3) The dependence of capital services on capital gains. As mentioned above, capital services KS_t should be included in the production function, while the basic equation (see below) includes capital stock K_t . To “close” the model, it was found that KS_t is reproduced quite accurately using the logistic function of the logarithmic growth rate of K_t :

$$KS_t = \frac{\beta_0}{1 + \exp\left(-\left(\beta_1 + \beta_2 \ln\left(\frac{K_t}{K_{t-1}}\right)\right)\right)} + \varepsilon_t \quad (100.7)$$

Fig. 100.1 Growth rates of real GDP in Russia, %
(2018–2025 model forecast)



$$\hat{\beta}_0 = 1.06 \pm 0.062, \hat{\beta}_1 = 1.36 \pm 0.38, \hat{\beta}_2 = 159 \pm 39.$$

The average approximation error of KS_t is 3.75%.

(4) Capital stock dynamics (linear regression model with AR(1) disturbances):

$$K_{t+1} = sY_t + (1-\delta)K_t + U_{t+1}, \quad U_{t+1} = \rho U_t + \varepsilon_{t+1} \quad (100.8)$$

$$\hat{\rho} = 0.54 \pm 0.2, \hat{s} = 0.113 \pm 0.025, \quad 1-\hat{\delta} = 0.9749 \pm 0.006$$

The average approximation error of K_t is 0.19%. The point forecast for the constructed model is performed in the following order: all values of L_t ; then sequentially K_{t+1} , KS_{t+1} , Y_{t+1} , etc. The following Fig. 100.1 illustrates the forecast values of the growth rate of Russia's GDP of about 1.3% per year.

100.5 Conclusions

The modeling performed allows us to make the following conclusions:

- based on data up to 2017 inclusive, it was possible to predict the output of the Russian economy to a real GDP growth rate of about 1.3% per year, which is confirmed by the official economic growth rate about 1.5% in 2018;
- contrary to popular belief, labor in Russia is highly productive: the coefficient of elasticity of the real gross output of the economy for labor is 1.42, meaning that with an increase in the volume of labor used by 1%, real Russian GDP increases by 1.42%;
- a real acceleration of economic development is possible only with an increase of its “fast” elements in the composition of the capital, i.e. technologies, advanced

- equipment, software, etc.; at the level of Russian Government, this can be achieved by reducing the amount of financing for infrastructure projects; this conclusion may seem paradoxical, given the great importance given by the Russian Government to the construction of infrastructure projects; nevertheless, in our opinion, the time when the latter played the role of “drivers” of economic development is gone forever; in the conditions of the post-industrial and, especially, the digital economy, the relative importance of the mass transportation of goods and passengers is decreasing—they, in many respects, should be replaced by the transfer of valuable data via telecommunication networks; the overestimated role of infrastructure projects, in our opinion, is associated with the relative simplicity of their management by state structures, the visibility of their results and the well-known subjective factor;
- d. investment rate in 2000–2017 averaged 11.3%;
 - e. average annual capital amortization rate in 2000–2017 amounted to 2.51%;
 - f. the most important factor in the growth of the Russian economy is the growth of human capital; there is no alternative to it.

Raising the retirement age will lead to a gradual increase in the number of employees and will limit the value of the latter, but this effect, as well as the effect of an increase in the value added tax rate on Russia’s economic growth, can only be traced at a later date.

In our opinion, the modified Solow-Swan model with discrete-time, supplemented by the phenomenological dependence of capital services on the growth rate of the capital stock, the Beverton-Holt model for the dynamics of labor used and the discarded constraint on the linear homogeneity of the macroeconomic production function, gives a fairly accurate description of the data and allows one to make meaningful conclusions and realistic predictions.

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Chapter 101

Influence of Employment Incentives for Seniors on the Pension Coverage in Russia



E. V. Vasilyeva and A. N. Tyrsin

Abstract This paper contains the results of assessing the impact of involving the senior population in labor activity on the income of the pension system in the current conditions of the Russian labor market. The paper is presented the theoretical research and empirical data of the positive and negative impact of population aging on economic growth and development. According to the calculations, more active involvement of seniors in working activity has an insignificant effect on the inflow of insurance contributions and, correspondingly, the pension system income due to the existing discrimination toward the senior population. The conclusion is drawn that from a tax perspective employment incentives for seniors should not be considered a driver for growth in insurance contributions. Furthermore, ensuring the stability and financial solvency of the pension system based on increasing the retirement age is only possible in the short term by reducing pension payments to individuals affected by that increase.

101.1 Introduction

Population aging is one of the main challenges for national pension systems, particularly, in Russia. In 2000, the ratio between the number of retired people and the number of employed individuals in Russia was 1.68, compared to 1.55 in 2019. This demographic shift essentially increases the financial burden on the pension system. In international practice, involving seniors in social and labor activity became the response to the issue of population aging [1–3]. Foreign studies [4, 5] show that

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an active aging policy creates the potential for economic growth in conditions of population aging.

Recently, attempts have been made to develop state policy in the field of improving quality of life for seniors based on the concept of active aging [6]. In 2002, the restriction on pensioners finding employment, which was in place from 1998–2001, was lifted to save pension system funds. However, the restriction on pension indexation for working pensioners was introduced in 2016 and is still in place. The new pension system incentivizes citizens to retire at a later age; however, according to calculations made by Dmitriyeva [7], this formula is not fair for citizens whose entire work history was attained at an employable age. In 2016, employment incentives for seniors were recognized as a priority focus area in the “Strategy of Actions for the Benefit of Seniors until 2025.” To ensure stability and financial solvency with regard to the pension system [8], the retirement age has been gradually increased since 2019. This is a common measure to deal with the consequences of population aging, as it creates a more favorable ratio between the number of employed people and the number of retirees. This change is expected to ensure a balanced budget regarding the Pension Fund of the Russian Federation (PFR). According to estimates of the Ministry of Finance [9], the expected effect of implementing these measures in the mid-term will be observed in the form of persistent growth of the PFR’s own funds between 2019 and 2021 and a reduction in the amount of compulsory pension insurance transferred from the federal budget as of 2020 onward. However, the extent to which governmental policy measures aimed at involving seniors in labor activity and realizing their potential will be effective in terms of ensuring the financial solvency of the pension system will depend on the specific features of the Russian labor market. This research attempts to assess the impact of involving the senior population in labor activity on the income of the pension system in the current conditions of the Russian labor market. The research results will make it possible to adjust policy with regard to employment for seniors, employment incentives for seniors, and creating age-friendly workplaces.

101.2 Approach to Assessment

There are many scientific works [10] that prove that population aging has a positive effect on the economic growth and well-being of the population. The results of one empirical study [11] show that it is in fact the increase in the number of young people that generates a “demographic burden” and hinders economic growth, not in the number of seniors. The consequences of population aging appear in the form of high pension savings, a large proportion represented by the workforce, and increased immigration of employees from developing countries. On the basis of regression analysis using cross-country data, scholars Park and Rhee [12] determined that population aging is accompanied by a growth in savings because people of employable age begin to save more in preparation for a longer period of time on pension. A study by Acemoglu and Restrepo [13] explains that population aging

has a positive impact on economic growth due to the widespread introduction of innovations and technologies that replace physical labor. According to calculations by Ivanova et al. [14], involving the senior population in labor activity partially contributes toward covering the labor shortage, while an increase in retirement age is intended to ensure a balanced budget in the long run and serves as an important tool for accelerating economic growth.

At the same time, the scientific literature also describes research results that prove the opposite—that is, population aging hinders economic growth, both in the short run and the long run. A study by Lee et al. [15] revealed that more active involvement of seniors in labor activity only mitigates the negative impact of population aging on economic growth. Scientists explain that this contradiction in the research results [16, 17] is due to the fact that the potential benefits of population aging depend on institutes and policies that require productive work from potential employees.

Theoretically, engaging additional employees in the labor market should promote a growth in income for the pension system based on the obvious correlation that an increased number of employees equals an increased number of payers of insurance contributions, and in the case of an increase in the retirement age, this also leads to a lower number of pension recipients—that is, a reduced payout for the pension system. This thesis may not prove true in practice as seniors are often discriminated against in the Russian labor market. An increase in the proportion of working seniors with a low salary may lead to a decrease in the average salary in the economy, which will in turn lead to a reduced amount of contributions to the pension system.

In Russia, the salary among individuals of retirement and preretirement ages is lower than the salary among younger age groups. In 2019, employees aged 60–64 years old received a salary 24.2% lower than that of employees aged 30–34 years old; in 2005, this gap was not so significant and amounted to 11.3%. According to the analysis of the Russian labor market conducted by the Higher School of Economics [18], the salary peak occurs very early, at the age of 35–39 years old. This is a peculiar feature of the Russian labor market as usually in developed countries employees of a senior age have larger salaries than the younger generation.

In addition, a significant proportion of people of retirement and preretirement age is employed in low-paid sectors. According to Rosstat, in 2019, 49.3% of employed individuals aged 60–69 worked in economic sectors such as “Agriculture, Forestry, Hunting, Fishery and Fish Farming,” “Manufacturing Industries,” “Education,” and “Health Care and Social Services” where labor remuneration is lower than the average across the entire economy. Less than 7% of employed individuals aged 60–69 work in high-paying sectors. Sonina and Kolosnitsina [3] explain this concentration of seniors by a more tolerant attitude to continued employment of individuals that have reached retirement age in sectors where the state plays a dominant role.

Taking into account the specific features of the Russian labor market, we propose the hypothesis that growth in employment due to the involvement of the senior population will not cause an increase in insurance contributions and, correspondingly, the income of the pension system.

101.3 Research Data

To assess the impact of involving the senior population in labor activity on the income of the pension system, data of the Federal Statistics Service were used. These data contained, without limitations, the results of sampling surveys from various organizations (excluding small businesses) that have been conducted twice a year since 2005.

First, the different classifiers of economic activity types that are used to compile the survey results in terms of salary have seriously hampered the processing of statistical data. Data prior to 2015 were formed pursuant to the Russian National Classifier of Economic Activity Types OK 029–2007 (NAC version 1.1)—OKVED-2007. Starting from 2017, statistical data are developed according to the type of economic activity in accordance with the Russian National Classifier of Economic Activity Types OK 029–2014 (NAC version 2)—OKVED 2.

Second, for statistical accounting, different age groups are used, both by indicator and by year. The salary statistics are formed according to five-year age groups and, for the employed population, ten-year groups. Prior to 2017, workforce surveys were conducted with respect to individuals aged 15–72, and since 2017, individuals aged 15 and over.

These restrictions on the statistical information were taken into account in the calculations by comparing the average gross salary of employees and the number of employed people with a breakdown into ten-year age groups and chosen types of economic activity, with the same wording in both classifiers:

- Section B. Mining
- Section C. Manufacturing industries
- Section F. Construction
- Section G. Wholesale and retail trade; repairs of motor transport and motorcycles
- Section I. Hotels and public catering
- Section L. Transactions with real estate
- Section P. Education
- Section Q. Health care and social services

101.4 Assessment Results

According to Rosstat, the share of employed individuals aged 60 and over in each chosen type of economic activity increased on average from 3.79 to 6.37% between 2005 and 2019. During that period, the specified share more than doubled for the following types of economic activity: “Wholesale and retail trade; repairs of motor transport and motorcycles,” “Construction,” “Transactions with real estate, lease, and provision of services,” and “Hotels and public catering.” The process of increasing the retirement age, which started in 2019, did not have a significant effect on the current

trend. By contrast, the share of employed individuals aged 29 and under and 40–49 years old decreased for all the chosen types of economic activity. For the youngest age group (18–19 years old), this decreased significantly, with the proportion of the workforce represented by this age group coming close to minimum.

To assess the impact of involving the senior population in labor activity on the income of the pension system, the age structure of the employed population in 2005, when the share of employees aged 60 and over was the lowest for the period under review, was carried over to the data on the number of employed people in 2019 for each type of economic activity. Thus, two data sets were received: the actual data set for 2019 and the hypothetical data set—that is, with the total number of employed people by economic activity type for 2019 but with the age structure for 2005.

Taking into account the number of employed individuals by economic activity type, age group, and respective average salary in 2019, the volume of insurance contributions to the pension system was calculated for these two sets of data (Fig. 101.1). The difference between the received amounts by economic activity type calculated based on actual and hypothetic data is insignificant and is within the range of 99.8–101.5%.

If the share of seniors is higher in the population employment structure, the income of the pension system is lower for “Transactions with real estate” and “Health Care and Social Services” by 0.6% and 0.2%, respectively, and for other chosen economic activity types, it is higher by 0.2%–1.5%. In both cases, the largest contribution of employees aged 60 and over to the total amount of contributions for “Transactions with real estate,” “Education,” and “Health Care and Social Services” is 8.8%–9.1% with a high share of employees of that age, and 4.2%–5.0% with a low share.

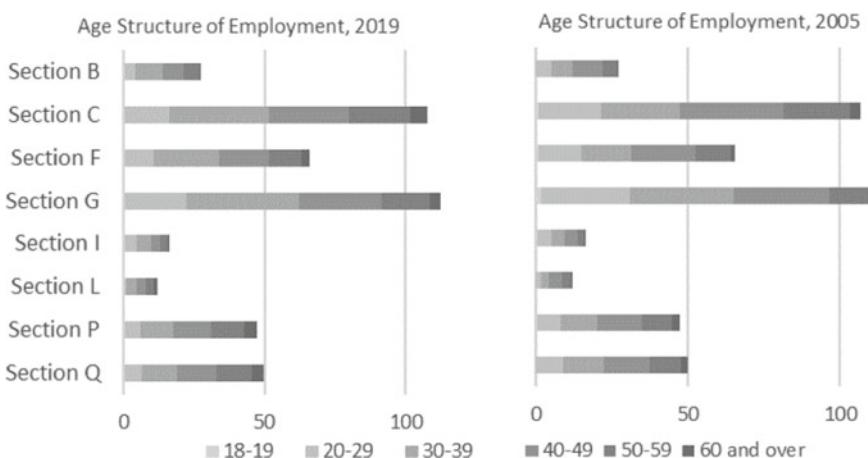


Fig. 101.1 Estimated amount of insurance contributions to the pension system by economic activity type and age group in 2019, RUB billion

101.5 Conclusion

Based on the calculations made in the current conditions of the Russian labor market, the impact of involving seniors in labor activity on the volume of insurance contributions and, correspondingly, the income of the pension system is insignificant. Thus, from a tax perspective, employment incentives for seniors should not be considered a driver for growth in insurance contributions. Furthermore, ensuring the stability and financial solvency of the pension system based on increasing the retirement age is only possible in the short run by reducing pension payments to individuals affected by that increase.

At the same time, today's seniors have a high potential [19] and are able to make a significant contribution to economic and social development. Therefore, by taking into account their incentives and tapping into this potential, they can remain active participants of labor activity in the economy.

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Chapter 102

Distance Learning—Challenges and New Opportunities Under COVID-19 Pandemic



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Abstract The research is devoted to distance learning in Russian under the new coronavirus infection (COVID-19). The article presents the results of polling students and professors of universities of Kazan, Magnitogorsk, Penza, and Ryazan. The respondents were over 100 students and 40 professors. The research showed that 67% of students and 91.7% of professors believe that higher education cannot be completely transferred into the online format. The professors consider a combination of online and offline regimes to be an optimal form of learning. The polling allowed evaluating the strengths and weaknesses of organization and content of distance learning at the local level, the difficulties and problems for professors and students, and the prospects of the phenomenon under study. The first and foremost of them is the insufficient preparedness of the professors and students for transiting to the distance learning regime. Many organizational problems were due to an unstable functioning of the digital educational environment, educational portals, and information-communication networks. The research showed that interaction between professors and students should be made more efficient. In general, both students and professors acknowledge that distance learning complements the existing traditional educational system and only certain forms of teaching can work in distant format. In this regard, the full transition of the Russian universities to distance format in spring 2020 is a forced necessity caused by the COVID-19 pandemic.

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102.1 Introduction

Today, Russia has entered the epoch of post-industrial society. Information flows are constantly increasing while computer devices and capabilities of the Internet are developing. Within a few recent years, a common global information space has been formed. Changes have touched upon all spheres of public life, including educational system, as introduction of new technologies created the need for a cardinally new approach to teaching and learning.

The broad use of distance learning at Russian universities became a response to the changed conditions. Under the accelerated pace of life, increasing information flows, and high requirements to specialists, it is distance learning that allows acquiring the desired profession at any university of the country in comfortable conditions without separating from one's family and job.

The 2020 coronavirus pandemic became a catalyst of intensive spreading of distance learning. The sharp complete transition from traditional intramural studies to e-learning took place due to the threat of COVID-19 pandemic. Distance education served as a means to prevent spreading of the new coronavirus infection. In March 2020, the Minister of Science and Higher Education, Valeriy Falkov, stated that all Russian universities under the Ministry had switched to distance learning. Following the orders of the Russian Government, due to the difficult epidemiological situation, the Russian universities also carried out the intermediate and state final attestations.

At the same time, according to the Russian educationalists, the Russian education system appeared to be not completely prepared for transiting to the distance format. Also, it should be noted that the extensive introduction of distant educational technologies, which are inherently individual, does not exclude the necessity to communicate with a professor and fellow students and cooperate in various cognitive and creative activities.

In view of the aforesaid, it is rather logical to arrange polling of the professors and students of Russian universities to evaluate the strengths and weaknesses of organization and content of distance learning at the local level, the difficulties and problems for professors and students, and the prospects of the phenomenon under study.

102.2 Topicality, Scientific Significance of the Issue, with a Brief Literature Review

The issue of distance learning is not new for the Russian and foreign pedagogy. However, today, it experiences a significant growth of interest due to the spreading of the new coronavirus infection (COVID-19). In this regard, it is topical to turn to the Russian and foreign experience of using distant educational technologies in the teaching process.

The importance of distance learning is proved by the normative-legal acts regulating this process, adopted at federal level. For example, as early as in 2005, the Russian Ministry of Education and Science issued an order “on using distant educational technologies,” which stipulated that the final control can be carried out both in the intramural and distant formats if teaching takes place with distant educational technologies.

In 2012, a Federal Law “on education in the Russian Federation” was adopted, which stipulated that educational programs are implemented by an organization carrying out educational activity, both independently and through network forms of their implementation, and that various educational technologies can be used when implementing educational programs, including distant educational technologies and e-learning. The law interprets distant educational technologies as educational technologies implemented predominantly with the use of information-communication networks with mediated (remote) interaction of learners and pedagogical personnel.

In spring 2020, the Russian Ministry of Enlightenment issued “methodological recommendations for implementing the programs of primary comprehensive, basic comprehensive, secondary comprehensive, secondary professional education, and additional educational programs with the use of electronic learning and distant educational technologies.” They describe suggested models of implementing educational programs and the features of carrying out educational and work practices in the distant format. They also contain recommendations for the order of learning sessions and various consultations at educational and other platforms with the use of distant educational technologies.

In March 2020, the Russian Ministry of Science and Higher Education issued an order emphasizing full-fledged implementation of the programs of higher education with the use of electronic learning and distant educational technologies and organization of contacts between professors and students solely in information-educational environment.

The above documents clearly demonstrate the need for rapid transition to distance learning under the coronavirus pandemic.

The issue of distance learning was transferred into the sphere of theoretical analysis rather long ago. For example, the work by Park and Shea [1] summarizes the 10 years of research on this sphere. Among the Russian pedagogues working in this field, one should mention Polat. Her works are devoted to the theory and practice of distance learning, as well as the pedagogical technologies of distance learning [2]. A well-known Russian pedagogue Khutorskiy devoted his theoretical and practical research to distance learning, distance technologies, and prospects of their development in Russia [3, 4].

Today, various problems and difficulties of distance learning are studied, including the features of transition to distance learning under pandemic [5–7], as well as techniques and means of teaching in the distant format [8–11], motivations and expectations of professors and students [12–15], quality of distance learning and means to ensure it [16, 17]. In particular, special attention is paid to massive open online courses based on distance learning technologies [18–22].

Among the modern research, one should highlight the works devoted to inclusive education under distance learning [23].

102.3 Problem Setting

The content and organizational characteristics of distance learning under the spreading of the new coronavirus infection (COVID-19) are still at the stage of development. Due to this, the objective of the present research is to determine the degree of preparedness of professors and students to transiting to distant format of education, to estimate the time spent by them to prepare for lessons, to analyze the quality of mastering the educational content, and to evaluate the prospects of developing distance learning in Russia as a whole and transferring the higher education into the online format, in particular.

102.4 Materials and Methods

To solve the set research objectives, we used a complex of the following complementary methods: theoretical—analysis of scientific pedagogical literature, synthesis, comparison and juxtaposition, systematization, and ranking; empirical—polling with a questionnaire and description. Together, these methods allowed obtaining reliable and complete information on the research object.

The method of analysis of scientific pedagogical literature enabled to consider the experience of distance learning accumulated by researchers and pedagogues and to view the key aspects in solving the problem under study. It was also used to study the essence of the “distance learning” notion and for processing the polling results.

The method of synthesis allowed penetrating into the essence of the “distance learning” phenomenon, considering its integrity and systematicity, and integrating the experience of the Russian and foreign scholars within the present research; it was used to summarize the practical results accumulated during polling.

The method of comparison allowed comparing and grouping the research results, identifying the common and the different.

The method of systematization enabled to carry out all the stages of the research in strict and clear sequence, observing the logic of scientific cognition.

The method of ranking was applied at the stage of compiling the polling questions, as well as to classify the polling results by their significance according to the selected criterion.

The method of polling with a questionnaire allowed forming the overall concept of the research object and reveal the attitude of the professors and students to the issues of distance learning. The polling was carried out in the form of a questionnaire with a Google form after finishing the spring semester of the 2019–2020 academic year. The

research participants were students and professors of the higher educational establishments of Kazan (Kazan National Research Technical University named after A. N. Tupolev—KAI), Magnitogorsk (Magnitogorsk State Technical University named after G. I. Nosov), Penza (Penza State University, Penza State Technological University, Penza State Agrarian University), and Ryazan (Ryazan State University named after S. A. Esenin). A large number of respondents testify to the representativeness of the sample.

Description as an empirical method was used at the stage of analyzing distance learning as an important social and pedagogical phenomenon.

102.5 Theoretical Part

The notion of “distance learning” or “distance education” is interpreted differently in various sources. For example, Polat defines distance learning as remote interaction of a professor and students, containing all components inherent in the educational process (goals, content, methods, organizational forms, teaching means) and implemented with the specific means of the Internet technologies or with other means implying interactivity [24].

According to Polonskiy, distance learning is a form of education of various groups of learners regardless of the distance (outside an educational establishment) by exchanging information with the help of technical means (Internet technologies) in line with specially designed programs and manuals [25].

In the dictionary on pedagogy by Kodzhaspirova and Kodzhaspirov, distance (distant) learning is defined as an educational technology which allows each person to master the program of any college or university at any place by using modern means of transmitting educational-methodological information to a certain distance [26]. Anderson and Rivera-Vargas highlight the relation of distance learning to digital learning, which had been partially implemented earlier in offline format: as illustrative material, video reels, and presentations [27].

Thus, having analyzed the above notions, we can distinguish the following features of distance learning: remote interaction of a professor and students; use of interactive technologies; use of the Internet resources as the leading means; high degree of autonomy of the learners.

In distance learning, the traditional forms of academic sessions (lectures, seminars, laboratory practice, independent work, and control measures) acquire a new form due to the modern information technologies.

As a rule, two types of technologies are used in distance learning: synchronous (online) and asynchronous (offline) learning. In asynchronous learning, the educational materials are delivered to students by means of electronic libraries, e-mail, and electronic educational environment resources. In synchronous learning, they are delivered when the students are in the network (online). For that, special network communication means are used (Web—and videoconferences). The efficiency of learning is increased when the two methods are combined.

Given the above technologies used in distance learning, one can distinguish the following forms of sessions: chat sessions and Web sessions.

The former type is implemented through chat technologies. During the session, all learners have access to the common conference (chat) and are synchronously engaged in the educational activity organized by a professor. Chat sessions are performed online. However, they do not provide eye-contact between a professor and students.

Web sessions are organized with telecommunication means and other opportunities of the Internet. Web sessions allow performing distance lessons, laboratory practice, conferences, seminars, and other forms of work. To organize educational activity, special messengers can be used (Skype, WhatsApp, Viber, Discord, Zoom, etc.), as well as specialized platforms for Web conferences.

Another type of sessions is Web forums. Unlike chat sessions, they provide an opportunity for a longer (several days long) work on a certain topic or problem in asynchronous regime.

For asynchronous work, one can record video lessons and webinars. A webinar host is a professor, while interaction with the learners is carried out through various means depending on the set functional (interactive questioning, voting, etc.).

In the distant regime, one can arrange consultations (interviews), both group and individual. They can be performed in various formats within the time period set for the learners.

To study the features of distance learning organization and using information technologies during the COVID-19 pandemic, we designed questionnaires for professors and students. The first block of questions was aimed at estimating the preparedness for transition to the distant format of education. A number of questions allowed revealing the changes which took place in the organization of mutual cognitive activity of professors and students. The issues of interaction between professors and students during their mutual cognitive activity were also studied. We were most interested in finding out the possibility of complete transition to distance learning at university.

The above questions allowed analyzing the state, problems, and prospects of distance learning at university.

102.6 Research Results

The present research was carried out among university students and professors. The study involved over 100 students and 40 professors of higher educational establishments.

Among the students, 25.3% were first-year students, 41.8%—second-year students, and 32.9%—students of senior academic years.

36.3% of the respondents had had an experience of distance learning before. However, 63.7% faced such form of education organization for the first time. This influenced the preparedness of students for distant format of learning. 27.5% of the respondents appeared to be not ready for learning in such format, while 35.2% of

the students evaluated their preparedness as incomplete. Just above one third of the respondents evaluated their degree of preparedness as high. The reasons for such situation will be seen when analyzing the answers to further questions.

The distant format of learning influenced the duration of preparing for the lessons. 60.4% of the respondents became spending much more time for preparation. 12.1% did not face significant changes in the time for preparation. This may be due to the new forms of work which appeared during distance learning.

Most of the types of work were to be done with a computer or in the electronic educational environment (EEE). 59.3% of the respondents spent over 5 h a day online. 31.9% of the respondents worked in the EEE from 3 to 4 h a day.

Electronic educational environment is an indispensable component of distant learning. It provides all necessary interactive elements of the educational process: providing the educational content in the form of lectures, seminars, practical assignments, feedback, and information exchange both online and offline. Additionally, interaction of the educational process participants is implemented through forums and chats, news posting, and information exchange during checking the tasks.

41.8% of the respondents estimated the quality of functioning of the electronic educational environment as satisfactory, while 24.2%—as unsatisfactory. This may be due both to disorders in the functioning of the electronic educational environment per se, and the quality of the educational content presented in the portal.

At the same time, over 44% of students think that their mastering of the content worsened, while 16.5% admit that the distant format influenced their performance.

41.8% and 61.5% of the respondents, respectively, stated that their mastering of the material and performance remained at the previous level. A small percentage (14.3% and 22%, respectively) admits that distance forms of learning enabled them to improve both mastering of the material and performance. A certain role in this could be played by both the educational material offered to the students and the features of organization of the interaction process.

52.7% of the respondents evaluate the quality of the educational content as good, 26.4% and 11% as satisfactory and unsatisfactory, respectively.

The distance learning efficiency is to a large extent determined by the form of feedback organization between each learner and a professor. Communication between professors and students in distant format can take place in the form of exchanging e-mails or messages in EEE. One may also use various messengers (Skype, WhatsApp, Viber, Discord, etc.), Web conferences, webinars, and social networks. This is up to a professor organizing the educational process.

According to the research results, most of the students (71.5%) consider the interaction with professors to be insufficient.

When estimating the efficiency of the forms of interaction between professors and students in the online format, the students preferred social networks (70.3%) and special messengers (68.1%). E-mail and interaction means in the electronic educational environment were recognized as less effective.

The distant form of intermediate attestation had a varied effect on its results. Only 28.6% of the students agreed that it appeared simpler to pass intermediate attestation in online format. 50.5% saw no advantages of the distant form of intermediate attestation.

When analyzing the answers to the question: "What would you like to change in distance learning?", one may conclude that all aspects of this process require improvement. 35.2% of the respondents would like to change the functioning of the online services. 35.2% of the students believe that the forms of interaction between professors and students should be changed, while 15.4% think that the educational content should be improved.

All the above factors influenced the willingness of the students to continue their education in distance form. 29.7% answered this question in the negative, while 40.7% would like to reserve the distant format for some types of work only.

Summarizing the above, we should emphasize that 67% of the respondents believe that the educational process at university cannot be completely transferred into the online format. There is an opinion that some humanities could be taught and learned distantly, while technical disciplines require obligatory intramural training. However, it is rather difficult to judge at present. Practices of various types and forms were hard to arrange in distant format. Besides, today both professors and students face problems with adaptation to the new format.

We also polled the university professors taking part in the research. The polling comprised over 40 professors with over 10 years of pedagogical experience.

66.7% of the professors had had an experience of distance teaching before. However, just 29.2% of the respondents appeared to be completely prepared for transition to the online format, while 66.7% were not completely prepared for such changes. Only 4.2% of the respondents appeared to be completely unprepared for organizing distance learning, which allowed us to make a conclusion about high professional level of the university professors.

Transition to distance teaching influenced the process of the professors' preparation for academic sessions. For example, 70.8% of the respondents became spending much more time for that. Only 8.3% of the respondents changed nothing in their regime of preparing for the lessons. This is due to the fact that 25% of the professors changed the educational content cardinally, while over 70.8% mastered new forms of education organization.

This influenced the time professors had to spend online. Over 70.8% of the respondents spent over 5 h a day for that.

The professors mark that the degree of mastering the study material by the students decreased. This opinion was shared by 66.7% of the respondents. Some of them noted that the procedure of evaluating the students' activity complicated, as there appeared opportunities for doing the assignments not by the learners.

Although 62.5% of the professors experienced no problems with identification of the students, there were some (33.3%) who had difficulties with that. Still disputable is the question who accomplishes the assignments in the electronic educational environment. Accomplishment of certain tasks requires eye contact and obligatory online regime.

The procedure of intermediate attestation also did not become easier in the distant format. Only 20.8% of the respondents called this process simple.

Just as students, the professors lacked interaction in the distant regime. 83.3% of the respondents evaluated the level of interaction as insufficient. According to the professors, the most effective forms of interaction with students are various messengers (Skype, WhatsApp, Viber, Discord, etc.) (70.8%), less effective—e-mail (20.8%), social networks (58.3%), and interaction means in the electronic educational environment (37.5%).

Among the difficulties faced by the professors, they mark unstable functioning of the electronic educational environment (79.2%), students not having the necessary devices (70.9%), increased time for preparation for the lessons (70.8%), and the lack of clear requirements of the university administration to the organization of the educational process (5%).

Considering the prospects of distance learning, 75% of the professors would like to leave only some types of work the online format.

91.7% of the professors believe that the educational process at university cannot be completely transferred into the online format. They consider the combination of the online and offline regimes to be an optimal form of the educational process organization.

102.7 Conclusion

Undoubtedly, distance learning has a number of advantages: significant saving of time and material costs; convenient planning of the educational process; opportunity for the students to combine the educational process with work and personal life; opportunity to choose the place of study without being dependent on classrooms; variety and a large amount of available information resources; convenient format of interaction and cooperation between professors and students; additional opportunities for organizing paid educational courses at universities.

At the same time, one may highlight the drawbacks of the distance learning: significant time expenses both for students and professors; difficulties with comprehending the lecture materials; significantly increased amount of assignments for students' independent work; insufficient skills of self-organization of educational activity outside the direct contact with a professor; lack of the necessary technical and material means.

Summarizing the performed research, we can identify a number of features in transition of universities to the distance format of education due to the COVID-19 pandemic.

First of all, we should highlight the insufficient preparedness of university professors and students for transition to the distant regime. This is due to both the lack of experience in such form of education organization and the unpreparedness of educational-methodological provision of this process.

A lot of organizational problems were related to the unstable functioning of the electronic educational environment, educational portals, and information-communication networks.

For the effective organization of distance learning, more attention should be paid to the educational-methodological provision and program of this process. It is necessary to significantly change the educational, methodological, instructional, and control material, which would allow proper comprehending and mastering the content of the studied disciplines and carrying out self-control and self-check of one's results at convenient time and place.

The educational process should be built on maximal involvement of each learner into intense independent cognitive activity. Besides, the control procedures should be thoroughly designed to ensure their systematicity, objectivity, and comprehensibility. Students should clearly understand what, when, and in what format they are to submit.

The consultative aspect of the students' independent work is also very important. The research results showed that it is essential to increase the efficiency of interaction between professors and students. To this end, both messengers and other types of communication can be used. Regular consultations with students must be carried out in the online format.

The online format requires changes in the current and intermediate attestation procedures, to make certain the achieved results belong to the definite student, not a virtual image. The assignment sent to the EEE or e-mail does not guarantee the material that had been studied and mastered by the student. In this case, interactive forms of work should be used in the online regime.

In general, both students and professors acknowledge that distance learning complements the existing traditional educational system and only certain forms of teaching can work in distant format.

Thus, the full transition of universities to the distance format is a forced necessity caused by the COVID-19 pandemic. Ultimately, as was noted by the Russian President V. V. Putin in his speech at the end of May 2020, distance learning would by no means become a substitute for the traditional one.

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Chapter 103

Using Informal Networks for Human and Relational Capital Analysis: The Role of Trust and Knowledge Sharing Intention



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Abstract An extensive stream of academic and practical research on management shows that elements of intellectual capital play a significant role in shaping customer value. Key components of intellectual capital in knowledge economy are human and relational capital as they reflect the socio-psychological nature of an organization when considering the processes of nurturing a reputation for trust, exchange, and accumulation of knowledge. An essential role in these processes is played by informal organization, which arises in response to the actions of managers when organizing structure of the company to strengthen communication channels, internal values, and imperfections in the formal structure and instructions. In this study, using the example of a Russian service company, we consider the effect of communication network statistical parameters on the indicators of employee trust and knowledge sharing intention. Results showed that the betweenness centrality of individual nodes in the considered organization positively affects the level of perceived trust and the intention of employees to share knowledge in order to support organizational goals. Practical implication of this study is to confirm the reasonableness of using informal networks for consistent investment in human capital. We suggest that in order to identify human and relational capital, managers should analyze informal networks and develop a set of management solutions to support and strengthen them in terms of organizational goals.

103.1 Introduction

Exploration and measurement of intellectual capital have become one of the central problems in modern management theory since more and more intellectual resources are perceived as the basis for achieving the competitive advantage of organizations

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[1]. In general, the intellectual capital theory supporters urge managers to consistently visualize the process of creating value in an organization and create an analytical basis for subsequent decision-making [2]. Unfortunately, many of these tools are difficult to apply in practice and require specific managerial competencies. The traditional three-component model includes human, structural, and relational capitals that continuously interact with each other, forming flows of added consumer value [3]. It is actually value, not cost, the basis for competitiveness formation; often, elements of relational and human capital play a key role in processes of planning, production and distribution [4].

Financial nature of structural capital has been studied well enough, direct measurement, market capitalization methods, and a balanced scorecard have been developed [2, 5]. In practice, however, the elements of the organization's social nature reflecting its organic structure are most difficult to analyze, for example, such as the psychological needs of individuals in trusting each other, sharing common values that contribute to social adaptation, coordination of actions and knowledge sharing intention [6, 7]. Traditional understanding of human capital typically focuses only on intelligence and experience, ignoring behavior of participants in the organization when interacting with each other in the internal social network. The psychological aspects help to understand the cause-and-effect relationships in internal informal community development, as well as shed light on the real balance of power within the organization. The key to identifying relational and human capital is understanding the social nature of organizations. One of the effective ways to assess the internal social environment is to determine its organic structure, namely, informal networks in the organization, which allow us to determine the true nature of the processes of communication and the formation of values in knowledge management [8]. Informality inevitably accompanies all key knowledge management processes and is the key to understanding employee response to organizational change and their ability to act effectively in crisis situations. In this article, based on theoretical analysis and case study of the Russian service organization, a practical approach to identifying relational and human capital and establishing cause-and-effect relationships between the statistical configuration of the internal social network, human and relational capitals is implemented.

103.2 Informal Nature of a Company's Human and Relational Capital

Intellectual capital, in the general view, is a unique set of intellectual resources that a company uses to achieve a competitive advantage [9]. This definition follows from a resource-oriented view of the firm nature, which focuses efforts of managers on the unique resources that give company distinctive features in market [2], further development of this dimension leads to knowledge-based view on the firm [10]. Intellectual capital, as a rule, consists of three main elements [3, 11]—structural

capital, as well as *human capital*—“living” knowledge, *knowledge sharing intention* and competencies of employees, which are used in business context and *relational capital*, which is a logical continuation of the social capital concept, these are shared values and *trust* within the company, which lead to effective interaction with all stakeholders [12].

One of the main methods for identifying and studying the dynamics of relational and human capital in a strategic perspective is informal social networks analysis [13]. Researchers of informal networks note some practical results that can be obtained from network analysis. In particular, Allen et al. (2007) believe that managers in the course of network analysis need to answer the question: do the individuals playing a key role in informal networks occupy key positions in the firm, if not, do these individuals realize organizational expectations, arising from their roles in knowledge sharing [14]? It is also important to determine whether an organization’s vulnerability, a threat to its competitiveness, appears as a result of trust loss in key nodes and knowledge loss in an informal organization [15]. For example, the clustering coefficient reflects the ability of a network to be divided into several homogeneous groups, taking into account the high density of connections in such homogeneous groups. To calculate clustering, a number of statistical indicators are used, including *centrality* indicators [16–19]. The more central a node is, the closer it is to all other nodes; measures of centrality are usually normalized from 0 to 1, where 1 means the absolute proximity of a node to other nodes in the network. *Betweenness centrality* reflects the level of binding of cluster-like structures by a specific node, in other words, the higher the level of intermediate centrality for a particular node, the higher the probability that it acts as a “bridge” between two or more cluster-like structures within the network, it is a source knowledge and trust and has a high level of human and relational capital, respectively.

Social component, embodied in human and relational capitals, is elusive, subject to the variability of the internal and external environment, since each time individuals revise their approach to their behavior when receiving additional information [20, 21]. In our study, we focus on knowledge sharing intention and trust as indicators of human and relational capital correspondingly. Generally, informal networks are strengthened as a result of confidential personal contact in order to build sustainable social interaction [14]. Thus, company managers should focus on identifying centrality of informal networks and interpretation of trust “assess”, influence and understanding to measure human and relational capital. Accordingly, the **research hypothesis: the level of betweenness centrality of a node is positively associated with trust and knowledge sharing intention in the organization.**

103.3 Research Methodology and Data

To visualize the social network within the organization, we used special software Gephi, which operates with common structures based on graph theory. Initial material for visualizing a social network within an organization was the sociometric data of

a survey of 33 employees in Russian small enterprise. The studied organization is a service company that performs repair works and custom-made metal structures in the Sverdlovsk region, in particular, for one of the largest railway companies in Russia. The company carries out design and selects compounds for the metal structures processing and protection using only internal human capital.

Formal structure of the studied organization is quite stable, although in the light of recent changes, the organization leaders develop the impression that internal personnel reallocations are necessary and optimal socio-psychological climate creation.. Disagreements often arose among employees within the company in matters of coordination of work, one of the main reasons for this situation was the unwillingness of employees to share information with each other, gradually the internal relational capital began to devalue. Failure to exchange information in a timely manner could affect the efficiency and even safety of the work, as well as the reputation of the company in the face of customers. Management suggested that a unique, but at the same time inflexible internal socio-psychological environment has formed within the organization: there are informal leaders who set the general tone for the work course. In particular, the level of human capital in the technical sphere, which leads to the success of projects in the long term, is focused among a few key employees who, as informal leaders, do not seek to formally take on managerial initiative (for example, participation as middle managers), preferring personal stability. The management sought not only to identify such centers of excellence, but also to develop effective strategies to stimulate and support them with training opportunities for project managers who would be responsible not only for the technical component, but also for the coordination of efforts and project control.

Each of these networks was rendered using Gephi 0.9.1. Each participant (employee) was marked with its own code value. In the course of the sociometric study, the levels of trust of employees to each other were identified, “advice networks” were also investigated, in fact, individual network participant’s influence on decision-making was assessed. The questions that were included in the simple questionnaire were as follows (here we used an analogy with earlier studies [22]):

- with whom of the specified employees do you have to communicate on various issues on a daily basis?
- rate the degree of trust in a particular employee in terms of the exchange of sensitive “political” information within the organization on a scale from 1 to 5 (1—I do not trust this person at all, 5—I completely trust this person, indicator TRUST_COLLE);
- to which of the specified employees do you most often turn for advice and with whom do you willing to share internal knowledge and “political” information? (1—I do not apply to this person at all, 5—I apply to this person daily, indicator KNOW_SHARE).

103.4 Results and Discussion

Internal informal communication network was analyzed to explore relational capital (it was found out with which employees are most often contacted on work issues during the day). The communication network is shown in Fig. 103.1. As a result of visualization, images of directed connected graphs were obtained, each of the nodes represents a specific member of the organization, marked with a numerical value, id (the participant's label in the program is the surname). The visual presentation was optimized with Yifan Hu's algorithm in one iteration. The analysis of

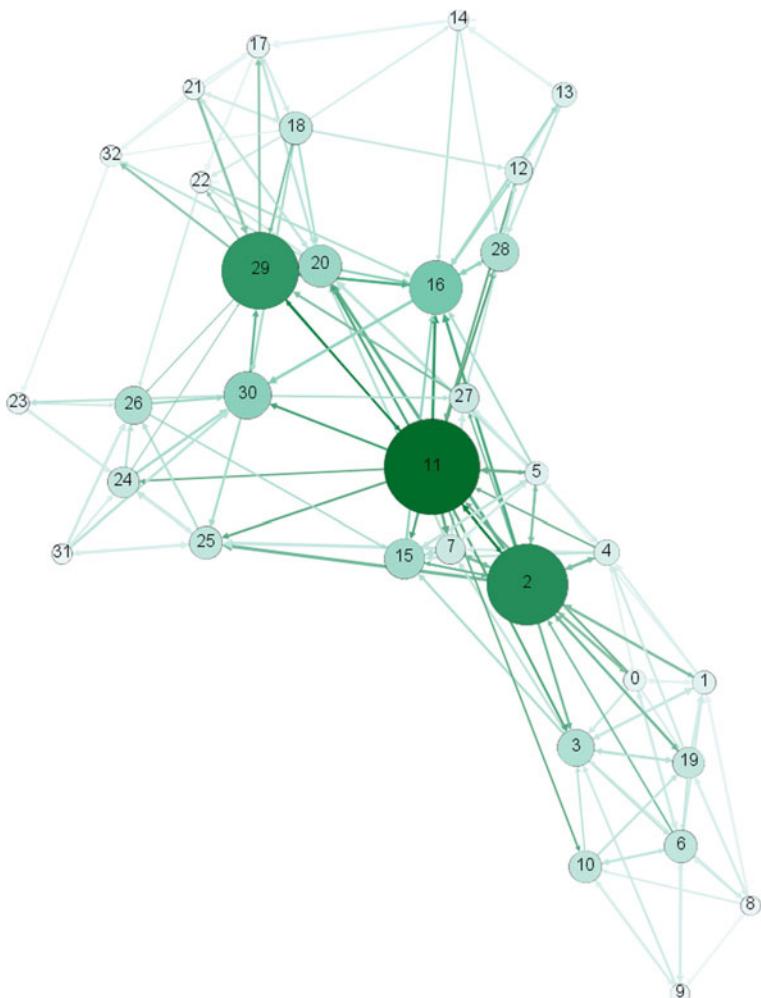


Fig. 103.1 Visualization of the informal network in the studied organization—by the parameter of betweenness centrality

the statistical characteristics of the network indicates a high level of connectivity of participants and a large scale of internal clusters. Graph density is 0,18, considered as a moderate level. The average degree of centrality—12,04—shows the average number of outgoing and incoming connections for each node, the clustering coefficient is 0.49—a low number of clusters, the relative integrity of the organization. The study of the parameters of intermediate centrality in relation to each node of the graph showed the high importance of individual nodes of the network in transferring information, which indicates a high level of human capital in these nodes. The centers of communication channels were senior managers (for example, 11—the head of the technical department, to whom three work teams of 4–5 people are subordinated under the leadership of mid-level managers 28, 29, and 30). Also an important link is the technical director 2, to whom node 11 is subordinated in the official structure.

Business-processes of a service company in terms of communication processes are concentrated in specific technical areas, where relational and human capital interact with each other. Meanwhile, the organization in question is a centralized structure, since individual participants are workers of the first (12, 13, 14, 16), the second (17, 18, 20, 21, 22, 32), and the third (23, 24, 25, 26, 31) brigades are loosely connected with each other. The director (node 0) plays a formal role in the hierarchy, since he is neither the center of the communication network, nor the center of the “advice network”. The next structure that was analyzed in the informal organization is the so-called “advice network”, which was also built on the basis of sociometric data. The results showed that one of the central links in the “advice network” is the specialist worker of structural installation department (16). Analysis of this specialist’s experience shows that his career has been associated with a significant number of organizations in the same industry over the past 20 years, however, apparently, this specialist does not have enough leadership qualities for further career advancement, which can be a subject for further study in the internal informal network. Most of the other workers remain isolated within the formal structure because the level of communication between teams is low.

To test the hypothesis about the influence of the betweenness centrality (BETW_CENT) on trust in colleagues (TRUS_COLLE), and willingness to share knowledge (or knowledge sharing intention, KNOW_SHARE) and, accordingly, on the accumulated human and relational capital, we built two linear regression models (see Table 103.1). The first model reflected the influence of gender (GEND), closeness centrality (CL_CENT) and betweenness centrality (BETW_CENT) on the trust of workers to each other, the second focused on their knowledge sharing intention (KNOW_SHARE, see Table 103.1). Despite the moderate level of models quality, they show betweenness centrality positively impacts on trust in colleagues and willingness to share information as indicators of relational and human capitals, betweenness centrality is the frequency of occurrence of a particular node (employee) within the “advice network”. The more an individual is included in the internal network of advices, the more he trusts his colleagues and shows a tendency to share internal information resources. As can be seen from the above models, betweenness centrality

Table 103.1 Results of linear regression analysis (the models were built to test hypotheses about the effect of betweenness centrality on the trust of colleagues and their knowledge sharing intention)

Indicator	Dependent variables			
	TRUS_COLLE		KNOW_SHARE	
	Coefficient	t	Coefficient	t
(Constant)	5.311	3.115	4.166	2.257
GEND	- 0.501	- 0.999	0.283	0.522
CL_CENT	- 0.332	- 0.077	1.812	0.389
BETW_CENT	14,262	2.600 (**)	10,461	1.762 (*)
R ² adjusted	0.335		0,274	
F	5.347		3.915	
Significance F	0.005		0.018	
Number of observations	32		32	

Note Table 103.1 (**)—the coefficient is significant at the 5% level, (*)—the coefficient is significant at the 10% level

significantly affects the trust of colleagues, at the same time, in the studied organization, the gender factor does not play a significant role, just like the indicator of the closeness centrality (proximity of nodes).

103.5 Results and Discussion

Intellectual capital continues to play a key role in the creation of customer value in organizations, in both industrial and service sectors. The study of the informal network structure allows not only to visualize the human and relational capitals accumulated in the organization, but also to create an analytical base for making management decisions. Using the example of a specific company, we have shown that the decisions that are made in the company are associated with a large number of internal participants, so it is important for the management to understand the role of each employee in achieving a specific result. We have shown that the indicator of betweenness centrality, which reflects the connectedness of the nodes of the informal network, has a positive effect on trust and the intention to share knowledge, which reflect the presence of relational and human capital in the organization, respectively. Therefore, while performing network analysis, one can use a reasonable interpretation of the mathematical characteristics of graphs reflecting the structure of internal social network, from the point of view of promising management solutions and diagnosing problems in organizational culture and knowledge and intellectual capital management processes.

Further research should focus on the social interpretation of the graphs characteristics that visualize relationships within the organization, as well as develop

methods for analyzing the level of salary satisfaction, working conditions, and career promotions and their impact on information sharing in informal networks.

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Chapter 104

Approaches to Measuring Employees' Competitiveness: Part 1. How Behavioral Labor Economics Methods Can Develop the Field?



M. N. Ivanenko

Abstract Employees' competitiveness is an ambiguous and complex concept that affects the interaction of three agents of the labor market: workers, companies and the state. The competitiveness indicators are not published by official statistics; therefore, they suggest an author's approach in research. We believe that study methods of employees' competitiveness can be developed by the methods of various sciences. We assume using of behavioral economics methods that suggests an interdisciplinary approach. Behavioral economics is a new field of science that arose 30–40 years ago and includes tools not only from economics, but also from other sciences such as social and neuroscience. This area of science, as well as its tools, still causes a lot of discussion in the scientific world and remains not fully disclosed or understood. The author aims to identify the possibilities and limitations of the methodology of behavioral economics in relation to studies of the employees' competitiveness measuring approaches.

104.1 Introduction

Employees' competitiveness is of an ambiguous and complex concept that affects the interaction of three agents of the labor market: workers, companies and the state. Increasing labor productivity in the Russian labor market, competitiveness indicators are not published by official statistics; therefore, they suggest an author's approach in research. Many authors in Russian literature such as Gorbanev [1], Mikulchik [2], Mironov [3], Nizova and Smirnov [4], and Stepus [5] offer various definitions of employees' competitiveness, as well as various classifications of factors influencing it. However, we believe that these approaches ought to be expanded, since the employees' competitiveness can be studied by the methods of various sciences. In this regard, we rely on research methods of behavioral economics advising an interdisciplinary approach.

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Behavioral economics is a new field of science that arose 30–40 years ago and includes tools not only from economics, but also from other sciences. This area of science, as well as its tools, still causes a lot of discussion in the scientific world and remains not fully disclosed or understood.

The author aims to identify the possibilities and limitations of the methodology of behavioral economics in relation to study of the employees' competitiveness.

To achieve the goal, you must complete the following tasks:

- To clarify the concepts of behavioral economics, its methods and methodology.
- To reveal and systematize methods of behavioral economics.
- To conduct a comparative analysis of possibilities and limitations of the behavioral economics methodology.

Object of study is the methodology of behavioral economics.

Subject of study is the possibilities and limitations of the methodology of behavioral economics in relation to studies of the employees' competitiveness measuring approaches.

As a hypothesis in the article, the proposition is put forward that the methodology of behavioral economics has the capabilities and limitations that provide directions for further research on the employees' competitiveness.

104.2 Methods of Economics and Neuroscience

104.2.1 *The Concept of Behavioral Economics and Its Methods*

Behavioral economics as a separate field of science arose in the 70–80 s of the twentieth century. It contrasted with the mainstream economy—neoclassical economists. Based on the empirical results, behavioral economists have proved that the individual's behavior is irrational: There are anomalies (deviations from rational behavior) that the neoclassical economics cannot interpret and resolve.

Despite the fact that the term “behavioral economics” is intuitive and used in many modern studies, there is no generally accepted definition.

Colin F. Camerer gives the following definition: Behavioral economics uses evidence from the psychological and other social sciences to create more accurate and fruitful alternatives to the classical economic theory based on the principle of optimization [6].

According to Richard H. Thaler, behavioral economics asks questions primarily about how people make decisions when making economic choices or how financial systems influence their choices [7]. Social psychologists are exploring ways to make non-financial decisions, such as: why people are motivated to create posters

for charity organizations or to be blood donation volunteers. Neurosciences introduce limitations on computational ability, willpower and selfishness compared to the historical principle of optimization.

John F. Tomer believes behavioral economics is a science that practices and develops methods different from mainstream economics [8].

Adrian Solek mentions that behavioral economics studies the actual decisions made by individuals, rather than the guidelines for how to make decisions [9].

Analyzing and synthesizing the above definitions, we give the following:

Behavioral economics is a combination of theoretical and practical methods in the economics of different sciences.

Before proceeding with the disclosure of the methodology of behavioral economics, it is necessary to disclose the concepts of method and methodology.

“A method (in the broadest sense of the word—‘the path to something’) is a way of the subject’s activity in any form.

The concept of ‘methodology’ has two main meanings:

- A system of certain methods and techniques used in a particular field of activity (in science, politics, art, etc.).
- A doctrine of this system, the general theory of the method, theory in action.”
- According to the author of this article, the methodology of behavioral economics is built from combinations of methods:
- Theoretical—consisting of theoretical postulates of not only economic, but also social and neuroscience.
- Practical—including equipment and empirical tools of social and neurosciences.

In this paper, we focus on practical methods, since they are not obvious and do not rely on the neoclassical economy in comparison with theoretical ones.

We offer the separation of practical methods of the mainstream economy into the following, which we will expand below:

- Quantitative—answering the question “How much?”.
- Quality—answering the question “How?".

104.2.2 Quantitative Methods of Economics

Keshab Bhattacharai divides the studies of economic science into theoretical and applied [10]. Theoretical studies use the derivation of equilibrium conditions during the optimization process, diagrams, equations, logical statements. It is necessary to put theory into practice in order to improve the welfare of society, for which applied research verifies the claims made by theories using various methods of estimation or calculation (Table 104.1).

Therefore, applied research mainly relates to information processing and varies depending on the method used. There are basically four categories of applied research.

Table 104.1 Quantitative methods of economics

Statistical and econometric analysis methods	Calculations of the system of equations
Strategic analysis	Experimental analysis

Statistical and econometric analysis methods Statistical analysis includes the design, collection of data on economic variables in a scientific manner and their implementation in theory, determines the properties of the distribution of variables and collects information on trends, correlations and causality patterns among variables.

Econometric analysis includes methods for processing data to test various econometric theories.

Calculations of the system of equations This method solves the N number of equations based on some assumptions about their behavior, for which linear, nonlinear or dynamic programming is often used.

Strategic analysis Game theory is becoming an increasingly popular tool for analyzing the interdependence between economic agents, where the action to be taken is determined by the beliefs or perceptions of that person about the actions of other agents. It is used to analyze the process and the results of negotiations, strategic planning in case of unforeseen circumstances, or simply describe the behavior of economic agents.

Experimental analysis This method has the concept of using control groups to test economic theories.

104.2.3 Qualitative Methods of Economics

Ligia Muntean Jemna gives five types of qualitative strategies in economic science: ethnography, a method of sound theory, case study, phenomenological research, narrative approach, as well as qualitative research methods such as observation, interviews, focus groups, document analysis and content analysis [11] (Table 104.2).

Strategies for Qualitative Research in Economic Science Ethnography is a research strategy in which a researcher studies an intact cultural group in a natural setting for a long period of time, collecting, first of all, observational data. The research process is flexible and usually develops contextually in response to living realities encountered in the field.

The method of grounded theory, in which the researcher tries to obtain a general abstract theory of the process, action or interaction based on the opinions of the participants in the study. This process involves the use of several stages of data collection and clarification of the relationship of information categories.

Table 104.2 Quantitative methods of economics

Strategies for qualitative research in economic science	Qualitative research methods in economic science
Ethnography	Observation
Method of grounded theory	Interview
Case study	Focus group
Phenomenology	Documentary analysis
Narrative approach	Content analysis

A case study is a form of qualitative research that seeks to provide a detailed report of one or more cases.

Phenomenology is a form of qualitative research in which the researcher tries to understand how one or more people perceive the phenomenon.

The narrative approach, or narrative interview technique, becomes an unstructured method that provides access to experiences that are integral to understanding the meaning of the narrator's everyday reality.

Qualitative research methods in economic science Observation is a method by which a researcher selects an individual or community, challenges and registers and encodes in accordance with certain rules, behavior, facts and event characteristic of an individual or community, observed in accordance with the goals and objectives of the study.

An interview is one of the simplest forms of data collection, which includes asking questions to people and getting answers from them.

The focus group seeks to determine as accurately as possible the attitudes, beliefs, feelings, feelings and reactions of respondents in a way that is less defined for qualitative methods—this is observation or interview. A focus group feature is interaction. Unlike observation or interviews, a focus group can provide more information in a shorter period of time, thereby saving resources (money, time, staff).

Documentary analysis is the most commonly used source of information for researchers, especially because of resource savings: time, money and so on. A documentary analysis may include analysis of specific reports, annual books and all details associated with the project. The big advantage is that the data is already collected, and there is no need to organize a survey or other methods of data collection.

Content analysis includes a systematic classification and counting of text units to redistribute a large amount of material into a brief description of some of its features. For quality researchers, the instant appeal of this approach is the convenience that it offers to simplify and reduce large amounts of data into organized segments. Using content analysis, you can translate the contents of thousands of pages of economic works, for example, on different topics.

Table 104.3 Quantitative methods of economics

Brain imaging	Psychophysical metrics
Method of registering individual neurons	Electric brain stimulation
Transcranial magnetic stimulation	Diffusion spectral tomography
Psychopathology	Accident-damaged brain

Areas in which the listed qualitative research is used:

- Marketing;
- Management;
- Personnel management;
- Finance;

104.2.4 Neuroscience Methods

Neuroscience is disciplines at the interface with which is the behavioral economy, as well as those studying neural processes (neurobiology, neuroimaging and others). Disciplines at the junction of neuroscience and economics as part of a behavioral economy are: neuroeconomics, neurofinance, neuromarketing [12–16] (Table 104.3).

Brain imaging Brain imaging is the most popular method, including comparing brain images of individuals performing “experimental” and “control” tasks. The difference between the two images is the activity of the brain during the execution of the experimental task. There are three main methods of brain mapping.

The oldest method—electroencephalography (EEG)—involves the use of electrodes attached to the skin surface of an individual’s head and reading electrical activity as a response to internal or external events.

Magnetoencephalography (MEG) is an analogue of electroencephalography, but using a magnetic field.

The method of positron emission tomography (PET) measures the level of blood flow in the brain of an individual as an indicator of the activity of a region of the brain when performing an experimental task.

Functional magnetic resonance imaging (fMRI) is a newer and more popular method that monitors the oxygen level in the brain regions of an individual with a magnetic field when performing an experimental task.

Psychophysical metrics Old and simple techniques for measuring psychophysiological indicators—pulse rate, blood pressure, galvanic skin reaction (RAG), change in pupil size.

These indicators can be simply and very quickly removed from the respondent.

However, these methods have the following problems:

- The presence of a single emotional response as a result of several reasons (dilated pupils can be associated with both interest and thoughtfulness).
- The inclusion in a single emotional response of a combination of several emotions close to each other (interest as the sum of involvement and arousal).
- Dependence of the manifestation of emotions on the cultural environment (external calmness of the Japanese compared with the emotionality of Italians).
- Occurrence of artifacts—superfluous reactions to the external or internal environment for the experiment (nervous twitching from the respondent's excitement or distraction to a fly flying in the room).

Registration of individual neurons The method of registering individual neurons measures the response of one neuron using a microelectrode, and not a whole family of thousands or more neurons, as in the methods described above.

However, there are risks of damage to a single neuron during damage, and so far this method has been used only on non-human animals.

Electric brain stimulation Electric brain stimulation is accompanied by the direction of electronic impulses to certain areas of the brain.

The method is used to study the behavior of animals (e.g., rats) as a reaction to a positive stimulus.

Transcranial magnetic stimulation Transcranial magnetic stimulation (TMS) is a method that uses pulsed magnetic fields to temporarily impair brain function in certain areas. Pulsed magnetic fields alter the respondents' cognitive and behavioral functions, making it possible to draw conclusions about which area of the brain is responsible for what.

Diffusion spectral tomography A new method of diffuse spectral tomography uses the fact that water flows quickly through the milled (sheathed) neural axons. The method is extremely useful for understanding neural circuits and is an important addition to the simple handling of images in several regions (using fMRI) with little ability to record which activity occurs first. In addition, this method can be used after autopsy, which is an obvious advantage, but it will not always find application in economic research.

Psychopathology Chronic mental illness (schizophrenia), developmental disorders (autism) and degenerative diseases of the nervous system (Parkinson's disease) help us understand how the brain works. Most forms of the disease are associated with specific areas of the brain. In some cases, the progression of the disease has a localized pathway in the brain. For example, Parkinson's disease initially affects the basal ganglia, spreading only later to the cortex.

Accident-damaged brain People with local brain damage caused by accidents and stroke, and patients who undergo radical neurosurgical procedures, are a rich source

of information. If patients with known damage to region N perform a specific task worse than healthy people, the difference is that region N is necessary for this task. Often, one patient with a one-of-a-kind lesion changes the idea of a particular area of the brain.

104.3 Behavioral Economics Perspectives

Behavioral economics divided economists into those who consider it promising and who do not. In this subclause, we will reveal key and complete points of view on behavioral economics. Let us start from the point of view “against behavioral economics.”

Once again, according to John F. Tomer, behavioral economics practice and use scientific methods different from the typical mainstream economy [8] (Table 104.4).

John F. Tomer compares behavioral and mainstream economics in the following six dimensions:

Narrowness When economic discipline limits its methods and/or the scope of its substantive investigation, the criterion of breadth. When these restrictions are severe, economic discipline will be considered narrow. Economic science is limited in methodology: It mainly uses mathematical modeling, excluding other approaches.

Rigidity A discipline with high rigidity does not have the ability to be pragmatic and flexible in relation to the methods that it uses. Conversely, a discipline with low rigidity can easily adjust its methods depending on the type of request.

Intolerance Intolerance refers to neglect of scientific work that does not comply with the requirements of its own discipline. Disciplines with a high degree of intolerance are those whose researchers are not impartial and, therefore, are relatively hostile and arrogant in relation to other approaches to economic science. Disciplines with a low degree of intolerance have practicing scientists who are relatively aware of the methods of other disciplines.

Mechanicalness The quality of mechanicalness refers to the degree to which the economy and its actors are viewed by the discipline as machine behavior. Disciplines with a high degree of mechanicalness are those whose practices tend to perceive the economy as a complex machine and tend to use mathematical metaphors and concepts such as equilibrium. Practicing disciplines with low mechanics tend to view the economy as an organic, integral, evolving human being.

Table 104.4 Measurements for comparing behavioral and mainstream economics by John F. Tomer

Narrowness	Mechanicalness
Rigidity	Separateness
Intolerance	Individualism

Separateness This is the degree to which economic discipline is loosely connected or not integrated with noneconomic disciplines, especially disciplines in the field of social sciences. Higher discipline is that which is relatively self-sufficient and, therefore, isolated from other disciplines. Discipline that emphasizes interdisciplinary activity will be judged on the basis of a low level of isolation.

Individualism Behavior and events stem from the characteristics and behavior of individuals. A discipline with a high degree of individualism is one in which explanations invariably focus on the individual decision-making process. Discipline with a low degree of individualism pays much more attention to individuals as part of collectivity, as well as social and group motivations and behavior.

The following two complementary points of view will be “for behavioral economics” as a promising science.

Bab Shiv with a team of authors suggests the following ways to enrich the science of decision-making using neuroscience [17]:

- Confirmation of the existence of certain phenomena.
- Creation of more fundamental (at the neuro-level) concepts of understanding decision-making processes.
- Clarification of existing concepts.
- Introducing new testing methodologies for existing theories.
- Let us explain these stages with a specific example of the placebo effect in economic decision-making:
- At the first stage, the study confirms the presence of a placebo effect in economic decision-making and its impact.
- In the second, we introduce additional theoretical tools into economic science.
- In the third, the two previous ones are analyzed and synthesized, as a result of which we supplement or change the theory that explains it before.
- At the fourth stage, we apply the methods of neuroscience—we localize the finding of the placebo effect using neuromethods, and a new cycle of research begins.

Thus, it is possible to introduce neuroscience at any stage of decision-making research.

Colin F. Camerer finds behavioral economics useful in making complex and difficult to achieve decision optimization principles [4]. The scientist identifies four types of such difficulties: risk, time, strategizing and prosociality.

Risk The risk is described by many statistical approaches, including the theory of expectations. Neurosciences have recorded a connection between risky decision-making and the activity of such areas of the brain as the striatum and insular cortex (islet), which proves the emotional side of the phenomenon in the perception of the individual. Another approach—the theory of prospects—speaks about the probabilities of risk perception, and perception of losses is two times stronger in magnitude than the benefits [9].

Table 104.5 Difficulties of making decisions, according to Colin F. Camerer

Risk	Time
Strategizing	Prosociality

Time Most decision-making involves the benefits and losses that are distributed over time. The traditional approach proves a possible tendency of an individual to the present or future period when making decisions; however, an individual's tendency to present is experimentally proved regardless of the degree to which the present value of goods received in the future is exceeded (Table 104.5).

Strategy Many important economic actions are social: The actions of one individual affect the actions of another as assistance (cooperative decision-making) and deprivation (decision-making by competitors). The game theory deals with this topic, in which individuals choose individual strategies based on the information provided and collective strategies based on the actions of other individuals to create total income.

Prosociality Most traditional economic theories suggest that individuals are broadly oriented toward their interests. Behavioral economists have uncovered several other motives and types of prosociality.

Behavioral economics develops in several directions:

- Prescribing methods for constructing decision choices to help individuals avoid making erroneous decisions, while at the same time preserving the freedom of choice of individuals who are confident in the correctness of their choice.
- The study of the neurobasis of making economic decisions, since the mathematical expressions of neural computing are comparable to the mathematics used in economic science to describe the optimization approach.
- Combining theories of various sciences, including biology as evolutionary selection, to describe and interpret aspects of the behavior of individuals and institutions.

104.4 Behavioral Labor Economics

According to Nathan Berg, labor economics is one of the economics fields least slowly adapting to behavioral economics [18]. "Instead of rejecting neoclassical concepts such as self-interest, maximization and equilibrium, behavioral economists' methodological agenda proves to be one of expansion and generalization. This suggests a possible explanation for why the influence of behavioral economics in labor economics has been less dramatic than in other subfields." The gap between traditional and behavioral labor economics is less dramatic than in other subfields of economics.

Leon Matsuro in his dissertation work assesses the effects of behavioral and psychological attributes on labor market outcomes in an uncertain economic environment. His assumption is the impossibility of neoclassical economics to explain these

effects; therefore, Leon Matsuro uses the theories of social sciences, in particular, Big Five personality traits: openness, conscientiousness, extraversion, agreeableness and neuroticism [19].

He provided evidence on the nature and distribution of behavioral and psychological attributes among a sample of Zimbabwean adult working population. Also, Leon Matsuro estimates the effect of behavioral and psychological attributes on three main employment outcomes: sectoral occupation, earning and job mobility.

Thomas Dohmen suggests that behavioral economics has profoundly changed labor economics in various areas. These areas include intertemporal labor supply, the wage–effort relationship and the role of fairness norms in wage determination. Therefore, behavioral economics stimulated new lines of research such as lines on the psychology of incentives, social comparison and peer effects [20].

Labor economists have not abandoned the standard economic framework entirely, but have rather tried to incorporate new aspects into existing models. This process is not without frictions. Psychological motives can be integrated into the standard economic framework in various ways, which almost inevitably results in the unsatisfactory situation that theoretical frameworks diverge.

Thomas Dohmen examples of behavioral approaches in the following labor economics fields:

- Nonstandard preferences.
- Individual differences: preference heterogeneity and personality.
- Nonstandard beliefs and nonstandard decision-making.

104.5 Opportunities and Limitations of the Methodology of Behavioral Economics

In addition to the above points of view, it is necessary to systematize what possibilities and limitations are inherent in the methodology of behavioral economics in relation to studies of the employees' competitiveness measuring approaches (Table 104.6).

Let us single out the possibilities as advantages of the methodology of behavioral economics:

Practicality Behavioral economics is based on a vast array of empirical evidence, which is why it arose.

Relevance Not all empirical foundations in economics are interpreted in neoclassical economics; therefore, other sciences come to the rescue.

Realism The decision-making methods proposed by the behavioral economics are easily applicable compared to the neoclassical school.

Descriptiveness Behavioral economists primarily describe reality, analyze and only then offer effective ways of making decisions in comparison with the neoclassical, which is based on normativity.

Table 104.6 Opportunities and limitations of the methodology of behavioral economics

Opportunities	Limitations
Practicality	Lack of specialists
Relevance	Unobvious evidence
Realism	Complexity
Descriptiveness	Theoretical contradictions
Prismatic	Practical contradictions
Interpretation	Dissonance
Modernity	Costliness
Infinity	Method intolerance
All possible	Unethical
Reciprocity	Transience

Prismatic The presence of various sciences, areas and schools in behavioral economics provides the right to choose a path that is close to the researcher and an effective way to make decisions.

Interpretation Each new problem in behavioral economics is interpreted on the basis of a theory from the economic and noneconomic sciences to find a more effective way of making decisions.

Modernity Behavioral economics is based in research on such modern and developmental methods as brain visualization, psychophysiological metrics and others.

Infinity The field of research seems endless, because so far the base of behavioral economics, both theoretical and practical, is small in comparison with the inherent potential, since not all neoclassical economics are explained from the point of view of behavioral.

All possible The opportunity to discover new phenomena of economic science that could not be discovered with the help of neoclassical economics.

Reciprocity Filling the economy not only with other sciences, but also the economy of other sciences, both at the theoretical and practical levels.

We turn to the limitations as the disadvantages of the methodology of behavioral economics:

Lack of specialists As a new science, behavioral economics is spreading slowly despite the widespread use of modern technology. The problem field, voiced in scientific papers 30–40 years ago, remains unknown to many either as a term or as hidden behind it.

Unobvious evidence Each of us face many behavioral deviations in life, so our economic behavior becomes so familiar to us that we do not notice mistakes; therefore, we find neither reasons nor ways to change ineffective behavior.

Complexity Behavioral economics is an interdisciplinary science that includes two or more sciences, depending on the field of study, and therefore a complex of sciences. To engage in interdisciplinary research, it is necessary to possess the knowledge and skills of both or more disciplines, since otherwise an incomplete and shallow picture of reality will arise.

Theoretical contradictions Behavioral economics includes competing sciences, directions, and schools. For example, there are problems that psychologists and biologists explain in different ways. Nevertheless, there are common ground as psychophysiology—science at the intersection of psychology and biology—however, it does not completely solve the problem.

Practical contradictions Since the object of study of behavioral economics is a human being, the results of some studies contradict each other. More empirical evidence is needed to form a dominant point of view.

Dissonance Behavioral economics includes a lot of schools, each of which offers its own interpretation of decision-making. Mostly, they complement each other, but a unified system is needed that can collect and structure such a large layer of information.

Costliness Expensive medical equipment, valued at more than a million rubles per device, also makes conducting research: maintenance of equipment, as well as payment to researchers and respondents, expensive, which reduces the number of devices used for interdisciplinary research.

Method Intolerance Not all methods of noneconomic sciences are used in economic science. For example, registration of individual neurons and electric brain stimulation were used only in studies on anthropoid animals and rats, and so far cannot be used in studies of human decision-making.

Unethical Methods of behavioral economics such as psychopathology and a brain damaged in accidents, according to some scientists, are contrary to moral standards.

Transience The high level of technology and the high rate of development of science as a whole cause a great risk of a sharp jump in development, which can stop the behavioral economy when more relevant science arises.

104.6 Conclusion

As a conclusion, it is necessary to take stock of the work done.

The aim to identify the possibilities and limitations of the methodology of behavioral economics, identified in the research, is achieved. It identified features such as practicality, relevance, reciprocity and others and identified restrictions such as a lack of specialists, complexity, unethical and others.

The first task, which was to clarify the concepts of behavioral economics, its methods and methodology, was completed in the point 1 and developed in points 4 and 5. It is proposed to define behavioral economics as a combination of theoretical and practical methods in economics of sciences different from it, to define a method as a way of subject activity in any form, definition of methodology as a system of methods.

The second task that was the disclosure and systematization of practical methods of behavioral economics was performed in the points 2.1, 2.2, 2.3, 2.4. Practical methods are disclosed and systematized as quantitative methods of economic science, qualitative methods of economic science and methods of neuroscience.

The third task was comparative analysis of possibilities and limitations of the behavioral economics methodology in relation to studies of the employees' competitiveness measuring approaches. As a result of the comparative analysis, many opportunities were identified as advantages and many limitations as disadvantages of the methodology of behavioral economics.

These stages led to the conclusion: the hypothesis that the methodology of behavioral economics has the opportunities and limitations that provide directions for further research in employees' competitiveness area of study.

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Chapter 105

Innovative Development of the Russian Economy in the Context of Global Economic and Political Realities



V. V. Zozulya, O. V. Romanchenko, and M. A. Skuratova

Abstract *Subject:* The economic and social development of the state is largely determined by the current system of innovation and investment development. In this paper, we have studied these systems in Russia and abroad, determined their development in modern conditions, and identified external and internal factors of influence. *Goals:* Analyze the state of the world and Russian investment potential and prospects for its development. *Methodology:* The research is based on a dialectical approach, which uses system and institutional approaches, statistical method, comparative analysis, methods of tabular, and graphical data visualization. *Results:* The processes of development of the world and Russian investment system in modern conditions were studied. The prospects for innovative and investment development are defined. *Conclusions:* As a result of the study, it was determined that the Russian Federation needs a successfully developing system of innovative investment development that ensures financial independence from international economic influence. However, there are a number of problems that need to be solved at the level of Federal and regional legislative and Executive structures in order to create investment attractiveness and legal security for both Russian and international investors. The prospect of innovative development in Russia is possible in terms of economic structure based on raw material exports, due to the development of the industrial sector of the national economy, high technology, industry, aerospace, energy and information technology, and the development of agricultural production.

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105.1 Introduction

The globalization of the world economy is increasingly affecting the development of international economic relations, including investment activities. The growth of competition at the global level is increasingly forcing firms to move their own activities to those areas of the world where they are offered the best conditions. It is very important for states that are pursuing economic modernization to create an attractive investment climate.

The political and economic situation in modern conditions creates a threat to the economic development of Russia in the first place due to sanctions. For this reason, investment in large Russian projects is based on the principle of investing in projects that pose environmental threats to other countries, since the costs of harmful production are very high, investors prefer to invest in underdeveloped countries, including Russia [1–3].

Regardless of the policy of global sanctions, the volume of foreign investment in the Russian national economy is growing. An increasing number of manufacturers in European countries are protesting against the sanctions, as this directly negatively affects the decline in production volumes, which for many years has been focused on the Russian market, therefore, state budgets are suffering significant losses. In world practice, three main types of investments are used: real, financial, and intellectual. Financial investments play a special role. The generally accepted classification considers direct, portfolio, and other investments, in the form of investments are divided into private, public and mixed. Public investment has a fairly broad orientation [4]. Most often, States invest:

- In the social sphere;
- In the field of science and high technologies;
- In the military-industrial complex.

We have analyzed the global investment volume and made a chart of their changes in the global investment volume for the period from 1996 to 2016 (Fig. 105.1).

According to the United Nations Conference on trade and development (UNCTAD), international investment increased by 8.5% in 2017. Among the reasons for this growth, experts note an increase in demand from European, North American, and Asian capital, which is diversifying its assets by entering foreign markets [5].

The analysis shows that in 2016, there was an increase in global investment by 36% to \$1.7 trillion [6, 7]. According to UNCTAD, the growth in investment activity was driven more by cross-border mergers and acquisitions, which involved the movement of financial resources rather than productive assets. The structure of foreign investment has changed significantly, and now developed countries are the main recipients. At this time, 55% of the world's total investment is in developed countries. The annual growth rate was over 90%. After a sharp decline in 2015, investment in the European Union and the USA increased 4 times. The main role in this was played by (Fig. 105.2):

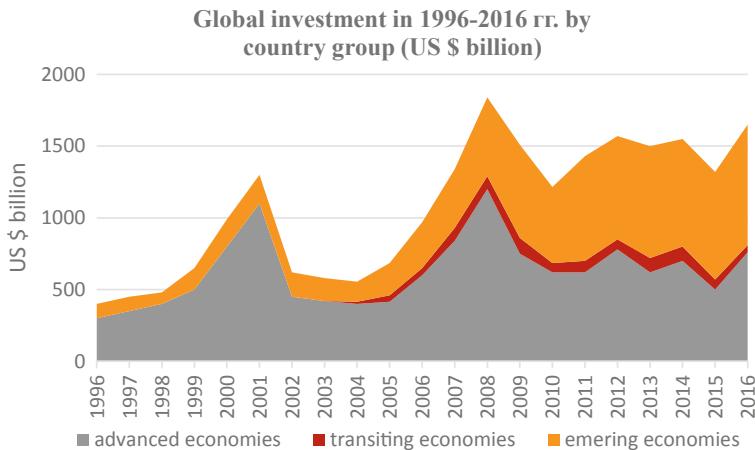


Fig. 105.1 Global investment in 1996–2016 years by country group (US \$ billion)

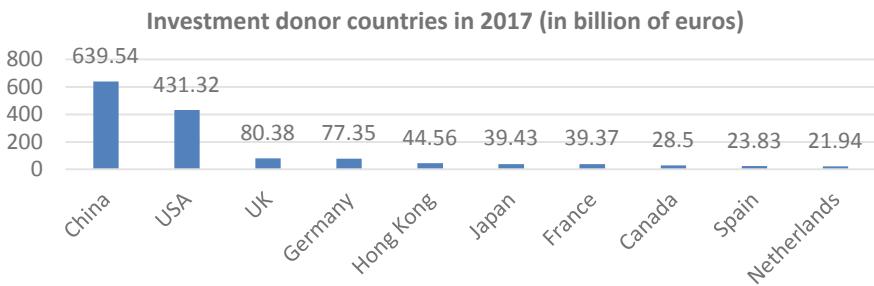


Fig. 105.2 Investment donor countries in the year 2017

- Growth of the dollar against other currencies against the background of lower oil prices;
- Active foreign policy;
- Low interest rates.

Then let us further consider the rating of the leading countries in terms of investment inflows and outflows for 2017 [8]. China remains a steadfast leader in both the donor and the recipient of the investment. The second place is occupied by the USA. By a significant margin, the UK is among the leading investment donor countries, with an investment of €80 billion. The list also includes Germany (€77.35 billion), Hong Kong (€44.56 billion), Japan (€39.43 billion), France (€39.37 billion), Canada (€28.5 billion), Spain (€23.83 billion), and the Netherlands (€21.94 billion) (Fig. 105.3).

Next, let us look at the rating of the most attractive countries for investors. Most of the money was invested in the Chinese economy, which attracted about €561.23 billion in 2017. In addition to China, these are the USA, which attracted €381.29

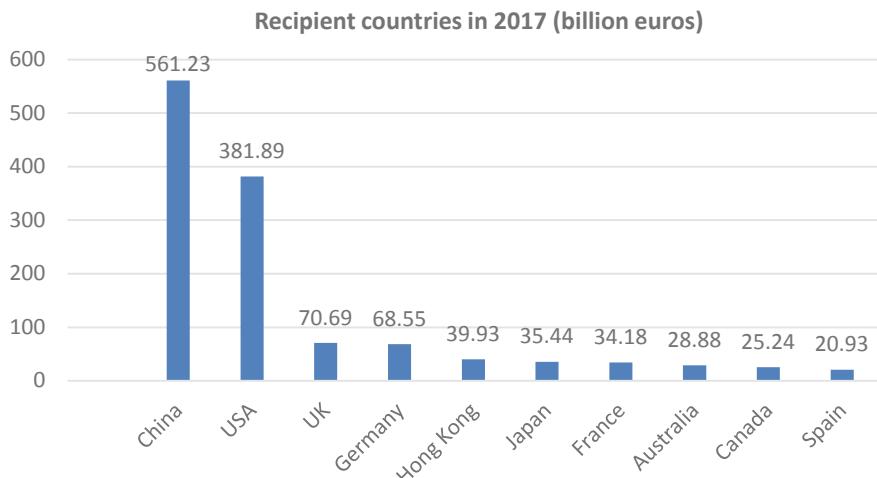


Fig. 105.3 Recipient countries in the year 2017

billion, the UK (€70.69 billion), Germany (€68.55 billion), Hong Kong (€39.93 billion), Japan (€35.44 billion), and France (€34.18 billion). The only difference between these two ratings will be the appearance of Australia among the largest recipient countries, which with an indicator of €28.88 billion ranked eighth in the ranking. Also among the countries that attracted the most money are Canada (€25.24 billion) and Spain (€20.93 billion) (Fig. 105.4).

Considering the national investment markets, we note that the largest annual growth in attracted investments in 2017 was demonstrated by Bulgaria—153% compared to 2016. However, the total volume of foreign investment in the Bulgarian market is €856 million. The growth was achieved primarily due to increased activity in the commercial real estate market. In 2017, a major real estate deal worth €252.9 million was completed in Bulgaria—the NEPI Rockastle Foundation bought Paradise Center Mall in Sofia. In 2017, this Fund also bought the Serdika shopping center in Sofia for €200 million, while Hyprop Investments acquired The Mall for €176 million. The third Fund from South Africa—MAS Real Estate-bought Galleria shopping centers in the cities of Stara Zagora and Burgas. Other countries that saw growth in foreign investment were Vietnam (+94%), Indonesia (+87%), Argentina (+86%), Malaysia (+79%), Brazil (+76%), Turkey (+75%), Romania (+65%), Hong Kong (+53%), and Finland (+52%) [9–11].

However, when analyzing foreign direct investment (FDI), which we considered above and found that they make up a large share of international investment. It was also noted that in 2017, the total volume of foreign direct investment in the world decreased by 16–23% compared to 2016 and amounted to \$1430–1520 billion. The main factor is the drop in the cross-border market—by 23–29%. Investors all over the world prefer new projects. In this segment, the decline was 14–15.2% due to the global economic crisis. Experts identify a number of factors that have

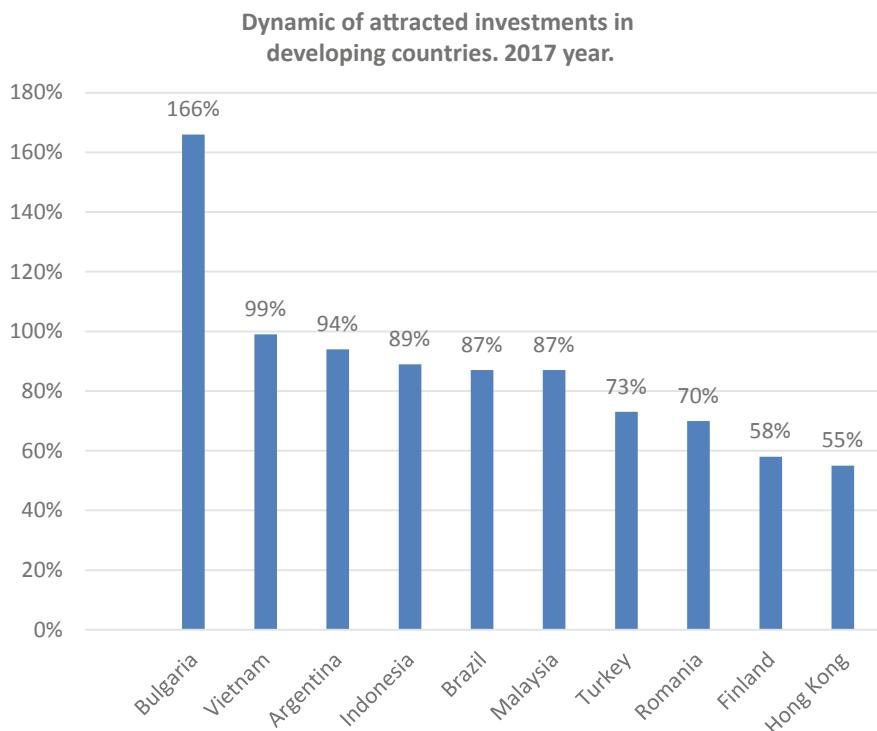


Fig. 105.4 Dynamic of attracted investments in developing countries. 2017 year (%)

influenced the negative development of the situation on the global foreign direct investment market. First of all it is: the threat of a trade war between the USA and China, a General decrease in China's foreign investment;—growing risks for global free trade zones: brexit, US intention to withdraw from a number of free trade agreements in order to protect the domestic market;—declining profitability—a General trend in the global economy.

In 2018, foreign direct investment in the world also declined, but at a slightly slower pace. An indicator of the ongoing global changes in the world economic system will be the gap in the correlation between the dynamics of the FDI and the world gross domestic product (GDP). In 2018, based on available data, the growth was 4%. The consequence of these changes is the growing importance of national institutional investors and a significant increase in the role of the state system for supporting investment projects. Promoting national development institutions and supporting promising industries, including the digital economy, remain a strategic priority that will determine the competitiveness of the economies of countries around the world in the long term. We conclude that the analysis of the international direct investment market has shown a negative development trend. In our opinion, this is

primarily due to the decline in investment activity in China, the leading country [12–18].

In 2019, the most attractive country for foreign investors was the USA. China is in second place. Foreign direct investment flows to Russia doubled, while those to the European Union fell by 15% [19, 20].

However, analyzing the General state of the international investment market, we came to the conclusion that the investment market is beginning to recover after the crisis and shows good dynamics of development. Russia's participation in the international movement of capital is noticeable, but very specific. Russia, as the country with the largest reserves of natural resources that have a certain value on the foreign market, actively sells them to developed countries and countries with developing market economies. In addition, in Russia, tolling is used as an outflow of production capital, as a mechanism for processing raw materials by a tollinger (a foreign partner) on the territory of the Russian Federation with its subsequent movement abroad. Thus, according to the tolling system, about 80% of the produced aluminum is exported from Russia to the world market. In modern Russia, there is a significant outflow of intellectual capital. Due to the restriction of conditions for testing and promotion of scientific products, the leakage of "bright minds."

At the same time, at the beginning of the third millennium, the share of intellectual labor in the produced social product reaches 70% or more, and accordingly, the intellectual resource becomes the main factor in ensuring the security of any state. In recent years, there has been an increase in private forms of capital export, and it is more profitable for entrepreneurs to open a company offshore and pay less income tax than to pay a high tax within their own country. The export of capital from Russia is mainly carried out in two ways: legal and illegal. Moreover, if, according to experts, the legal part is 9–10 billion dollars, then the illegal turnover is 3–5 times more. In order to reduce this trend, some measures are being taken.

According to the Central Bank of Russia, for the period from 2007 to 2017, the net outflow of capital abroad amounted to 588.2 billion us dollars. Illegal export of capital during this period amounted is estimated at \$325.1 billion.

The trend continues for total capital outflows, the largest volumes of which occurred in the crisis years of 2008 and 2014 and amounted to \$133.7 billion and \$154.1 billion, respectively. The largest volume of illegal export of capital was registered in the crisis year 2008 in the amount of \$59.5 billion. In 2015–2016, there is a tendency to a sharp decrease in the volume of both legitimate and illegitimate capital outflow from Russia. But in any case, this is several times less than what flowed out of the country in previous years. However, in 2017, we see a reverse trend and a twofold increase in both net capital outflows from the country and illegally transferred funds compared to 2016. Investment cooperation with Russia, the European Union, China, and other countries will grow in the coming years. Cooperation between Russia and the EU, including energy, is one of the foundations for developing a strategic partnership between them, not only in the economic sphere, but also in the social sphere.

Currently, preparations for the implementation of the Nord stream 2 project are in full swing, and the line was planned to be completed at the end of 2019. However,

the opposition of a number of European countries, the USA and Russia, delays construction. In case of improving of the political situation, this world project could be completed.

Analyzing the opportunities for Russian investment activity, it should be noted that the difficult political and economic conditions for doing business, as well as cultural and language barriers, make it necessary to provide state support to Russian TNCs.

Only those parts of the legal export of capital from Russia to foreign countries that contribute to the realization of the country's long-term foreign policy interests and the development of Russian companies should be promoted. Thus, we conclude that the rational orientation of the Russian investment policy is of particular importance.

105.2 Conclusion

In this paper, we have considered the development of the international investment market, its trends and prospects for the development of this market in Russia within the framework of the tasks. Given the difficult political and economic situation in the world, pressure from the international community on Russia, many sanctions threaten the implementation of certain investment projects such as Nord stream 2 with international participation. However, a number of countries, such as China, Turkey, and others, continue to cooperate with Russia, increasing investment in the Russian economy. Considering the prospects for the development of the international investment market, we note that there are a number of trends that determine its direction. The most important of them, in our opinion, is the globalization of the international investment space, during which a number of countries implement policies to reduce barriers to investment.

Conflict of Interest The authors declare that there is no conflict of interest.

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Chapter 106

Improving the Effectiveness of Professional Education Based on Innovative Methods and New Technologies in the Framework of an International Project «ImProfEdu»



A. O. Ivanova , A. Haapajarvi, T. A. Ignatieva , and V. P. Pilyavsky

Abstract The article is devoted to the problems of improving professional education in the service sector in Russia and Finland. The international project ImProfEdu, implemented within the framework of the South-East Finland—Russia cross-border cooperation program 2014–2020, funded by the European Union, the Russian Federation and the Republic of Finland, is dedicated to solving these problems. The ImProfEdu project is aimed at improving professional education focused on the needs of the labor market in Russia and Finland using digital technologies, creating the necessary conditions for students and University graduates to develop motivation for training, advanced training and professional retraining for subsequent employment. The article presents the relevance of the project, its mission, goals and objectives. The General problem of improving the quality of professional education in the article is divided into four sub-problems: improving the effectiveness of distance training, increasing the motivation of students, improving the quality of distance training, ensuring the availability of training for all population segments.

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106.1 Introduction

Traditionally, the trusting partnership of Russia and Finland, both in the political and economic spheres, is based on a common historical and geographical basis. Today, countries are the most important economic partners. This project is aimed at improving professional education, focused on the needs of the labor market in Russia and Finland by using digital technologies [1].

The project involves three stages: As part of the implementation of the first stage of the project, an analysis of the labor market needs at joint ventures of Russia and Finland and the conditions for organizing the educational process implemented in the framework of professional and postgraduate education of the two countries will be carried out, identifying “growth points”; analysis of the existing program methodical and personnel support, satisfaction of participants in the educational process, business partners of joint ventures [2].

Within the framework of the second stage, it is planned to create organizational-pedagogical, program methodical, personnel, informational conditions implying improvement of the educational process in terms of updating the content of Russian–Finnish educational programs, the use of digital educational technologies, the use of modern equipment, the organization of production practices and internships in the countries project partners, exchange of experience; study by students and teachers of the specifics of joint Russian–Finnish business projects and enterprises in order to master the necessary technologies, obtain the necessary knowledge and skills that contribute to the development of social mobility; organization and holding of joint events: conferences, webinars, master classes, internships, etc.

Development of the system of continuous education of students today is on a qualitatively new level. The third stage of the project involves the formation of developed Russian–Finnish educational programs, the presentation of the first experience of their implementation, the use of modern digital educational technologies; an increase in the number of employed students, participants in professional competitions of various levels; positioning the results of a joint project in the educational space of the participating countries. The target groups are students of vocational secondary degree, their teachers and cooperation companies.

During the project students with teachers first perform unit of Finnish–Russian working culture of their own study field on a common digital platform made by Spb Institute of Business and Innovation, continue studies in a hosting country in workshops with students of hosting organization and perform a short period in a company. The workshops in Finland will be virtual ones, so also students in home country are able to take part in them. The main outputs of the project will be the platform, open to everybody also after the project and other learning material including virtual workshops, also open for everybody on the home page of the project.

The main activities implemented are the research about skills and competencies needed, of the staff working in the cross-border companies, plan about the learning units of these skills, platform where students can gain these skills, mobilities of students and teachers to the partner country, workshops in colleges, working in

companies and taking part in competitions in a hosting country and finally after graduation a workplace in a cross-border company.

The result of the project will be a platform-based study unit, where the students will carry out a study unit for working in Finnish–Russian companies, learning material in a homepage and mobilities (workshops, working in companies, competitions, teachers' meetings), multiplier events to inform about the project strengthened cooperation with the companies and qualified working force for the companies. The cross-border cooperation is needed, because the participants try to solve the problem of how to offer qualified working force for the companies, who need staff who know both Finnish and Russian working methods, customer service, safety regulations and other rules. This is also the aim of the project and also the change.

106.2 Focus of the Research

The development of the digital economy and the formation of new breakthrough growth directions at the junction of existing industries, the expansion of employers' personnel needs with multidisciplinary competencies and the minimum need for an adaptation period for employment are global trends that define the global context for the development of the professional education system. Specialists in the field of architecture and construction, hairdressing, hotel service, middle managers and others are currently in demand, both in St. Petersburg and the Leningrad region, and in Finland.

Within the framework of good-neighboringness, there is a mutual exchange of specialists: graduates of St. Petersburg professional schools (colleges) go (or are ready to go) to work in Finland, and Finnish graduates go (or are ready to go) to work in Russia, in particular, on Finnish enterprises that work or open in Russia. Such an exchange of specialists requires the study of practice in various countries in the field of organization of training, employment of graduates, business and legislation; in the field of mentality and language, etc.

This project involves the implementation of the main directions of the state policy of the two countries in the field of training skilled workers (employees), professional workers in the long term in the framework of mutually beneficial border cooperation. The project is aimed at improving professional education focused on the needs of the labor market in Russia and Finland using digital technologies, creating the necessary conditions for developing motivation among students and college graduates for training, advanced training and professional retraining with subsequent employment.

Thus, the project's relevance is due, on the one hand, to state interests in the field of training competitive mid-level specialists, developing the internationalization of professional education, and on the other hand, the need to ensure maximum coverage of capable, highly motivated students who are oriented toward mastering new Finnish–Russian educational programs, using digital technology.

Overall objective of the project: To increase the level of education among young and elderly people and to guarantee skilled workforce.

Specific objective of the project: Problems in the professional education systems of the partner countries, which can only be solved jointly, while maintaining the best practices, experience and technology, are as follows [3–8]:

- the widening of the gap between the “requirements” of the labor market, the development of the world economy, technological processes and the level of training of graduates of professional institutions, the qualifications of teachers;
- imperfection of conditions (personnel, program methodical, material and technical, etc.) affecting the level of training of mid-level specialists;
- low mobility of college graduates;
- an insufficient amount of practice and internships for students conducted at enterprises; exchange of experience, joint work with enterprises for the training of specialists, including dual training;
- the absence of joint Russian–Finnish professional education educational programs, including those implemented using digital technologies, which allow preparing highly motivated specialists for joint business projects and enterprises;
- insufficient training of students to participate in various creative and professional competitions with the aim of developing professional and general competencies;
- insufficient mobility of teachers of professional institutions of Russia and Finland in the framework of ongoing training courses and internships in specialized centers.

All these problems were identified by analyzing the labor market, monitoring the employment process of college graduates, assessing the dynamics of changes in the number of people wishing to undergo professional training and additional professional education in order to obtain a new specialty, participate in professional competitions, develop joint business projects and enterprises [9].

These problems can be solved by developing and implementing an interactive self-learning online educational platform based on new concepts in the field of distance learning.

Lack of modern educational platforms in the existing technologies for the presentation of educational material and their corresponding IT-solutions, such as 3D, 3D+, 4D, artificial intelligence and data science formats, determine the low degree of assimilation of the proposed educational content and thus lead to a low quality of distance learning in the context of a sharp increase in demand for distance education. These problems are relevant for both the domestic and international markets, especially in the context of socio-economic disasters, in particular pandemics. When using the solutions proposed in the project, it significantly increases the quality of distance education and reduced learning time, which makes it competitive in the world market of educational services.

In order to constructively describe the proposed solution technology the described problem is proposed to be considered in the format of four object-oriented sub-problems:

1. Improving the efficiency (assimilation) of the distance learning process.
 - This product provides 5 options for transmitting information to the student (text information, video information, audio information, augmented reality, virtual reality).
 - To maximize user comfort and improve the efficiency of the platform, it will implement an interactive virtual assistant program that uses an up-to-date knowledge base.
 - Learning from mistakes—if an incorrect answer is given in a test task, the student immediately receives a message about it with a description of the correct answer. The next time you try to retake the test, the list of questions changes.
2. Increasing students' motivation.
 - Formation of an individual educational trajectory, that is, in addition to the compulsory General education block, it will be possible to independently choose modules from the variable part without reducing the volume of the course.
 - Use of game technologies in distance learning
3. Improving the quality of distance education.
 - Permanent upgrade of educational content modules.
 - The product will allow students to study additional material (sources) by accessing knowledge bases on the subject of the course.
 - Using a human–machine interface with artificial intelligence elements.
4. Availability.
 - The platform's versatility ensures its use at all levels of education.
 - Ease of use of the educational platform for all key actors: the teacher, students, and the platform administrator.
 - Availability of a mobile app for distance learning, which provides access to the educational platform from any type of gadgets.

106.3 Conclusions

Only in the context of cross-border cooperation can the main objectives of the Project be achieved, and the related tasks be accomplished:

- the study by teachers of the specifics of the organization of the educational process in certain specialties, taking into account the features of the educational technologies of the partner countries;
- improving the professional competence of students in order to prepare qualified specialists for joint business projects and enterprises;

- development of partnerships with employers of Russian and Finnish companies to study the professional competencies that graduates currently lack, the study of experience in training personnel in educational institutions of the partner countries.

The advantages of the proposed project are that it offers simultaneously existing forms of presentation of the material (text, clip, audio, VR, artificial intelligence and advanced knowledge) and all types of interaction with students (individual study of the material using the Internet platform, interaction with other students, interaction with teachers, participation in webinars, online conferences, etc.).

The traditional matrix of providing educational content and tests for them, which strictly regulates the number and content of training modules of the program, forms a strictly regulated educational trajectory without the participation of the student.

The second option of forming the educational trajectory involves dividing the milestones of the program modules into two parts: permanent and variable. The educational trajectory is formed in this way: permanent part of the program is studied by students in compulsory and of variable part, he has the right to choose those modules that seem most interesting to him, but so that this set of modules from a variable part with a permanent part of the would provide a full picture of the study material of the program as a whole. Thus, the educational trajectory is partially formed with the participation of the student and includes "mandatory" modules in accordance with the Federal State Educational Standard.

The third option of forming an educational trajectory can be implemented using chatbots technology, which, based on the quality of knowledge assessment when testing a student, makes suggestions and forms new tests for a more in-depth study of poorly learned material.

The fourth option of forming an educational trajectory is to form an educational trajectory exclusively using artificial intelligence based on the existing curriculum, while filling the content with advanced knowledge, namely, relevant material based on the Scopus and WoS databases.

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Chapter 107

Circular Economy and Digital Technologies as a Tool for Overcoming the Post-Pandemic Crisis in Russia



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Abstract In Russia, in modern conditions, the relevance of the transition to the principles of a circular economy is growing. First of all, this refers to the sphere of waste management. The hierarchy of waste management methods is officially focused on maximum use of secondary materials in production processes. But at the moment, the contribution of the waste management industry to the gross domestic product of the Russian Federation is very low (about 3%). Nowadays, a large number of valuable secondary resources stays within the flow of municipal solid waste and goes to landfills. Currently, the regional operators in the field of MSW management are responsible for organizing secondary resources circulation. In the absence of material interest, the percentage of recycling for the main types of secondary resources (paper, plastic, glass) remains quite low. In accordance with the adopted federal legislation, the principle of extended producer responsibility will be implemented in Russia, which expected to increase the percentage of involvement of secondary resources in production cycle. In the context of the adopted concept of digitalization of the Russian economy, the role of digitalization in the field of waste management is increasing in the form of the use of “smart” technologies for collecting, delivering and processing garbage.

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107.1 Introduction

Currently, the economy of the developed world is replacing the linear production model with a cyclical production model based on the processing of secondary raw materials, the transfer of industry to renewable energy sources. The cyclical economy is an important component of the Quad industrial revolution, which already leads to the optimal use of all types of resources. However, the transition to a cyclical economy requires the use of innovative industrial technologies that are implemented in the form of a closed product life cycle, minimize the use of resources, and restore their natural component.

According to expert estimates, with the widespread introduction of a cyclical economy, global GDP could increase by \$1 trillion by 2025, creating about 100,000 jobs by 2030, while preventing the appearance of 100 million tons of waste [1].

Following the paradigm of a cyclical economy, the European Union has adopted an appropriate strategy and started to develop an appropriate system of state regulation. Although Russia is lagging behind in the development of a cyclical economy, in January 2018, a Strategy for the development of industry for processing, recycling and neutralization of production and consumption waste for the period up to 2030 was adopted. As part of this Strategy and the corresponding Federal Law, Russia is developing a new industry for waste processing and recycling [2], which will return up to 30% of resources to secondary turnover, reduce the volume of landfills and reduce other negative environmental consequences.

It is obvious that the transition to a cyclical economy has such advantages as reducing the negative impact on the environment, reducing the cost of production and the emergence of a new industry, and, consequently, new jobs.

107.2 Focus of the Research

The world health organization formally declared the coronavirus epidemic a pandemic on March 11. Different scenarios (soft, medium and hard) consider the different economic consequences of the pandemic, the measures to combat it, and the tools used by different governments to support the economy. But all scenarios agree that the main economic effects of the pandemic are actually tested in the form of sharp shocks that can stop or transform labor markets and trade relations; break the production chains of complex products, both domestic and global; undermine public financial and monetary systems; change the behavior of people and the structure of demand; significantly reduce both the country's GDP and global economic growth (the loss of the global economy in 2020, according to the Bloomberg model, will amount to about 2.7 trillion dollars).

Society in the context of the pandemic was in a unique situation requiring the mobilization of all resources: medical staff trying to save lives, scientists rapidly invent a vaccine against COVID-19, economists are trying to prevent the collapse of

the economy, sociologists take steps to prevent the collapse of the labor market. In this situation, a very worrying factor is the increase in unemployment, which is due to the fact that about 30% of small and medium-sized enterprises have gone bankrupt and ceased to exist, and millions of families have to deal with everyday issues of survival. In this situation, we need to analyze the transformation of the labor market. In just two weeks of June 2020, the number of unemployed in Russia increased by 16%, and today the real number of unemployed in the country is approaching 5 million people. In this regard, the prospect of remote work becomes relevant. Some technology companies are already giving up permanent offices. This solution creates a new business model that is more flexible than the co-working model. Within this model, the key will be the creation of project teams, when specialists will be recruited for the implementation of a newly opened project. This applies to the entire economy as a whole and applies, of course, to the cyclical economy in particular. It should be noted that in this case, elements of corporate culture are not lost, since modern software already replaces the traditional offline communication with colleagues with daily communication in Zoom, collaboration panels in Miro and online corporate events.

An important response of the labor market to the challenge of the pandemic is the institution of self-employment, aimed at reallocating human resources toward relevant areas of activity. The status of self-employment on a par with small and medium-sized enterprises gives access to a large number of orders from business companies. There is a whole separate specific ecosystem of self-employed citizens that will help restore the economy, including the circular economy, in the post-pandemic period.

The Institute of freelancing (self-employment) will inevitably lead to the development of such a format of work as sharing services, which forms a platform for temporary employment, similar to cloud technologies. Only in this case, the cloud includes a large number of people looking for work: students, freelancers, professionals, people with no experience, and others.

All this, of course, is reflected in the development of a cyclical economy—the economy of resource renewal. And, it would seem, in a post-pandemic economy—the economy of survival—society is not up to waste disposal and energy saving, but it is a cyclical economy aimed at preserving and renewing resources that can become a saving path for the economy as a whole.

The concept of development of a cyclical economy in Russia implies the creation of a network of ecotechnoparks that are aimed at creating developing and implementing the main business technologies for waste management [3]. Ecotechnopark is a structure consisting of production and laboratory facilities equipped with appropriate equipment, United by energy and material flows and aimed at continuous waste processing and production of industrial products based on them. At the same time, ecotechnoparks carry out both research and educational activities; by 2030, it is planned to create 70 ecotechnoparks that will process 80% of solid waste [4].

The effective functioning of a closed-loop waste management system relies on the so-called three-R principle: reduce, reuse and recycle [5]; this principle was presented by Japanese scientists at the G8 summit in 2004. The main goal of implementing the

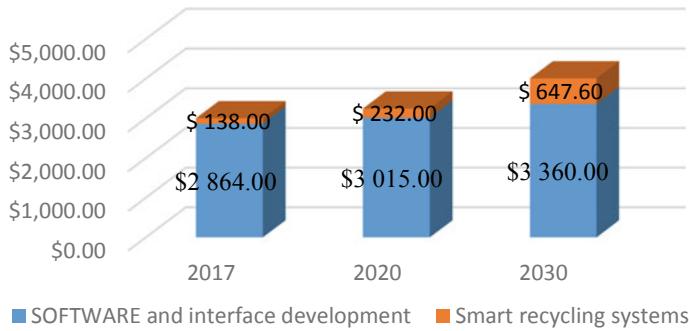


Fig. 107.1 World the cost of digital technologies in the field of waste management

three-R principle is to use three types of resources so effectively that the concept of waste itself ceases to exist and the industry ceases to function in the format of the concept of «zero waste» [6].

At the same time, all business models should be implemented using “smart” technologies (digital technologies) that allow optimizing and automatizing the main and auxiliary business processes of waste collection [7], transportation and processing. For example, garbage containers are equipped with special RFID sensors that transmit information about the degree of its occupancy. In turn, garbage collection vehicles (or so-called smart garbage collectors) are equipped with special equipment and SOFTWARE that allows you to optimize logistics routes, and thus reduce fuel consumption and driving time. For example, the global cost of developing digital technologies in the field of waste management in 2020 will amount to about 3.6 billion rubles \$ (Fig. 107.1).

As for the Russian Federation, the Ministry of construction of Russia in 2018 developed the project “Smart city”, which is part of the national program “Digital economy of the Russian Federation”, which is planned to spend 13 billion rubles by the end of 2024 [8].

The last few years have become significant for the waste management sector in the Russian Federation—the formation of a new industry has begun.

Reform of the waste management industry fundamentally changes the mechanism of waste management. One of the key changes is the introduction of the institution of regional operators: a company that is selected by each subject of the Russian Federation to coordinate the process of handling MSW. This subject becomes the person with whom the waste owners will have to conclude an agreement on the collection, removal and disposal of household waste. Accumulating all the cash flows coming from the population, management companies and other generators of household waste, the regional operators conclude agreements with other market participants on the actual actions with the waste or do everything on its own if this is possible [9]. The regional operator is determined on a competitive basis in each entity for a period of at least 10 years. The new institution is supposed to streamline the relationship between all industry participants in waste management. For the waste

management industry, a new institution, if implemented successfully, means that a streamlined mechanism for the movement of raw materials flows will appear in each region, since the regional operators will have to create an infrastructure for collecting and transporting waste, as well as ensure the construction of the necessary sorting facilities [10].

Under the new rules, the regions have the responsibility to create territorial schemes for waste management, as well as to develop appropriate financing instruments—regional programs for waste management, on the basis of which the activities of the RO will be carried out.

Currently, territorial schemes and regional waste management programs have been approved in almost all regions of the Russian Federation. Despite the fact that according to the initial plans, all regional authorities were obliged to develop and approve territorial schemes and programs for waste management, select a regional operator and approve the tariff for the population no later than 2017. However, the process was delayed, and the implementation of the reform was postponed to 2019–2022 [11].

At the beginning of 2020, 76-subjects of the Russian Federation completely switched to a new system of MSW management, 6-subjects of the Russian Federation partially switched to a new system of MSW management, 3-subjects of the Russian Federation did not switch to a new system of MSW management [12].

Some of the territorial schemes approved on time were declared invalid and sent for revision. Experts note that many schemes need serious adjustment, since the information contained in them contains biased and/or incomplete data on the generated waste, not all waste disposal, processing and disposal facilities are taken into account, which will complicate the incorporation of existing players into the new scheme with the participation of the RO. In addition, almost all regions of the country did not have a public comment procedure. And one more important point: in many TPAs «growth» of waste generation is «envisioned», which contradicts the main priorities of state policy. It should be noted that the difficulties in adopting territorial schemes and choosing a RO on time were compounded by the fact that many by-laws and regulations were adopted with a significant lag behind the schedule. Delays in the transition to the new system negatively affect the waste processing market, since the introduction of the RO institution means new rules of the game, and business is afraid to invest in this area until everything is completely clear.

An analysis of territorial schemes approved and made publicly available at the time of the present study showed that they include plans for the construction of new waste sorting complexes and, in some cases, waste recycling facilities. However, due to the fact that there is no single format for providing information on territorial schemes on the Internet, it is difficult to assess the potential increase in capacities and prospects for the development of recycling.

In 2019, a public law company was created in Russia to form a comprehensive system for the treatment of MSW «Russian Environmental Operator». The company was created to create an integrated system of MSW management, ensure management of this system, prevent the harmful effects of these wastes on the environment and human health [13], involve them in economic circulation as materials, raw materials,

products and turn them into secondary resources for the production of new products and energy and resource conservation.

107.3 Conclusions

Summing up the results of this paper, we should first point out that the main problem of the development of the circular economy in Russia is insufficiently developed legislation in the field of secondary resources circulation. In addition, a very small number of technological processes for the production of goods and services include a full product lifecycle with a recycling stage. At the same time, a large amount of valuable secondary resources is sent to landfills in the form of solid household and industrial waste. Further effective development of the Russian economy can only be implemented in the format of a cyclical economy. One of the directions of implementation of the cyclical economy methodology is the creation of ecological and industrial parks in the regions of Russia.

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Chapter 108

Event-Situational Aspect of the Subjective Experience of Mental States



L. V. Artishcheva

Abstract The article reveals the content of the subjective experience of mental states—in particular, the event-situational aspect. Mental states that people experience are determined by certain situations in their lives. The subjective experience of mental states contains a wide range of indicators that reflect various manifestations of person's experience, internal and external determinants of mental states. We studied the subjective experience of mental states of the following groups of subjects: adolescents with deviant behavior staying at a juvenile correctional facility, adolescents brought up in family deprivation conditions, adolescents with disabilities, and normotypical adolescents living in a family. The selected mental states differ in the level of mental activity (high, medium, low) and modality (positive, negative). Subjects retrospectively described their mental states. To identify the components of the subjective experience of mental states, the method of content analysis was used. It was found that the subjective experience of mental states of each group of subjects has both common and specific components. The specificity of the content of the subjective experience of mental states of children is associated with physical and social conditions of their life, as well as with situations that caused the experiences. The subjective experience of mental states of individuals with different living conditions has common features which, in our opinion, allow individuals to identify and recognize the mental states of other people.

108.1 Introduction

In psychology, the term “subjective experience” is considered comprehensively and in a different context. Foreign scientists study subjective experience as a mental experience [8], and as a set of settled interactions of an individual with the world—individual experience or life experience [5]. The experience of mental states is indirectly studied as a memory of a person of one's own experiences [2]. Russian psychological science studies the structure of experience, its connection with other mental

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phenomena, and processes such as memory, perception, activity, and consciousness [2]. There are a number of research conducted by domestic and foreign scientists aimed at studying the specifics of emotional experience, recognition and identification of mental states, and emotional intelligence [2, 3, 9].

The category “subjective experience” plays important role and acts as a repository of images of mental states in the concept developed by Prokhorov [6, 7]. Recent studies have shown that the subjective experience of mental states has a different structure and content depending on the age, social, and biological conditions of life [1, 4].

Mental states experienced by a person are determined by certain situations in one's life [6, 7]. The same situations can cause different experiences in different people; however, the same mental state can also be determined by different events. In order to identify the specifics of the structure, content and event-situational aspect of the subjective experience of mental states, mental states of various modality, and mental activity were studied in individuals who live in different life, social, and physical conditions.

108.2 Research Methods and Techniques

108.2.1 Please Note Sample Description

The research involved: adolescents brought up in residential institutions (20 individuals), adolescents with disabilities (severe speech disorders (SSD) and cerebral palsy (CP)) (24 individuals), adolescents with deviant behaviors staying at juvenile correctional facility (33 individuals), as well as adolescents with normotypical development brought up in families and studying in a comprehensive school (44 individuals).

108.2.2 Research Techniques

In order to determine the specifics of the experience and the course of the flow of mental states of adolescents and situations associated with this state, we used the method of self-reporting. We studied mental states of different level of mental activity and modality: joy (a state of a positive modality of a high level of mental activity), anger (a state of a negative modality of a high level of mental activity), calmness (a state of a positive modality of an average level of mental activity), indifference (the state of negative modality of an average level of mental activity), fatigue, and sadness (the state of a negative modality of a low level of mental activity).

Self-report data were analyzed by a group of experts (KFU staff) who identified empirical indicators.

108.2.3 Organization of the Research

Subjects retrospectively described their mental states. The instruction said: "Remember how you experienced the mental state in the past and the events that this state was associated with. Describe your experiences in a free form."

The answers of the subjects were processed using the method of the content analysis, and the semantic units were singled out (in the description of the results of the research for each group of subjects, the obtained values of indicators will be shown). After the analysis of self-reports of respondents about their experiences in the past, it was revealed that in one self-report, one indicator had several empirical indicators, i.e., was used several times in the form of various words or phrases carrying a single meaning. As a result, we determined the frequency of the occurrence of the selected components in the respondents' texts.

To identify the event-situational aspect of the subjective experience of mental states, we separately analyzed the semantic unit reflecting the events associated with a mental state. The frequency of occurrence of this semantic unit in self-reports is highlighted, and its content is revealed.

108.3 Analysis of the Research Results

108.3.1 Adolescents Brought Up in Family Deprivation Conditions (in Residential Institutions)

Adolescents brought up in family deprivation conditions gave a description of all the mental states indicated in the study (joy, anger, calmness, indifference, fatigue, and sadness). Using the method of content analysis of their self-reports, the following indicators were identified (semantic units of texts reflected in Table 108.1).

The highlighted characteristics in the descriptions of the subjects refer to various manifestations of the mental (expression, emotional processes, behavioral manifestations, value-semantic sphere), as well as to external factors (events, situations, actions of significant adults). That is, the experience of mental states of orphans contains not only internal indicators of a person's states, but also events that cause this state.

In general, self-reports of adolescents living in family deprivation conditions are characterized by poverty and a small coverage of the used characteristics of mental states, and a scarcity of descriptions.

Adolescents brought up in residential institutions place great emphasis on describing the events that determine mental states. That is, the leading component in their subjective experience of mental states is represented by the event-situational aspect. To analyze the situation, we combined indicators into semantic groups. Let us consider it in more detail (see Fig. 108.1).

According to Fig. 108.1, we can state that there are a number of situations that cause a different spectrum of experiences, sometimes even opposite in modality and

Table 108.1 Empirical indicators of the subjective experience of mental states of adolescents brought up in family deprivation conditions

No.	Indicators	Empirical indicators
1	Emotions/mood/feelings	"I felt sorry," "sadness attacked me," "when I miss," "anger," "I get depressed," "fun," "joy," "happiness," "pleasant feeling," etc.
2	Expression	"Tears," "I cried then," "very sad," "I cry," "laugh," etc.
3	Events/situations/circumstances	"They hit a cat," "when something bad happens," "grandmother died," "when parents leave," "became an aunt," "a nephew was born," "I will cure my sister," "so that she can take me," "I will become an economist," "Holidays," "New Year," "when he is close to me," etc.
4	Activity/behavior	"I'm lying on the bed," "to kill this," "I want to be alone," "I want to sleep," "to walk," "to play," "I will give some of the money ...," "I'm learning," "I like to embroider," "I jumped," and etc.
5	Expectations/assessment	"You hope," "it turns out not done," "everything will be fine," etc.
6	Feelings and behavior of others/significant people	"My grandmother died," "when my parents leave," "they refuse to do something," "they hurt with their words," "grandma wrote an application to the orphanage," "nephew was born," "live with my grandmother," "so that she can take me away," "beloved and closest person," "friends who support me," "so that my mother and family can take me away," etc.
7	Values	"To give part of the money to sick children," "... to orphanages," "there will be a home," "... sports," "... work," "many friends," "to have my own baby," "family," etc.
8	Desires/needs/dreams	"I want the same ...," "I hope ...," "... I do not want ...," etc.
9	Conditions/place/time	"In the fall ...," "in a month," "in the summer ...," "... for 20 days," "it is raining," "... in silence," "... on Saturday," "in the evening," etc.
10	Mnemonic/mental processes	"I don't remember," "I don't know...," "I don't want to think...," "I remember...," "... I don't want to remember it," "I think...," etc.
11	Physiological/somatic processes	"If he gets sick...," "... I was tired," "... broke my arm," "... died...," "... tired," "my throat hurt," "... I will sleep...," etc.

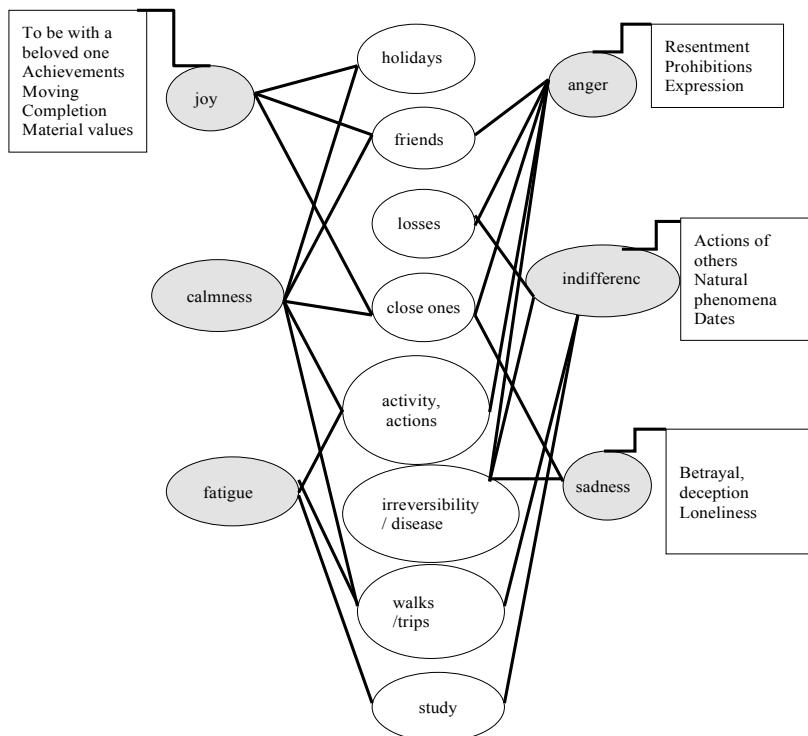


Fig. 108.1 Event-situational aspect of the subjective experience of mental states of adolescents brought up in family deprivation conditions

level of mental activity: holidays (joy and calmness), friends (joy, calmness, anger), losses (anger, indifference), loved ones (joy, calmness, anger, sadness), activity and actions (calmness, fatigue, anger), irreversibility, illness (anger, indifference, sadness), trips (calmness, fatigue, indifference), and study (fatigue, indifference). We also identified situations that seem specific, that is, one specific mental state was determined in all subjects.

The biggest number of variations of situations and events relates to states of a high level of mental activity—joy and anger. Most situations and events are associated with the experience of separation from parents, as well as with the experience of sadness, grief about admission to residential institutions. The subjective experience of a mental state of sadness arises due to such circumstances and events as betrayal (“parents leave,” “grandma wrote an application to the orphanage and did not tell me,” etc.), irreversibility (“the cat died,” “grandfather died,” etc.), loneliness (“I have no one”). That is, sadness is caused by events that can be classified as traumatic, which determine deeper experiences (grief, despair, hopelessness, etc.). Adolescents living in a situation of family deprivation have a more difficult experience of the state of sadness associated with psychological trauma.

108.3.2 Adolescents with Disabilities

Adolescents with developmental disorders described their past experiences not for all of the mental states reported in the study. Some did not quite understand what mental states were stated in questions, which was most likely explained by a poor level of identification of the states (more research is required). Some of the states experienced in the past were described very poorly or not by all subjects, so we could not include them in the data analysis. Thus, adolescents with developmental deficits fully described their experiences in the past in only three states: joy, anger, and calmness. Content analysis of self-reports of adolescents with disabilities allowed us to single out the indicators given in Table 108.2, with their empirical indicators.

The highlighted indicators relate to various realities and phenomena of life. Adolescents with developmental disorders describe mental states experienced in

Table 108.2 Empirical indicators of semantic units of the subjective experience of mental states of adolescents with disabilities

No.	Indicators	Empirical indicators
1	Assessment/quantity/comparison	“everything is fine,” “very rarely,” “mostly,” “the subject I don’t like,” “very much,” etc.
2	Relatives/close relationships	“with loved ones,” “with mom,” “with grandmother,” etc.
3	Unity/acceptance	“discuss it with parents,” “being with loved ones,” “started to speak,” etc.
4	Feelings/emotions/experiences	“when I’m happy,” “make me very angry,” “resentment,” “I don’t feel anything,” etc.
5	Causes/situations	“because of something,” “birth of the sister,” “when I eat sweets,” “when I’m satisfied,” etc.
6	Regulation	“it passes,” “to calm down,” “they cope with them,” etc.
7	Actions/activities	“read books,” “participate in various competitions,” “play the guitar,” etc.
8	Mental, mnemonic, reflexive processes	“think about that ...,” “there are all sorts of good thoughts,” “I think about something,” “if I stop thinking,” etc.
9	Conditions/location of events	“it ends,” “on the weekend,” etc.
10	Desires/dreams/expectations	“well, this is my dream,” “when I really wanted to,” etc.
11	Reactions/behavior	“I can quarrel,” “do nothing,” “sit quietly,” “react calmly,” etc.
12	Physiological processes	“my heart bleeds,” “I’m tired,” etc.
13	Communication	“I discuss,” “I do not talk at all,” “I’m sitting talking,” etc.
14	Abstraction/metaphors	“like I’m falling,” “how nature speaks,” “when I give up,” etc.

the past by indicating the causes of the states and through external markers—for example, communication and unity with someone. They reveal the states through their behavior, reactions, actions, and activities. But the experience also contains internal markers related to the world of their feelings and experiences, value judgments, and reflections. It is worth to pay special attention to the elements of regulation and overcoming problems. When describing negative states, some children resort to regulatory techniques, that is, the subjective experience of negative mental states may contain a way of overcoming them.

In comparison with other indicators, the situational component is not strongly expressed in the subjective experience of these states, but the range of the situations is quite large. In order to analyze the situation, we combined indicators into semantic groups. Let us consider it in more detail (see Fig. 108.2).

When revealing the subjective experience of their mental states, adolescents with disabilities rarely describe the situations that caused these experiences, and the situations themselves are very heterogeneous. The biggest number of variations of situations and events refers to the states of high and medium levels of mental activity—joy, anger, and calmness.

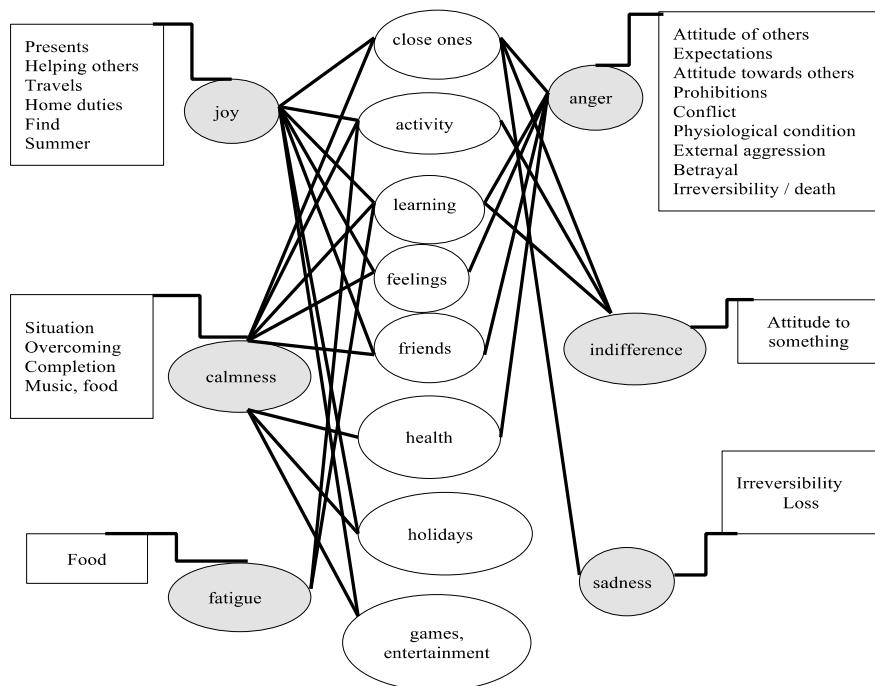


Fig. 108.2 Event-situational aspect of the subjective experience of mental states of adolescents with disabilities

We revealed situations that determine various mental states, sometimes opposite in modality or in level of mental activity: close people (joy, calmness, anger, indifference, sadness), activity (joy, calmness, fatigue, indifference), study (joy, calmness, fatigue, anger, indifference), feelings and friends (joy, calmness, anger), holidays and entertainment (joy, calmness), and health (calmness, anger). Mental states of low and medium levels of mental activity, fatigue and sadness, indifference develop in adolescents with disabilities due to a small number of events. We also revealed specific situations that cause only one certain condition in adolescents with disabilities (see Fig. 108.2).

108.3.3 Adolescents with Deviant Forms of Behavior

Adolescents with deviant forms of behavior staying in juvenile correctional facilities gave a description of their past experiences on all the declared mental states. Table 108.3 shows the indicators of the subjective experience of mental states and their empirical indicators identified with the help of a content analysis.

Indicators of the subjective experience of mental states of adolescents with deviant behavior refer to various manifestations of the mental (emotional-sensory sphere, physiological and mental processes, behavioral manifestations, value-semantic sphere), as well as to external factors (events, situations, relationships with beloved ones, time and place of events). The subjective experience contains indicators that act as symbols or abstractions, as well as describe regulatory functions.

The analysis of self-reports showed that the events that determine a particular state are multidimensional and different. We combined them into semantic groups and showed a connection with mental states (see Fig. 108.3).

As in the groups of subjects analyzed above, a number of events cause mental states of different modality and level of mental activity. But there are some situations that determine one specific state. Lonely situations can cause the state of joy, calmness, indifference; events related to beloved ones—joy, calmness and at the same time, anger and sadness; entertainment determines joy, calmness, and fatigue; conflict situations cause negative mental states—anger, indifference, and sadness; learning leads to the states of calm, fatigue, and indifference; sadness and anger are determined by troubles with beloved ones; the situation of being in a correctional center causes joy, anger, and sadness in adolescents with deviant behavior.

The figure shows that only the state of fatigue is caused by a limited number of situations. The rest of the states have a large number of causes.

108.3.4 Adolescents with Normotypical Development

Adolescents with normotypical development gave a description of their past experiences on all the declared mental states. Table 108.4 shows the indicators of the

Table 108.3 Characteristics of the subjective experience of mental states and their empirical indicators in adolescents with deviant forms of behavior

No.	Indicators	Empirical indicators
1	Relatives/close people	“you’re doing something with your mother,” “a friend came,” “next to beloved ones,” “quarreled with beloved ones,” “grandmother came here,” etc.
2	Unity	“with the family,” “next to beloved ones,” “with me,” “mom with me,” “to be alone,” etc.
3	Assessment/quantity/comparison	“it hit me hard,” “they insult me,” “always,” “eternal state,” “very strong,” “I was recently,” “everything is fine,” “I don’t care,” etc.
4	Feelings/emotions/experiences	“feeling of peace,” “feeling tired,” “rage,” “fury,” “sadness appears,” “fear,” “I was joyful,” etc.
5	Actions/activities	“I did sports,” “walk down the street,” “it hit me hard,” “when I sit at the computer,” “did my homework,” etc.
6	Events/situations	“when they gave a kitten,” “when the team lost in football,” “when they won,” “when there will be a wedding,” etc.
7	Reactions/expression	“anger turned into a fight,” “shouting,” “tears welling up,” “when the voice was raised,” etc.
8	Physiological processes	“sleepiness,” “go to bed,” “grandmother died,” “I will be ill,” “wake up,” “relaxation,” “my head ached,” etc.
9	Desires/dreams	«получил долгожданный результат», «надеюсь», «не хочу», «желательно», «я хочу, чтобы» и др. “I got the long-awaited result,” “I hope,” “I don’t want,” “Desirable,” “I want to,” etc.
10	Regulatory processes	“I try not to express it (anger),” “when I’m sad, I know it will pass,” “to control all situations,” etc.
11	Time/conditions/place	“punished for a month,” “got into such places,” “go to a café,” “walk down the street,” “I got here,” “a year and a half ago,” “when being at school,” etc.
12	Mnemonic/mental/reflexive processes	“I can’t even imagine,” “I thought I was doing well,” “I think about home,” etc.
13	Symbols/abstraction	“like cats, many lives,” “there will be a second life,” “she will fly on the wings of the wind herself,” “let happiness fly into my window,” “well, let the sadness bury me,” etc.

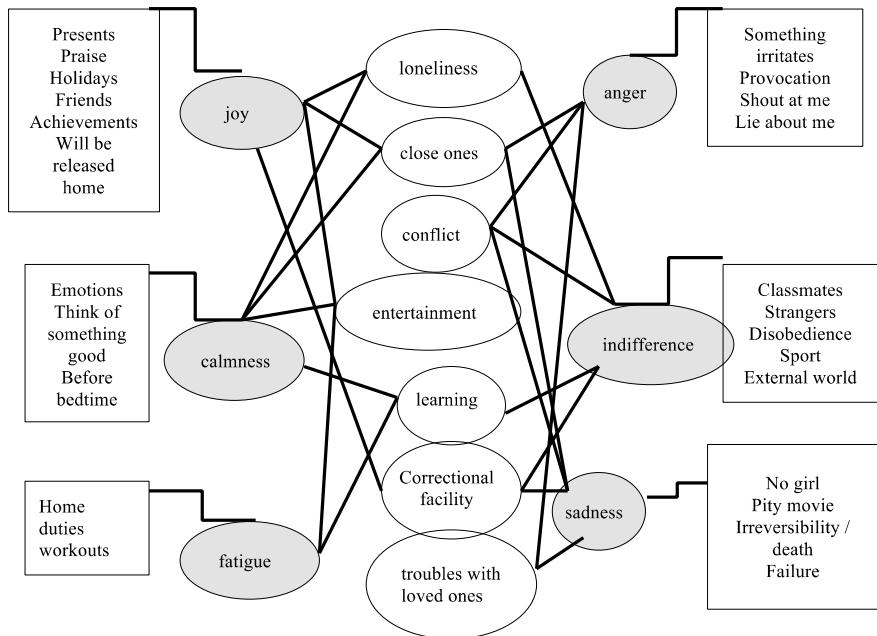


Fig. 108.3 Event-situational aspect of the subjective experience of mental states of adolescents with deviant behavior in a correctional facility

subjective experience of mental states and their empirical indicators identified with the help of a content analysis.

The subjective experience of mental states of normotypical children is represented by a wide range of indicators that can be attributed to various manifestations of the mental (mental and physiological processes, desires and expectations, emotional sphere, evaluative aspect), as well as to external circumstances (events and situations, time aspect, actions, etc., their own actions and actions of beloved ones). We have revealed indicators of the subjective experience of mental states, which reflect regulation and management of behavior and state.

Description of events and causes of mental states in the subjective experience of normotypical adolescents is less common in comparison with leading indicators. Let us consider in detail the event-situational aspect of the subjective experience of mental states of normotypical adolescents (see Fig. 108.4).

As in all other samples, we see that the same events determine mental states that differ in the level of mental activity and modality. For example, a situation of expectation produces both joy and anger; learning is the cause of the states of joy, fatigue, and indifference; outdoor environment can cause anger, joy, and calm; the feelings experienced determine the state of fatigue, indifference, and sadness; an aspect of the future awakens both joy and sadness; relationships with relatives and close ones determine joy, calmness, anger, and sadness.

Table 108.4 Empirical indicators of the semantic units of the subjective experience of mental states

No.	Indicators	Empirical indicators
1	Assessment/attitude/comparison	“Usually,” “rare,” “much worse,” “nice words,” “I like,” etc.
2	EvenEvents/situations	“When quarreling,” “when meeting with someone,” “when I am alone,” “when life is stable,” etc.
3	Time/perspective/duration	“At that moment,” “during the period of long and tense days,” “tomorrow,” “one day,” “in the end,” “already three days,” etc.
4	Actions/activities/deeds	“They congratulated her,” “I listened,” “we had fun,” “I talk a lot,” “I want to jump,” “I hug my cat,” etc.
5	Feelings/emotions/experiences	“Happy,” “I get angry,” “lack of feelings,” “I feel lightness and optimism,” “from overwhelming happiness,” etc.
6	Relatives/close relationship/unity	“My beloved one,” “either friends,” “my sister,” “all together,” “people dear to me,” “with a person with whom I have spent a long time,” etc.
7	Conditions/location	“On some street,” “sitting at work,” “silence,” “after some sad news,” “that evening,” etc.
8	Desires/dreams/beliefs/expectations	“Unexpected news,” “they want to hear,” “I want to jump,” “in unwillingness to think,” “I counted on,” etc.
9	Physiological processes	“I yawned,” “I could sleep well,” “my eyes were reddened,” “they are healthy,” “tears,” “my head ached,” etc.
10	Abstractions/metaphors/associations	“My heart is getting warm,” “as if I unloaded a truck,” “I give up,” “like a squeezed lemon,” “I discovered my Zen,” etc.
11	Mental, mnemonic, reflexive processes/awareness/understanding	“I don’t think,” “it’s always forgotten,” “I cannot forget,” “it seemed to me,” “I understand how,” “it follows from this,” “my thoughts are directed,” “why do I feel indifference?,” etc.
12	Regulation	“But then it lets me go,” “maintaining neutrality warns me against mistakes,” “I tried not to be rude to anyone,” etc.
13	Perception/feeling	“This feeling of abandonment,” “sensations were dulled,” etc.
14	Attention	“Pay attention to this,” “focus drops sharply,” “I am distracted,” etc.

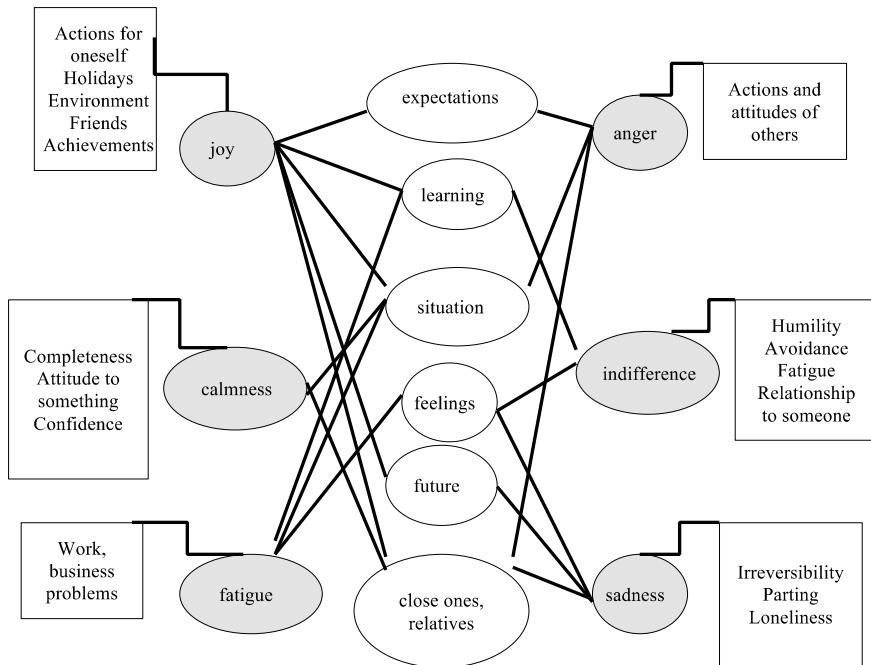


Fig. 108.4 Event-situational aspect of the subjective experience of mental states of adolescents with normotypical development

Situations determining only one mental state have also been identified. The mental state of joy can be caused by the biggest number of situations.

108.4 Discussion

The content of the subjective experience of mental states differs in each group of subjects, but common features have also been identified. The subjective experience of mental states of all subjects contains components that reveal the emotional-sensory sphere, value judgments, events that determined these states, activities, and actions that accompanied the experiences, and it reflects dreams, desires, expectations, descriptions of places, and conditions of the course of mental states or events, associated with these states. Adolescents often associate their experiences with relationships with relatives, with significant other people. It is important to note that their experience also contains description of mental processes, ruminations, and reflection. Earlier studies also revealed that mental states in people are represented in consciousness by the description of thought processes, but subjects' self-reports often featured descriptions of other mental processes (memory, perception, sensations, speech, and

imagination). In our research, such content of the subjective experience was revealed only in normotypical adolescents living in families.

An interesting fact to mention is that values are contained only in the subjective experience of mental states of adolescents who are brought up under family deprivation conditions. The results of the research, which were not included in this article, covered not only retrospective descriptions of mental states, thereby representing past experiences, but also perspective descriptions (how I will experience this state in the future). They showed that the orphans placed special emphasis on family values, transferring them to the future (I will buy a house for the whole family, I will help orphans, etc.).

The event-situational component in the subjective experience of mental states of adolescents is represented widely. We revealed the specificity associated with the conditions of life, and with the level of mental activity and modality of mental states. Each group of subjects showed situations that can cause various mental states. Events related to the loved ones, relatives, and learning in each group determine different experiences. Most likely, this might be explained by the fact that learning activity at this age is still ongoing and occupies a large segment of children's lives, while relatives represent the closest environment and interaction with them is relevant and significant throughout entire person's life.

We should note that holidays, gifts, achievements, and relationships with relatives in all groups cause the state of joy, but there are events that are specific only for one specific group of subjects. The situation is different with the state of anger. Only family relationships can cause the state of anger equally in each group, the rest of the situations are quite specific. Adolescents with deviant behavior call provocation and lies about them the cause of their anger. Adolescents living in family deprivation conditions say that their anger is caused by offenses, prohibitions, and losses. In other words, the spectrum of situations that determine anger is quite saturated.

In each group, fatigue is equally caused by learning and some kind of activity (walks, household duties, etc.). The state of sadness is determined by family relationships, but other situations are specific. In adolescents with deviant behavior, sadness is caused by being in a correctional facility, quarrels, watching sad films and irreversible events (death of beloved ones). When it comes to adolescents from orphanages, the main cause of their sadness are associated with situations of betrayal, deception, loneliness become. Irreversible events (death or serious illness of beloved ones) in each group of subjects represent the cause of the state of sadness.

The state of indifference is experienced quite individually in each group of subjects. An interesting fact to mention is that indifference is caused mainly by those situations that determine positive states (joy, calmness). Adolescents often disclosed indifference as an attitude toward something or someone. The state of calmness is achieved by adolescents mainly in situations that can be called regulatory—for example, before bedtime, positive thinking, environment, completing something. Another reason for calmness is well-established relationships with relatives or their presence nearby.

108.5 Conclusions

1. The subjective experience of mental states of individuals with different living conditions has common features, which, in our opinion, allows us to identify and recognize mental states of other people. The revealed specificity of the content of the experience of the states reveals to us the influence of social and physical conditions on the characteristics of the experience of states, which is reflected in the subjective experience;
2. The event-situational component of the subjective experience of mental states is determined by the living conditions (residential institutions, juvenile correctional facilities, family, and correctional institutions), as well as by the modality and level of mental activity of mental states;
3. In each group of subjects, situations are associated with educational process and interaction with relatives, significant close people cause a wide range of experiences. But we also identified situations that were specific not only for a certain state, but also for a group of subjects.

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Chapter 109

Revolution or Evolution is the Inevitable Change in Bulgaria



V. Terziev, M. Georgiev, and Denis B. Solovev

Abstract The purpose of this publication is to examine the challenges facing social change in our new social development and the inevitable change in Bulgaria. The inevitable change is likely to come, but how we feel about it, make it, or neglect it is only a matter of time before we accept or register it. Challenges are various in nature and communities and individuals experience them differently. They relatively accurately reflect the follow-up actions, but they are not always a consequence of these challenges—economic, social, political, cultural, ethnic or other, and in most cases, they are the result of action or lack of action in a particular situation.

109.1 Introduction

From time to time we seek or hope for change, at least that is what our recent and distant history shows. Without looking for regularity or cyclical, we purposefully strive to change our lives for the better or make them more bearable for us and our perception of it. And today we are looking for change again, we strive for it persistently and quickly.

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“When we deny the story, it defines us. When we own the story, we can write a brave new ending”, says Brene Brown, and perhaps her statement has some unforgivable accuracy, without even being a scientific postulate or interpretation. Rarely do we look at our near past of which we are witnesses, participants or just observers. It shows our Bulgarian persistence that everything should happen immediately and right away, without answering very important and basic questions—what does it bring us or, in other words, what happens next.

109.2 Social Change in Our New Social Development

There is no need to enter into the political depths of connections and complex relationships within the parties, which are not something new and we cannot pretend to find out about them just now, and there is no way to defend the statement that, you see, we should uproot them. In this line of thought, I ask myself where our roots are, the healthy and strong foundations that we can find and step on to walk proudly upright. In order not to make the assessment of today’s so tense and even unpredictable situation too sentimental, the situation in which we set on a campaign for another active or sudden change, we must soon think about what all this will bring after crossing this thin red line of tolerance. Would not we fall into the whirlpool of unexpected questions that we have to ask ourselves today and look for not only a logical, but also an accurate and correct answer? What and how will happen next? Because the change is not in the specific event and circumstance, but in the action or process that will follow. It will create those new social relations with which we must all comply and abide because it is we who have desired them. However, will the events allow the most appropriate process to take place or will they be guided by a neighbor “whatever comes”?

In our recent history, we have witnessed such events and not very pleasant consequences. We were looking for solutions to issues that followed one another in irreversible sequence—staggering unemployment rate, inflation, erasure of entire sectors of the economy, depopulation of entire areas, destruction of traditions and much more. And the worst part is that these issues have happened several times in the last thirty years. We always looked for and managed to find excuses for what happened or is happening, but could not find an approach or a solution to prevent these events from happening again.

Changes are not always easy, but in retrospect, they may be the best thing that has ever happened to us. They may be inspired by our expectation that something new and unexpected will happen to us and that this will be an exciting risk. Although if this sounds acceptable when it comes to an individual, it is unacceptable enough when talking about development of a community or our entire country and cannot even be influenced by the philosophy of the relevant legitimate form—whether it be a strategy, law or plan for action.

As Bill Clinton said, “The price of doing the same old thing is far higher than the price of change”, but is it always the right opinion? Everyone involved in economics will ask about the price and will be totally right to ask such a question.

The change, wanted or not, is about to happen to us. I wonder to what extent it is possible and what the consequences will be. And if one thinks that it is only related to the resignation or state collapse, they are deeply wrong.

Undoubtedly, “Progress is impossible without change, and those who cannot change their minds cannot change anything”, says George Bernard Shaw, and I tend to agree with him because moving in the opposite direction or backwards is possible, but almost never brings good results. Now more than ever we have to think about how and in what way to seek and find change. People are taking to the streets, protesting, cursing, arguing, and some are even having fun. Most of them manage to formulate quite general and clichéd demands, which our native politicians often use whether they are relevant or not. The more important question here is how and whether all this will happen. Without linking our opinions on this topic to the current political speeches, which are not very pleasant even for the unpretentious listener (and these speeches should lead to a fundamental change), we must say that we wander more than we find the right solution we so desperately need.

The boldest solution in the period of another inevitability of future change is to look for those who have gathered enough wisdom and courage to complete this difficult and complicated task, which would even defile them and blacken their names. This time the repetitions of mistakes are so unthinkable that our peripheral awareness tries to assume that they will not happen.

“Intelligence is the ability to adapt to change”, says Stephen Hawking. We will now try to look for this opportunity. Whether we are prepared or not is difficult to answer unequivocally. Parties, loyalty, voters who have to give their votes, even political games, manipulations and many others are obstacles to this logical and good process. It is good to think and prepare for it. Obviously, our intellectuals will not be pressured to lead the party lists and become chairmen of organizations, but this time we must all beg them, and even push them to move forward, since because of our human nature we may again miss this opportunity.

Everyone is aware that the local and not only nobles will want to be included in these ranks and will try to satisfy their own needs, however, it seems to have always been so. And we do not need revolutions and evolutions today, but what we need it to sit for a while, to think a lot and make a right and far more thoughtful decision, so that the inevitable change does not become a replacement or whatever label we put on it.

Currently, there are circumstances that can catalyze social and political processes. They can be considered as internal and external. Their relative influence on the ongoing processes can be interpreted and commented on in different ways, but the consequences of such a solution will be the necessary changed situation.

For example, one such element could be that Bulgaria is second in terms of unemployment growth in the entire European Union. This is shown by the latest Eurostat data (Table 109.1) [1]. From April to May, the number of unemployed Bulgarians rose by just over 1%. Thus, our country ranks next to countries such as Greece and

Table 109.1 Unemployment rate in the EU (01–06.2020)

Time GEO	2020 M01	2020 M02	2020 M03	2020 M04	2020 M05	2020 M06
Belgium	5.1	5.0	5.1	5.3	5.4	5.5
Bulgaria	4.5	4.2	4.1	4.8	4.6	4.4
Czechia	2.0	2.0	2.1	2.2	2.4	2.6
Denmark	4.9	4.9	4.8	5.0	5.5	5.8
Germany	3.4 (e)	3.6 (e)	3.8 (e)	3.9 (e)	4.1 (e)	4.2 (e)
Estonia	4.7	4.7	4.8	6.0	7.0	:
Ireland	4.8	4.8	5.3	5.4	5.6	5.3
Greece	16.2	15.9	14.5	15.5	:	:
Spain	13.8	13.6	14.5	15.4	15.4	15.6
France	7.9	7.6	7.6	8.8	8.2	7.7
Croatia	6.3	6.2	6.8	8.1	8.9	8.8
Italy	9.5	9.2	8.4	6.8	8.3	8.8
Cyprus	6.1	6.0	6.7	8.9	10.2	9.8
Latvia	6.9	6.9	7.4	9.0	9.8	10.1
Lithuania	6.1	6.3	6.6	8.6	9.3	9.4
Luxembourg	5.7	5.8	6.6	7.5	7.7	7.7
Hungary	3.4	3.6	3.7	4.1	4.8	:
Malta	3.4	3.4	3.5	4.1	4.3	4.2
Netherlands	3.0	2.9	2.9	3.4	3.6	4.3
Austria	4.4	4.5	4.7	5.0	5.9	5.7
Poland	3.0	3.0	2.9	2.9	2.9	3.0
Portugal	6.8	6.4	6.2	6.3	5.9	7.0
Romania	3.7	4.3	4.6	4.8	5.2	5.2
Slovenia	4.2	4.2	4.3	4.7	4.8	4.8
Slovakia	6.1	6.1	5.8	6.4	6.5	6.6
Finland	6.7	6.8	6.9	7.1	7.2	7.3
Sweden	7.2	7.6	6.8	7.9	8.5	9.2

(Available flags: “e”—estimated; Special value: “:”—not available, Eurostat)

Slovenia. In just one month, a 4% increase in unemployment has been registered in our southern neighbor Greece. Eurostat reports the lowest unemployment rates in developed countries such as the Netherlands, Austria and Luxembourg. In contrast to the states where the level is below 5%, in the Baltic States and Spain the number of people who have lost their jobs is constantly increasing. In Spain, it is reported that over 20% of the working population is unemployed. In general, Eurostat reports a “freeze” on unemployment in the European Union. And in May, just like in April, it remained at 9.3% [2–4].

These are processes that objectively stem from the economic problems, that some European countries have, and the unforeseen crisis situation resulting from the pandemic caused by COVID 19.

Undoubtedly, such situation intensifies an emerging social tension, which is caused by the unemployment of a large number of people in certain sectors of the economy or in certain regions. Although the big cities are relatively the least affected in this respect, the ongoing social processes of dissatisfaction and disagreement with certain policies and actions are most tangible. The sensitivity of larger communities is sharper and more unpredictable.

Everything that is caused by objective realities can seek answers in political decisions and processes that are related to policy changes, the change or relocation of political figures or, more precisely, their social influence. The possible development scenarios may be several, but most likely the political system will calm down and solutions will be sought at a later stage, which is most possible in terms of the lack of clear and unambiguous views on what and how will be done after the next choice.

We are now charged with energy, pathos, many words, expressions, flags and even torches, but whether we are charged with ideas is hard to say... A brief historical account shows that relatively in such an order the circumstances change and events follow one another and we leave the results to happen by themselves.

Whether this will happen is too early to say. This is a difficult mission even for the best political analysts. I do not ignore these facts and circumstances of the external environment and external factors, which inevitably have their significant influence, but they can be quickly swept away by fragile internal events, and then we will comply with them and even obey them.

Sometimes I think we need to go back to our school years more often to understand some essential and important processes! I agree with one interesting opinion of Snezhana Nankova, a teacher at the "Stefan Peshev" Primary School in Sevlievo: "As I watch the protesters gather and present their demands, I expect my fifth-graders to gather under my terrace next week, shouting, "Resignation!" No problem, sweethearts, I immediately pack my stuff! The question is where to run so I can't see or hear anything! Until now, young people have been repeating that they cannot live in such a poor country as Bulgaria, so now is the time for us, the adults, to run away from lack of spirituality and values. I guess it is easier to live in poverty!"

109.3 Conclusions

The inevitable change is likely to come, but how we feel about it, make it, or neglect it is only a matter of time before we accept or register it. Challenges are various in nature and communities and individuals experience them differently. They relatively accurately reflect the follow-up actions, but they are not always a consequence of these challenges—economic, social, political, cultural, ethnic or other, and in most cases are the result of action or inaction in a particular situation. In most cases, this situation carries a charge for political processes that would not otherwise have

appeared or this situation would have been irrelevant to social receptors. The accumulated defects in the periods of economic, political and any other deformations lead to unconventional and not quite logical actions in the social development of the former socialist countries.

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Chapter 110

National Employment Plan in Bulgaria and Opportunities for Change as a Result of COVID-19



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Abstract This publication analyses and explores the processes of the Bulgarian market currently taking place due to the emergency caused by the COVID-19 pandemic. This work attempts to systematically analyse the current national employment plan and its priorities, as well as to address the possibilities for change in a critical situation. It offers alternative options for action both in the direction of the current set of measures and for the financial resource restructure to provide these measures in the crisis.

110.1 Introduction

The crisis situation resulting from the COVID-19 pandemics has been increasingly affecting both all sectors of the economy and the social policies pursued. In the period preceding the crisis, the European economies recorded little growth, with Bulgaria not being an exception. This relatively good condition creates some optimism about the ability to respond to such an emergency. The labour market, which had been performing well up to this moment, is expected to come under some pressure. The analysis of the indicators on the labour market prior to the crisis situation would

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provide a good opportunity for the execution of the already effective Employment Action Plan in Bulgaria. The changes will be necessary both in the state budget itself and in the implemented active policies on the labour market.

110.2 Labour Market Policies in Bulgaria in Periods of Crisis Situations

It is the second time in the recent periods of foreseeable economic and political development of Bulgaria that the implemented social policies regarding the labour market have been facing challenges that must be overcome fast and by making the right decisions.

The first such period was the transition to a market economy, which predetermines its priorities in the national social policy, including labour market policy. During this period, at the end of the last century, the role of the state in relation to property and in the regulation of social and labour relations changed. At present, the state guarantees an income of the population only within the minimum social standards, and the state authorities determine only the minimum of labour rights of workers established by the current labour legislation.

The search for ways and methods for forming a market model of socially oriented employment is already in the final stage of this development and experts report that this transitional period lasted much longer than expected taking Bulgaria at least twenty years.

This is evidenced by the processes in each of the structural blocks of social and labour relations, largely determining the nature of the labour market and the sphere of employment, namely: on the labour market, in the sphere of productive employment, in the block of relations covering the payment of labour and the utilization of its results, and in the relations related to consumption like the conditions for the formation of a standard of living and at the same time the conditions for the reproduction of the workforce.

At the same time, the labour market creates space for the manifestation of the objective economic law for the interaction between supply and demand of labour, performing primarily the function of balancing them. Thus, the mechanism of the labour market is a mechanism for the distribution of individual labour by industries and spheres of public benefit, a mechanism for transforming the potential of labour resources into public labour, realizing the capabilities of individuals and a source of income for them. Therefore, productive employment appears to be the ultimate goal in the regulation of the labour market and its socially acceptable functioning.

The second and very decisive function and factor of the economic law for the interaction between supply and demand of labour are the determination of the initial price of workforce as the main incentive for employment and a source of support for workers and their families.

In the initial period of building labour market as part of the factor markets, its only regulator was the mechanism of free competition, based on the law of supply and demand. Under this pressure, labour spilled over into more profitable industries. But the processes of specialization and division of labour under the influence of scientific and technical innovations made workforce more and more closely professionally oriented, thus hampering its “spill over” from branch to branch.

Objective reasons for the existence of unemployment emerged. In addition, capital would accumulate and concentrate, striving for monopolization and change in its spheres of influence. All these are the socio-economic prerequisites for the emergence of state regulation of labour market as a workforce sphere.

Moreover, we consider workforce as the main object of regulation as labour resources. Workforce as the ability of an individual to work (otherwise labour is potential), and labour as a purposeful human activity (functioning workforce) in order to provide for themselves with means of livelihood is presented to us as various functional forms of labour resources. In such a context, the relationship between these categories is consistent and subject to certain logic of development.

Labour resources include: the labour reserves of the permanent residents in a given municipality (potential workforce), as well as the current workforce—the employed and the unemployed. Depending on the contingent, this is the part of the working-age population (employed and unemployed) plus the working young people (who have not yet reached 18 years of age, but work under certain conditions), working pensioners less people with disabilities from the first and second groups.

The workforce, which is in the stage of orientation (on the labour market), when in the sphere of production, begins to be used by it. In addition, the production process involves means of production, subjects and instruments of labour, i.e. the material factors of production. Here, the work force “discards” its commodity form and becomes a productive force (part of the productive forces of society).

Moreover, the role of the wage level as a basic condition for employment is ambiguous: high wages, on the one hand, increase the demand for jobs by the economically active population, and on the other hand, lead to its reduction, as the employer's wage costs increase, so does the cost of production. Trying to limit this process, the employer increases the organic structure of capital and dismisses workers thus increasing the stratum of people who join the group of the unemployed. The approbation of these processes in the interests of respect for the constitutional rights of all members of society is an important task of social policy with regard to the labour market and employment.

The employment sphere and the labour market interact under the law on “connected vessels”—the greater the tension in the labour market (supply exceeding over demand), the less it is in the employment sphere, and vice versa. Therefore, its condition is one of the key indicators for all government decisions in the social and labour sphere and joint (tripartite) agreements in the field of social partnership.

The question arises, why the problem of labour market regulation has been gaining such relevance in Bulgaria?

The point is that market transformations very unevenly cover all parts of the economy and penetrate its internal mechanisms and interdependencies. Their

management in order to form a single national labour market requires concerted actions.

A critical moment in the labour market occurred during the period of restructuring of the Bulgarian economy 1990–1997. This period is associated with the processes of privatization and transformation of “socialist” state property into private property and the release of a large labour resource. This process developed sporadically with certain peaks and troughs, lasting for a relatively long time. All this is related to the regulated periods of state privatization of various sectors of the economy.

The need to strengthen the state principle in the regulation of the market model of employment is also dictated by the fact that a visible part of the public sector in the structure of production is preserved. Therefore, the role of the state in its regulation should not be reduced during the transition period for economic development. The modern in their social importance measures for regulating the employment of the economically active population as forms of inclusion of individual labour in the public in order to obtain income and realize the creative talents of the individual must bear the main burden in the system of measures to regulate the level of living.

In the process of regulating the economy, the discrepancy between the significance and the scale of economic transformations and their social cost is becoming increasingly apparent. It is also influenced by the underestimation of the reformist social employment policy in terms of their place in the structure of the factors of living standards of the population, as well as their impact on work motivation and demand for livelihoods, i.e. on the transformation of social and labour relationships in general.

The property inequality emerging in the reforming period of hired labour, a social stratification of society by income level, brings to the fore the public task of coordinating the interests of all segments of the population in the social and labour sphere—a task to reach a consensus between the interests of employers and employees. This also becomes the most current goal of the labour market management system with all related tasks.

The discussion on the goals of regulating the social and labour sphere, which includes the labour market, began even before the reforms. At that time, the interpretation of the goals prevailed its regulation as the achievement of full and universal employment. In the economic literature published after 1992, we find attempts to rethink the concept of full employment characteristic of periods of full employment and compulsory labour. At that time, many authors associated the concept of “full employment” with socially useful labour for the benefit of the entire working population.

Such views make the statements of some economists about the possible conceptualization of inefficient employment as a form of hidden unemployment that accompanies “full employment” in the administrative-command system formally irrelevant.

Apart from the various insignificant modifications, the positions of the researchers on this issue can be categorized into two main streams. The first of them considers the full satisfaction of the population’s needs for work as a fundamental characteristic of full employment. The second places at the heart of full employment of the

characteristic of correspondence between the population's need for labour (supply of labour) and the solvent demand of labour (number of jobs).

Out of these two points of view, it seems to us that the former better meets the socio-economic goal of labour regulation, as it characterizes full employment in terms of meeting human needs which it considers primary.

The second position, in our view, suffers from the replacement of the concept of 'full employment' by another definition, which is characteristic rather of the balance between material and personal factors of production. Though of high importance, "balance" characterizes employment in terms of meeting the needs of production by efficient use of labour and production capacity. This level of relationships is very dependent on the interest of the employer, but it does not fully reflect the public interest in full employment of the population in a market economy, but is one of its quantitative indicators. There is also an interpretation of "full employment" as a set of primary and secondary employment, i.e. the variant in which the workers do not earn enough funds from the first employment as a source of material support. This makes secondary employment for them a source of additional payment and support for themselves and their families. This is rather a quantitative approach. People have the right to independently determine which of the spheres of employment is basic for them and which is additional and what the size of each of them should be.

In practice, the function of balancing the material and personal factors of production is rational employment, a very mobile and optimal for a given period combination between labour and means of production—a goal of local employment policy.

For society as a whole, the social balance of power, which would stimulate economic prosperity not by suppressing individual interests, but by reaching their consensus and social peace, is also important. This is part of the task of state regulation of the labour market, where the state is:

- a guarantor of the constitutional rights of citizens;
- an employer that organizes and is responsible for the labour market in terms of state and municipal property;
- a party to the tripartite agreements in the sphere of social partnership.

The measures for state impact on the labour market are aimed at optimizing its main elements—supply of labour which is related to the structure that is built in accordance with the demand for a given framework and quality of positions in terms of gender and age, qualifications, wage, etc.

The second critical situation was during the financial crisis in 2008 and 2009. In Bulgaria, this period occurred with some delay and economic recovery lasted until 2010. Compared to the previous period of crisis, the unemployment rate did not reach such critical values, but there were a number of negative phenomena in some sectors of the economy which led to negative processes in the labour market. Certain regions of the country were characterized by peaks of high unemployment with the corresponding serious consequences.

The overcoming of the crisis was also quite slow and painful and involved a certain social price that society as a whole had to pay.

These are complex and multifaceted economic processes that correlate with the macroeconomic components of a market economy such as: the ratio between the level of employment and the cost of labour, the dynamics of the forms of ownership (in conditions of a structural change), the investment and tax climate, the social tension in society, etc.

Such global issues are resolved by the government as the main bearer of the interests of the country, based on the national concept of socio-economic development. In addition, we need also to take into account the opportunities for active influence of other entities on the development of the labour market [1, 2].

The goals and the objectives of the social policy in regulating the labour market and employment productivity are as follows:

- creation of all necessary preconditions for economic growth, structural change of production in order to create new and preserve the modernized jobs for employment of the economically active population;
- giving the workforce flexibility, mobility for the purpose of free flow between industries, spheres of employment and professions, as well as between territories in the interest of increasing labour productivity and living standards;
- combining all parameters of demand and supply of labour, providing for a normal level of unemployment;
- assistance for job placement and social protection of the unemployed and socially vulnerable groups of economically active population on the labour market;
- formation of new motivation for highly productive work of the individual;
- a decent level of wages and income, adequate to one's own qualifications, experience and level of entrepreneurship;
- material interest and civic responsibility of the individuals to maintain the standard of living of their families;
- elimination of the causes and factors of both external and internal nature, for underemployment or hidden unemployment.

To regulate the labour market, these goals and objectives change depending on:

The level of the subject of management:

- national (macro level);
- regional (level of the administrative district);
- local (micro level, reflecting the interests of the individual or group interests).

The time for their implementation:

- short-term (current, operational)
- medium-term (tactical);
- long-term (prospective).

According to funding sources:

- funds from the state budget, extra-budgetary funds, funds from public organizations or commercial entities, funds from operational programmes financed by the European Union.

According to the nature and forms of impact:

- direct (laws, by-laws, decrees, orders of the administration, etc.);
- indirect (taxes, tariffs, exchange rates, interest rates on loans, etc.);
- mixed (national programs for socio-economic development, targeted national programs, targeted regional programs, programs for insurance against labour market risks such as unemployment, late payment of unemployment benefits).

By content and expected consequences:

- incentive;
- prohibitive;
- restrictive;
- protective.

When choosing certain regulatory measures, the managing entity must always account for the specific situation on the labour market, the trends found in the analysis, their assessment and the preference of a labour market measure, their coherence or inconsistency with existing legislation, possible socio-economic consequences, etc.

The specific use of one or another measure to regulate the labour market is in itself a combination of the above areas and forms of social policy. However, each time it refers either to the type of passive labour market policy or to its active type. The given typology for social policy is approved by the International Labour Organization (ILO) and is used in its documents.

The basis of the passive policy on the labour market is the responsibility of the state for the position of the worker and the employer on the labour market. Such a policy is typical of the transition economy and presupposes certain guarantees for the workers on the part of the state for the period of stabilization of the country. In essence, it is a continuation of state paternalism in the context of building a market economy and is aimed at smoothing out social conflicts.

The measures for passive labour market policy include: registration of citizens who have applied to the employment administration, determination of unemployment benefits, organization of timely payment of unemployment benefits, early retirement.

Being an integral part of the social policy of the state in the period of building a market economy, passive labour market policy pursues its main goal—to stabilize the level of consumption of the working-age people who are unemployed, thus avoiding the conflict between labour and capital.

Its critics consider passive labour market policy to be socially dangerous and breeding parasitic attitude and de-motivation on the part of the unemployed, thus infringing the rights of the employed. The opponents of the idea of the predominance of passive labour market regulation programs, including unemployment insurance

programs, argue that for the state budget, as well as for budgets at other levels, the main task should be to promote productive employment, and not the “conservation” of unemployment. This is already a measure of active labour market policy.

The active labour market policy should be based on the idea of assistance of the unemployed in their active search for ways to be included in employment, which would allow them to earn income and other means of subsistence for themselves and their families. In other words, active labour market policy transfers the responsibility for the position of the individuals and their dependants to themselves. They live on the income they earn and the position of the people they support will depend on themselves only [3–7].

The active labour market policy is designed to prevent mass unemployment. It therefore provides for:

- preventive measures on behalf of the employment administration and employers for reorientation and professional retraining of the personnel of the enterprises and the organizations, that carry out the structural reorganization of the production;
- active search for job positions and placement in accordance with the profession, personal experience and the preferences of the employee;
- measures to promote self-employment;
- professional consulting for individuals who wish to open their own companies;
- subsidies in the amount of one-year unemployment benefit;
- non-monetary support for small and family businesses.

Thus, the active policy is aimed at strengthening the competitiveness of the labour force, promoting all forms of individual employment, including family business and farming.

The difficulties of different periods suggest a low level for the realization of this responsibility in the field of living standards—the level of minimum social standards. However, the other directions in the state assistance to employment: social protection of the employed and unemployed, social assistance and support in the field of employment—currently need the appropriate tools for assessing individual labour capacity.

Renouncing its past paternalistic positions in the field of labour and employment, the state must not remain an indifferent observer of the difficulties faced by the population in changing the economic model. It must be an active part in forecasting and regulating employment with its inherent specific functions in the employment sphere—wages and social support, social protection and social partnership.

The current crisis situation caused by the spread of COVID-19 virus infection is another test for the implemented unemployment and employment social policies. Entire sectors of the economy are in downtime and other are limited to such an extent that their functioning is minimal. This suggests active processes of pressure on the existing social system. To what extent it is able to deal with these critical processes and to what extent they will take place remains to be seen, but it is obvious that the negative impact is already a fact and it will increase. Despite the fact that the Bulgarian economy has been growing in recent years, the progress is quite weak and insignificant to be able to compensate for what is happening.

The basis of the European active social policy on the labour market is related to the project principle. This is a process that requires the preparation of projects by local communities to be submitted for funding under the relevant operational programs. This approach makes it possible to implement and finance projects that have been proven necessary for local communities and will improve the social environment.

Unfortunately, this approach requires a long implementation period, which is accompanied by a tender procedure, a preliminary assessment of the project proposals and a subsequent conclusion of the respective execution contracts. Practice shows that the time required for such a procedure is about 6 months in its optimal implementation.

In this crisis situation, in which almost all sectors of the economy, with few exceptions, are affected, the question arises as to whether this is a possible scenario and to what extent it will meet public expectations.

There are several possible solutions in this direction. Under an emergency situation regime to undertake interventions that are temporary in nature and change the National Action Plan in the employment sphere. Usually such crisis measures must be preceded by an in-depth and detailed analysis—for which time is insufficient and it is not possible to implement, i.e. they must build on previous experience in times of crisis.

If we use previous experience and seek to test these measures, we must take into account that their automatic transfer to the current situation is impossible and even unthinkable. The need for a quick response puts to the test not only the Bulgarian government, but also the other European governments, which should act in a synchronous policy, conditioned by our membership in the European Union.

In practice, at present, we do not avail of such consistent policy except for a set of measures for protection of human life and health. This raises the question of whether it will take place or whether national authorities should act independently without expecting such European synchronization. The latter is more likely to happen, and each individual country will try to implement an appropriate and adequate mechanism. At present, we know the measures applied by countries such as Italy and Spain. These are passive measures of direct compensation in financial and material resources, which will ensure a relatively normal life during the quarantine period. This provides for the relative peace of mind to the people who are affected and quarantined, and the opportunity to postpone for a relatively short period the making of the rest decisions.

In the already present crisis situation in Bulgaria this decision-making process has slowed down, the previously proposed set of such passive measures is still not effective thus its impact—not possible to assess yet. Moreover, the Bulgarian Parliament has been making recurrent changes in this direction, and the individual approved proposals have not been enacted yet. This increases the pressure on the social system, as employment administration reports an increasing number of registered unemployed from different affected sectors of the economy. In this case, the standard methods of social support apply—unemployment benefits under the terms of the effective Social Security Code, benefits for very low social status, people with disabilities and others.

This, of course, is not the expected solution to the problem, and in any case, the social security system in the broadest sense of the term will be under far bigger pressure. In this situation, it will be necessary to apply emergency measures taking into account the specific circumstances (most affected sectors, impending mass layoffs, regional disparities, inflow of people from other countries returning to Bulgaria as a result of the crisis and other areas with a relatively high number of people infected with COVID-19, etc.) [8–10].

In terms of implementing the active measures, this process is in the initial stage of development. No process of their active discussion and implementation is proposed for it is believed that in view of the stressful situation the social system is in, it is not able to react so quickly and adequately. A set of diverse measures and actions is needed, for example, for those in the field of culture, the recovery of which, even after the pandemic period is over, will be quite long. It is necessary to reasonably differentiate this approach to decision-making and “dress” it in the appropriate legal form. Our predictions are that the decision-making process will be delayed and will not have the needed impact. Undoubtedly, the economic system of the country is in relative equilibrium, and it does not have the whole set of elements that characterize a complete critical stage, but we must also account for the delay in the unfolding of this process, related to the employers’ behaviour. They make their best, using the instruments provided by labour law, to maintain their businesses, even at a reduced rate—using the provisions for paid and unpaid leave, downtime, reduced working hours, home office, etc. These actions on the part of employers can be relied on for a relatively short period of a month or two, after which the state must make full use of its protection and regulatory powers, to fulfil its role of an active player in the labour market in the better possible way. To what extent and how this will happen, we are to see and experience!?

110.3 Conclusions

In the world of modern labour legislation for each individual, as well as for the society as a whole, employment cannot be superfluous, of course in the broad social (rather than physiological) interpretation of this concept. The upper—acceptable in itself—limit of the volume and content of employment individuals determine themselves. Hence, non-occupation is not unemployment yet. Unemployed is considered to be an unoccupied individual who wants to work, is capable of productive labour and is actively seeking a job.

The principle of equal opportunities in exercising the constitutional right to work does not exclude, but presupposes a differentiated approach in the choice of forms of assistance and support for different groups of the economically active population in the labour market. All types of assistance must be equally accessible to those who need them. This requires diligent work of employment structures and services to create, classify data banks for each group and the specifics of the assistance.

In addition, it is necessary to organize the goals and specify the tasks for regulating the relations of all levels of government as well as its active entities on the labour market.

The competencies of the central authorities also include those for determining and controlling the implementation of social guarantees in the field of employment, ensuring the volume of centralized investments for the implementation of national social programs, including programs for full employment, creation and keeping of job positions, vocational guidance and other cooperation with corporate capital in its involvement in the process of investing in employment. The regional structures responsible for the employment situation should also take their place in the active labour market policy.

Local authorities determine the status of the unemployed and the level of low security of the population in the region, identify the citizens in need and provide them with specific assistance in finding employment with cash or benefits in kind.

In this regard, the group of measures for active labour market policy aiming to promote employment also include the so-called “transitional forms” from unemployment to productive employment and therefore the tactical goals of regulating the labour market. This requires, in our opinion, to clarify the concepts of “temporary employment,” “basic” (primary) employment, “additional” (secondary) employment and other [11–13].

Recently, researchers in our country and abroad have been paying close attention to temporary employment as a demand for labour limited in time. Sometimes temporary employment is determined by the content of labour, limited by a temporary (seasonal) period.

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Chapter 111

Interregional Inequality: Experience in Medium-Term Forecasting



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Abstract The article is dedicated to the analysis of macroeconomic aspects of the pandemic crisis with an emphasis on the socioeconomic development of Russian regions. According to the results obtained via neural network modeling studies, the authors make a conclusion of inequality at the meso-level to be deepened. All shocks have a similar negative impact on the economy of countries but current macroeconomic shocks have a sharply different impact depth and therefore different necessary anti-crisis measures both at State and regional levels. Short term consequences are already visible: labor market sees rising unemployment; trade sphere—sales reduction; healthcare system experiences is overloaded in terms of staff and beds; education—transited to distance learning revealing general unpreparedness of programs, staff and transition to a large-scale audience; social welfare is deepening inequality in access to means of isolation and technology. More pronounced negative effects should be expected in the medium term—“rainy day” funds depletion both at the micro-level of households and firms, and at the State level of the National Welfare Fund, the growth of regional and State budget deficits. Not only countries, but also regions need a specific approach to recovery and growth strategies that reduce inequality, as opposed to a growth for growth’s sake strategy. The article presents an analysis of interregional gaps in the socioeconomic aspect from regional budget deficit point of view. The results of medium-term forecasting of socioeconomic development are presented via using, neuromodeling. The leading and outsider regions are identified.

111.1 Introduction

Russian regions react differently to external shocks. Until recently, National projects were considered to have a positive financial impact on the socioeconomic development of regions, as their implementation was assumed to result in both development and smoothing of socioeconomic interregional gaps. Today the implementation of

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these projects is being postponed until 2030: the progressive improvement has been disrupted by several negative shocks. The most relevant exogenous factor, of course, is the COVID-19 pandemic, which generates another, equally dangerous pandemic of socioeconomic consequences of the first.

The impact of the pandemic can be seen at all levels, from the global one to the micro-level of the individual households and people. Regardless of the country, its size and population composition, there are a number of similar long-term trends at the macro level, namely: preservation and a slowdown of globalization, the steady and more rapid technology development, demographic shifts to reduction of elderly population and the lowering of world trade volumes due to new trade wars (US–China, US–France). Thus, according to the forecast of the International Monetary Fund, the decline in global GDP in 2020 is expected to be 4.9%, in 2021—an increase by 5.4% which is about 6½% points lower than it was predicted in January 2020 before COVID-19 pandemic. At the same time, Russia as a whole is forecasted to experience a decline in real GDP dynamics of minus 6.6% in 2020, and an increase of 4.1% in 2021 [1].

111.2 Theoretical Part

Along with global exogenous shocks, Russia is exposed to additional factors weakening its economy: increased external sanctions pressure, bankruptcy of small and medium-sized businesses, and a narrowing of domestic demand for durable goods. The main consequence of these and other shocks is the growth of inequality at all levels, in particular, the interregional inequality of Russian regions.

According to the results of the World Bank rating, Russia is among the three leaders in regional inequality among the countries of Europe and Central Asia. According to the Ministry of economic development, different regions the level of poverty varies from 6 to 40% of population. Target indicators for poverty reduction have been formulated for different regions, taking into account the need to reduce regional differentiation in terms of living standards. Therefore, in the “Main directions of budget policy” until 2022, reduction of differentiation in the level of socioeconomic development of regions, including measures of incentive mechanisms for regions with a low level of development, is one of the government’s strategic priorities [2].

Paul Krugman notes that developing countries, especially China, are characterized by regional inequality, and considers the problem of inequality in income distribution to be the primary importance. He explains that as inequality increases, the gap between the average rate of income growth and the rate of income growth for middle- and low-income families increases by about one percent per year over several decades. Krugman proposes to reduce the growing regional differences in income by combining the advantages of Heckscher–Ohlin model interregional trade and agglomeration effects of scale. However, on the other hand, improving the well-being of some regions will lead to an even greater weakening of the others that

do not have or do not use these opportunities [3]. There are no universal models for equalizing inequality. However, there are more specific models that allow us to identify the specific needs of a specific region and its population. Therefore, economists R. Rodrik and R. Hausmann developed a system of indicators for the growth of a country's economy, a particular industry or region which assumes that before choosing, for example, a territory for investment, it is necessary to identify differences in the specific needs of its population [4, 5]. The Nobel Prize winner E. Duflo suggested conducting field experiments to reduce poverty and inequality and using methods and tools specific to each territory [6].

The example of pandemic fighting shows contrasting results of using different methods to compare regional capacities and capabilities and their combination. In Northern Italy, for example, in the Veneto region, authorities used more comprehensive testing and early travel restrictions which resulted in better results compared to the neighboring region of Lombardy. In the USA, the authorities of Kentucky declared a state of emergency and closed public facilities much faster, and also obtained better results compared to the neighboring state of Tennessee [7].

The pandemic is irrevocably transforming all spheres of human life. At the same time, on the one hand, the development of previous trends is accelerating, on the other hand, purely Russian features are becoming more acute. More differences in trends can be noted at the meso- and micro-levels, which provide a basis for short- and medium-term forecasts of socioeconomic development [8, 9]. The most significant negative impact will be felt by low-income households. Therefore, in the nearest future, the scale of poverty will increase, and income inequality will expand geographically.

In the medium term, we should expect even greater damage both to the economy and to the society. Migration restrictions will change demographic and gender landscape. The migration of the working-age population to megapolises will exacerbate the inequality between urban and rural populations. Reduction in jobs and incomes will further deepen inequality in housing, education, and health care accessibility, accelerate the decline in employment in small and medium-sized businesses, expand innovation and hybridization in food and retail trade, and increase digital inequality. Universal digitalization and technological innovation will destroy jobs and deepen inequality between age groups [10, 11]. Inequality manifests itself in the varying availability of universal goods—high-quality, adequate public healthcare and education, public transport, infrastructure facilities and decent housing. Such basic services are more important than income subsidies because they are public goods.

111.3 Materials

Russian particularities of pandemic consequences contradict a number of global trends. Thus, the experience of foreign countries shows that epidemics contribute to reducing the level of social inequality, but for Russian regions, it is only getting worse. Socioeconomic inequality is not limited to income gaps, which also differ

significantly in different region. According to the experts of Sberbank's Sberdata laboratory, from March to May 2020, 75% of Russians employed in the main industries had their wages reduced, and labor incomes of all employees have fallen by half, including 20% of those employed whose wages have decreased by 30% [12].

Inequality is not limited to the narrow meaning of income differentiation. It includes access to services, especially to scarce ones, as well as to infrastructure. There are examples of different attitudes to movement throughout Moscow—unrestricted for the administrative classes and constant police control over ordinary citizens. As a huge transport and business center, Moscow became the main source of pandemic infection, which also led to territorial separatism and confrontation between the center and the regions. Another example of the center's "selectivity" is the choice of the Arkhangelsk region for a landfill construction.

Regional segregation is reinforced by varying amounts of Federal budget transfers, at the expense of which a significant part of the territories lives. If in 1993 there were 35 donor regions, nowadays there are only 13 of them left. However, there is a significant variation and unevenness of socioeconomic indicators of these regions. In the Sakhalin region, the GRP per capita is 1,577,910.3, the average per capita income is 51,705.7 rubles, which is comparable to the corresponding indicators of Moscow—1,263,698.0 rubles and 66,377.1 rubles, respectively. At the same time, the unemployment rate in the Sakhalin region is 5.3%, while in Moscow it is 1.2%. In another donor, the Kaluga region, average incomes are lower than the general national figure, but unemployment is also lower, due to high employment in the automotive industry located in the special economic zone. Regional financial dependence is closely linked to political dependence. The expected strengthening and deterioration of socioeconomic situation in the regions may lead to a decrease in social cohesion and trust in society, as well as to increased political polarization and social unrest.

The reasons for Russian interregional gaps have been formed throughout the history. From the time of Tsarist Russia, and later in the USSR, it was necessary to evenly distribute the productive forces around the country. This was not always economically effective, since the political component of settlement around one or two system-forming enterprises dominated, which proved ineffective due to the break in technological chains or due to resource depletion. The population was forced to migrate from desolate single-industry towns and found themselves in an unequal position with the indigenous inhabitants of megapolises and agglomerations. Objective unevenness in the initial conditions and development trajectories inevitably led to the emergence of leading and outsider regions.

During the transition to the market, inequality has become entrenched and is determined by uneven wages and distribution of value added per capita across regions. Thus, according to the Rosstat data for 2015, the average gross value added per person was 444 thousand rubles (2015 data, Rosstat). Closely located regions differ significantly in the value of this indicator. If 1.103 million rubles of added value are created in Moscow, in the Ivanovo region only 165 thousand rubles, in the North Caucasus and in Ingushetia—116 thousand rubles. For example, let us compare three neighboring regions—the Sverdlovsk, Tyumen, and Kurgan regions. In the Sverdlovsk region, the added value is 411 thousand rubles per person. In the Tyumen

region without Autonomous districts, where oil is extracted, produces 625 thousand rubles per person, and the Kurgan region—only 208 thousand rubles per person. This heterogeneity partly explains the outflow of 23% of the population of the Kurgan region during the post-Soviet period and the growth of the population of the Tyumen region by 17%. An important factor in this variation is the quality of regional and municipal governance.

According to RIA Novosti experts' estimations, based on Rosstat data, the average ratio of median income to the cost of a fixed set of goods and services (the poverty level) in Russia was 1.65. The variation of this indicator is significant: 65 regions were below the national average, and 20 regions were above the average. The poorest region was Tuva (0.97), the richest is Yamalo-Nenets Autonomous district (3.11). The average values were distributed unevenly geographically: Nenets Autonomous district (2.92), Moscow (2.4), Chukotka Autonomous district (2.27), Magadan region (2.26), Sakhalin region (2.22), Khanty-Mansi Autonomous district—Yugra (2.17), Moscow region (2.08) and Saint Petersburg (2.05). The Kurgan region, Karachay-Cherkessia, Ingushetia, Kalmykia and Altai were among the poorest regions. In addition to the previous indicator, the level of poverty is important. In 2000, there were 2.3 times as many poor people as there are now. In 2012, the lowest level of poverty in the history of post-reform Russia was 10.8% or 15.5 million people, and by the end of 2019—12.3% or about 18 million citizens. 1.9% of the population receive incomes less than half of the subsistence minimum. In 17 Federal subjects, the share of the poor population is less than 10% [13].

Regional differences are observed in changes in welfare level and effective demand of the population, connected with absolute and relative increases in wages. It is known that the lower the household income, the greater the share of income spent on food. Thus, according to analysts of the ACRA rating Agency, which estimates the share of food expenditures from all consumption expenditures on average per household member, in Ingushetia, Dagestan and Chukotka food expenditures are the highest. In 14 Russian regions, the share of food expenditures is 40% or higher. The decline in income connected with the pandemic crisis, in the short term will contribute to interrupting the last 15 years toward food expenditures reduction share [14].

According to analytical commentary by the National credit ratings rating Agency, 32 Russian regions ended 2019 with deficit budgets, which is twice as much as in 2018. This is explained by almost threefold slowdown in income tax revenues and the depletion of liquidity reserves accumulated in previous years. In three regions (Udmurtia, Ulyanovsk region and Mordovia), reserves have been completely exhausted, and in 16 regions there has been an increase in overdue accounts payable: Magadan region, Mordovia, Ingushetia, Khakassia, Khabarovsk territory, Pskov region, Perm region, Oryol region, Kalmykia, Jewish Autonomous region, Moscow region, Komi Republic, Irkutsk region, Krasnodar region, Yaroslavl region and Karachay-Cherkessia. Regions are increasingly relying on Federal subsidies and are not implementing their ability to attract debt. The planned amount of subsidies for 2020 has already increased up to 717 billion rubles. The first three places in terms of subsidies were distributed between the Republic of Dagestan (10% of the total amount), the Republic of Yakutia (7%) and the Kamchatka territory (6%). In

addition, it is planned to allocate another 39 billion rubles to ensure budget balance (additional subsidies for certain regions if necessary). This amount may increase significantly if the Ministry of Finance still intends to restrain the growth of the regions' debt burden. Given the fall in oil prices, trade wars, and disruptions in transport and logistics chains, tax deductions will continue to fall, and regions will have to resort to more active debt financing. We should expect a prolonged negative impact on tax revenues, zero growth in the revenue part of budgets and indexation of expenditures by 10%, while the regions' needs for debt financing of budget deficits will amount to about at least 500 billion rubles. This allows us to forecast a further increase in the number of regions with deficit budgets and no reserves. By the end of 2020, 62 regions may be left without liquidity reserves due to outpacing growth in expenditures. In the medium term, accumulated debt causes a wave of disorderly defaults and bankruptcies [15].

111.4 Research Methodology

Under the socioeconomic development of a region, country or territory, we understand an increase in the subjects' socioeconomic potential realization degree. Given the urgency of interregional inequality increase at the meso-level in the medium term, we used the results of an earlier study of socioeconomic development using AI methods with updated data and additional subjects of the Russian Federation. The purpose of our study is to forecast the trajectory of interregional inequality in Russia in the medium term based on the assessment of socioeconomic development of regions using the neuromodeling method. In order to build a medium-term forecast (3–5 years), we used the neural network modeling method described in detail in [16]. We consider it important to use an integrated combination of economic and social potentials at the international, national and regional levels. The latter is understood in the interpretation given in [17].

111.5 Results of the Research

Our results complement existing studies on socioeconomic development of constituent entities of the Russian Federation. The article considers the regions of Russia including Crimea and Sevastopol. Neural network modeling allows us to build a more accurate and objective forecast of socioeconomic development of regions, which gives an objective assessment of the results. The conducted research in dynamics showed the following results of forecasting the socioeconomic development of regions in the medium term.

Interpreting the results of the assessment, we can make a clear conclusion that using the Bayesian ensemble, it is possible to forecast the index of socioeconomic

development of the Russian Federation's constituting entities with a high degree of accuracy.

Among the regions of Russia, the leading regions were selected and a medium-term (three-year) forecast was made for them. Indicators of socioeconomic development are aggregated as follows: Labor, living standard, Industry and construction, Science and innovation. The group of leading regions in terms of socioeconomic development includes Moscow, Saint Petersburg, Tyumen region, Sakhalin region and the Republic of Bashkortostan. Because of the small time period (only four years), the forecast of aggregate indicators (exogenous variables) is based on the assumption that the average annual growth rate in 2019–2021 will remain unchanged.

In the medium term, changes are expected in the distribution of the first three places among Russia's leading regions in terms of socioeconomic development. Thus, Moscow's competitive position is expected to weaken, and vice versa, it is expected to strengthen in Saint Petersburg and the Tyumen regions. As a result, the leader region is expected to change. The main reason for this is the slowdown in innovative development in the capital of the Russian Federation.

The results of forecasting can serve as a scientific basis by Executive authorities of Russian regions for making managerial decisions concerning actualization of socioeconomic policy. Thus, based on the identified "bottlenecks" in the socioeconomic development of the region, a set of measures to eliminate them should be developed promptly.

111.6 Conclusion

The above-studied facts, as well as the forecast of socioeconomic development of regions, allow us to identify some preconditions for the medium-term forecast of socioeconomic regional development, in particular, related to the impact of current shock effects.

Based on the example of a change of the leader region in the medium term, the study showed that, despite higher indicators of socioeconomic development, the gap in income remains, and the effective demand in Moscow remains high in comparison with neighboring regions. And, consequently, all other types of regional inequality exist. The change of the leader region is assumably temporary, since the budgets of most regions, as the analysis showed, are in deficit, and debt dependence on the center continues to grow. Therefore, in our opinion, the issue of smoothing and overcoming interregional gaps in the socioeconomic aspect remains relevant, not only by increasing the financing of the social sphere of the Russian Federation's entities, ensuring proper control over budget spending, but also by stimulating innovative drivers of social development.

Thus, on the example of the selected leading regions, the identified problems of socioeconomic regional development allowed us to formulate a number of recommendations that, according to the authors of the study, will serve to reduce interregional differentiation and smooth interregional gaps.

111.7 Recommendations

For the purpose of sustainable socio-economic development of Russian regions with an emphasis on the impact of the pandemic shock, the following recommendations are made based on the results of the study:

1. Formation of an independent budget spending effectiveness monitoring system designed for protecting the health of the population and increasing healthcare funding;
2. Improving the institutional environment in the field of socioeconomic policy of the regions;
3. Targeted support for socially vulnerable segments of the population;
4. State support of small and medium business in the regions;
5. Development of regional infrastructure;
6. Creation of new jobs, increasing the level of employment in the regions, curbing migration to major cities and megapolises;
7. Development and implementation of digital technologies in the regions.

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Chapter 112

Assessment of Current Trends in State Financing of Innovative Development in Russia



V. V. Kookueva 

Abstract The article presents the main problems of financing innovative development of the country's economy. The system of state programs has advantages and disadvantages. The latter include constant changes, non-compliance of indicators and targets with the main goals, low level of co-financing from territorial budgets, duplication of efforts, and a large number of activities that are not related to the target indicators. Significant budget funds are allocated for the social and economic development of the country, but there is no corresponding economic growth. The conducted correlation and regression analysis showed, on the one hand, the positive impact of public financing in all programs on GDP growth, on the other hand, when analyzing the impact of individual programs on indicators and indicators of implementation, the relationship was absent in most cases. For example, some indicators show a positive impact and prove the feasibility of measures, while others show that the situation is either reversed or there is no impact. Despite the ambiguity of the obtained results, we believe that the state should undoubtedly participate in the socio-economic development of the country, should not only cover expenses, but also encourage development by the private sector, and should also ensure high efficiency of public funds.

112.1 Introduction

112.1.1 Aims

Innovative development of the country is an important element of state policy. Its development cannot be carried out without state support. The tools and forms of support should be comprehensive, effective, and impact from different angles. State programs are one of the instruments of state policy. The system of financing the

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economic and social development of the state is changing: the budget, individualized federal targeted programs, state programs, federal targeted programs, national projects, federal projects.

The purpose of this article is to study the main trends in state budget financing of innovative development of the Russian economy.

112.1.2 Materials and Methods

An important place in the system of financing the country's economic and innovative development belongs to state programs and projects. There are conflicting approaches to their effectiveness and appropriateness. Thus, some scientists believe that state programs copy federal target programs and are not a tool for modernizing the economy, and they are exposed to risks of underfunding [1].

Assessment of the impact of budget expenditures on economic growth and economic development is the subject of research by various Russian and foreign scientists. Some believe that increased government spending should stimulate economic growth, while others believe that this link is valid in the short term and is typical for less developed economies. The theory of John Maynard Keynes, who gave a large role to state regulation, states that the impact of public spending on the development of the economy is multiplied. According to Robert Solow, the impact of budget expenditures in the long term is minimal, long-term growth is possible if the population grows and technological progress is made. Robert Joseph Barro, in turn, believes that the state can influence economic growth in the long term through a system of public spending and effective taxation [2]. Chuk Chong Tan in his research using the case of Malaysia found confirmation of the approaches of Wagner and Keynes [3].

The research of individual scientists emphasizes that a positive impact is possible for a certain stage of development of the country and should be carried out within the limits, and exceeding them will give a negative result. Idrisov, Sinelnikov-Murylev believe in the importance of efficiency of public expenditures, not their growth [4]. Illarionova, Pivovarova consider the optimal ratio of public spending to GDP to be 15–24% [5], and Forte and Magazino believe it to be 37%, and excess spending by 10% causes a slowdown in economic growth by 2.1% [6]. According to scientists Semenova, Eremina, Morozova, Filichkina productive expenditures affect economic growth through capital accumulation, while non-productive expenditures do not significantly affect production factors [2].

Various research methods are used in the research process. To substantiate the theoretical part of the study, various methods of theoretical knowledge were used, and the controversial nature of the study was proved. As empirical research methods, economic and statistical research methods were used, including the correlation and regression method, grouping methods, comparative analysis, and others.

112.1.3 Discussion

The review of research in the field of funding the economic development of countries has been shown to be controversial. Some pay attention to evaluating the effectiveness of expenditures made, while others pay attention to the growth rate of expenditures and the ratio of budget expenditures to GDP.

State budget expenditures are an important tool of the state, and the volume of GDP may depend on their volume. So Wagner came to the conclusion that GDP growth should be accompanied by a rise in public spending.

A lot of works are devoted to the problems of implementing state programs, the analysis of which makes it possible to conclude that there is a need for further research.

According to Bachurinskaya, the advantages of the program-target method include: the possibility of using different sources, indicators measured by targets; disadvantages: competition of territorial and sectoral approaches; problems of interdepartmental relations, inconsistencies, formalism, low-performance discipline, weak orientation towards innovative development [7].

Mishchenko and Rezinkin note constant changes in the priority directions of state development, changes in the number of programs, funding volumes, but they believe that they are objective in nature, associate them with the conjuncture of world markets, the macroeconomic situation within the country, and a change in priorities [8].

In his research on the impact of the state program on the development of agriculture in the studied region, Volkov gives a positive answer and finds the dependence of efficiency on the degree of financial support, and comes to the conclusion that further state support for the agro-industrial complex of the region is necessary [9].

Many studies are devoted to evaluating the effectiveness of government programs. Sadovnikova, Klochkova suggested the use of expert assessment methods, preparation of reports on the implementation of the program, which has already been implemented in practice.[10] Sokolov offers a three-level system for analyzing program and non-program expenditures to identify areas of inefficient management [11]. Oborin, Sheresheva, Ivanov consider it important to form a unified methodology for evaluating state programs implemented at the regional level. [12].

The development of the digital economy is also one of the priority areas of innovative development. Goncharov believes that the majority of funds under the national program “*Digital economy*” will not ensure better digitalization, and that it only duplicates existing information systems [13]. According to Konyakhina, the main obstacles to the development of the digital economy are: “limited resources, investment risks, low financial attractiveness of socially significant areas, insufficient financing of innovative projects, and a limited number of specialists” [14]. Pavlova refers to the restraining factors: “low level of information technology development, distrust of new investment tools” [15]. Kapranova cites “the main reasons for Russia’s lagging behind world leaders are the unfavorable environment for doing business, transferring

and launching innovations into production, and an inappropriate regulatory framework.” [16]. Chazhaev believes that the mechanism of public–private partnership in the implementation of innovative programs by business is poorly formed: the part of companies that are financed from the state budget is only 0.8% in the Russian Federation [17]. The advantages of the digital economy include: simplification of financial payments, introduction of remote work, reduction of time, document flow and development of electronic, cost reduction, productivity improvement [18].

112.1.4 Results

We will conduct a correlation and regression analysis of the relationship between federal budget expenditures and GDP based on data from the Federal Treasury, Rosstat, and the Ministry of Finance of Russia [19–22]. So, the correlation coefficient is 0.967740165, which indicates a high relationship between them, and the resulting model shows a positive relationship between them, the coefficient of determination is 0.91430,9435, which indicates a high quality of the model (Fig. 112.1).

Consider whether there is a relationship between oil and gas/non-oil and gas revenues and GDP. Figure 112.2 shows the results of correlation and regression analysis. It can be seen that the relationship between GDP and non-oil and gas revenues is stronger, and the resulting model describes the observations by 92.6%.

Since 2011 one of the tools for implementing state policy is the program method. State programs are implemented in the following areas: “New quality of life,” “Innovative development and modernization of the economy,” “Effective state,” “Balanced regional development,” “Ensuring national security.”

Figure 112.3 shows that most of the program expenditures are made up of government programs aimed at improving the living standards of citizens. From 1.6 to 2.1 trillion rubles were allocated annually for programs aimed at innovative development of the Russian economy.

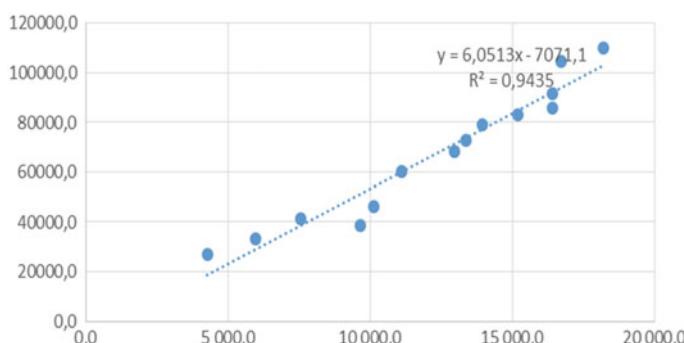


Fig. 112.1 Correlation and regression model of the relationship between GDP and federal budget expenditures

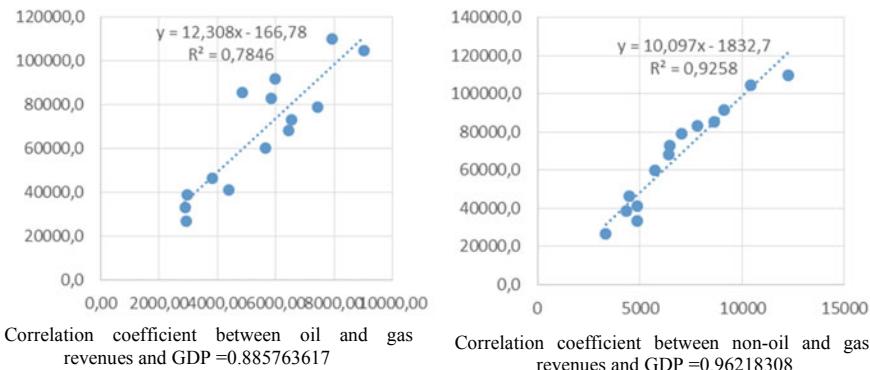


Fig. 112.2 Results of correlation and regression analysis of the relationship between oil and gas/non-oil and gas revenues of the Federal budget and GDP

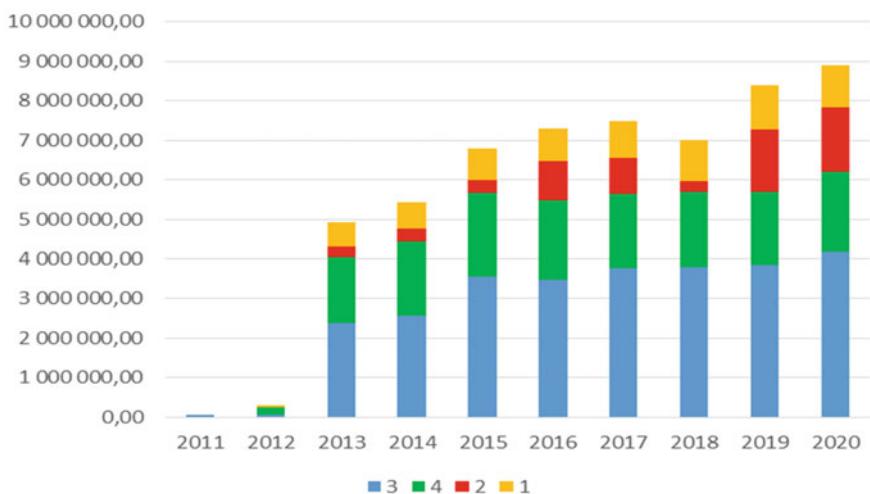


Fig. 112.3 Program expenditures of the Federal budget, million rubles. 1—“balanced regional development”, 2—“Effective state”, 3—“New quality of life”, 4—“innovative development and modernization of the economy”

Let us consider whether the implementation of programs has an impact on the development of the country's economy. The correlation analysis of data on the financing of state programs for 2013–2019 and GDP data showed a close relationship, which confirms the correlation coefficient = 0.87.

Correlation and regression analysis showed a positive impact of government program funding on GDP, the diagram and the resulting equation, the coefficient of determination = 0.756, shows that in 75.6% of cases, the model is described by the formula (Fig. 112.4):

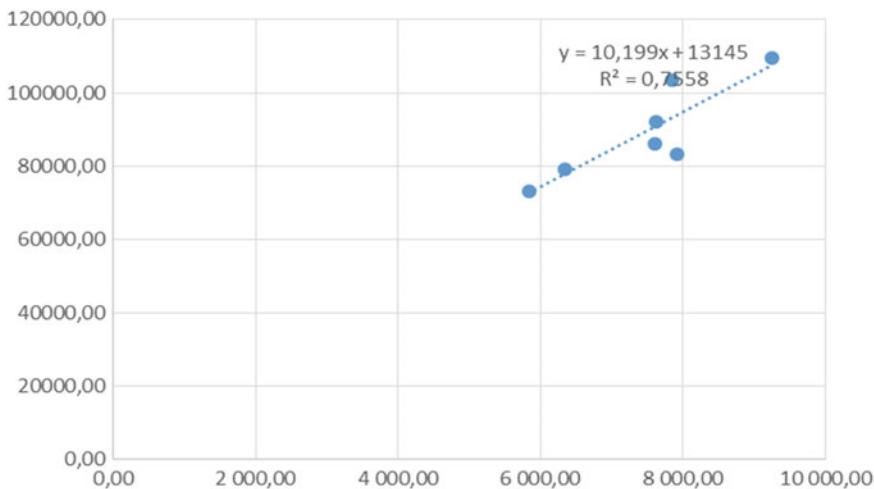


Fig. 112.4 Correlation and regression analysis of the relationship between GDP and government program financing

$$y = 10.199x + 13145$$

$$R^2 = 0.7558$$

Innovative development of the economy includes such subprograms as “Formation of a favorable investment environment”, “Development of small and medium-sized businesses”, “Improvement of state and municipal management”, “Promotion of innovation” and others. The main support tools can include: subsidizing interest rates on loans and leases, part of interest or the down payment, targeted grants, creating guarantee funds, guarantees, developing microfinance, creating business development infrastructure, supporting leading innovative regions, research centers, developing innovative economy personnel, and others.

The analysis of the subprograms and activities of the program allows us to conclude that individual activities do not have a direct positive impact on the innovative development of the economy. Individual indicators do not reflect the achievement of the program's goals. Such programs should be included in other programs aimed at improving public administration, rather than inflating the program with non-core activities. And if we consider the option of excluding non-core subprograms by allocating funds to core ones, we believe this would contribute to achieving the target indicators.

We believe that state programs can contribute to the country's innovative development, but only if the subprograms and measures are carefully selected and the target level of indicators is correctly determined. As you know, now state programs are being replaced by national projects, and some of them are already being implemented within the framework of the state program “Economic development and innovative economy.”

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Chapter 113

Socio-economic Risks and Benefits of Legalizing Shadow Self-employment: Russian Case



N. V. Tonkikh, T. L. Markova, and M. V. Chudinovskikh

Abstract The article aims to summarize the indicators and results of the pilot projects designed to regulate self-employment in the Russian Federation. The authors assess the impact of the changes in the Russian legislation regarding self-employment regulation on the statistical indicators of the self-employment registration, with a focus on shadow and female self-employment. The main hypothesis is that the established regulatory framework for self-employment does not fully stimulate the legitimization of shadow self-employment. Quantitative assessment and analysis of self-employment indicators was carried out using classical scientific methods of socio-economic research. It is found out that the current self-employment regulation has pros and cons from both perspectives: a self-employed person and the state. The undertaken measures resulted in increased risks and individual responsibility of the self-employed. For citizens, the risks of loss of social guarantees when switching to official self-employment are higher than the number of positive consequences acquired. The results of the project also show that the structural sectoral specificity of the activities indicated at registration intersects very closely with typical female employment preferences. Due to diverse reasons, women occupy a significant share of the self-employed in the “shadow” segment. One of the reasons is that the average income offered in official employment is significantly behind the estimated, expected income in shadow employment. It is concluded that the current regulatory and legal mechanism for legalizing shadow self-employment needs further improvement.

113.1 Introduction

Modern processes taking place in the Russian labor market pose a number of pressing managerial tasks. The top priority objective is to form a stable and real mechanism for providing citizens with jobs, and the second priority task is to establish the level of remuneration not only at a decent level, but also to guarantee its stability.

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New tools to promote economic and social stability in the field of employment include the introduction of the concept and legal status of “self-employed.” Self-employment can be attributed to varieties of non-traditional, non-standard types of employment in Russia. It is based on the citizens’ initiative to handle the issues of providing themselves with a basic or additional labor income [1, 2].

It should be recognized that at the moment the self-employment segment is one of the most poorly studied aspects of social and labor relations [3, 4]. Often this type of employment falls into the “gray,” informal zone of the national economy. The population working in this zone often belongs to the most vulnerable social categories of citizens in the state [5–7].

Statistics show that more than 15 million citizens are employed in the informal sector of the economy, in turn, almost 5 million citizens carry out labor activities independently and could get self-employed status, but the state paid attention to this segment of employment relatively recently. The first attempts to withdraw this segment from the gray zone were made in 2016, a special tax regime was introduced, i.e., “tax holidays.” Citizens, who got registered as self-employed, were exempted from taxes for two years. Then, they could make a decision whether they ceased their activities or registered as sole traders and, as a result, were entitled to pay a tax rate of 13%. There were identified activities falling under the scope of this law, namely tutors, nannies, nurses and cleaners, and the Russian Federation subjects were assigned the right to expand this range of professions. This attempt proved to be unsuccessful, due to the fact that citizens did not see real motives for legalizing their activities. In 2019, the state made a new attempt to encourage citizens to obtain the status of the self-employed by introducing a new law, under which the self-employed received a new rate of taxation and the boundaries for conducting their activities.

The regulatory, legal and information technology framework for legitimizing self-employment as a whole has been worked out, but as we see, a unified legislative program for developing and supporting self-employment has not been formed yet. It is necessary to finalize motivational tools that can push the self-employed out of the informal sector of the economy. The above makes the study of these issues relevant.

The main goal of our work was to summarize the first results and indicators of the pilot projects aimed to regulate the self-employment of Russian citizens with the focus on two aspects: shadow and female self-employment.

The objectives were as follows:

- assess how the change in Russian legislation in the field of self-employment regulation has affected the statistical indicators of self-employment registration;
- identify gender features in the structure of self-employment by sector, by type of economic activity;
- summarize the pros and cons of the current self-employment regulation from two perspectives: a self-employed citizen and the state.

113.2 Hypotheses and Research Methods

The main hypothesis tested in the process of studying the situation in the self-employment segment was the following. The established regulatory framework for self-employment does not fully stimulate the legitimization of gray self-employment. The methodological basis of the study was compiled by Russian normative legal acts in the field of employment and self-employment, the works of Russian scientists on the issues of employment, and the development of self-employment both in the Russian Federation and abroad. There were also studied publications, describing models and gender aspects of employment, as well as proceedings of international, all-Russian, and regional scientific conferences. The authors analyzed regulatory documents and resolutions of the Russian Federation in the field of self-employment regulations and data from the Federal State Statistics Service, the Federal Tax Service, and open publications of reports on the results of pilot projects in the field of self-employment, published in interviews with officials representing state structures of the labor market regulation institute. In addition, the authors conducted a content analysis of the list and cost of services provided by the self-employed and advertised on the Internet pages on popular social networks: "Vkontakte" and "Odnoklassniki."

Quantitative assessment and analysis of self-employment indicators were carried out using classical general scientific methods of socio-economic research: systemic analysis, generalization, comparative analysis methods, and statistical methods of data processing.

The concept of a self-employed person on the labor market of the Russian Federation has appeared quite recently and seems to be a new phenomenon. The concept of self-employment is not enshrined in official sources of information, the definitions are blurred and have no specifics.

We can note that many Russian specialists engaged in theoretical and fundamental research of self-employment refer to it as a type of entrepreneurship. An alternative approach is used in foreign practice and international statistics, in which the concept of "self-employed" is broader than the concept of "entrepreneur." Entrepreneurs are included in the group of the self-employed, to which refer all citizens who are not employees. This approach to determining the status of the self-employed leads to some divergence and "erosion" of the socio-economic content and specifics of this category. In this case, both entrepreneurs who use hired labor and entrepreneurs who perform business functions on their own are included in the same group [8]. It seems to us that this is not quite correct.

In Russian practice, the formulation of the self-employed category should be guided by the Federal Law of the Russian Federation of November 27, 2018, no. 422, which discloses the concept of a taxpayer of professional income tax. Taxpayers of the professional income tax include individuals, i.e., sole traders, who have switched to a special tax regime. The law regulates and defines the list of economic activities for which the state provided the opportunity to work as sole traders without state registration and to use a more favorable option of taxing income at low tax rates.

Summing up the studies of different authors, it can be concluded that they analyze the concept of self-employment based on the above-mentioned normative document [1, 2].

In our opinion, the concept of self-employment needs further development and clarification. By the self-employed, we propose to mean citizens participating in socially useful work based on personal initiative, independence, and responsibility, receiving labor income from their officially registered activity in the status of “self-employed.” The labor activities in the status of “self-employed” involve the absence of employees under labor contracts and the annual income not exceeding the amounts established by Federal law (currently—2.4 million rubles per year).

There is no clear list of authorized self-employment activities in the law. The logic of regulating “self-employment” is not permissive, but restrictive. The legislation lists those types of economic activity for which it is impossible to carry out economic activity in the mode of self-employment. People involved in some economic activities are not permitted to get registered as “self-employed” and are not entitled for the relevant taxation regime (professional income tax). They include:

- wholesale and retail trade of goods produced by third parties;
- work under an agency contract;
- mining;
- trade in excise goods as well as goods subject to mandatory labeling.

The logic of the state order for self-employment is clear, the main task of the new project is to remove the self-employed from the “shadow” and implement levers of influence on the self-employed population in order to increase interest in legalizing their activities.

113.3 The Results of the “Self-employment” Project in the Focus of the Shadow Economy and Gender Specificity

As part of our study, we tried to distinguish the topic of “classical” informal employment, in other words “shadow” self-employment, as part of the issues related to self-employment regulation. For obvious reasons, shadow self-employment is difficult to assess [9]. However, the digitalization of tax databases, financial sector databases, online cash registers, and other innovations can increase government influence on shadow employment. There are more and more tools to identify gray business patterns.

Earlier, before the implementation of the pilot project in the self-employment sector, the main way for citizens to work legally in their own small business was to get registered as a sole trader (sole proprietor). Due to the fact that entrepreneurial income was often insignificant, and the tax burden was high, as well as bureaucratic difficulties with paperwork, a significant number of citizens went into the “shadow.”

Table 113.1 Statistics of registered self-employed entrepreneurs for 2016–2018 in the Russian Federation

Type of activity	Number, people	Share, %
Supervision and care for children, sick persons, people who have reached the age of 80, as well as other persons who need constant care upon conclusion of a medical organization	203	18.9
Tutoring	697	65.1
Cleaning of residential premises, housekeeping	163	15.2
Other types of services established by the law of a subject of the Russian Federation	8	0.8
Total	1071	100.0

Table 113.1 is compiled by the authors based on the analysis of sources: [10]

Obviously, for the real legalization of the self-employed, understandable economic incentives are to be introduced.

In 2016, the first wave of the self-employed exited the shadow of informal employment segment, when “tax vacation law” came into effect. According to this law, it was necessary to register as a sole trader. As a bonus, legalized self-employed entrepreneurs were entitled for two years of tax holidays.

As of March 1, 2018, in some regions of Russia, where the opportunity of self-employment was provided, statistics registered a fairly wide industry palette of activities performed by citizens who took advantage of the new opportunity. The list of activities performed by the self-employed includes: grazing, tailoring repairs, renovations and refurbishment of the premises, finishing and construction, hairdressing services, repair of household appliances and gadgets, and photography activities (Table 113.1).

We see that this program did not bring significant results, we can say that it even failed. The number of people who officially announced their status as self-employed is extremely small during the period from 2016 to 2018. Only 1071 people took advantage of the tax vacation program in comparison with the Rosstat data on the number of the employed population—this is just a drop in the ocean (Table 113.2).

It is worth noting that the types of activities performed by citizens who have declared their self-employment status can be attributed to typically female. By comparing them with areas in which women are predominantly employed according to tax statistics (Table 113.3), we can draw a clear parallel. Supervision and care refer to the provision of individual services, tutoring belongs to the field of education, and cleaning of residential premises also refers to the provision of individual services. Women are predominantly employed in all these activities.

At the next stage, in 2019, the state made new attempts to increase the citizens' interest in getting out of the shadow and adopted Law no.422 “On conducting an experiment to establish a special tax regime “Professional income tax.” We should note that according to the estimates by the Tax Service, the number of potential self-employed entrepreneurs in Russia is about 5 million people.

Table 113.2 Typical female activities, thousand persons

Type of activity	2016	2017	2018
Healthcare	1042	1090	1197
Education	3625	3678	3699
Administration	3294	3370	3329
Culture	1798	1838	1966
Handling documentation, accounting	1896	1958	2009
Public service	416	432	430
Office employees	421	415	431
Service and trade	7681	7879	7961
Individual services	2099	2205	2183
Sales	4527	4648	4734
Individual care services	804	768	776
Textile and garment industry	1001	1011	1070
Food industry	129	120	120

The table is compiled by the authors based on the analysis of sources: [10]

At the moment, people who have received the self-employment status can use a special tax regime when providing services to individuals and legal entities, the amount of tax is very attractive. It is 4% for settlements with individuals and 6%—with legal entities. This regime is valid in 23 territories of the Russian Federation and is experimental.

To facilitate self-employment activities, there has been developed application-based software. This application is designed to:

- obtain a self-employed entrepreneur status by registering from a telephone;
- generate and send a check to the client;
- monitor the tax assessment;
- receive notifications of the due date;
- generate a certificate of income;
- carry out an analysis of the activities;
- interact with the Tax Service.

The experiment is designed for ten years; the law indicates the end date of the experiment: December 31, 2028. It is worth noting that the law has a special instruction that during the entire period of the experiment, changes in terms of increasing tax rates and reducing the marginal amount of income will not be made.

Benefits of this program [11]:

1. Simple registration as a taxpayer. To register, a citizen must submit an application, attach a photo, and a copy of the passport. At the same time, all documents are submitted to the Tax Service through the mobile application “My Tax.” If a citizen is connected to the Federal Tax Service “Personal Account” (any

Table 113.3 Registered self-employed entrepreneurs by activity for 2017–2019, person

Type of activity	2017	2018	2019	Growth rate, 2017–2019
Supervision and care for children, sick persons, people who have reached the age of 80, as well as other persons who need constant care upon conclusion of a medical organization	203	482	572	2.8
Tutoring	697	1898	7290	10.5
Cleaning of residential premises, housekeeping	163	565	690	4.2
Other types of services established by the law of a subject of the Russian Federation:	8	147	155,698	19,462.3
Grazing	No data	40	No data	No data
Tailoring repairs	No data	21	No data	No data
Construction and finishing works	No data	12	No data	No data
Hairdressing services	No data	18	No data	No data
Photography activities	No data	12	No data	No data
Repair of household appliances	No data	3	No data	No data
Repair of household appliances, home and gardening tools	No data	1	No data	No data
Organization and holding of ceremonies (weddings, jubilees), including musical accompaniment	No data	30	No data	No data
Manicure and pedicure services at a client's home	No data	5	No data	No data
Total	1071	3092	163,650	15,280.1

The table is compiled by the authors based on the analysis of sources: [10]

- individual can connect to it), then for registration, you will need to submit an application through the application “My Tax.”
2. No need to generate tax statements, submit income statements. When settling with customers, the taxpayer is obliged to create a check in the application “My Tax” (enter the necessary information about the buyer and the transaction in the electronic form). The generated check is sent in paper or electronic form to the client, and its electronic copy is sent to the tax office. Then, on the basis of the cheques transferred, the tax office sends a monthly receipt calculation to the taxpayer, based on which tax deductions are made.
 3. Tax rates are 4% in settlements with citizens and 6% in settlement with self-employed entrepreneurs or organizations.
 4. The possibility of obtaining 1% deductions from the rate of 4 and 2% deductions from the rate of 6% within the amount of 10 thousand rubles. That is, de facto

you will have to pay 3 and 4% off the income, respectively, until the amount of savings amounts to 10 thousand rubles.

5. The taxpayer is exempted from paying insurance premiums to the Pension Fund of the Russian Federation, Federal Compulsory Medical Insurance Fund, and Social Insurance Fund.

Program shortcomings:

1. Limitation on the duration of the tax regime. It will last until 2028. It is not known yet whether it will be extended or not.
2. Income is limited to 2.4 million rubles. If the limit is exceeded, the citizen will have to switch to the “entrepreneurial” tax regime. That is, use Common System of Taxation, Simplified Tax System, or Unified Tax on Imputed Income. If a citizen does not do this on one’s own, the tax authority will automatically transfer them to the Common System of Taxation.
3. Ban on trade in excise goods and products with special markings. This disadvantage is relevant due to the fact that the range of labeled goods is regularly expanded.
4. There are special sanctions for violation of the procedure or deadlines for transferring data to the tax office. Thus, for any violation of the procedure or delay in transmitting data, the taxpayer will be automatically fined 20% of the amount of tax not paid correctly and in a timely manner. And if within six months from the moment of the first violation, the taxpayer once again violates the terms or procedure for transmitting data, then the amount of the fine will be equal to the income received with violations.

Since the new law came into effect, the list of activities and professions has not been updated. So we analyzed which activities are indicated by self-employed entrepreneurs now, and the data are given in Table 113.3.

The latest figures on the scale of the self-employed who have come out of the shadow again show that the structural sectoral specificity of the activities indicated at registration intersects very closely with typical female employment preferences. Does this mean that women were predominantly employed in the informal sector of the economy, since citizens come out of the shadow from areas more typical of female employment (Table 113.4)?

Table 113.4 shows the areas with the most informal employment. Activities dominated by women’s employment are trade, health, education, and services. We can attribute some of these activities to potential self-employment, for example, education, where tutoring is possible; provision of services, where before the recent events with COVID-19, home beauty services were in demand. As we found out, women occupy a significant share of the self-employed in the “shadow” segment. The reasons for the transition of women to this segment are diverse, but many of them can be classified into groups [12–14]:

- additional income generation;
- change of the main sphere of activity;

Table 113.4 Percentage of women employed in the informal economy, %

Type of activity	Women
Agriculture, forestry, hunting, fishing, and fish farming	37.5
Manufacturing	41.5
Construction	8.5
Wholesale and retail	60.8
Healthcare and social services	75.3
Transportation and storage	7.9
Education	79.7
Other services	75.1
Other types of economic activities	60.7

The table is compiled by the authors based on the analysis of sources: [11]

- physical capabilities;
- no opportunity to work within one's specialty;
- difficulties in combining roles in society;
- flexible working hours;
- no access to professions in highly paid areas.

113.4 Research into Social Media Content as a “Shadow” Employment Site

The development of social networks served to create a new platform for unregistered income of a huge part of the population. Increasingly, people are switching to self-employment, and social networks are a platform for searching for customers. We conducted a study of the most popular social networks as a possible platform for promoting the services of “shadow” employment. In December 2019, an estimate was made of the number of Internet pages on which people offer their services. The list of services is close to the list of professions that were indicated by those who got officially registered as the self-employed in the period 2018–2019 (Table 113.5).

The analysis studied the databases of the most popular social networks in Russia, such as Vkontakte and Odnoklassniki. On these sites, it is possible to set filters according to the parameters necessary for our purposes. Our study did not study the data of the social network Instagram, and this is due to the inability to install the required filters when searching for people. In our opinion, there is a high probability that the information of different social networks is duplicated. The rationale is as follows: in order to expand the client base, service providers often advertise themselves in Vkontakte, Instagram, and other social networks.

Odnoklassniki is the most popular platform for offering self-employment services: the total number of users offering their services (according to our list) amounted

Table 113.5 Composition of potentially “self-employed” citizens by occupation and number of Web pages/units (evaluated by social media content analysis)

Occupation, field	Vkontakte	Odnoklassniki
Manicurist, pedicurist	4828	10,760
Brows and eyelashes stylist	1649	6550
Knitting	558	5518
Tailoring	350	1194
Photographer, videographer	8009	22,541
Presenter	260	918
Toy-maker	1071	410
Hairdresser	2052	5386
Permanent makeup	756	1420
Makeup and hairstyle	1360	896
Sugaring	3095	6416
Massage	1612	7669
Musician	981	2176
Designing albums, invitations, etc.	170	651
Tutor	320	1202
Redecoration of premises	1528	327
Making jewelry	386	98
Counselling	1065	39
Animal training	22	103
Total	30,054	74,272

The table was compiled by the authors

to 74,272 people (more than twice the volume of ads on the Vkontakte network). The largest offer was found in the segment of photographers and videographers, their number equaled to 30,550 people (29.3% of the total number of pages). The profession of manicure master ranks second (14.9% of the total number of pages). It should be noted that there is observed the predominance of services in the field of beauty and health. As a rule, women provide services in this area.

Information published on social media pages also made it possible to identify the average estimated income in the context of professional activities. It was possible to compare income with the list, since most pages on social networks have open access and freely upload information on the cost of services provided. The summary is given in Table 113.6.

The analysis of income data made it possible to conclude that many of the services are seasonal, that is, income is uneven, and there is no guaranteed monthly income. We considered estimated income per month as the difference between profit, taxes, rent, and materials. Profit per month was defined as the number of working days per average number of customers per day multiplied by the average cost of the service. The profit of the seasonal project was calculated as weeks per year multiplied by the cost of the service and divided by 12 months. The calculations are conditional

Table 113.6 Expected, estimated “shadow” employment income

Occupation, field	Vkontakte	Odnoklassniki
Manicurist, pedicurist	4828	10,760
Brows and eyelashes stylist	1649	6550
Knitting	558	5518
Tailoring	350	1194
Photographer, videographer	8009	22,541
Presenter	260	918
Toy-maker	1071	410
Hairdresser	2052	5386
Permanent makeup	756	1420
Makeup and hairstyle	1360	896
Sugaring	3095	6416
Massage	1612	7669
Musician	981	2176
Designing albums, invitations, etc.	170	651
Tutor	320	1202
Redecoration of premises	1528	327
Making jewelry	386	98
Counselling	1065	39
Animal training	22	103
Total	30,054	74,272

The table was compiled by the authors

and show the maximum possible income. For comparison, we will provide data on average earnings during official employment for vacancies published on personnel search sites (Table 113.7), and the content analysis was also conducted in December 2019.

According to the study, we see that the average income offered in official employment is significantly behind the estimated, expected income in shadow employment. It also lags behind the average wage in the Russian Federation.

113.5 Opportunities and Risks for Participants in Economic and Legal Relations in “Shadow” and Legal Self-employment

Work in the informal employment segment presents both a number of significant risks and opportunities for participants in economic relations. Oddly enough, even

Table 113.7 Wages and salaries in formal employment

Occupation	Wages and salaries, rub	Number of vacancies across Russia
Manicurist, pedicurist	25,000–35,000	23
Brows and eyelashes stylist	25,000–35,000	3
Knitting	–	0
Tailoring	20,000–32,000	540
Photographer, videographer	35,000	293
Presenter	–	0
Toy-maker	–	0
Furniture maker	40,000	25
Hairdresser	25,000–30,000	633
Permanent makeup	30,000	16
Makeup and hairstyle	25,000–35,000	3
Sugaring	24,000–30,000	3
Massage	24,000–30,000	376

The table was compiled by the authors

for the state, there are certain positive aspects in the presence of shadow employment, if citizens do not position themselves as self-employed. Let us consider what “bonuses” and risks the self-employed have when they perform activities in the “shadow” (Table 113.8).

Obviously, the informally employed have a lot of positive aspects, but in turn, the negative aspects in our opinion carry much more significant risks. Let us consider the

Table 113.8 “Bonuses” and risks of “shadow” self-employment

Participants	Risks	Bonuses
Self-employed entrepreneurs	1. No pension contributions 2. No social guarantees 3. No official experience 4. Fraud 5. No opportunity to use the benefits provided to the self-employed 6. Prosecution of offenses 7. No physical security 8. No way to get a loan	1. No taxation 2. Receiving the benefits 3. Flexible working hours 4. Customer selection option 5. No education needed 6. No experience needed 7. Lack of bureaucracy 8. No state control

The table was compiled by the authors

Table 113.9 Bonuses and risks of participants when leaving the shadow

Participants	Risks	Bonuses
The self-employed entrepreneurs	<ol style="list-style-type: none"> 1. Pension and social deductions fall on the shoulders of the self-employed, an increase in the tax rate 2. Services to the former employer can be provided only after 2 years 3. State control 4. Fixation in the database 5. The state can change the rules of the game 6. Responsibility for the provision of services 7. The risk of job losses for women is higher than for men 8. Gadgets service 	<ol style="list-style-type: none"> 1. Participation in public procurement 2. Cooperation with online retailers 3. New clients (legal entities) 4. Working experience is recorded at pension deductions 5. Possibility of advertising 6. Appeal to the court 7. Recognition 8. Compliance with the law 9. Possibility of lending, mortgage 10. Participation in state support programs

The table was compiled by the authors

example of Table 113.9 that how risks and opportunities will change when activities are legalized.

Thus, at the moment, the official status carries more negative connotations for the self-employed, and the pros are mostly imaginary in nature.

113.6 Conclusion

The current regulatory and legal mechanism for legalizing shadow self-employment needs further improvement. Risks and individual responsibility in self-employment have only increased. For citizens, the risks of loss of social guarantees when switching to official self-employment are higher than the number of positive consequences acquired. Some of the positive aspects of the self-employment tax regime are imaginary. The shortcomings of the current mechanism include the lack of social and pension contributions.

Although there is the possibility of “buying” a year of insurance experience, the cost of insurance experience is determined in the amount of 32,448 rubles. This payment is still voluntary, it will be indexed annually according to the level of inflation, but at present, it is unlikely to be “lifting.”

We can note that the self-employed have a low level of the state credibility, due to the fact that laws in the Russian Federation are often subject to changes. The risk of abuse of the new norm by employers is high: the risk of transferring employees to self-employment in order to reduce staff costs.

Against the background of the worsening situation due to the spread of coronavirus COVID-2020 and recommendations to minimize visits to public places, switch to

remote work, restrictions on any contacts, the situation of those engaged in the self-employment sector has significantly worsened. The self-employed, including nannies, builders, tutors, and masters of cosmetic services, are often deprived of the opportunity to work remotely, and many of them will not be able to restore their income (customers stay at home and do everything themselves, or do without these services at all) [15].

The main set of declared state support measures is now aimed at small- and medium-sized businesses, including reducing tax rates, deferring the payment of taxes and insurance premiums [16]. The state grants deferred payment of lease payments under lease agreements for municipal or state property. The self-employed, who got registered in 2019, got trapped. Most recently, they were removed from the shadow, and now, in conditions where it is not possible to carry out the working process, the self-employed do not have the opportunity to register as unemployed and receive social unemployment benefits from the state.

The current situation shows that the self-employed turned out to be the most vulnerable group in the labor market—this is one of those groups that will now experience the main economic blows. The state did not provide for any algorithm for dealing with crisis situations, thereby lowering the already low level of credibility on behalf of the self-employed, which in the future will reduce the number of citizens willing to leave the “shadow” and obtain the status of the self-employed entrepreneur.

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Chapter 114

Assessing the Social Component of the Genuine Progress Indicator for Russia



Yulia I. Pyzheva

Abstract The article is devoted to discussing the importance of transition from traditional economic indicators to indicators that take into account social and environmental aspects of economic development. The Genuine Progress Indicator serves as a basic indicator for assessing sustainability of development. Problems that the country's population may face in the process of economic development intensification are considered. The author suggests possible variants of cost evaluation of indicators included in the calculation of the social component of GPI, and identified indicators that currently cannot be evaluated for Russia due to the peculiarities of the statistical system and the lack of necessary research. Adaptation of the GPI calculation methodology for Russia is extremely important. The obtained estimates can be compared with similar estimates for other countries and will make it possible to draw conclusions about the level of true well-being of the Russian population.

114.1 Introduction

Despite being widely used as the main indicator of population well-being, GDP at present cannot be a truly comprehensive measure of countries' well-being because it only assesses the economic component and does not take into account environmental degradation and possible social problems. There are many studies of sustainability of environmental and economic systems [1–19]. However, they do not address the development of the social sphere, which is one of the three equal components of the well-known *triad* of environmental economics. In this regard, the studies aimed at assessing the state of specific social and economic systems, monitoring and identifying trends in their development and, most importantly, at developing a methodology that will make it possible to develop recommendations that will correct the trajectory of development of the systems under consideration are relevant.

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This paper attempts to summarize the possible options for assessing the social components of the Genuine Progress Indicator (GPI) for Russia suggested by Cobb, Halstead and Rowe in 1995 [20]. The relevance of the proposed study is due to the broad recognition that this measure of well-being has received in recent years. The best proof of this fact is the recent publication of a comprehensive study of the well-being of the Earth's population [21, 22]. Few authors emphasize the critical importance of replacing traditional GDP with GPI, which provides a much broader view of the processes in the economic, social and environmental spheres of life in a particular territory.

This issue is also relevant for Russia, which is reflected in a number of studies conducted by several leading teams in the field of environmental economics. The most comprehensive assessments of sustainable development indicators in Russia and its regions were obtained by Bobylev et al. [23, 24]. Environmental aspects of interregional inequality have been studied in detail in the works of Glazyrina et al. [25–28].

As the GPI is developed by a group of researchers, rather than an official international organization, there is no strict and universal methodology for its calculation. It should be noted that due to the rather wide list of indicators used for calculating such a method would be difficult to develop because of the significant differences in statistical accounting systems of different countries. Therefore, only a very general methodology is developed for this indicator. It is supposed that specific indicators should be developed for individual countries or its local districts.

114.2 Results and Discussion

I use a methodology called “Redefining Progress”, which is a surplus of the original methodology by Cobb et al. [20]. The algorithm for calculating the Genuine Progress Indicator itself is much simpler than obtaining data on individual indicators. The GPI is an algebraic sum of 26 indicators with different signs depending on whether the indicator makes a positive or negative contribution to the well-being of the region's population. In this paper I will focus on the possible options for calculating the components of only the social block of the Genuine Progress Indicator, which include the following (the sign for each indicator is given in parentheses):

- (1) Personal consumption (+)
- (2) Income distribution index (+)
- (3) Weighted personal consumption (+)
- (4) Value of housework and childcare (+)
- (5) Value of higher education (+)
- (6) Value of volunteers' work (+)
- (7) Vost of durable goods (+)
- (8) Road transport network services (+)
- (9) Damage from crime (-)

- (10) Loss of rest time (-)
- (11) Damage from underemployment (-)
- (12) Costs of commute (-)
- (13) Damage from road accidents (-).

Personal Consumption and the *Income Distribution Index* (known as the Gini Coefficient) are available from the official Rosstat data. It is assumed that the income distribution index is calculated by taking the lowest Gini coefficient as a baseline (100%). The *Weighted Personal Consumption Index* is calculated as the ratio of *Personal Consumption* to the Gini Coefficient. Computation of the *Value of domestic labor and child care* and *Value of higher education* indicators is much more difficult. Data needed to estimate the average time spent on household chores and child care are not included in official data and are not included in known sociological questionnaires. Therefore, estimating this indicator requires additional research, but it should be based on information about the time spent by parents on activities with children and time spent working at home, as well as the *Value of housework and childcare*.

Assessing the *Value of higher education* indicator can be based on the total number of people with higher education and take into account the difference between the income of people with higher education and the income of people who did not receive it. The indicator *Value of volunteer work* is becoming more and more important for Russia every year, as more and more people tend to spend a significant amount of their free time doing volunteer work. It is possible to estimate this indicator using data on the number of volunteers, the average rate of their salary and the time worked per year.

The *Value of durable goods* indicator can be estimated as the sum of expenses for some types of goods (cars, TV sets, computers, washing machines, refrigerators). The choice of types of durable goods is due to the fact that they are actually included in the list of the most demanded by the population. Data on the total cost of sold goods from this list are available in official statistics. The weighted average credit rate is regularly assessed by the Bank of Russia. The depreciation rate can be assumed to be 20%, taking into account that the average life of these goods is five years. The indicator *Road transport network services* are easy to estimate using data on the annual costs of regional road funds. This amount should be taken away from 25%, as it is assumed that approximately this amount of time is spent on moving between work and home, and the remaining 75% is “clean” services of the road network to the population. These indicators have a positive impact on well-being. Now let's look at the features of calculating indicators that reflect the negative impact on population well-being.

Public *cost of crime damage* due to lack of data can be estimated only partially as the sum of two components (regional budget expenditures on crime prevention and total loss of human lives). Data for the first component are available in official statistics, while the evaluation of the second component requires additional calculations. In our opinion, the total loss of human lives should take into account indicators of those killed and those who have been killed as a result of the crime (calculated by official statistics), as well as the cost of human life. There are many approaches to

estimating the cost of human life, but only some of them can be applied in Russia. As an assessment option, the approach outlined by Aganbegyan [29] can be used, where the cost of human life is estimated at 2 million rubles (officially established insurance benefits for victims of aviation and traffic accidents in Russia). Last years, there was evidence on payments of such sums within the limits of resonance air crashes and other incidents of technogenic nature.

The indicator *Damage from underemployment* for the minimum estimate can be obtained based on the number of registered unemployed and the amount of the established unemployment benefit, these data are recorded by official statistics. The indicator *Loss of rest time* can be quantitatively estimated using information about how many people in the country worked overtime, how many hours and what minimum wage they could get for this work, taking into account that overtime work according to the Labor Code of the Russian Federation should be paid in one and a half or double amount of standard wages. Such data can be obtained by conducting sociological surveys of households.

The *Costs of commute* can be roughly estimated thanks to Rosstat's study Integrated Living Conditions Monitoring. Interviewees claimed that they spend between 35 and 50 min on one trip between home and work, i.e., on average 42.5 min (85 min per working day). This value is multiplied by the number of employed people in the economy, the number of working days in a calendar year and the average hourly wage rate.

The indicator *Damage from road accidents* can be estimated only partially. Theoretically, it includes the cost of damage to the health of victims and the cost of repairing cars and road infrastructure, but there is only data on the number of deaths in road accidents. The same value can be used as an estimate of the cost of human life as was previously mentioned when discussing the estimate of the cost of life of those who died at the hands of criminals.

114.3 Conclusions

Clarification of the assessments of indicators included in the calculation of the Genuine Progress Indicator is necessary not so much from the theoretical but from the applied point of view, because a correct and comprehensive view of the true change in the well-being of the population can become an extremely important tool for decision makers on key parameters of the country's development. In addition, the assessments obtained for Russia as a whole can be compared with those obtained by other researchers in other countries, in order to compare the true well-being of the population of different countries.

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Chapter 115

The Phenomenon of Russia's Delayed Economic Crisis



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Abstract In the context of the crisis, practical analysis of financial markets becomes especially relevant. At the same time, determining the actual beginning of the crisis and its duration is not an easy task. Effective risk management is vital for companies to operate. An error in determining the onset of a crisis can significantly reduce the effectiveness of measures taken. This article is devoted to modern methods of risk management in a crisis in financial markets, the definition of the crisis in the Russian economy. The article discusses new approaches to the study of finance and financial markets. New methods of comparison of fundamental events and their technical interpretation on price charts are presented. Suggestions for improving the efficiency of risk management of financial market participants are given. Recommendations are given for working with ready-made expert assessments, including erroneous ones. A comprehensive approach to market analysis is recommended. When analyzing the market and assessing risk, one should take into account the fundamental background with the mandatory use of technical analysis tools. The larger the scale of fundamental market events, the more closely they correspond to the rules of technical analysis. Market participants are recommended to use the following methods of technical analysis, especially in the context of functionally related assets: Fibonacci levels, a triangle, which have shown their high accuracy both in a stable and in a crisis market.

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115.1 Introduction

Currently, the situation in the financial markets remains difficult. Therefore, financial managers, brokers, and other interested professionals have to look for new methods to improve the efficiency of working with securities. At the same time, as is customary in practice, all methods can be conditionally divided into fundamental and technical. Fundamental analysis methods study various factors that can influence quotes, as well as the extent of this influence. The key parameter is the choice of the factor and methods of its analysis. Now, we see that as a separate category, fundamental analysis is entering a new phase of development: It is not the facts themselves that are analyzed, but the opinions of experts about these facts. This is partly justified—it is not always a specific market participant who has direct access to information. This may be due to geographical distance, existing skills, and information collection and analysis skills. And, thus, there are whole groups of financial market participants who build their pseudo-fundamental analysis on the basis of the opinions of so-called experts. By “pseudo-fundamental” analysis, we mean someone’s opinion used by a market participant as *the main* factor influencing the decision on a transaction. At the same time, it should be noted that this is partially *also* justified, since the media can influence quotes with their materials: For example, at the end of 2014, the media supported panic over the growth of the RUR/USD exchange rate. Similarly, in the fall of 2016, the media cited a lot of “authoritative” opinions regarding the election victory of Hillary Clinton and the absolute impossibility of a victory for Donald Trump. As we can see from these two examples, if a market participant relies entirely on other people’s opinions, he can suffer serious financial losses.

115.2 Relevance

A trader always takes risks. It is associated with the fact that any asset has a risk of price decline. Even if the trader does nothing, i.e. all assets are in cash, there is always a risk of their price falling. In the Russian context, this is even more significant, because we can recall serious fluctuations in the exchange rate of RUR/USD, as a result of which the dollar increased in value by tens of percent, the ruble fell, and the economy became confused, turning into panic. It should be noted that such fluctuations in the Russian market occur approximately once every 5–7 years. Therefore, a trader should have in his Arsenal current, adaptive methods of identifying risky situations, stable trends in the markets, and predict their beginning and end. If the market situation is often confusing with trends, it is still, in our opinion, much more favorable to market participants than lateral movement and, especially, gaps. Thus, in order to correctly choose a risk strategy, a trader needs to be able to determine the current situation with quotes on the market (trend, sideways, gap). The trend is characterized by a relatively long period (10 time frames or more) of price growth or decline (Fig. 115.1) [1, 2].



Fig. 115.1 Index RTSI, time frame “day”. Growing trend

A sideways movement manifests itself as a weakly changing price (within 1–2%) for a long time (Fig. 115.2) [3, 4]. As we can see, the sideways movement on this chart has a fairly long duration.

115.3 Problem Statement

The easiest risk management of a market condition for risk management is a trend: A trader sees a steady price change and has some confidence that it will continue. The risk consists in a sudden change in the trend, and as a result of which, the open position may turn out to be unprofitable. It should be noted that there are no stable trends in the current crisis. Even the collapse of quotes can occur with rebounds, or it can be very short-lived. But all these falls stop quite quickly, and the chart goes into a sideways movement. Lateral movement, despite all its “weakness”, and apparent passivity carry a much greater risk of losses. Lateral movement can be mistaken for stability. But it is also extremely difficult to achieve stability in the economy: To do this, *all* the many factors that affect the price must be fixed (the desires of buyers, the capabilities of sellers, the technical conditions of production, the health of company employees, even weather conditions, and so on). As a rule, this is unattainable, and these factors change in the course of life, which is why there is a rise in quotes, then their fall. Lateral movement is a kind of expectation of the unknown by many market participants. Various non-market assistance, for example, from the state, can also contribute to this. If we regularly hear, for example, about the government's help to some Bank, and its quotes are in a sideways trend, then,



Fig. 115.2 Index RTSI, time frame “day”. Lateral movement

most likely, without this help, they would have already fallen quite significantly. Therefore, bokovik requires a trader not only to perform technical analysis, but also to search for obvious fundamental factors that confirm it. We recommend that you stay out of position during lateral movements. Technical analysis can help trader to avoid the risky, ill-considered transactions. So, by studying Fig. 115.1, a trader can close a long position when the quotes break through the support line. At the end of a growing trend, the quotes go into a sideways movement (Fig. 115.2). According to our recommendations, the trader refrains from transactions (this is psychologically difficult, since the duration of the sideways movement is about 6 months), and when the resistance line breaks, he can open a long position [5].

And the longer the sideways movement lasts, the stronger the upcoming trend will be. At the same time, there is a danger to take a local puncture in the price of the sideways corridor line as the beginning of a trend. To avoid this, you should make sure that the price moves for a long time and strongly when leaving the corridor. Fundamental factors in the Russian environment have another characteristic feature: perhaps the news that the trader has just received *may*, already be known to someone. We can cite examples where the use of insider information in a number of countries, including the United States, can lead to serious criminal liability. In the Russian reality, such examples are still not well known, despite the fact that the temptation for insiders is extremely high, and in our opinion, given the volatility of the market, insiders in Russia can get much more income than anywhere else. Therefore, to reduce

the risk level, including from the impact on the market of insiders, we recommend using technical analysis against the background of fundamental analysis as a priority.

115.4 Theoretical Part

Studying the state of the Russian economy, we have found the following features: Since 2014, the financial market has been in a state of stagnation, turning into an increasing crisis.

Let us analyze the state of different markets for the period from 01.02.2008 to the present (September 2020) [6]:

1. The United States market. Index The Dow Jones rose from a low of 6470.27 points to 27,584.99 points (an increase of 4.26 times);
2. The Russian market on the MICEX index has grown from 589.48 points to 2922.96 points (an increase of 4.96 times).

On the first impression, it turns out that the Russian economy has overtaken the US market or at least is keeping pace with it. But here, we note that the MICEX is calculated in rubles. Therefore, you should pay attention to the RTS index and the dollar exchange rate:

1. The RTS index rose from 532.54 points to 1162.73 (an increase of 2.18 times);
2. The US dollar rose from 30.3 rubles to 79.13 rubles (height times).

If the growth of the MICEX index is recalculated taking into account the dollar exchange rate, then its actual growth will be $4.96:2.61 = 1.90$ times. Which roughly corresponds to the growth of the RTS index, since it is calculated in dollars, but the composition of securities of the MICEX and RTS indices is somewhat different.

Thus, we can make a reasonable conclusion that the growth of the US markets was 4.26 times and of the Russian markets in dollar terms—about 2 times. This value is extremely low. The point is that, according to Kondratiev's wave theory, the economy has a cyclical development. The last global crisis was in 2008. About 10–12 years later, according to the theory, a similar economic crisis should occur. As we can see, in 2020, it was started by a Coronavirus infection. And, according to our calculations, the US markets will begin a steady decline over the next year or two to about the level of March 2020 (21,445.12 points). Of course, the Russian markets will also start to decline significantly. But here lies the most important feature of this crisis for Russia—the fall in the RTS index can surpass the fall in the US markets and reach the level of 2008. This is due to the fact that the RTS index broke through the triangle shape (pennant) (Fig. 115.3).

In our opinion, this is due to the fact that the crisis of 2014 was exclusively Russian: While the world markets were setting records for market growth, the Russian market was falling. There were many reasons, including sanctions, inefficient management, etc.



Fig. 115.3 Gap on the graph and index RTSI, time frame “60 min”

It may have been a mistake to save large crisis enterprises with state financial support (e.g., JSC AVTOVAZ) [7]. This did not solve the fundamental problems that led enterprises to the crisis, but only pushed them to the far horizon.

We believe that now is the moment when the unresolved problems threaten to get out of control and lead to an even more difficult economic situation.

To account for the onset of the crisis, market participants should use technical analysis. It allows you to draw reasonable conclusions based on objective data. So, our research experience has shown that the triangle shape is one of the most reliable. We previously determined the price of Brent crude oil in the range of approximately 3–5 dollars per barrel. In March 2020, the price of actual oil reached \$16, and futures went into negative value. We analyzed only the actual oil. Based on our research results today, we can see that the oil price has not yet reached the target value and that in the next 3–5 years, it may approach that the price we previously indicated of 3–5 dollars per barrel. When such an indicator occurs, the dollar exchange rate will rise from today's 79 rubles (oil 42 dollars/barrel) to 1100 rubles per dollar. This scenario seems improbable, but it is a manifestation of the delayed crisis of the Russian economy: Crises are overcome by structural changes, improved technologies, management decisions, etc. In Russia, the 2008 crisis was overcome, in our opinion, by a favorable external environment, especially in the oil market. And the correlation of Russia's financial markets with oil has become even more significant.

In our opinion, the crisis in Russia will develop according to the following scenario.

It should also be noted that crises in Russia are often aggravated by additional complex circumstances. Such factors were once the sanctions of many leading Western countries (since 2014) and now a Coronavirus infection. And if infection can be attributed to a common problem in many countries of the world, then sanctions are a selective problem only for individual countries. In particular, sanctions against Russia deprive it of access to modern world developments, as well as to the necessary materials and technologies to maintain the existing level of technological development. Many sectors of Russia can only work effectively using imported materials and technologies. Switching to domestic substitutes will either significantly reduce the profitability of the business, or it will not be possible at all. Until the advent of real-world domestic developments, the Russian economy is very heavily dependent on imported materials and technologies. Therefore, one of the most severe variants of the economic crisis becomes possible.

As we have noted, a decline in oil prices is extremely likely. At the same time, the availability of imported materials and technologies will decrease. The sanctions also impose severe restrictions, including banning the supply of necessary resources. Together, these two factors are beginning to severely reduce the efficiency of individual industries. Some businesses may come to a complete standstill due to the unavailability of critical imported resources. Falling oil prices will also cause an even greater decline in the purchasing power of the population. Therefore, domestic demand will fall sharply. It will become more difficult to export goods due to problems with the supply of necessary imported resources. Joining the Coronavirus to this situation коронавирус can causes even more severe damage and critically worsens the economic situation.

115.5 Practical Significance

In our opinion, each of the above factors is very important for preventing a crisis. But in this case, the solution must be structural. An increase in the money supply and targeted support for inefficient enterprises can further worsen the situation.

For financial market participants, we offer a comprehensive analysis of the crisis situation in order to better understand it.

We want to focus on combining fundamental and technical analysis.

One of the most striking examples of the erroneous result of fundamental analysis should consider the predicted market reaction to the results of the US election on 08.11.2016. The election of D.Trump by some experts was associated with an almost inevitable market decline and the beginning of a global decline around the world [8, 9]. The Russian market opened on 09.11.2016 with a fall of about 1.5% (Fig. 115.4).

Almost immediately, there were reports in the media about the negative development of the market that traders should be adjusted to open short positions. However, during the day, the market turned around and ended the day with an increase of almost 2%.

In such situations (before big events), we recommend the following:



Fig. 115.4 Fall of the market and the index of RTSI at the opening on 09.11.2016, time frame “60 min”

- Close the position at the end of the session;
- At the opening of the session, wait for a stable signal of technical analysis and only then open new positions. Technical analysis in this case acts as an accumulator of all known and unknown data, and as a result of which, the decision will be much more correct than the opinion of analysts.

Let us show why technical analysis, even in this completely unique situation, could help traders.

We recommend always using one of the best tools—the “Fibonacci Levels” (Fig. 115.5).

In August–September, we built the Fibonacci levels on the chart and the index RTSI. Then, when trading, their movement was taken into account.

As we can see from Fig. 115.6, even a serious event for the markets—the choice of the US President—is clearly described by technical analysis: The price chart fell exactly to a specific Fibonacci level (the value of 960 points), after which, there was a rebound. After the rebound, with the breakout of each subsequent level, the trader could add to the long position, since these were very positive signals indicating a strong market movement.



Fig. 115.5 Fibonacci levels on the chart and the index R TSI, time frame “60 min”

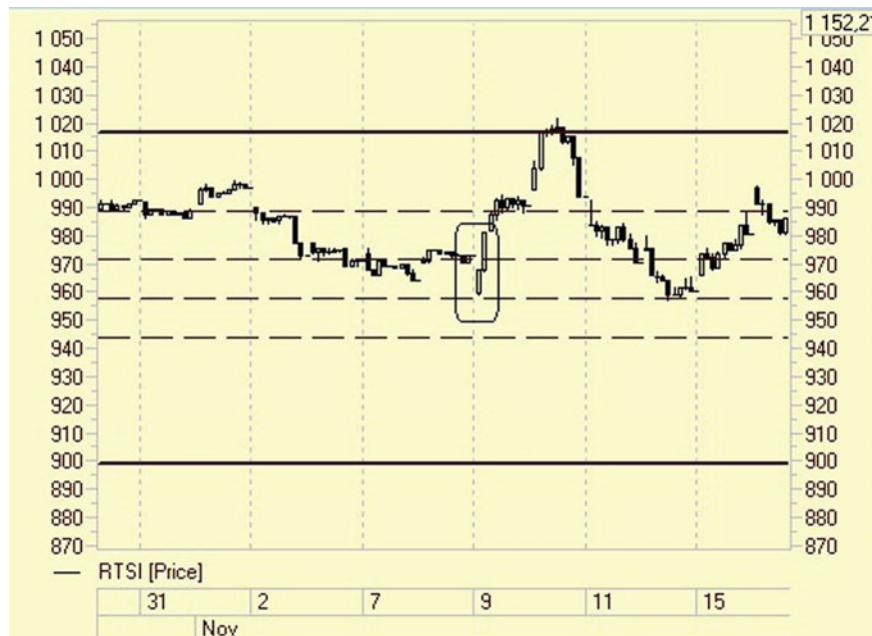


Fig. 115.6 Fibonacci levels on the chart and the R TSI index as of 09.11.2016, time frame “60 min”

115.6 Conclusions

To sum up, we should draw the main conclusions from our provisions:

1. Risk management is a very relevant and urgent task for the whole society and especially for specialists;
2. A comprehensive approach to market analysis should be used;
3. When analyzing the market and assessing risk, you should take into account the fundamental background with the mandatory use of technical analysis tools;
4. You should be able to determine the current market situation (trend, sideways movement, gap);
5. We recommend closing positions to avoid the risk of a gap, which can be considered a rule in a crisis period;
6. Even major fundamental events in the market follow the rules of technical analysis, so traders should use it constantly;
7. For risk analysis, the “Fibonacci Levels” tool is well suited, which has shown its stability in both stable and crisis markets;
8. The crisis in Russia is the result of a combination of deferred problems of the past years and the emergence of new ones. The problems of low oil prices, Coronavirus, and sanctions on the supply of critical imported resources are critical.

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Chapter 116

Social Technologies as a Way to Develop Human Capital



D. Shalina and N. Stepanova

Abstract The article is devoted to the practical using of social technologies in education. Now, we must be flexible in our approach to human capital development: constantly adding knowledge, acquiring new skills, and introducing new technologies. This approach will help you improve your main business and gain additional skills. The article presents a variant of the implementation of a social project on the development of drawing skills on topics. Aspiring people can go through rapid training using modern technology and master basic drawing skills. Study is carried out online, using Internet resources. The study was designed to allow practitioners to explore emerging issues of technology in a social context. A holistic approach was taken to enable a suitable contextual working model to be developed.

116.1 Introduction

Today, the world has been hit by the COVID-19 coronavirus pandemic. Like other pandemics, the coronavirus will also pass. However, our world will not be the same. In general, society will change its view of the world, of technology, of itself, and of how it obtains information. Therefore, it is important to use the received shocks as opportunities right now. We have a huge number of digital devices and resources, which can make our lives easier and improves us.

Training and modern education will also not be the same. With a huge number of digital devices and resources, almost all educational institutions have switched to distance learning today. Currently, millions of students and schoolchildren study at home using the resources of the Internet. Lessons, conferences, assessments and project defenses are now being held online.

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In the post-pandemic phase, mass development of distance learning may not happen to the same degree, but we are guaranteed drastic changes. There are various models for using online courses in training. We will consider the practical implementation of available social technologies in additional training on a specific example of the implemented project "How to draw it."

116.2 Purpose of Research

The goal of our work is to focus on creating a working model for teaching drawing skills in a distance format, in order to share practical experience in creating an online course in additional education.

The subject of research in this case is educational practice, namely, its holistic description.

To achieve this goal, the following tasks were explored:

- Talk about the educational ecosystem;
- To highlight emerging issues;
- Analyze the advantages and disadvantages of social work (social technology) in training;
- Make a correlation for changes (foresee the future, be one step ahead, be able to transform);
- Analyze successful experience;
- Describe our project to share ideas and approaches to launching new public practices.

We want to expand such practices for enthusiastic communities who intend to join similar initiative projects. So social technologies will help society to effectively achieve socially significant ideas in practice in their field of knowledge.

116.3 Material and Methods of Research

The study used empirical and theoretical methods. Empirical methods include the study of various sources of information and best practices. This approach allowed us to study the practice used from different sides, identify the best, find the necessary facts and information to justify it. From the theoretical methods, analysis and synthesis were used. A step-by-step algorithm for working on the topic is performed. All the information obtained during the search was thoroughly analyzed, and the main points for our research were highlighted. After studying all aspects of the object under study, we synthesized information and conclusions about it into one general conclusion, in order to share practical experience of using our social practices.

116.4 Conducted Research, Its Results and Their Discussion

116.4.1 *The Educational Ecosystem of Our Time*

The concept of “educational ecosystem” is gradually replacing the concept of “educational environment” in modern society. In an educational environment, a person tries to survive certain shocks and difficult situations. And in the educational ecosystem, people adapt to changing conditions [1].

The educational ecosystem is enriched by evidence-based innovations. New technologies help to increase the involvement of students in the educational process, which is a prerequisite for the development of an innovative educational ecosystem. The cooperation of schools with government authorities is also being strengthened, many financial problems are being resolved, and preparations are being made for an innovative future [2].

Dynamic development of the educational ecosystem is one of the factors of effective professional activity. This is how human capital develops and a professional and educational ecosystem is formed, where people focus on teaching professional skills through innovation. Further development and improvement of this direction are required [3].

116.4.2 *Emerging Problems of the Educational Process*

Development of education is becoming a promising and important area. Its formation and improvement require studying its weaknesses and shortcomings. Experts identify the following problems of the modern educational system [4, 5]:

- Lack of the necessary number of highly qualified practitioners. The predominance of theoretical values over practical skills;
- The educational system is lagging behind digital technologies and digital progress, including incomplete provision of school resources during training;
- Inflexible educational programs. The prevalence of old methods and principles of education, which is not unacceptable for modern society;
- The direction of “personality formation” is not a priority in the educational process;
- Small number of research and experimental bases in universities;
- Unequal distribution of higher education institutions in the country;
- Lack of funding for educational institutions.

Extracurricular activities are of great importance for the formation of fully developed individuals [6–9]. Today, additional education is widely used in some universities for this purpose. Courses of minor courses (additional profiles) are being successfully implemented for students choice in addition to the main program [10–12].

Additional education in the format of a circle movement and mentoring is gaining strength [13–15]. The priority in educational work should be the education of an active civil position. The cultural component in the development of a harmonious personality is undoubtedly relevant.

116.4.3 Social Work in Training

The training process involves several stakeholders, among which there should be stability and good interaction. This is the only way to achieve effective work in the educational sphere. These stakeholders include students, teachers and administrators. Mutual respect should be not only between these groups, but also within them [16].

Work for the benefit of the public has a high degree of significance, as it contains the following advantages [16]:

- Solving educational problems related to psychological components (stress, emotional pressure);
- Assistance to students from low-income families, including improving their social well-being;
- Resolution of disputes between social educational groups;
- Ensuring social stability.

In addition to the positive aspects, there are disadvantages [16]:

- Many different tasks in social work (educational, psychological, health, etc.);
- The need to use the entire set of social technologies;
- Scientific analysis of all social groups, their problems and views.

Caring people and social communities are able to develop a successful educational environment. Perhaps, this will help in solving the educational problems that were presented in the previous paragraph.

Education is not only the acquisition of basic theoretical skills, but also the development and formation of personality. Supporting and developing the educational process, we must pay attention to additional education, which will allow students to express themselves and find their favorite business.

116.4.4 Correlation to Changes

It can be argued that education is moving to a new level. The level of complete provision of digital objects. This leap in development was triggered by the “coronavirus.” And after the pandemic, remote work will no longer be uncommon. The consequences and outcomes of this situation vary widely. We have identified the following possible trends after the pandemic:

- The educational ecosystem will include learners, teachers, professionals in their field, the administration of the organizers and training technologies;
- The principles of the educational process will change—traditional principles will be replaced with more modern and flexible ones;
- Training methods and methods are being modified. Distance learning will be as popular as offline learning;
- There will be modern qualified teachers of new realities;
- Students will plan their time flexibly. In a transformed world it will become especially important to be able to allocate your time;
- Interest in additional education will increase;
- Humanity's free time will be more productive.

Thus, under the burden of negative phenomena in life and economy, digital technologies will bring the educational ecosystem to a new level. Society will be motivated to constantly grow and overcome the crisis. By applying new ways of organizing, planning and managing, the workflow will not be primitive and trivial. Additional education or development will help people to work effectively, live productively and be motivated for the better.

116.4.5 Successful Extracurricular Activities in the World

As you know, in America or Europe, training and extracurricular activities differ from Russian. We have considered the characteristic features of extracurricular activities abroad.

In America, extracurricular activities are very diverse. This is evidenced by the research of Berezhnaya I. F. and Dyuzhakova M. V. Students at American universities are the organizers of extracurricular activities, forming student self-government. This administrative body represents the interests of students. Integration with the educational process is another sign of American extracurricular activities. In the course of educational activities, students are taught to serve for the benefit of society selflessly. Developing many qualities, extracurricular activities are also a bonus for employment. For students, extracurricular activities are both fun and an opportunity [17].

In Europe, there are European clubs that are forms of extracurricular activities. They are aimed at mastering European problems, forming common European values, critical thinking and creative abilities. The goal of European clubs is to educate individuals with an active social and political position. Students who participate in various clubs learn tolerance. As a result, they better understand other Nations and respect their way of life. They also improve their educational skills. This is writing, speaking and foreign languages. Virtual groups or online interest groups are also popular, where students develop depending on their hobbies [18].

Achieving success in the development of their children in Asia, or rather in Japan, is carried out through many different sections of extracurricular activities. In their free

time from school, students engage in additional activities that form certain skills. For example, music classes are organized to develop musical dexterity and intelligence. This also helps in mastering foreign languages, the study of which is the second basis of extracurricular activities. Creativity, art and sensitivity can also be developed by practicing calligraphy. Self-control and respect for others are embedded in the Japanese martial art. Students can learn humility and hospitality in the tea ceremony classes [19].

The Russian experience of extracurricular activities includes certain elements of work from America, Europe and Asia. Based on our own experience, we have identified the main characteristics of extracurricular activities in Russia. First, the division by age levels for preschoolers, school children and students, there are additional educational institutions or groups in these educational institutions. Second, it is diversity, in fact, there are many opportunities for additional development in Russia. Sports clubs, music schools, dance and vocal groups, art schools, etc., are mostly popular. Third, there is always an opportunity to prove yourself at a higher level. There are many incentives for the most gifted students. Fourth, a completely new and extensive range of extracurricular social activities opens up for students. These are student organizations, teams, volunteers and interest teams.

Any community is identified with sociality and is brought to the joint activity of people in all possible spheres [19–21]. In our work, we consider additional training.

116.4.6 Our Project

The training model we use is based on networking. Our activities in the proposed project are completely social and do not contain a commercial component. This is most closely related to the community of interest, volunteer and circle movement. We offer to teach drawing to those who have never done it, but have a great desire to do it.

Using our work with professionals, we try to introduce new social practices into our daily life. We want to develop and expand such practices in our society and join such initiative projects.

The relevance of the project is to create a working model for teaching drawing skills. The essence of which is to learn the elements of drawing from real experts, through duplication and repetition for professionals on their own experience. These specialists work in various fields and professions where you need to have drawing skills. After completing a course of several lessons, you can get the prerequisites for professional orientation in creative professions, which are impossible without drawing elements.

The project for the development of project learning and the development of circular motion goals is that:

- Each class is conducted by a specialist in the field of professional activity;

- Specialists transmit not only knowledge and skills, but also share real cases and life situations in their profession in interviews with the presenter;
- Freestyle training is used together with the accumulation of video lessons for further use.

It is assumed that this will be an online course using Internet resources. The duration of the program is set independently. The recommended duration is 8 weeks (1 lesson per week). As a result, drawing skills are acquired.

The problem that the project solves.

Sometimes, some young people in the process of gaining practical experience in their specialty need practical drawing skills. And it is desirable to get them in a short time. Our project can help you do this.

The result of the product.

The best result is achieved in the representation of the profession and in the acquired drawing skills, thanks to the step-by-step instructions of specialists on the types of drawings through viewing videos (in the proposed videos, specific lessons on different types of drawings are explained simply and clearly).

Simply and clearly, after watching the video and repeating the invited expert, you can master any type of drawing. What the video clearly demonstrates the host, who works as a designer, but cannot draw. And also learn a lot of useful and interesting information.

The main interested party is the Ural Federal University (UrFU), the Boiling Point of ASI (Agency for strategic initiatives), including the University Boiling Point (66 Lenin street). Interested parties may also be orphanages, clubs for responsible mothers with children and parents.

As a result of the project, educational and practical materials will be accumulated, consisting of a series of different videos on different topics. They can help you learn how to draw comprehensively, as well as locally for a specific task.

The test will be feedback in the chat on scans of drawings of project participants in open access, on the YouTube channel, where everyone can put likes or dislikes, as well as leave comments.

Educational results—drawings, subject knowledge and skills on topics.

The final online session is organized as an exhibition of participants' works on the site and discussion of them in a chat. You can look at the dynamics of what participants knew and were able to do at the beginning of the project, what skills and knowledge they have at the final stage.

The project initiator and inspirer of the project is Stepan Lyaptsev. He works as a creative designer in the production center "Rikki" (We know him from everyone's favorite TV series "Smeshariki"). Steve has created his own professional channel "nyashastepasha" on YouTube. The channel has more than two thousand subscribers. Here, Stepan is happy to share his experience using social technologies [22].

We invite artists, animators and designers and ask them to tell us how they draw. This is usually a small interview. And then follows the practice in which we analyze the drawings of guest artists.

As for evaluating the improved model (style and other), we plan to conduct a second study with the same questions and determine the loyalty index. Each of the numerical values of its component parts will need to be compared with their values before the event, to see whether they have increased or not. These are plans for the next stage of work on the project.

116.4.7 Discussion of Results

Our project is a movement of enthusiasts, project participants, organizers, professional artists, designers, animators and many others, and project leaders whose activities are aimed at transitioning to a new socio-technological way of life. Our goal was to find and spread effective working practices.

Practice is considered to us as a reproducible form of socially significant activity. In practice, a person creates a new reality—the world of material and spiritual culture, new conditions of existence and life, developing learning and creative activity.

Many are engaged in similar projects. Our strong point is our social orientation and our desire to help people who are interested for free. We are always happy to receive any fair criticism and accept any suggestions to make our online drawing lessons even better.

116.5 Conclusions

The educational ecosystem is changing along with modern society. The results of the study showed that there are certain problems in this area. Many of them help solve social technologies combined with digital technologies. At present, when everyone is in a difficult life situation, it is important to adapt and make rational use of time and opportunities.

To motivate something new and perfect, there is such a person as an enthusiastic mentor. This is not a teacher, not a legal body. This is a person who helps you find yourself without controlling you. It gradually teaches you certain knowledge and skills, forms basic professional skills and qualities.

Our training project develops and forms artistic opportunities in a short period of time. It develops not only drawing skills, but also patience, creative thinking, striving for a goal and motivation support. Video lessons are presented in remote format. They are interesting, rich and productive. Online mode is now, more than ever, convenient and practical for the whole society. But even after the pandemic, our online project will not lose its relevance. In the age of the digital economy, creative skills will embody people.

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Chapter 117

The Influence of the Value System in Human Capital Investment on the Satisfaction with Studying at Universities



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Abstract The existing gap between the high value of human capital and the low awareness in knowledge acquisition can be brought about by several interrelated and interdependent factors including the value system in society, situation factors, infrastructural, institutional, social, and cultural environment, etc. The research presented in this paper aimed to study the relevance of the value system in human capital investment among younger students and determine its influence on the students' satisfaction with the study process. The work is based on the axiological approach and the theory of human capital. The main empirical method of sociological research was the mass polling of full-time university students in the Republic of Tatarstan. The overall population of respondents was 870 people. This work deals with the typical modernist value of investing in one's human capital, i.e., training to facilitate career growth and improve the financial situation, as a combination of four modernist values (money, material assets, success, career, professional growth, education, professionalism). The classical value system in human capital investments influences only one of the job dissatisfaction causes: "I am not sure I can get a job in my degree field after I graduate." This is one of the most popular answers, and it reflects the worry that after the graduation, students will not be able to utilize their human capital. We believe that it is important to consider this trend when setting the quality assessment criteria for educational services and focus on the practical applicability of the disciplines taught.

117.1 Introduction

The current higher education system is one of the more stable social institutions in Russia that helps socialize the majority of school graduates. Today, about 40% of the country residents have a higher education degree by the age of 30 [1]. Obtaining higher education is still deemed quite important in Russia, and the requirements

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set to it by different parties of the study process, especially students, are also high. The education efficiency improvement based on the human capital theory requires a comprehensive solution that would stipulate both the improvement of the academic, technical, and legal bases, and the change of the attitude toward the education process and the formation of one's human capital. Studying at a university is a multifaceted process that can be evaluated using several parameters related to various aspects of the educational institution's operations. The direct interaction of students and teachers takes place within the study process, and the satisfaction with it often substitutes the evaluation of satisfaction with the education in general.

The existing gap between the high value of human capital and the low awareness in knowledge acquisition can be brought about by several interrelated and interdependent factors including the value system in society, situation factors, infrastructural, institutional, social, and cultural environment, etc.

These factors should include students' personal values because they determine the majority of the decisions they take in life. Any modernist society, Russian included, is eclectic: They feature traditional, modernist, and postmodernist values. We must understand that modernist values can be interpreted as related to investing in one's human capital.

If this approach is used, the research question shall be as follows: How widespread are the human capital development values among young students? and How can human capital development values influence the students' dissatisfaction with the study process? With a view to the above said, we come up with two research hypotheses: modernist values dominate the mindset of modernist students, and the specific causes of study process dissatisfaction do not depend on all of the human capital investment values; it is only influences if one or a few of them are preferred.

The goal of the presented research is the study of human capital investment values among students as the basis of their assessments of study process satisfaction.

117.2 Review of Publications

Many Russian and foreign authors studied students' value systems [2–5]. The problems of students' human capital investment were also covered in some research works [6–11]. One of the ways to mitigate the negative consequences of education loans is the introduction of human capital contracts [12, 13]. Some works review specific aspects of the human capital investment process during higher education studies. There are also publications dedicated to students' human capital investment through academic mobility programs and international scholarship programs [14–16]. Besides, we were also interested in works analyzing students' satisfaction with the study process at universities [17–21].

117.3 Methods

We carried out a standardized multi-method strategy-based sociological survey among the higher education students in Tatarstan. The students can be classified according to their degree fields: natural sciences and engineering, social studies and humanities, and management and economic studies. The main research method was multistage combined sampling. The representativeness was determined using such parameters as gender, city of residence, and student's degree area. The overall sampling volume is 870 people. The maximum permissible error is within 3%.

117.4 Research Results

The identification of terminal values was one of our research objectives because they comprise the basis of people's lives under any circumstances. We used the civilizational approach when selecting terminal values. We assumed that these values must include traditionalist (family, children, love, health, personal safety), modernist (education, professionalism, prestige, fame, success, career, professional growth, respect, recognition, money, and material wealth), and postmodernist (congenial employment, interactions with friends, pleasures, creativity, the realization of abilities, independence, freedom, business) components typical of traditional, modernist, and postmodernist societies.

The classification of young students based on their preferred values is shown in Fig. 117.1.

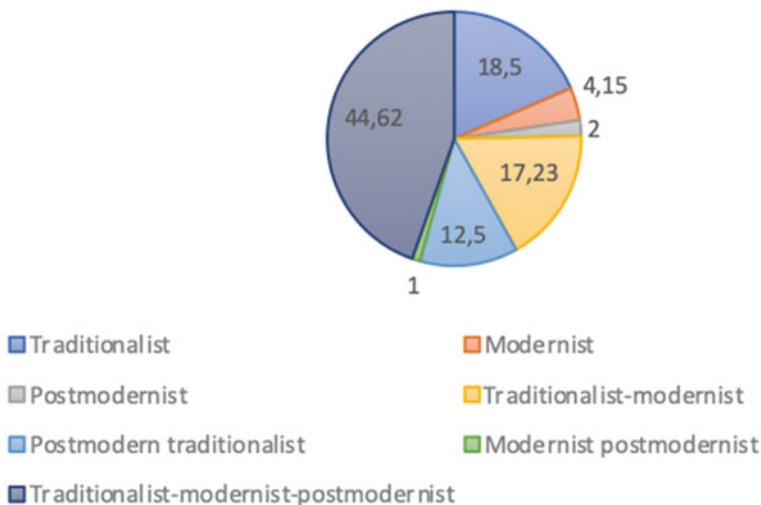


Fig. 117.1 Young student classification based on their preferred values

As we can see from Fig. 117.1, about half of the students (44.62%) have all three types of values; 17.23% feature a combination of traditional and modernist values, while only 1% share modernist and postmodernist values.

Traditional values or private life values are the structural elements of today's students' worldview. The number of students who aim to invest in their human capital by obtaining a higher education is 62.85%. This is also the proportion of students who see at least one modernist value as positive. A combination of four out of six modernist values comprises the classical value system for investing in one's human capital. The combination of money, material assets, and success can be referred to as material success. If it is complemented by career and professional growth, this combination can be perceived as a career that brings material success. If we add the resulting construct with education and professionalism, we can formulate a typical modernist human capital investment value: obtaining an education to facilitate career growth and bring about material success. Further on, we shall analyze these four values (Table 117.1).

Based on the data in Table 117.4, we see that about a third (32%) of the respondents chose money and material assets as values, over a quarter (26.8%) selected career and professional growth, a fifth (20.9%) selected success, and about a sixth (15.1%) chose education and professionalism.

The analysis of modernist values across extended degree groups (if significantly different from the analysis without classifying students according to their specialization) showed that the relevance of the career and professional growth value was strongly influenced by the degree area. This value was the least significant for natural science and engineering students (23.7%), and it was more relevant for social studies and humanities students (30.0%) than for the economics and management students (27.6%).

Based on the data in the table, we can claim that students from Almetyevsk attribute significantly less importance to modernist values (24.4% for money and material assets, 20% for career and professional growth, 15.6% for success, 2.2% for education and professionalism) than students in general. This is due to the fact that the city is less urbanized than the others, and it retains a small-town lifestyle where demonstrating one's individuality and difference from the surrounding is uncommon. Traditional private life values are the most prominent ones here.

Let us review how students value systems impact their satisfaction with studying. The results of verifying the hypothesis that there is a connection between two attributes using the chi-squared test are shown in Tables 117.2 and 117.3.

Table 117.4 contains data on the proportions of students whose dissatisfaction causes and values correlate.

According to data from Table 117.4, we can conclude that the students who are completely satisfied with their education contain the smallest number of those who selected the majority of the following values: money and material assets (15.9%), career and professional growth (13%), success (10.1%). Only the proportion of those who selected education and professionalism as values (2.2%) among them is the same as for the whole set of respondents. This distribution means that the proportion of

Table 117.1 Distribution of responses to the question “What is the most valuable thing in life?” across the degree areas and cities of residence in %

Degree area		City				Total			
Natural sciences and engineering	Social studies and humanities	Economics and management	Naberezhnye Chelny	Nizhnekamsk	Almeteyevsk	Kazan	Naberezhnye Chelny		
Money, material assets	31.5	33.7	31.1	27.6	29.3	24.4	33.6	27.6	32.0
Career, professional growth	23.7	30.0	27.6	29.9	36.6	20.0	26.0	29.9	26.8
Education, professionalism	14.7	15.6	15.0	23.9	12.2	2.2	14.3	23.9	15.1
Prestige, fame	7.5	5.3	2.0	4.5			5.9	4.5	5.1
Respect, recognition	14.7	14.8	15.0	12.7	29.3	8.9	14.8	12.7	14.8
Success	19.8	18.1	24.6	23.1	7.3	15.6	21.7	23.1	20.9

Table 117.2 Contingency tables for preferred modernist values (career, professional growth, education, professionalism) and study dissatisfaction causes

		Career, professional growth		Chi-squared		Chi-squared
		Yes	No	Yes	No	
The predominance of traditional education forms	Yes	35	65	13	86	
	No	190	580	4.92	110	660 0.09
Low quality of training in many subjects	Yes	60	104	29	134	
	No	165	541	12.12	94	612 2.18
Poor connection between the acquired knowledge and real-life and professional activities	Yes	82	233	43	273	
	No	142	412	0.02	81	474 0.16
Teachers pay little attention to face-to-face work with students	Yes	41	81	13	109	
	No	184	564	4.43	110	637 1.42
Teachers often have biased attitudes	Yes	69	146	29	186	
	No	156	499	5.78	94	560 0.10
Low chances of getting a job in the degree field after graduation	Yes	108	234	72	270	
	No	117	411	9.60	52	476 21.31

(continued)

Table 117.2 (continued)

		Career, professional growth		Chi-squared		Education, professionalism		Chi-squared	
		Yes	No			Yes	No		
Lots of drawbacks in the organization of the study process	Yes	47	125	0.23	89	35	137	6.51	
	No	178	520			609			
Overloads, lack of time	Yes	39	94	0.98	21	21	112	0.35	
	No	186	551			102	635		
Everything is fine	Yes	12	80	565	8.81	16	76	0.83	
	No	213	565			107	670		

Note the critical values $\chi^2(0.05, 1) = 3.84$. Statistically significant correlations are put in bold

Table 117.3 Contingency tables for preferred modernist values (money, material assets, success) and study dissatisfaction causes

		Money, material assets		Chi-squared	Success	Chi-squared
		Yes	No			
The predominance of traditional education forms	Yes	36	64		39	61
	No	254	516	0.36	149	621
Low quality of training in many subjects	Yes	78	85		43	121
	No	211	495	19.25	145	561
Poor connection between the acquired knowledge and real-life and professional activities	Yes	112	203		65	250
	No	178	377	1.09	122	432
Teachers pay little attention to face-to-face work with students	Yes	56	67		48	74
	No	234	514	9.65	140	608
Teachers often have biased attitudes	Yes	74	141		47	169
	No	215	439	0.17	141	514
Low chances of getting a job in the degree field after graduation	Yes	129	213		94	247
	No	161	367	4.87	93	435
Lots of drawbacks in the organization of the study process	Yes	76	96		51	121
	No	214	484	11.36	137	561
Overloads, lack of time	Yes	64	69		40	93
	No	226	511	15.44	148	589
everything is fine	Yes	15	77		9	82
	No	275	793	4.02	178	600
						8.13

Note the critical values $\chi^2(0.05, 1) = 3.84$. Statistically significant correlations are put in bold

Table 117.4 Distribution of responses to “What is the most valuable thing in life?” and “Why are you dissatisfied with studying?” in % of the selected value

	Money, material assets	Success	Career, professional growth	Education, professionalism
Predominance of traditional education forms	36.0	38.7	34.7	13.3
Low quality of training in many subjects	48.0	26.0	36.6	17.9
Poor connection between the acquired knowledge and real-life and professional activities	35.4	20.7	26.2	13.5
Teachers pay little attention to face-to-face work with students	45.7	39.1	33.7	10.9
Teachers often have biased attitudes	34.6	21.6	32.1	13.6
Low chances of getting a job in the degree field after graduation	37.7	27.6	31.5	21.0
Lots of drawbacks in the organization of the study process	44.2	29.5	27.1	20.2
Overloads, lack of time	48.0	30.0	29.0	16.0
Everything is fine	15.9	10.1	13.0	17.4
Total	32.0	20.9	26.8	15.1

Note statistically significant correlations are put in bold

students who selected the same values will be higher than the average among those who selected other causes of their dissatisfaction with studying.

117.5 Discussion

The classical value system in human capital investments influences only one of the job dissatisfaction causes: “I am not sure I can get a job in my degree field after I graduate.” This is one of the most popular answers, and it reflects the worry that after the graduation students will not be able to utilize their human capital.

The only cause of dissatisfaction with studying that is statistically uninfluenced by any of the four modernist values is the poor connection between the acquired knowledge and real-life and professional activities. This problem is a result of evaluating the study process not as something valuable per se but from the point of view of applying the acquired knowledge in future jobs, and it reflects the skepticism toward the existing education system that lags behind the real life. Thus, the respondents that do not see education as preparation for their future professional activity do not have to be aimed at investing in their human capital.

Three values (money and material assets, success, education, and professionalism) have a statistically significant influence on dissatisfaction with studying due to the numerous drawbacks in the organization of the study process. The combination of these values helps students aim at investing in their human capital through education that must bring about material success. Respondents believe that external conditions do not allow them to efficiently invest their resources (money, time, etc.) to develop their human capital. As we can see in Table 5, the education and professionalism value only has a statistically significant influence on two of the dissatisfaction causes. Some of the causes are influenced by a combination of other modernist values excluding education and professionalism. This combination cannot be seen as a value system for investment in one's human capital.

117.6 Conclusion

Throughout the research, we determined that modernist values are perceived as positive by the majority of students. Therefore, they significantly influence various aspects of their lives, including their satisfaction with studying at universities. This must be taken into consideration when determining quality indicators for educational services. Special focus must be made on the real-life applicability of the subjects taught and the structural organization of the study process.

The results covered in this paper reflect only a part of the data we obtained during the research. We shall describe the influence of postmodernist values on students' satisfaction with the study process in the following publications.

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Chapter 118

Experience in Defect Formation on Examination Models for Certifying Personnel



M. Arkulis , O. Logunova , and N. Misheneva

Abstract The paper substantiates and presents two simple methods for obtaining defects on the surface of samples for conducting a practical examination during personnel certification in accordance with the rules of IS-03-440-02: a method for cutting cracks on a sample and a method for inserting a joint with welding. A distinctive feature of the methods is the possibility of obtaining defects on the surface of examination specimens with a given orientation, localization, and size. The developed methods allow creating sets of samples for examination centers. In the period from 2018–2020 in the laboratory of non-destructive testing of the Federal State Budgetary Educational Institution of Higher Education “NMSTU” made and certified more than fifty samples. The authors of the work proposed two simple methods for obtaining defects on examination specimens: a method for cutting cracks on a specimen and a method for insertion with welding. A distinctive feature of the proposed methods is the simplicity and the possibility of obtaining defects on the surface of samples with a given orientation, localization, and size.

118.1 Introduction

Ensuring safe operation of pipelines in all operation areas is one of the main problems of the modern pipe manufacturing industry. To date, most of the pipes are manufactured using welded joints.

The most costly part of projects for the transportation of gas, oil, and similar projects is the creation of a transport system, the cost of which reaches 70%. The high cost of transport systems and the safety requirements for its operation require a high-quality quality expert assessment of welded joints. In order to assess the quality of welded joints, non-destructive testing methods are actively used [1–3, 5]. The methods for automated assessment of product quality are also being developed [3, 4].

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Personnel qualifications and experience are the basis for obtaining reliable information on the quality of welded joints [6, 7]. Certification of qualified personnel is carried out in accordance with the Rules for certification of personnel in the field of non-destructive testing (PB-03-440-02) [8]. These rules determine the multistage certification and include a practical examination at the final stage. During the practical examination, candidates must confirm possession of non-destructive testing tools, control technology, the ability to register, analyze the results in accordance with regulatory documents, and, for level II candidates, draw up a conclusion based on the control results [8].

According to the personnel certification rules [8], practical examinations are conducted on examination samples that correspond to the selected control objects. Examination samples must contain characteristic defects that arise at various operation stages of objects. The category of the most common defects to be detected includes defects in welded joints: cracks, pores, undercuts, lack of penetration, lack of edge fusion, etc. Depending on the defect localization, various control methods are selected and applied. Internal defects are detected by ultrasonic, radiation, X-ray methods. Surface defects are detected by magnetic particle flaw detection (MPD), capillary (PMT), fluxgate, and eddy current methods [9–13]. When conducting the examination, it is important to provide the examinee with samples with defects of various localizations on the test object (TO) surface: weld metal, heat-affected zone (HAZ), fusion zone, base metal.

The techniques for the formation of artificial defects are described in the normative and technical documentation. Methods for the formation of internal defects are quite simple and not laborious in execution. Basically, they consist in laying a refractory fragment in the groove area with subsequent welding. The situation is more complicated with superficial discontinuity.

The documents [14, 15] describe the formation methods of surface defects by repeated overheating of the samples followed by sharp cooling, as well as the procedure for the destruction of the pre-hardened surface layer of the sample material. Strengthening of the surface layer is carried out by chemical-thermal treatment (nitriding, cyanidation, etc.), surface heat treatment with high-frequency currents, and chemical-thermal treatment with induction heating.

The described methods are rather laborious and require expensive equipment and materials. Moreover, the disadvantage of the described methods is the unpredictability of the localization and direction of the defect development on the sample surface.

In order to conduct a practical examination successfully, a set of samples is required, on which typical and non-typical types of defects are presented. For example, it is necessary to have samples with a longitudinal crack in the weld metal.

The guidance document [16] presents the classification of welded joint defects. According to [16], the classification of surface cracks of various localization includes more than 10 types. Each type of crack has a designation, which reflects the type of defect, direction, location and size. For example,

- the designation “1011-100-10” identifies a longitudinal crack in the weld metal with a coordinate of 100 mm from the reference point, with a length of 10 mm;
- the designation DE-125-30 identifies a longitudinal crack with a origin coordinate of 125 mm and a length of 30 mm, according to RD-125-60-10-KTN 016-15 (rev. 1) [17].

The authors' experimental experience in the manufacture of examination specimens in a non-destructive testing laboratory at FSBEI HE Nosov Magnitogorsk State Technical University made it possible to develop two fairly simple and easy-to-use methods for obtaining surface defects of samples with welded joints. A distinctive feature of the proposed methods is the possibility of obtaining defects on the surface of samples with a given orientation, localization, and size: a method of cutting cracks on a sample and a method of insertion with welding.

118.2 Methods for Formation of Defects on the Surface of Examination Samples

118.2.1 Method for Cutting a Crack in a Sample

The method of cutting a crack in a sample contains a sequence of steps:

- (1) the prepared fragment of the welded joint is cut from the back side (from the root of the seam) with a cutting disk 1.5–2.5 mm thick to a depth equal to the thickness of the weld seam minus 1–2 mm, the hole in the cut is controlled with a caliper, the length of the slot is set based on the size of the formed crack;
- (2) the remaining 1–2 mm is punched with a pre-prepared punch to the appearance of a crack on the outside of the seam, which is visible to the naked eye;
- (3) the sample is turned over, the slot is welded, and the weld is cleaned;
- (4) the crack is caulked from the outside with a prepared mandrel, which makes it possible to reproduce the original flakiness of the seam and the shape of the surface;
- (5) the crack is processed with an abrasive tool to the “invisible” state.

Pro-welding should be carried out exactly at the fourth stage, because if this is done after the final finishing of the crack to the “invisible” state, it can disperse.

Tool description: The punch is made of high carbon steel. The punch should be thick enough to fit freely into the slot. A band saw blade is used as the material for the punches.

118.2.2 Pro-weld Insertion Method

The pro-weld insertion method contains a sequence of steps:

- (1) the sample is cut with a cutting disk from the front side;
- (2) a wedge-shaped metal insert made of the sample material is driven into the slot in such a way that it completely fills the crack;
- (3) the insert and the base metal are welded from one side of the insert;
- (4) the insert is cut to the level of the base metal surface;
- (5) the insert is cleaned to the required roughness value (according to the requirements of the normative and technical documentation).

The developed methods make it possible to form defects in the fusion zone, heat-affected zone, and the base metal of the examination sample.

118.3 Results and Discussion

1. An invisible crack is a subjective concept. Visual measurement control involves the use of optical systems, with the help of which the expert sees almost any defect with an exit to the surface. However, in the arsenal of any inspector there are a number of examples in which it is impossible to visually detect a defect even with an “armed” eye. Figure 118.1 shows a sample before and after magnetic particle inspection.

As a sample, we used a template cut from the forging of the “wheel” part made of 35 structural high-hardness steel (SHS steel). The photographs (Fig. 118.1) show the images of the sample at the preparation stages of the test surface and after the test. Cracks on its surface before inspection cannot be discerned even with an 8× magnifying glass.

The sample was controlled by magnetic particle inspection in accordance with GOST R 56512-2015 Non-destructive testing. Magnetic particle method. Typical technological processes [10]. In this example, the crack opening is so small that, with capillary inspection, defects appeared only after a few days.

2. In the developed methods, defects are obtained that are detected by all methods of non-destructive testing. If, after bringing the crack to the finished state, it is not controlled by the PMT method, this means that as a result of grinding the crack is “licked.” Consequently, an internal defect with a shallow depth of

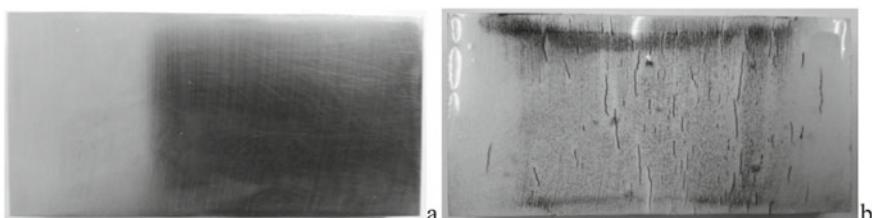


Fig. 118.1 Examination sample: **a** before the control; **b** after control

occurrence was obtained. This observation casts doubt on the advisability of carrying out capillary control as a duplicate after the procedure for eliminating the defect by the sampling method in real conditions. Defects with a depth of 1 mm are detected by MPD, flux gate, and eddy current methods.

Here are a number of photographs (Fig. 118.2) of samples with defects obtained by the described methods and revealed by the method of magnetic particle flaw detection. It should be noted that the defects on the sample remained invisible prior to testing.

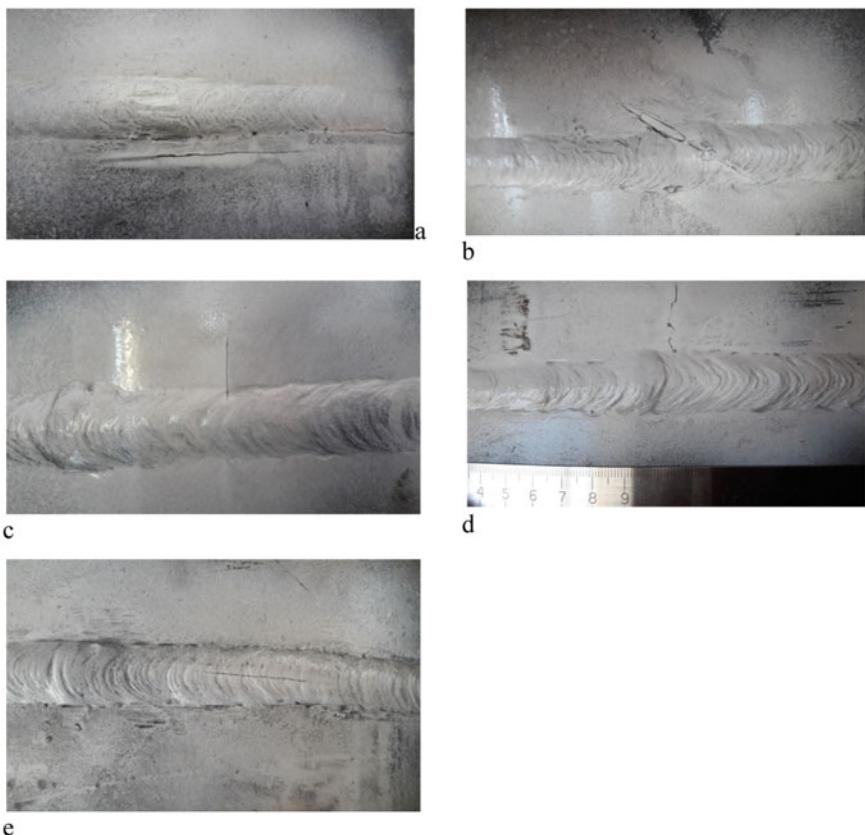


Fig. 118.2 Photographs of samples with defects: **a** longitudinal crack in the HAZ; **b** branched crack in weld metal with transition to HAZ; **c** transverse crack in the HAZ; **d** transverse crack in the HAZ; **e** longitudinal crack in the weld metal

118.4 Conclusions

1. To date, there is a high demand for certified personnel for non-destructive testing of welded joints of pipe metal, which is the main material for creating transport systems in the oil and gas and other industries.
2. Existing methods of creating examination samples for conducting a practical examination during personnel certification are labor-intensive and do not allow obtaining samples with a given number and location of defects.
3. The authors of the work proposed two simple methods for obtaining defects on examination specimens: a method for cutting cracks on a specimen and a method for insertion with welding. A distinctive feature of the proposed methods is the simplicity and the possibility of obtaining defects on the surface of samples with a given orientation, localization and size.
4. With the help of the developed methods for the formation of defects, more than fifty examination samples were made and certified for conducting a practical examination. All samples are accompanied by technological control charts and conclusions of specialists of the third and second levels.
5. The problem of using capillary control as a duplicate one after the defect elimination by the sampling method is indicated.

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Chapter 119

Strategy for Forming Financial Resources in the Context of a Conflict of Interests Between an Economic Entity and Its Creditors



E. P. Peshkova, S. P. Kyurdzhiev, and A. A. Martazanov

Abstract Subject of article is the development of theoretical provisions and methodological approaches to the development of a strategy for the formation of financial resources in the context of a conflict of interests of an economic entity and its creditors. Aim of the work is to propose a methodology for analyzing the impact of profitability and the price of borrowed capital on the financial condition of a business entity using a game-theoretic approach, which makes it possible to find out the effect of the return on assets on the stability of the financial position of an enterprise. Research hypothesis is based on the objective need for a comparative analysis of the impact of profitability and the cost of borrowed capital on the financial position of an economic entity. Methodological foundations of the analysis of the financial condition of business entities are applied using game theory and economic and mathematical modeling: comparison of the impact of profitability and the cost of borrowed capital on the financial condition of business entities. Proposed approaches can be used by financial analysts to attract alternative sources of the formation of investment resources and, accordingly, the need to enter foreign markets in order to mobilize additional financial resources.

119.1 Introduction

Financial resource management is aimed at providing a business entity with the necessary financial support for the implementation of current financial and economic activities. Choice of a source of financing is determined by the need of a business unit for financial resources, as well as a combination of factors affecting the conditions of its functioning and use. Analysis and assessment of the results of the formation

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of financial resources and their impact on the stability of the financial condition of a business entity are an important stage in the early diagnosis of crisis phenomena in the economy.

Competition, structural transformation and a number of adverse events change the norms of functioning of market participants and create unexpected, and sometimes even crisis situations. Currently, all business entities operate in conditions of freedom of choice of management decisions, and the state only creates such opportunities and maintains general rules of conduct for all subjects of market relations. Lack of market space is a limitation of economic freedom when there is a threat of violation of the rights of at least one of the participants.

Thus, the directions for increasing the efficiency of the financial and economic activities of business entities provide for the creation of appropriate operating conditions, covering a complex of organizational, economic, methodological, and methodological measures focused on the formation of their financial strategy in a competitive environment. Determination of the directions of financial and economic development of a business entity in such conditions requires a systematic approach to the use of various management tools, including the use of a mathematical apparatus and modern computer technologies in making managerial decisions.

119.1.1 Scientific Significance of the Issue and Problem Statement

The implementation of the strategy of economic and social development of Russia requires appropriate funding, which will ensure the effective functioning and development of all links of the national economy. Formation of financial resources of business entities creates the preconditions for rapid economic growth in a competitive environment both in the domestic and in the foreign markets.

Management of the formation of financial resources is associated primarily with the processes of attracting them from various sources in accordance with the needs of enterprise development [1].

It is obvious that each business entity, regardless of the type of economic activity, pursues its own interests (making a profit) and can use various methods to achieve its goals. A characteristic feature of the market environment is the fact that business entities are in a conflict situation (the interests of the participants contradict each other) and at the same time act in the absence of complete information about the intentions of other participants. In particular, in the financial market, the buyer of money (business entity) tries to get the funds he needs at the lowest price (i.e., to minimize his expenses), and the seller (creditor)—to provide (sell) funds at the highest price (to get the maximum profit).

Taking into account the peculiarities of equity and borrowed capital, it can be stated that their ratio, i.e., capital structure, has a certain impact on some indicators of the business entity [2]. Based on this, we should talk about optimizing the structure

of capital, determining such a ratio that maximizes the total value of an economic entity. However, optimization is a relative concept, always associated with a certain criterion that must be maximized or minimized in order to achieve the best value.

Assessment of the structure of financial resources of a business entity is determined by the need and its ability to meet its debt obligations. Corresponding methodology is based on the calculation of indicators characterizing the composition of capital and the possibility of maintaining its structure. Based on this, two groups of indicators are distinguished, which are conventionally called capitalization ratios and coverage ratios.

Financial risk ratio is the most important indicator of financial stability and the efficiency of the financial and economic activity of a business entity, since it acts as a controllable parameter for increasing the return on equity. The growth of this ratio in dynamics means an increase in financial dependence and financial risk, a fall in the market value of capital. Nevertheless, given a fairly high level of profitability, increasing this ratio is not economically feasible.

Thus, it will be justified to use it to study the financial condition of a business entity and determine the impact of the cost of borrowed capital on the economic activity of a business unit. In this case, the financial and economic activities of each market participant will depend on the balanced management decisions made by each party. In many cases, the uncertainty is not caused by the opposition of the partner, but by the lack of awareness of the participant about the conditions in which the parties operate. In this case, the actions of the “intelligent agent” (who makes a decision) are determined by his awareness of the state of the environment, as well as predictive data, which depend on uncertain parameters and actions of the player himself (game theory). Therefore, the behavior of any particular business entity cannot be specified, but is determined by the peculiarities of taking into account the possible behavior of all market participants. Analysis of the game consists in the ability to predict its solutions—a set of possible moves and their results [3].

Modeling the choice of a strategy for the impact of return on assets and the price of borrowed capital on the financial condition of a business entity. Our studies have made it possible to manifest a certain conflict situation in the market: Under certain conditions, with a decrease in the profitability of activities, business entities tend to attract additional financial resources at the highest interest rates.

In the process of performing the correlation analysis (the dependence of profitability and the cost of borrowed capital—Table 119.1), we see a dependence, in most cases the opposite, i.e., the cost of borrowed capital increases in many cases in the process of reducing the profitability of business. This situation is understandable from the point of view of the lender (banking institution), which charges a high initial cost of bank credit resources, a premium for the risk of the borrower's insolvency in the future and non-return of funds to the interest rate for borrowed funds. Nevertheless, the consent of a business entity to attract financial resources looks illogical, provided that entrepreneurial activity is unprofitable, as well as, provided that there are no sources of repayment of borrowed funds and that debt dependence generally worsens.

Table 119.1 Correlation analysis dependence of the return on assets and cost of borrowed capital for economic entities in energy sector in 2010–2019

Entrepreneur	Relationship value
PJSC “Rostovenergo”	-0.487
PJSC Volgogradenergosbyt	-0.185
PJSC “Astrakhanenergo”	0.066
Adyge ES: branch of PJSC Rosseti Kuban	-0.661
PJSC “Stavropolenergosbyt”	-0.236
PJSC “Kubanenergo”	-0.142

Consider the problem of modeling the choice of a strategy for the influence of the return on assets and the price of borrowed capital on the financial condition of a business entity. These indicators reflect the dynamics and efficiency of financial and economic activities. A correct assessment of the impact of their ratio makes it possible to choose a financial strategy.

Let us conduct a correlation analysis of the dependence of these indicators to assess the financial condition of a business entity, taking into account the relationship between the return on assets and the average cost of borrowed capital (Table 119.1).

Data in Table 119.1 show that there is an inverse relationship between the return on assets and the cost of borrowed capital, i.e., an increase in the profitability of entrepreneurial activity makes it possible to attract additional financial resources at a low price. This dependence is most clearly traced for the Adyge ES (-0.661) and Rostovenergo (-0.487). Actually, data we obtained show (the value of the number modulo from 0.124 to 0.661) that the cost of resources is one of the factors affecting the final financial result of a business entity.

Analysis of the macro- and microeconomic environment of the functioning of a business entity makes it possible to determine the directions of its entrepreneurial activity, which would ensure the desired result at minimum cost. Nevertheless, the competitive conditions of the market space provide for uncertainty in the actions of individual players. Thus, the influence of the profitability of the assets of a business entity and the price of borrowed capital on the stability of its financial condition is expedient, in our opinion, to represent in the form of a final antagonistic game [3]:

$$\Gamma = \langle A, B, C \rangle, \quad (119.1)$$

where A —set of possible values of the return on assets; B —set of possible values of the price of borrowed capital; C —utility function of a business entity.

Business entity and the creditor independently of each other choose a specific strategy of behavior and.

$$A = \{1, 2, \dots, m\}, \quad B = \{1, 2, \dots, n\}, \quad (119.2)$$

where m and n —number of net strategies of influence, respectively, of the return on assets and the average cost of borrowed capital on the stability of the financial condition of a business entity.

Then the value of the function C can be represented as:

$$C = \|C_{ij}\|, i \in [1, m], j = [1, n], \quad (119.3)$$

in the i th row of which the winning values of the return on assets are sequentially located in situations $(i, 1), (i, 2), \dots, (i, n)$, and in the j th column are its winning values in situations $(1, j), (2, j), \dots, (m, j)$.

Let us denote by the k_i return on assets, and by the price of borrowed capital in the i th year. Then we represent the payoff matrix C :

$$c_{ij} = \begin{cases} k_i, & \text{where } i = j, \\ -l_i, & i \neq j \end{cases} \quad (119.4)$$

Let us reduce the matrix C to an equivalent matrix with a zero diagonal C^* [4, 5], and for this, we multiply the first one by the coefficient s_1 , the next one—by s_2 , and so on, so that the condition is met:

$$s_1 k_1 = s_2 k_2 = \dots = s_n k_n = k, \quad (119.5)$$

and subtract the number k from all elements of the matrix (4). We get the matrix C^* :

$$C^* = \|c_{ij}^*\|. \quad (119.6)$$

$$c_{ij}^* = \begin{cases} 0, & \text{where } i = j, \\ -d_i, & i \neq j \end{cases} \quad (119.7)$$

$$d_i = k \left(\frac{l_i}{k_i} + 1 \right), \quad t_j = k \left(\frac{l_j}{k_j} + 1 \right). \quad (119.8)$$

Resulting matrix C^* contains many optimal strategies for the impact of the return on assets on the price of borrowed capital. Using the previous calculations, we can find the optimal strategies for the players.

Optimal strategy for the impact of the return on assets will be determined by the vector $B = (b_1, b_2, \dots, b_n)$ on the stability of the financial condition of the business entity, the elements of which are equal [6]:

$$b_i = 1 - \frac{n-1}{1 + \sum_{\substack{j=1 \\ j \neq i}}^n \frac{d_j}{t_j}}, \quad \sum_{i=1}^n b_i = 1, \quad (119.9)$$

$$i \in [1; n]; \quad j \in [1; n].$$

Vector defines a mixed strategy of the influence of the price of borrowed capital on the financial condition of a business entity:

$$a_i = 1 - \frac{1}{1 + \sum_{\substack{j=1 \\ j \neq i}}^n \frac{d_j}{t_j}}, \sum_{i=1}^n a_i = 1, i \in [1; n]; \quad j \in [1; n]. \quad (119.10)$$

To solve this problem, we use the data of the subjects of entrepreneurship of the energy sector studied by us for 2010–2019, given in Table 119.2.

Thus, if business entities have the opportunity to use various sources of financial resources, then the probabilities a_i and b_i can be interpreted as, respectively, the shares of the influence of the cost of borrowed capital and the return on assets on the stability of the financial condition of the business entity.

Let us take the return on assets and the price of borrowed capital from Table 119.1, we will build a matrix C for PJSC “Rostovenergo” (matrices C for other business entities which are presented (119.11)):

$$\begin{pmatrix} 0.003 & -0.029 & -0.029 & -0.029 & -0.029 & -0.029 & -0.029 & -0.029 & -0.029 \\ -0.015 & 0.034 & -0.015 & -0.015 & -0.015 & -0.015 & -0.015 & -0.015 & -0.015 \\ -0.022 & -0.022 & 0.008 & -0.022 & -0.022 & -0.022 & -0.022 & -0.022 & -0.022 \\ -0.027 & -0.027 & -0.027 & 0.013 & -0.027 & -0.027 & -0.027 & -0.027 & -0.027 \\ -0.026 & -0.026 & -0.026 & -0.026 & 0.019 & -0.026 & -0.026 & -0.026 & -0.026 \\ -0.044 & -0.044 & -0.044 & -0.044 & -0.044 & 0.014 & -0.044 & -0.044 & -0.044 \\ -0.069 & -0.069 & -0.069 & -0.069 & -0.069 & -0.069 & 0.024 & -0.069 & -0.069 \\ -0.096 & -0.096 & -0.096 & -0.096 & -0.096 & -0.096 & -0.096 & 0.025 & -0.096 \\ -0.118 & -0.118 & -0.118 & -0.118 & -0.118 & -0.118 & -0.118 & -0.118 & 0.018 \\ -0.146 & -0.146 & -0.146 & -0.146 & -0.146 & -0.146 & -0.146 & -0.146 & -0.01 \end{pmatrix} \quad (119.11)$$

To construct an equivalent matrix with a zero diagonal (119.11), we multiply first row of the matrix by $S_1 = 1$, second by $S_2 = 0.088$, third by $S_3 = 0.375$, fourth by $S_4 = 0.231$, fifth by $S_5 = 0.158$, sixth by $S_6 = 0.214$, seventh by $S_7 = 0.125$, eighth by $S_8 = 0.120$, ninth by $S_9 = 0.167$, tenth—by $S_{10} = 0.300$ and subtract the value $k = 0.003$ from all elements. We get (119.12):

$$\begin{pmatrix} 0.000 & -0.032 & -0.032 & -0.032 & -0.032 & -0.032 & -0.032 & -0.032 & -0.032 \\ -0.004 & 0.000 & -0.004 & -0.004 & -0.004 & -0.004 & -0.004 & -0.004 & -0.004 \\ -0.011 & -0.011 & 0.000 & -0.011 & -0.011 & -0.011 & -0.011 & -0.011 & -0.011 \\ -0.009 & -0.009 & -0.009 & 0.000 & -0.009 & -0.009 & -0.009 & -0.009 & -0.009 \\ -0.007 & -0.007 & -0.007 & -0.007 & 0.000 & -0.007 & -0.007 & -0.007 & -0.007 \\ -0.012 & -0.012 & -0.012 & -0.012 & -0.012 & 0.000 & -0.012 & -0.012 & -0.012 \\ -0.072 & -0.072 & -0.072 & -0.072 & -0.072 & -0.072 & 0.000 & -0.072 & -0.072 \\ -0.015 & 0.015 & 0.015 & 0.015 & 0.015 & 0.015 & 0.000 & 0.015 & 0.015 \\ -0.023 & 0.023 & 0.023 & 0.023 & 0.023 & 0.023 & 0.023 & 0.000 & 0.023 \\ 0.041 & 0.041 & 0.041 & 0.041 & 0.041 & 0.041 & 0.041 & 0.041 & 0.000 \end{pmatrix} \quad (119.12)$$

Note that the transformation of matrix (119.11) to an equivalent matrix with zero diagonal (119.12) does not change the optimal strategies of a finite antagonistic game [6]. Based on matrix (119.12), we write:

Table 119.2 Dynamics of return on assets and the price of borrowed capital of economic entities in the energy sector in 2010–2019

Entrepreneur	Indicator	Years	2019						
			2010	2011	2012	2013	2014	2015	2016
Rostovenergo	Return on gross assets, k_i	0.003	0.034	0.008	0.013	0.019	0.014	0.024	0.025
	Debt capital price, l_i	0.029	0.015	0.022	0.027	0.026	0.044	0.069	0.096
Volgogradenergosbyt	Return on gross assets, k_i	0.073	0.154	0.120	0.024	0.011	0.017	0.014	0.011
	Debt capital price, l_i	0.027	0.068	0.027	0.014	0.014	0.030	0.023	0.025
Astrakhanenergo	Return on gross assets, k_i	0.067	0.073	0.086	0.116	0.065	0.091	-0.032	-0.051
	Debt capital price, l_i	0.000	0.082	0.137	0.057	0.052	0.042	0.050	0.073
Adygea ES	Return on gross assets, k_i	0.062	0.030	0.034	0.028	0.026	0.035	0.043	0.047
	Debt capital price, l_i	0.000	0.052	0.071	0.045	0.038	0.061	0.049	0.026
Stavropolenergosbyt	Return on gross assets, k_i	0.105	0.031	0.022	0.008	0.015	0.016	0.014	0.029
	Debt capital price, l_i	0.010	0.032	0.036	0.031	0.014	0.040	0.031	0.272
Kubanenergo	Return on gross assets, k_i	0.274	0.225	0.130	0.155	0.192	0.242	0.303	0.153
	Debt capital price, l_i	0.011	0.028	0.116	1.465	0.000	0.120	0.084	0.126

$$\begin{aligned} d_1 &= 0.032; d_2 = 0.004; d_3 = 0.011; d_4 = 0.009; d_5 = 0.007 \\ d_6 &= 0.012; d_7 = 0.012; d_8 = 0.015; d_9 = 0.023; d_{10} = 0.041 \end{aligned} \quad (119.13)$$

The ratio (119.9) and (119.10), which are used to calculate strategies a_i and b_i , in our case, will look like this:

$$\begin{aligned} b_i &= 1 - \frac{9}{1 + \sum_{\substack{j=1 \\ j \neq i}}^{10} \frac{d_j}{t_j}}, \quad a_i = 1 - \frac{1}{1 + \sum_{\substack{j=1 \\ j \neq i}}^{10} \frac{d_j}{t_j}}, \\ i &\in [1; 10]; \quad j \in [1; 10]. \end{aligned} \quad (119.14)$$

Let us calculate the strategies a_i and b_i , using the values of the coefficients d_i and t_j , we found above. The results are shown in Table 119.3.

Analysis of the performed calculations makes it possible to draw the following conclusions: (1) the influence of the price of the borrowed capital of a business entity on its financial condition in the case of a balanced production and financial policy for the period 2010–2019 differs by 21.3%. In particular, the greatest impact was observed in 2011—24% and the smallest in 2010—3.7%; (2) at the same time, the impact of the return on assets on the financial condition of a business entity for the period 2010–2019 was more ambiguous and this value was 61.6%, in particular, the highest in 2010—67.1%, and the lowest in 2012—6.5%.

Negative values of the indicators calculated by us indicate a_i and b_i that a number of unforeseen and unexpected factors influenced the activities of the business entity in the i th year.

Similarly, we calculate the effect of the price of borrowed capital and profitability on the stability of the financial condition of a business entity.

On the basis of all the calculated indicators, the financial work in the Adyge ES is best organized (here you can determine the base cost of capital and find the optimal values of the profitability components).

Table 119.3 Dynamics of return on assets and the price of borrowed capital of economic entities in the energy sector in 2010–2019

No.	Years	a_i	b_i
1	2010	0.037	0.671
2	2011	0.240	-1.433
3	2012	0.103	0.065
4	2013	0.127	-0.140
5	2014	0.165	-0.481
6	2015	0.094	0.154
7	2016	0.101	0.095
8	2017	0.081	0.275
9	2018	0.052	0.536
10	2019	-0.028	0.257

Optimization of the interests of the business entity and the creditor. It should be noted that the application of game theory has two different aspects: It can be used, firstly, to optimize the decision-making mechanisms of counterparties, and secondly, to determine the principles of organization.

In particular, in the second case, the question of stability of the game in the understanding of DF Nash is relevant [7]. If each participant builds expectations of the partner's behavior according to past experience, the solutions of this game that are stable in some sense are called equilibrium. In these cases, the Nash equilibrium is of particular importance. The game is called stable in the understanding of Nash, if none of the players can increase the winnings only by their own actions. Nash equilibrium is a point from which no player has any reason to follow a partner, and strict Nash equilibrium is a point from which it is not profitable to follow.

Since the interests of market participants do not coincide, we need to find a compromise solution that would satisfy both participants. As we have already noted, the behavior of both players is determined by the strategies of actions A and B (119.2), we denote their frequencies p_1, p_2, \dots, p_m and, respectively, q_1, q_2, \dots, q_m , where:

$$\begin{aligned} p_i &\geq 0, \quad \sum p_i = 1, \quad i \in [1; m] \\ q_j &\geq 0, \quad \sum q_j = 1 \quad j \in [1; n] \\ m &= n \end{aligned} \quad (119.15)$$

In mixed strategies, the equilibrium situation always exists; i.e., any matrix game in mixed strategies has a solution, and mixing strategies leads to an expansion of the payout opportunities, since the decoupling is based on calculating the average payoffs of players A and B, which can be determined by the formula [7]:

$$C_A = \sum_{i,j} a_{ij} p_i q_j, \quad C_B = \sum_{i,j} b_{ij} p_i q_j. \quad (119.16)$$

Let us focus on the case when each of the players has exactly two strategies (in our case, for a business entity—an increase and decrease in the return on assets, for a lender—the maximum and minimum cost of borrowed capital), i.e., $m = n = 2$. Let us construct the matrices of the players using the data in Table 119.2. When calculating, we will take into account that the cost of borrowed resources will be influenced by the financial condition of the business unit, in particular, the profitability indicators achieved in the previous period.

So, the matrices of Rostovenergo and creditors can be written as follows:

$$\begin{aligned} A &= \begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix} = \begin{pmatrix} 0.034 & 0.008 \\ 0.025 & -0.01 \end{pmatrix} \\ B &= \begin{pmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{pmatrix} = \begin{pmatrix} 0.022 & 0.027 \\ 0.118 & 0.146 \end{pmatrix} \end{aligned} \quad (119.17)$$

Having carried out the necessary calculations given in [8], we obtain an equilibrium situation, where $C_A = 0.08$, $C_B = 0.027$.

It should be noted that under such conditions a situation is realized when the payoff functions of both players reach their maximum simultaneously: lender receives the desired profit, and business entity has the opportunity to attract the necessary financial resources from outside, while maintaining a stable financial condition. Under such conditions, any deviation from the given situation of one of players will lead to a decrease in the payoffs of both. As you can see, payoff of each participant depends not only on the strategy he has chosen, but also on the strategies of other participants [9, 10].

119.2 Conclusion

Methodology determined in this way for modeling the possible behavior of market participants will affect the increase in the efficiency of actions of participants in credit relations in conditions of conflict of interest.

Proposed methodology for analyzing the impact of profitability and the cost of borrowed capital on the financial condition of a business entity using a game-theoretic approach makes it possible to find out the comparative effect of the cost of borrowed capital available to business entities in the case of a balanced financial policy, and to find out the influence of the return on assets on the stability of its financial condition.

Domestic business entities do not use the potential for increasing the return on equity by attracting borrowed resources from financial market.

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Chapter 120

Impact of Digitalization on the Efficiency of Russian Economy



M. A. Nikolaev and M. Yu. Makhotaeva

Abstract The object of the paper is to analyse the impact of digital transformation processes of the economy on its structural and qualitative characteristics, and to substantiate the strategic directions to improve economic dynamics in the context of the digital transformation of the economy. The analysis showed that the rather rapid development of the information infrastructure as well as the digital economy had not been accompanied by corresponding structural changes in the economy and improvements in its efficiency. The downfall of «digital inequality» indicators of regions has not led to a reduction, but to an increase of their socio-economic differentiation. In addition, the digitalization of economic sectors has had little impact on the sectoral structure of employment. Nor has the growth in digitalization been matched by positive performance indicators such as productivity and the share of the high-tech sector. The negative aspect of the digital transformation of the economy is the reduction of the need for highly qualified specialists and, as a result, the decrease in the number of students enrolled in higher education programmes. Low levels of investment and innovation, as well as high level of dependence on imported equipment and other products for the introduction of digital technologies, have been identified as the main factors for the lack of impact of the growth of digitalization on the efficiency of the economy. As a result, the multiplier effect from the rather impressive expenditures on the development of digital economy turned out to be insufficient for a significant improvement in economic dynamics.

120.1 Introduction

Digitalization is currently considered as a priority factor in the growth of regional economy. In this regard, technology and digital economy infrastructure development is among the main objectives of public policy.

At that, its main subjects are federal authorities and large IT companies. It should be noted that certain success has been achieved in solving this problem in recent years.

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So, for the period 2010–2017, in Russia as a whole, the proportion of organizations using broadband Internet access increased from 56.7 to 83.2%. At the same time, due to the higher growth rate in the regions lagging behind, the problem of «digital inequality» has been largely solved. Thus, for example, in 2010 in the Northwest Federal District the minimum value of the indicator was in the Republic of Komi—43.8%, and the maximum was in St. Petersburg—84.9%. By 2017, the indicator of Komi Republic increased to 88.1% and St. Petersburg—up to 93.5%.

At the same time, the decrease in the level of digital inequality did not have a significant impact on the socio-economic differentiation of regions (Fig. 120.1). So, if in 2010 the ratio of the maximum and minimum nominal nominal GRP per capita in the regions of the Northwest Federal District was 1.9, then in 2018 it increased up to 2.2 times.

The differentiation growth also takes place in other important socio-economic indicators: investments in fixed assets per capita, average monthly nominal accrued wages, etc. Thus, the Russian Federation regions have not yet been able to use the possibilities of digital economy to improve economic dynamics. Information infrastructure development and the fall in “digital inequality” level did not make a significant contribution to the reduction of socio-economic inequality.

When studying the issues of digital transformation of the economy, it is necessary to proceed from the fact that the main goal of digitalization is to use the information potential and communication technologies to form sustainable growth of the regional economy, as well as to promote innovation [1].

In the Development Strategy of the Information Society in the Russian Federation for 2017–2030, digital economy is considered as an economic activity in which digital data is the key factor of production. Their use can significantly improve the efficiency of the economy.

The increase in the economy efficiency as a result of digitalization is largely due to the labour market transformation, the reduction in the number of jobs requiring low

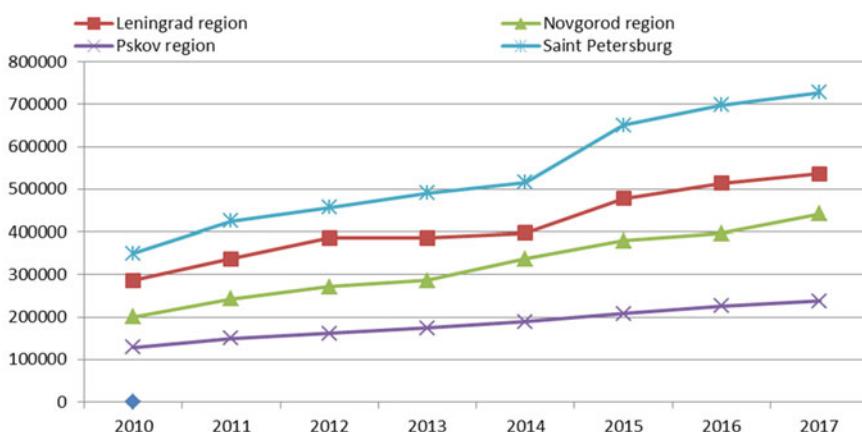


Fig. 120.1 Dynamics of the nominal gross regional product per capita, roubles

and medium skill levels and an increase in high ones. Research on this phenomenon received considerable attention in the scientific literature. There are conflicting estimates of the impact of the digital economy on employment. A number of experts are of the view that digitalization will lead to significant job cuts [2]. It is noted in the paper [3], for example, that in the digital economy, there is no need for a pool of low-skilled labour. It is the authors' opinion [4] that by 2030, about half of jobs in the world and a little less in Russia will have to be adapted during the Fourth Industrial Revolution, because they are doing routine, potentially automated work. High risks to sustainable employment are associated with the development of artificial intelligence, which contributes to the replacement of human resources and the reduction of jobs. At that the largest agglomerations with high proportion of digital economy and larger and more diverse labour markets have the lowest risk.

At the same time, many researchers hold the opposite view. In their view, digital technologies do not replace workers entirely, but mostly displace their new jobs created through the high-technology sector development and the acceleration of economic growth [5]. Thus, there is already a shortage of highly qualified personnel in the field of digital technology innovation [6].

So, the processes of digitalization lead to the low-skilled jobs cut, which can only be compensated by the creation of jobs in high-tech industries and, in part, in services. Given this, in order to achieve sustainable economic and social development in regions, the priority should be given to the development of high-technology sector of the economy. Besides, digital skills of both labour force and population of the region as a whole should also be enhanced.

The increase in the efficiency of the economy as a result of its digitalization is also due to the increase in labour productivity. The Development Strategy of the Information Society in the Russian Federation noted that the introduction of data-processing technology would reduce the cost of production of goods and providing services on that basis, ensuring the efficiency of digital economy.

At the enterprise level as well as at the level of the economy as a whole, the following factors in the efficiency of the digital economy may be considered [7–9]:

1. Operational management decision-making;
2. Improved forecasting and planning;
3. Introduction of innovative business models and technologies;
4. Optimization of internal and external business processes;
5. Accelerating the use by enterprises of new market opportunities through direct digital signals from the outside environment;
6. Improving customer service by customizing collaboration processes;
7. Expanding the enterprise market by using digital channels to interact with buyers;
8. Promoting competition by opening up new markets by developing digital channels of cooperation with suppliers and consumers;
9. Jobs creation through increased remote employment opportunities;
10. Improving the public services quality through their personalization and availability.

Thus, digitalization has the potential to increase economic efficiency. The challenge is to define the criteria for this efficiency. Labour productivity is the universal measure [10]. Economic efficiency enhancement from digitalization can also be viewed from the perspective of increasing the share of the high-tech sector of the economy.

Policy documents as well as scientific literature give considerable attention to this issue. Thus, the paper [11] examines the role of digitalization in shaping the ecosystem of innovative entrepreneurial economy, transforming knowledge and ideas into innovative products. The ecosystem brings together educational, and scientific organizations, as well as the business sector of the economy, and ensures the transfer and commercialization of knowledge, information and technology. The role of territorial innovative ecosystem in digital economy as a precondition for innovative ideas production and participation in global innovation processes is also given in the paper [12]. The programme “Digital Economy of the Russian Federation” defines as one of the goals “the creation of necessary and sufficient conditions of an institutional and infrastructural nature, the elimination of existing obstacles and restrictions for the creation and (or) development of high-tech businesses and the prevention of new obstacles and restrictions emergence both in traditional industries of economy and in new industries as well as in high-tech markets”.

Thus, the digital economy efficiency is improved in the following ways:

- Reducing low-skilled jobs proportion and increasing the proportion of high-tech jobs in the economy;
- Labour productivity enhancement through higher levels of production organization at all stages of value addition;
- Increasing the share of high-tech sector in the economy;
- Creating conditions for human capital development.

120.2 Problem Statement

The research goal is to analyse the impact of the economy digital transformation on its structural and qualitative characteristics and to substantiate the strategic directions for improving economic dynamics in the context of the economy digital transformation. The research focuses on the structural and qualitative characteristics of the economy and the impact on the dynamics of their digital development. The differentiation of regions according to the level of socio-economic development and the sectoral structure of the economy are considered as structural elements. The qualitative characteristics include labour productivity, high-tech industries share and the need for highly qualified specialists. The research methods include the analysis of domestic and foreign literature on the digitalization efficiency in terms of influencing the dynamics of socio-economic processes. The systematization of the authors' points of view in the scientific literature made it possible to substantiate the pressing problems of the development in the context of digital transformation of the economy. The use of integrated analysis of socio-economic processes made it possible to assess

the impact of digital processes on the structural and qualitative characteristics of the economy and to identify problems.

120.3 Research Findings

At the first stage, in order to analyse the impact of the processes of digitalization of business on the labour market, let us consider the dynamics of the sectoral structure of employment (Table 120.1). In 2017, two branches with high employment—manufacturing, as well as wholesale and retail trade, had the maximum value of «Business Digital Index» [13]. At the same time, the industries had different dynamics in the proportion of employees. When in manufacturing, the share of employment decreased by 4%, then in trade it increased slightly. Branches «Real estate activities» and «Water supply; wastewater disposal, waste management» had the minimum values of the digital index. At the same time, these activities were the most affected by the sectoral structure of employment. Employment in the medium-digital sectors (25–30%) also shows variety of trends.

Thus, at the level of the national economy, the impact of digitalization on employment in the industry is not apparent. Let us further consider the regional aspects of the impact of digitalization on the sectoral structure of employment using the example of St. Petersburg and the Pskov region. The regions have a similar economic structure and historically close economic ties. At the same time, the entities of the Federation are characterized by high and medium level of digital business, respectively [13].

Table 120.1 Structure of employed population by economic activity and business digital index

Economic sector	2010	2019	2010–2019	Business Digital Index (average 28.4)
Mining operations	2	2.3	15.00	29.1
Manufacturing	14.9	14.3	-4.03	34.9
Electricity, gas and steam supply;	2.8	2.6	-7.14	27
Water supply; wastewater disposal, waste management	0.9	0.7	-22.22	22.4
Construction	7.2	6.9	-4.17	25.4
Wholesale and retail trade	15.4	15.6	1.30	35.7
Transportation and storage	8.2	8.8	7.32	27.4
Hotel and catering activities	2	2.6	30.00	29.4
Information and communication activities (telecommunication)	1.8	1.8	0.00	42.5
Real estate activities	2.1	1.9	-9.52	15.6
Professional, scientific and technical activities	4.4	5.8	31.82	25.7

Two branches—«manufacturing» and «wholesale and retail trade; maintenance» has the maximum share in the sectoral structure of employment of the regions. Between 2010 and 2018, the share of these industries in the regions changed slightly. In Saint Petersburg, the share of manufacturing increased from 14.1 to 14.5%, while in the Pskov region it fell from 16.4 to 16.2%. At that the share of trade in Saint Petersburg declined from 21.7 to 20.7%, while in the Pskov region it increased from 16.0 to 16.4%. When analysing the dynamics of these industries, the high level of their digitalization must be taken into account. As well as at the level of the national economy, the share of the industry «hotels and catering activities» increased and the level of «real estate activities» decreased in the regions. As can be seen, at the regional level, the impact of digitalization processes on the dynamics of the sectoral structure of employment is not apparent either. Thus, the analysis does not reveal the significant impact of the level of digitalization of industries on job dynamics. The quantitative analysis confirms this conclusion, and the correlation between the indicators of the change in the share of employment in industry and the digitalization index is 0.17.

Let us further consider the impact of the digital transformation of the economy on the skills requirements of the labour force. Table 120.2 shows the dynamics of the composition of the employed population by the level of education for the Russian Federation as a whole, as well as for four regions—two metropolitan and two neighbour constituent entities of the Federation. The largest increase in the proportion of the persons with higher education was in Tver and the Pskov regions, with a slight increase in the metropolitan regions. A specific feature of St. Petersburg is a significant increase in the number of the employed with an average level of qualifications, against an insignificant increase in a higher qualification level, which is largely due to the development of manufacturing industries in the region.

Thus, the general trend is an increase in the labour force share with high level of qualifications and a decrease in the average one, which generally corresponds to the consequences of the economy digitalization presented in scientific literature. At the same time, we do not yet observe the processes of intellectual capital concentration in megalopolises, due to the growth of capital mobility and the increasing role of digital platforms [14].

Let us further consider the impact of digitalization processes on the economy efficiency. In the programme “Digital Economy of the Russian Federation”, one of the

Table 120.2 Composition of employed population by level of education

	Higher education			Secondary vocational education		
	2010	2018	Gains/decline	2010	2019	Gains/decline
RF	28.7	34.2	5.5	46.8	45	-1.8
Tver	20.4	25	4.6	55.8	55.5	-0.3
Moscow	47.9	49.7	1.8	44.1	43.1	-1.0
Pskov	20.7	26.3	5.6	53.5	51.9	-1.6
Saint Petersburg	43.4	43.5	0.1	39.1	43.2	4.1

goals is defined as “increasing competitiveness in the global market of both individual sectors of the Russian economy and the economy as a whole”. Labour productivity is one of the key factors of competitiveness. In this regard, it is important to analyse the relationship between the level of digitalization and labour productivity in the sectoral context. Table 120.3 presents business and labour productivity indices for the market sectors of the economy. The qualitative analysis does not reveal a significant impact of the level of digitalization on productivity. For example, industries with a high level of digitalization: manufacturing, trade and telecommunications, have, respectively, high, low and average productivity indices. The correlation coefficient between the indicators is minus 0.04, i.e. the level of digitalization of the industry actually did not affect labour productivity.

The digital processes efficiency can also be seen in terms of influencing the development of high-technology sector of the economy. The proportion of organizations using broadband Internet access will be used as the indicator of digitization. Over the period 2010–2018 for the Russian Federation as a whole, the value of the indicator increased from 56.7 to 86.8%. At the same time, the share of high-tech and knowledge-intensive products in the gross regional product remains almost at the same level (Fig. 120.2). In the Russian Federation as a whole, the rate fluctuates between 19 and 20%. The situation is similar in the other regions analysed. The exception is St. Petersburg, where the indicator is also quite stable but at a higher level.

Thus, the development of information infrastructure at the analysed stage of Russian economy development does not have a significant effect on the increase in the share of the high-tech economy sector. The development of human capital is

Table 120.3 Business digitalization impact on labour productivity

Economic sector	Business Digital Index (average 28.4)	Labour productivity indices in the Russian economy in 2012–2018
Mining operations	29.1	108.24
Manufacturing	34.9	119.34
Electricity, gas and steam supply;	27	105.12
Water supply; wastewater disposal, waste management	22.4	97.38
Construction	25.4	97.11
Wholesale and retail trade	35.7	93.54
Transportation and storage	27.4	104.03
Hotel and catering activities	29.4	98.12
Information and communication activities (telecommunication)	42.5	106.89
Real estate activities	15.6	111.38
Professional, scientific and technical activities	25.7	120.19

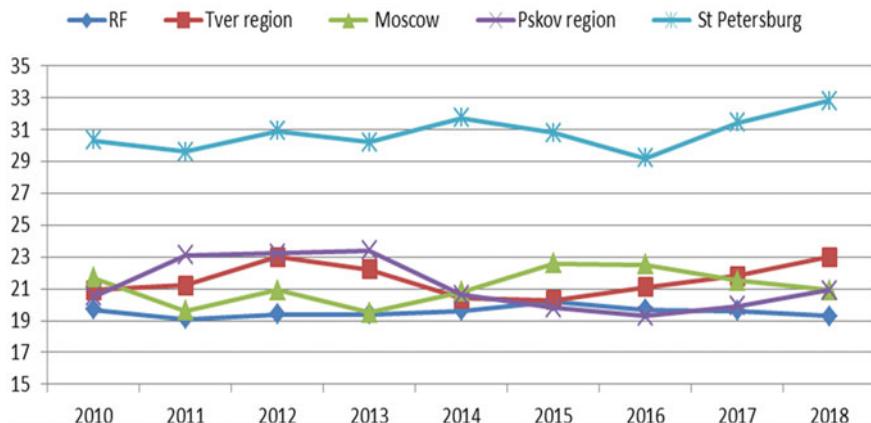


Fig. 120.2 High-tech and knowledge-intensive industries share in the gross regional product, % [15]

considered as a significant factor in the digital transformation of the economy in the scientific literature. For example, the paper [16] notes that the accumulation and the use of human capital act as the major factor of the production in the context of digitalization. The relationship between digitalization and human capital development is discussed in the paper [17, 18]. According to the authors, on one hand, in order to build a digital economy, the state increases the costs of human capital development (social policy, education and R&D). On the other hand, the diversion of these funds from their intended purposes results in a slight increase in the efficiency of the use of human capital and does not allow for a high rate of digitalization of the Russian economy.

The institution of higher education plays an important role in human capital development, producing, preserving and enhancing scientific knowledge. In the paper [18], the university is regarded as a source-integrator-translator of new knowledge and technologies in the context of digital transformation of the economy.

At the same time, there is a steady trend in the Russian Federation to reduce the number of students enrolled in higher education programmes, university graduates and academic teaching staff (Fig. 120.3).

Thus, the number of university students in 2018/2019 academic year has almost halved compared to the year 2010/2011.

The studies have not revealed a significant impact of economy digitalization on its efficiency:

- The downfall of the «digital inequality» indicators in the regions is accompanied by their socio-economic differentiation growth;
- The economic sectors digitalization has little impact on the sectoral structure of the employment;
- Business digitalization growth does not result in a marked increase in economic productivity;

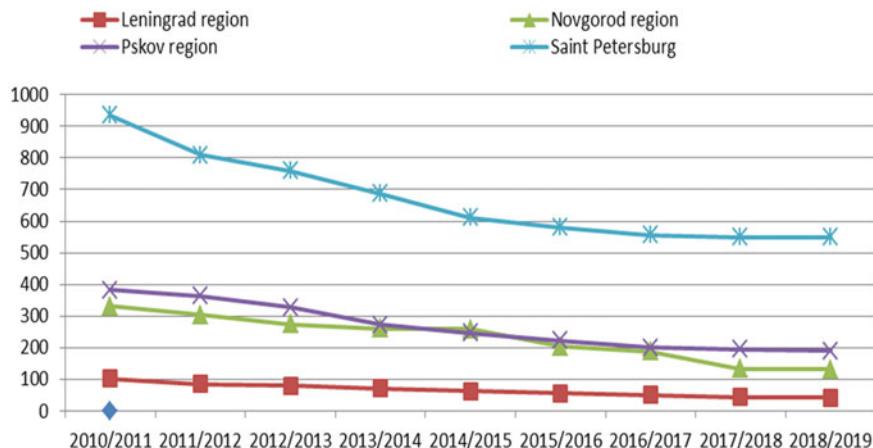


Fig. 120.3 Number of students enrolled in higher education programmes per 10,000 people

- The economy digitalization process has little impact on the development of its high-technology sector;
- The digital transformation of the economy has been accompanied by a decline in the need for highly qualified specialists and, as a result, a decline in the number of higher education programmes students.

It is therefore important to identify the reasons for the poor performance of digital processes in terms of improving economic dynamics.

Most researchers agree that the level of investment and innovation are among the main factors [19, 20]. In addition, the flexibility of the institutional environment and the level of financial literacy have a significant impact [21].

Indeed, the low level of investment activity in the economy should be seen as a major factor in the low efficiency of digitalization. Thus, between 2011 and 2019 the share of investments in fixed assets was at the level of 20–21% of GDP. Meanwhile, the Decree of the President of the Russian Federation of 2012 “On Long-term State Economic Policy” determined the need to increase the volume of investments by 2018 to at least 27%. At the same time, the value of the indicator remains at a sufficiently low level, which makes it impossible to carry out the necessary modernization of the capital stock in the context of the digital transformation of the economy. For example, in the manufacturing industry, which should be leading in the introduction of digital technologies, the rate of capital depletion in 2019 was 51.4%; and in the sector «information and communication activity» it was 63.2%.

Innovation performance is also quite low. Thus, in the period 2010–2017, the indicator «the ratio of the organizations that carry out technological innovations in the total number of organizations» in industrial production was in the range of 9–10%. The situation is similar for information technology activities. The total number of organizations in 2017 was 8.5%. However, in most EU countries it was between 40 and 60% [22].

So, among the main factors contributing to the low level of impact of the economy digital transformation on its efficiency, the low level of investment and innovation activity in the economy should be highlighted.

In addition, the digital transformation of the economy is taking place against the background of continued high dependence on imported digital equipment and products. Under these conditions, the multiplier effect of digital costs remains low. Thus, in 2018, the gross domestic expenditure for the development of the digital economy amounted to a fairly substantial amount of RUB. 3795 billion or 3.7% of GDP. About 50% of the costs were for hardware, software and digital content [13]. At the same time, only 0.2% of the organization's ICT development and use-related training costs were spent. The first priority for Russia is to move from the resource economy to the manufacturing-based economy and then to the digital economy. The stage of the development of industry, microelectronics, computing should precede the stage of transition to the digital economy.

Thus, the information infrastructure development and the increase in the level of business digitalization have not been accompanied by the corresponding structural changes in the economy and an increase in its efficiency.

The analysis did not reveal the impact of the growth of digitalization on the dynamics of the sectoral structure. The key performance indicators, such as labour productivity and the proportion of high-tech branches, also remained stable. This is mainly due to the low level of investment and innovation.

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Chapter 121

Labor Migration in Russia



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Abstract The purpose of this study is to assess labor migration in Russia. The study was carried out using the analysis method of the Federal State Statistics Service, the Federal Migration Service of the Ministry of Internal Affairs of the Russian Federation. The result of the research was the specification of the migration effects (population and capital outflow), indicating the need for migration policies regulating the out-migration to external labor markets. The research results can be used in the practice of various services for analyzing the migration situation in the country, assessing the current state, as well as identifying weaknesses and correcting them are possible in the development and implementation of social policies in the field of labor migration. The main findings are as follows: The use of statistical data and empirical research results allows describing the current situation in the field of labor migration of the population of the Russian Federation, which has both positive and negative features; there is a need to regulate the processes related to labor migration—on the one hand, increasing its efficiency, and on the other, minimizing its costs.

121.1 Introduction

Migration processes have a significant impact on the population structure. Thus, labor immigration increases the proportion of the economically active population in total, as well as the proportion of the male population, since it is mostly men who migrate in search of work. To date, the migration situation in the Russian Federation is characterized by measures to improve migration policy, which are taken both by federal state authorities and by government authorities of the constituent entities of the Russian Federation. Special attention is paid to the suppression of illegal migration.

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International experience in regulating migration processes has a huge significance in the implementation of state migration policy. It helps to fight for migrant workers as a cheap resource that can be effectively used to strengthen the country's economy. However, the latter does not always correspond to the specifics of the migration situation in Russia.

First of all, migration is a complex process that can be reflected in the ethnosocial and ethnopolitical aspects. In the first decade of the twenty-first century, the problems of migration shifted to a relatively uncontrolled mode of demographic policy [1]. This contributed to the emergence of new extraordinary approaches [2–6], represented by various public organizations and government structures. In the global migration image of the world, Russia is both a host country, a country of migrant's origin, and a transit country.

It should be noted that, currently, there are various approaches to the definition of the concept of "migration" as follows:

- (1) relocation, population transfer [7];
- (2) movement of people, related generally to the change of residence [8];
- (3) transfer of people from one country to another with the intention to settle [9];
- (4) mass displacement, movement of the population from one place of residence to another due to economic reasons, national oppression, natural disasters, and catastrophes [10];
- (5) the movement of groups of people from one place to another (to places of rest, from remote areas, etc.) [11].

On the basis of the presented approaches, it can be assumed that migrants are a group of people who left their place of permanent residence for economic, political, social, or other reasons. According to the authors, migration processes are a combination of certain movements, with the aim of changing the place of residence or temporary stay.

Migration processes and migration legal relations are those that arise between participants in the migration process regarding the realization of their rights and obligations associated with entering the country, leaving the country, staying, and living in its territory [12, 13].

In the context of changing the existing geopolitical picture of the world, increasing political, ethnosocial, religious conflicts and demographic instability, and social contradictions in various aspects of its manifestation are intensified [14, 15]. In this regard, the migration processes in the most pronounced extent are able to characterize the modern development of society. History has many examples of how migration contributed to the change of civilizations, the death of some, and the birth of other ethnic groups, social development of previously unknown geographical space.

Currently, migration flows to Russia can be divided into three main groups as follows:

- (1) migrants from regions where the Russian population is subjected to political and economic discrimination (Baltic countries);

- (2) refugees from areas of inter-ethnic and civil wars (Transcaucasia, Moldova, Tajikistan, Ukraine);
- (3) Russian repatriates from the near abroad of Russia (Ukraine, the Baltic states, the states of Central Asia), resettled for economic reasons and for family reunification. According to different estimates of experts outside Russia, in the CIS countries, there are between two and seven or eight million Russian-speaking people who want to return to Russia [11].

Russia's experience shows that the solution of resettlement problems is possible only with the organizing role of the state at all stages of the migration process, right up to the settlement. At the last stage, the specific material support of immigrants by the state is especially important. It is the state that is able to regulate the directions and volumes of migration flows and minimize the element of spontaneity in these processes. Migration processes in their essence should be considered not only as a process of spontaneous movement of people but also as a phenomenon that has a significant impact on all areas of the social interaction system, both positive and negative [16–18].

In those regions of Russia where there is a steady negative balance of population migration (these are entities such as Chukotka Autonomous Okrug, Kamchatka Autonomous Okrug, Sakhalin Region, the Republic of Yakutia, etc.), the number and density of population are decreasing, shortage of labor appears, and economic growth slows down. At the same time, the central regions of the country, characterized by a high influx of population (Moscow and Moscow Region, St. Petersburg and Leningrad Region, Krasnodar Territory), suffer from problems of overpopulation, oversupply of workforce, and excess load on infrastructure, while the problem of the assimilation of immigrants with the local population appears.

The purpose of the study is to assess labor migration in Russia, and the following tasks need to be performed:

- (1) to determine what proportion of labor migrants make up in the total migration flow to Russia;
- (2) to determine how many migrant workers are from CIS and developed countries;
- (3) to draw conclusions.

121.2 Materials and Methods

Accounting issues of migration flows are under the jurisdiction of two state structures: the Federal State Statistics Service and the Federal Migration Service of the Ministry of Internal Affairs of the Russian Federation. Empirical studies were conducted using the method of data analysis. In the course of the research, an array of data from the State Statistics Service on the purpose of migrants' arrival to Russia was analyzed, and the answers were grouped for five reasons as follows: tourism, study, work, private visit, etc. Further, a generalization was made. An array of data on migration flows from CIS countries and developed countries was also analyzed. Further, a generalization was made.

121.3 Results

Table 121.1 provides the information on the purpose of the arrival of foreign citizens, depending on the Russian region.

According to Table 121.1, Russia is popular among many categories of citizens—tourists, students, and workers, but this stratification is headed by the people who arrive there for earnings. In 2017, there were 4,284,181 people. The Central Federal District is considered more attractive in terms of work, the North-Western Federal District is the second, the Volga Federal District is the third, and the North Caucasian Federal District is the fourth. This distribution is not surprising since it is Moscow and the Moscow Region that is the main center of attraction for foreign labor. According to the Ministry of Internal Affairs of Russia in 2017, the number of such persons was 1,670,626 people and 336,954 people, respectively (Central Federal District), then—St. Petersburg and the Leningrad Region—446,906 people (North-Western Federal District) and the Samara Region—106,600 people (Volga Federal District). Tables 121.2 and 121.3 illustrate the scale of the stay of foreign citizens from the CIS and EU countries in the Russian Federation, respectively.

As one can see, the dominant position here is occupied by the CIS countries, of which in 2017, the most active “donors” were Kazakhstan, Ukraine, and Tajikistan. So over the past five years, in 2017, the number of arrivals from Kazakhstan has increased from 51,958 up to 71,680 people. In contrast, the number of arrivals from

Table 121.1 Purpose of the arrival of foreign citizens, depending on the Russian region

Region	Purpose of the arrival of foreign citizens				
	Tourism	Study	Work	Private	Other
Central Federal District	540,699	126,286	2325,503	848,238	180,860
Northwestern Federal District	1,267,870	80,058	515,962	220,220	249,750
Southern Federal District	92,540	37,762	251,991	260,121	71,834
North Caucasian Federal District	10,630	9485	46,263	78,429	33,565
Volga Federal District	47,766	53,707	380,042	184,425	96,285
Ural Federal District	17,692	21,052	320,633	129,744	40,253
Siberian Federal District	99,319	64,568	289,104	164,208	70,520
Far Eastern Federal District	168,701	13,134	154,683	21,993	92,015
Total	2,245,217	406,052	4,284,181	1,907,378	835,082

Source Federal State Statistics Service of Russia

Table 121.2 Stay of foreign citizens from the CIS to the Russian Federation

Country	2013	2014	2015	2016	2017
Azerbaijan	23,453	26,367	24,326	24,109	25,602
Armenia	42,361	46,568	45,670	43,929	46,898
Belarus	15,748	17,931	17,741	14,590	21,282
Kazakhstan	51,958	59,142	65,750	69,356	71,680
Kyrgyzstan	30,388	28,543	26,045	28,202	41,165
Moldova	28,666	32,107	34,026	32,418	31,369
Tajikistan	51,011	54,658	47,638	52,676	63,467
Uzbekistan	5986	6038	6539	7242	8734
Ukraine	118,130	131,275	74,242	60,977	64,073
CIS, total	422,738	529,448	536,157	511,773	524,452

Source Federal State Statistics Service of Russia

Ukraine decreased by 45.75%, so in five years their total number decreased from 118,130 to 64,073 people.

For a number of countries, an increase in migrants is observed. Over the past five years, the number of citizens from the USA has increased by 286 people. However, based on the data of Table 121.3, it is possible to conclude that there is a decrease in the number of arrivals.

This phenomenon can be explained by several reasons: the tightening of immigration legislation, the weakening of the ruble exchange rate, changes in the state of the labor market, and the increase in the number of own specialists. The change in legislation led to an increase in the illegal labor force, since some migrants were unable to pay large sums for obtaining a patent, others were forced to buy “literacy” and medical certificates.

As for the highly qualified staff, the situation is similar. Firstly, they were influenced by the legislation, namely that since 2015, visa-free migrants have lost the

Table 121.3 Stay of foreign citizens from some EU countries and the USA in the Russian Federation

Country	2013	2014	2015	2016	2017
Germany	4166	3743	3976	4153	3704
Spain	364	303	279	218	227
Italy	426	494	425	376	453
Great Britain	221	185	273	226	375
Finland	429	468	401	393	345
France	352	351	360	303	346
USA	954	1000	1084	1137	1240

Source Federal State Statistics Service of Russia

opportunity to issue a work permit as qualified specialists. Secondly, the devaluation of the national currency has led to the fact that many companies cannot afford specialists of such level.

In this regard, the entities of the Russian Federation are less interested in attracting foreign labor. For 2018, there is a reserve requirement for such a force in the amount of 30% of the requests of the subjects of the Russian Federation in the amount of 40,856 people, and the number of quotas for this year was requested at a rate of 83% of the 2017 level, which is almost 37 thousand people of the difference.

Most of all quotas were reduced in the North-Western Federal District—by 44.91%. The Southern Federal District is in the second place—the reduction was 41.55%, and the Central Federal District is the third—by 36.25%. Only two districts requested more quotas than last year: the North Caucasus (by 50.91%) and the Ural (by 5.39%).

This quota, according to the government, will allow satisfying the demand of employers for qualified foreign workers, as well as implementing a number of investment projects.

It is worth noting that, despite all the negatives that have befallen upon migrants, the Russian Federation is implementing various programs in support of certain categories of citizens, for example, a simplified system for obtaining citizenship for Russian-speaking people. On March 25, 2017, authorities announced an amnesty for migrants from Tajikistan; it lasted until April 24, 2017.

The labor force in the Russian Federation is made up of the employed population, that is, people who have any paid work and migrants who arrive in the country. The role of migrants in the labor market is very significant. The high demand for foreign workers is primarily due to the shortage of skilled workers who ensure the comprehensive development and economic growth of the country.

121.4 Conclusion

Many modern scholars argue that migration is beneficial for both host countries and sending countries. In various countries, without the involvement of migrants, the normal development of individual sectors of the national economy is impossible. Host countries use foreign labor for productivity. Migration contributes to the elimination of labor shortages, thereby easing employment problems.

Highly qualified specialists who have been educated abroad provide labor and intellectual resources without preliminary expenses for their creation. It is proved that foreign workers contribute to a slowdown in the rate of inflation, which has a positive effect on the economy. Many economists argue that without the constant replenishment of intellectual resources through migration, the country's economic growth is impossible. Speaking about the negative features of migration, one can emphasize the fact that, according to statistics, the number of labor migrants working in Russia is constantly increasing. If in the early 2000s, the number of employees coming from other countries did not exceed a few hundred people, then in the second

half of the decade there was an increase in migration flows. According to Rosstat, the number of migrants arriving in Russia in 2017 was more than 300 thousand people. It can be observed that the migration situation in the country is constantly changing, which is typical of almost all states.

Thus, migration has a huge impact on many elements of a country's social infrastructure and a particularly strong impact on socioeconomic development. It is of great importance for maintaining the economic balance of the state; therefore, the state should pay special attention to migration flows in the country.

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Chapter 122

Concept of System and Activity Approach in Improving Higher Polytechnical Education Quality



Valery V. Glushchenko

Abstract The article subject is the concept of system and activity approach (SAP) development in the higher polytechnical education; the article object is the quality of higher polytechnical education; the research purpose is the development of the concept of a system and activity approach in higher polytechnical education to improve higher education quality; to achieve this purpose, the following research objectives are resolved: studying the situation existing in the higher polytechnical education, estimating possible development of such situation with the account of technological advances, development of the concept of a system and activity approach in the higher polytechnical education, description of its components and the mechanism of its development, synthesis of a mathematical model for calculating economic efficiency of the application of a system and activity approach in the higher polytechnical education, analysis and elaboration of suggestions on introducing known matrix organization structures in polytechnical universities systematically integrated with the application of HR management models and lean production principles.

122.1 Introduction

The concept of system and activity approach development in the polytechnical higher education is a general view on a range of organization conditions and methodologies, and educational activity forms in higher education institutions. At the development of the system and activity approach concept in the higher polytechnical education, it is recommended to consider the existing situation as of 2019 characterized by the following. The problem of improving higher education and increasing education quality is global in its nature [1, pp. 30–36].

At resolving the problems of the higher polytechnical education, one should take into account the opinion of corporate employer heads [2, pp. 104–113]. One should also consider the global crisis impact [3, pp. 68–80].

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The fundamental principle of higher education growth is increasing the quality of educational services in polytechnical HEIs [4, pp. 125–128]. One should take into account the limits in increasing higher polytechnical education funding in the crisis conditions [5, pp. 9–16]. Some scientists express the opinions there is a kind of “higher education inflation” [6, pp. 88–95]. It is believed that crisis has also affected higher education [7, pp. 23–25; 8, pp. 14–18], which, in its turn, affects higher education quality [9, pp. 84–85].

It is suggested higher education quality has some flaws which can be connected with the subject approach prevalence [10, p. 3]. Crisis signs are also identified in the higher education sector [11, pp. 98–114].

Scientists mark the impact of distant education technologies on the university post-industrial development [12] and discuss the problem whether further development of smart education could result in reducing the university influence [13, pp. 40–45].

In this situation, it is relevant to develop method for designing the processes in the higher polytechnical education [14, p. 2], also with the account of post-industrial science development trends [15, pp. 26–31]. The economic and financial activity complication in social and economic environment results in the growth of the number of specialities [16, p. 97].

The acceleration of technological advancement can allegedly result in the increase of polytechnical education institution influence as integrated science and educational structures providing for the acquisition of knowledge and their transfer to a new generation within some minimum period of time and with minimum risks of violating the integrity of knowledge acquisition and transfer.

The significance of implicit knowledge formed in the process of system integration (aggregating) of separate parts into a single product will grow. Implicit knowledge occurs on the basis of the system emergence characteristics. The synergic effect development, i.e., the effect of increased efficiency of the economic actors inadequate to the scope of invested resources, should be considered to be the result of implicit knowledge influence.

In its turn, the increase in implicit knowledge significance will induce the change in the functions of academic staff in the scientific and education process: increased significance of obtaining new knowledge (both explicit and implicit); development of the capabilities to transfer implicit knowledge; and increased significance of the academic staff diagnostic function in collaborative academic work with learners. Under the conditions of student differentiation in relation to their level and creative potential, this will require academic staff familiarization with new academic tools. It can also trigger a broader application of individual approaches in the work with a student group and/or a specific student.

Supposedly, there will be closer integration in the methodology of education levels on the basis of the system and activity approach (SAP) [17, pp. 37–41].

122.2 Method

With the understanding that the system and activity approach (SAP) in the higher polytechnical education is such a methodology of organizing the scientific and educational process and cooperation of academic staff with students in a polytechnical education institution when learners are educational subjects and influence the organization, methodology and properties of the scientific and educational process by means of active personal participation (participation in the academic activity) in the university academic process.

In the framework of higher polytechnical education, a system component of a system and activity approach will consist in the implementation of the product approach in HEI functioning. The product approach is based upon the consideration of not only separate discipline as an educational product but a set of knowledge (disciplines) and organizational culture necessary for the implementation of the most significant business processes in the economic sector and their modification in the future [18, pp. 166–168]. The activity component of a system and activity approach will manifest itself in the development of the university client-oriented approach. To introduce the client-oriented work methodology in a polytechnical higher education institution, such institution (or its separate subdivisions) should develop the strategic partnership with certain basic organizations in the economic sector [19]. The SAP principles in the higher polytechnical education can be formulated as follows.

1. Academic staff should not deliver new research methods, skills (competences) and knowledge to students in some ready form, but the students acquire knowledge in a creative process which is a part of a larger academic process.
2. Accumulation and improvement of knowledge and skills (competences) of the students are implemented in a specific professional and cultural environment in their system interaction with the peculiarities of the potential employer activity and taking into account the peculiarities of the external and internal environment in a higher education institution and a basic organization.
3. All skills and knowledge acquired by students should have a dynamic component defined by the rate of technological advancement and real and industrial, and business processes in the technosphere.
4. Students voluntarily and independently perceive, realize and think over the content and the function of educational, professional and cultural components of the professional activity as well as any anticipated problems.
5. Academic staff will organize student independent work within the SAP in such a way that will make students independently analyze the situation, diagnose problems and find solutions in the process of creative search.
6. The communication “academic staff–student” will be efficient in case academics conduct the classes on leadership positions and gradually lead students to the solution of the class problem and achieving the purpose set for an academic course.

7. Within the SAP, it is recommended that all subjects should carry out a comparative analysis of information from various sources used for organizing learning and education in the higher polytechnical education.
8. Academic staff and a higher education institution develop motivation in students to increase the level of their competences (knowledge and skills) and improving their self-motivation to raise their competence in their future professional activity.
9. Within the SAP, academic staff is recommended to develop in students skills such as team work, ability to give a correct response to the research and educational process, reply and reflect.
10. The SAP implementation in a polytechnical education institution should include changes in philosophy and organization culture in part of the market methods of integration of science, practice and education; the methodology of the HR and social development management for academic staff [20, p. 3]; and practical implementation of lean production methods in higher education polytechnical institutions [21, p. 3].

As the stages of polytechnical university preparation and transition to the SAP, one can consider: conceptual development stage; preparatory stage; introduction of SAP into the education practices of polytechnical higher education institutions; the stage of monitoring and assessment of the results of research and educational processes on the basis of the SAP.

122.3 Discussion

At forming the SAP concept and the preparation of transition to it in the higher polytechnical education, one could recommend to take into account the experience of the Massachusetts Institute of Technology (MIT).

The transition of polytechnical universities to a matrix type of organization structures can increase the level of orientation toward the product (knowledge and culture of the economic sector business processes) and client orientation as well as the level of susceptibility to the needs of economic and technological practice, the educational process flexibility in a polytechnical university. The structure matrix type of a polytechnical university will consist in the existing of two fundamentals in the structure of such institution: a product fundamental responsible for the quality of education in view of business process knowledge and a client-oriented approach, and a functional fundamental responsible for the quality of subject delivering.

When a matrix organization structure in a polytechnical university is used, the growth of quality of the higher polytechnical education can be provided on the basis of the following: system integration (aggregating) of skills and knowledge on the basis of real business processes and organizational culture of the economic sector; a deeper insight into the nature of objective industrial processes by university students taking into account the peculiarities of technological advances in the economic sector;

growth in the level of integration of scientific research and education materials with the account of the university work profile and its basic companies within the economic sector and a certain profession from the economic sector; increasing the rate of introducing relevant skills and knowledge; and many other measures.

The SAP economic efficiency can be qualitatively assessed (by means of interrogating the employers on the change of education quality) and quantitatively. For a qualitative assessment of the economic efficiency of SAP introduction, the organization of the economic sector can be suggested the following mathematical models:

$$K_s = K_p * K_l * K_c * K_a;$$

$$F = A * M_i * K_s;$$

where:

K_p —level of the academic staff competence in a polytechnical university;

K_l —coefficient (share) of student learning the teacher knowledge at subject-specific education (is the student motivation function);

K_c —coefficient (more than one) reflecting the increase in the education level and, as a consequence, improved student work efficiency (organization staff efficiency) due to the enhanced staff competence on the basis of the SAP system component in the higher polytechnical education;

K_a —coefficient (more than one) reflecting the improved quality of knowledge and, therefore, the enhanced efficiency of staff work due to the assimilation of the SAP activity component in higher education;

F —financial result of the basic organization;

A —amount of financial resources prefunded for the basic organization activity;

M_i —innovative money multiplier in the operation of a basic organization or the economic sector [22, pp. 104–117].

All the listed coefficients of these mathematical models can be obtained by a statistical way or with the help of expert review.

The article develops the system and activity approach concept in the higher polytechnical education and discusses organization conditions and components of transition to the SAP and the matrix structure of polytechnical universities. It provides a rationale for the transition to the concept of HR management, suggested mathematical models for assessing the SAP economic efficiency.

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Chapter 123

Control Mechanism of Increasing Economic Efficiency of Corporate Re-branding



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Abstract The subject of the article is forming a control mechanism, methods and tools to implement corporate re-branding programmes (as well as other economic entities); the object of the article is organization re-branding; the purpose of the research is increasing economic efficiency of a re-branding control mechanism as a marketing tool of corporations; to achieve it, the following objectives are set: research and revelation of the organization re-branding functions and roles; defining notions, structures and the content of the control mechanism of increasing economic efficiency of corporate re-branding; and synthesis of mathematical models for assessing economic efficiency of corporate re-branding programme efficiency. The research describes the Russian experience of corporate re-branding, defines the idea and elements of the re-branding project control mechanism and develops methodological basics of implementing corporate re-branding as a project and long-term investment in the corporate brand and image. Re-branding is considered as economically efficient marketing tool providing a possibility to resolve a set of important objectives of a financial and economic activity and corporation competition. The authors propose mathematical models for assessing re-branding economic efficiency.

123.1 Introduction

The crisis of 2008 identified the need to improve the efficiency of control over economic entities [1, pp. 333–354]. At that time, corporate re-branding use was activated [2, pp. 84–86; 3, pp. 42–45]. But the control mechanism and re-branding methodology have not been sufficiently developed [4, pp. 45–53]. The authors study the following problems: re-branding practicability [5, pp. 38–39]; potential re-branding failures and risks [6, p. 146–152]; re-branding content and tools [7, pp. 25–30]; and re-branding values in crisis conditions [8, p. 39]. Meanwhile, re-branding is positioned as a new type of marketing technology for our economy

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and/or a new type of social communications [9, pp. 68–71]. The authors pay attention to the assessment of social and economic results, and re-branding efficiency [10, pp. 80–86]. However, methodological re-branding provisions of the beginning of the twenty-first century have not been studied or described in scientific literature yet [11, pp. 35–59]. It is noted that starting from 2014 re-branding has been attracting more and more attention [12, pp. 57–58]. Re-branding as an efficient marketing tool has already occupied strong positions [13, pp. 39–43]. Re-branding may be considered as a strategic marketing tool of the company [14, pp. 339–356].

It is also important that re-branding is simultaneously considered as one of the brand (branding) control tools and as a brand restructuring. The brand advantages and values form its significance for purchasers [15, pp. 205–210], the efficiency and estimation of the brand efficiency for the company conducting re-branding. The assessment of the brand value is calculated as a difference between the company's market cost and the book value of its assets by the balance [15, pp. 207–208]. The brand value abroad is equivalent to the term "goodwill", while the Russian accounting practices describe it by the term "positive business reputation". In the beginning of the twenty-first century, all large manufacturing and commercial organizations have their own trademark as consumers do not like the uncertainty risk. Effects from the trademark use are described in the paper [15, p. 204].

The legal grounds of using trademarks and brand names were defined in the Law of RF "On Trademarks" adopted in 1992.

At re-branding, it is recommended to take into account that trademark serves as a part of a wider notion—corporate style, the structure of which includes: trademark, logotype, corporate colour, corporate set of types, corporate block and corporate constants [15, p. 205]. Brand loyal consumers are considered as an important component of the brand capital. Efficient brand management is based upon the clear definition of a brand and its position towards the competitors in each moment of time [15, p. 212].

Brands are connected with corporate image. The organization image aim and principles are described in the paper [15, p. 211]. The additional relevance of the development of re-branding efficiency increase control mechanism is explained by the fact that in the twenty-first century re-branding is applied to a larger number of social and economic entities including infrastructural subjects [16, pp. 45–50; 17, pp. 53–55].

123.2 Method

The relevance of developing the re-branding methodology under global crisis could be rationalized with the help of the following suggestion logic: "if there is crisis, then the market structure changes"; "if the market structure changes, then the positioning should be changed"; "if positioning is changed, then re-branding is necessary"; "if re-branding is conducted, then the control mechanism and re-branding methodology should be developed". On the basis of the transition property of conditional syllogism obtain: "if there is crisis, then one should develop re-branding control mechanism and

methodology". Applying the rule of separation, we conclude one needs to develop the control mechanism and methodology for re-branding. Therefore, using the logic of suggestions proves that under crisis conditions re-branding always takes place. Such re-branding can be conducted: by necessity or by initiative, and by the method of trials and errors or on the basis of the re-branding methodology and control mechanism development.

Corporate re-branding is defined as a targeted brand changing to provide a harmonious interconnection of the external and internal environment guaranteeing long-term competitiveness. Such re-branding can be considered both as an innovative marketing technology and as a form of external restructuring of the organization activity. At external re-branding, all or some structural components of corporate style can be changed. Complex re-branding is accompanied by the change of activity directions, organization structure (restructuring) and organization culture.

Re-branding can be caused by decreasing product competitiveness (services and products); reduction in client loyalty; PR problems, reduction of possibilities to take loans abroad; deteriorating the company's positioning or its image, etc.

At the organization level, re-branding can be conducted as a specific re-branding project (project approach) and/or as a set of consecutive measures in marketing (process approach). Incorrect re-branding can generate risks.

Agree the control mechanism of re-branding economic efficiency increase will cover a set of methods and tools of controlling re-branding methodology and process for the purpose of increasing re-branding economic efficiency. The main methodical elements of re-branding control mechanism can be considered planning, organization, motivation and control over re-branding project implementation. Re-branding plan will denote a directive decision on the issues of resource distribution, re-branding project tasks between subdivisions and executives, and defining the terms of re-branding task implementation. Under the organization of re-branding, we will understand taking the decision on the issues of certain corporate subdivisions and its official bodies' participation in the implementation of a re-branding project. The re-branding project should denote the development of special incentive and negative measures aimed at the provision of such conditions under which all project participants would be interested in increasing the economic efficiency of the re-branding project. Control in the re-branding project will cover all the set of management operations aimed at the establishing of the fact of organization purpose achievement or establishing the fact of their non-achievement.

At the stage of re-branding project planning, one should define the re-branding project mission, vision and purposes. Agree the re-branding mission is explaining the society the benefit it will have from re-branding in general. Re-branding vision will include a re-branding scenario inspiring corporate employers involved in the re-branding project. The purpose of re-branding projects will be an ideal result of re-branding project in future. Agree the re-branding implementation tool will cover something artificially made for increasing the efficiency/or reducing the risks of organization re-branding programme implementation. The tool of the company re-branding programme implementation will be divided into technological (type change, logotype pattern, etc.) and methodical.

Corporate re-branding functions should include: indicative function of corporation behavioural readiness to changes; renewal of brand philosophy, ideology and functioning policy; renewal of organization image; and actualization and increase in the efficiency of external and internal social communications and others.

Re-branding roles can include: growth of efficiency of social external and internal communications, and providing long-term economic competitiveness of a company.

Re-branding project principles can be considered as key values as well: historical succession of a renewed brand; existence of system connection of a renewed brand with the company's strategic plans; science-based nature of the re-branding process; objective defining of organizational motive for the implementation of the re-branding project, etc.[18, pp. 30–32].

One can identify the following stages (steps) of re-branding:

1. Developing re-branding philosophy as the most general view of reasons, purposes, tasks, forecast re-branding results;
2. Forming re-branding ideology in two components (key idea and distribution of power in the re-branding process);
3. Defining the policy of implementing the re-branding project as a system of measures which would be implemented in the re-branding project;
4. Defining the re-branding methodology as a general re-branding theory including the re-branding project specification and the system of indicators for assessing the re-branding project efficiency;
5. Forming the re-branding project control mechanism;
6. Development of the re-branding project by using in-house resources of the marketing service or conclusion the agreement on the re-branding project development;
7. Corporate re-branding project implementation;
8. Monitoring the situation and assessing the efficiency of the corporate re-branding project on the basis of application of the system of efficiency indicators and informal quality assessment.

Economic assessment of re-branding efficiency can be conducted with the use of the following formulas proposed:

$$E = R_a - R_b - C_r; \\ P^r = (R_a - R_b) / C_r;$$

where

E —economic impact from re-branding project implementation;

P^r —economic efficiency of the re-branding project implementation;

R_a —corporate revenue after re-branding project implementation;

R_b —corporate revenue before re-branding project implementation;

C_r —costs of financial resources for the re-branding project.

123.3 Discussion

Development of a control mechanism and methodical basics of corporate re-branding allows increasing the economic efficiency of projects and decreasing the related risks.

At the social assessment of re-branding efficiency, it is recommended to assess the changes occurring in the relations with corporate internal and external environment subjects.

The article develops re-branding control mechanism and methodical fundamentals as long-term investments into the company's image and brand. It proposes a mathematical model to estimate re-branding economic efficiency.

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Chapter 124

Mechanisms of Interaction and Integration of Universities into the Global Higher Education Space in the Modern World



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Abstract The paper considers the topical issue related to mechanisms of interaction and integration of national and regional universities into the global higher education space. These processes require the development of new educational, research and commercial standards for the development of universities. This matter will enable to implement the promising ways of the development of national and regional higher education and implementation of the University 3.0 model in Russia. Global best practice defines coordinates and development level of national and regional universities. Structural and logical, systematic and methodological approaches on the standardization basis provide the framework for solution of problems in the sphere of university education. A complex of principles of university development (including global best practice through the developed “Economy of Knowledge and Innovation” course) is substantiated and tested. The optimal modular structure of this course, with practice-oriented tasks of innovative content as mandatory elements of each module, is defined and worked out. Universities 3.0 are very productive as the poles of economic life in the economy of knowledge and innovation, and as the centers of educational process in modern society. The ideas presented in the paper allow to make a statement that new mechanisms of interaction and integration of universities into the global higher education space will increase their role in Russian and regional economy, turning them to the poles of innovative development.

124.1 Introduction

The steady increase of the role of higher education in conditions of information technology revolution is related to the increasing importance of knowledge economy that solves global, large-scale problems. The special importance of higher education is stipulated by its place in the social sphere, importance in the economic, scientific and technological development of society. It opens up the intellectual capacities of

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each individual who learns and acquires new knowledge. Historically, each stage of society development is associated with the aspects of the educational process determined by it. The modern stage of socioeconomic development, specific in its scale and role, creates conditions for the formation of new educational institutions. Higher education is a project of promising investments, which state and efficiency are to determine the main parameters of economic development of a country for the next decade. In the knowledge economy, the economic activity focuses on the production and consumption of information (here knowledge, as unique production advantage, becomes the limiting factor). Knowledge becomes the dominant goal, the form of leading means and the main result of production activity in the society.

The scale of the goal requires an appropriate level of universities. The process of development of the knowledge economy increasingly depends on these institutions. In the modern period, the fundamental provisions about the increase of universities' role in whole are clearly articulated in many works. These works define that the universities have never play such an important role, both in terms of the formation and development of the knowledge economy [1]. In case of the world-class universities, the importance of their formation determines the huge role of human capital in the development of the knowledge economy. World-class universities directly affect the effectiveness of post-industrial development, quality of management, quality of specialists' labor and reflect the full use of innovative technologies. These institutions consider the characteristic for the unique creative participation of specialists in new production processes, the level of their new knowledge, skills, and abilities to work, the development of innovative thinking. World-class universities concentrate on the results of innovation in the economic sphere.

In the framework of the formation of the information paradigm for economic and social development, focused on the convergence of scientific knowledge, the recognition of the new role of universities as a new pole of economic life is required. In the global world, world-class universities are becoming a factor of information economic growth. This trend is very relevant and promising, as it will serve as the foundation for new research and educational projects. The integration of Russian higher education into the global higher education space opens new opportunities for the development of regional universities. In these conditions, the adaptation of systems and practices of specialists' training, research, and innovation structures is updated.

124.2 Review of Literature

Any manifestation of economic activity meets the special requirements for the forms of higher education necessary for its implementation. According to this, there are grounds for singling out universities where special tasks are completed and specific means and qualities are in possession. In other words, the knowledge economy in its diversity is linked to the development of new types of universities. The actual task is the correct selection of types of universities, mostly affecting the development of

the knowledge economy. These types are reflected in the research works of Gasanov and Gasanov [1], Glukhov [2], Davenport [3], Rakitov [4], and others.

Knowledge of the essence, mechanism of formation, and development of universities makes it possible to find the most effective forms and methods of management of educational processes and actively contribute to the implementation of the basic principles of the knowledge economy. This aspect, to some extent, allows us to give a qualitative description of the historical path of universities' development in relation to exploitation of the economic sphere of society. A common understanding of the essence of universities allows us to observe the individual stages of their formation in different parts of the historical path of a country.

It should be noted that a certain aspect of understanding of universities serves their empirical selection and description. Certain aspects of understanding the universities, whether theoretical or empirical one, are complement to each other. Almost all the definitions of universities are united by its modern understanding that the level of universities is determined by global relations. This is confirmed by the content of economic relations and educational activity, the connection between regional, national, and global relations. The qualitative status of society is more concrete and fully expressed in the achieved level of universities' development. This aspect is reflected in the educational system. World-class universities are defined as a new qualitative characteristic of the knowledge economy. The increasing role of world-class universities is related to objective factors: the dynamic development of the knowledge economy, the power of economic problems, solved in conjunction with social, scientific, technological problems. The formation of research universities is presented in research works by Altbach and Salmi [5], problems of the development of world-class universities are studied in the works of Salmi [6], Pankova [7], the ways of formation of the third-generation universities are studied in the works of Wissem [8], Karpov [9]. Conditions of formation of Russian world-class universities are considered in the works of Balatsky and Ekimova [10]. The role and importance of universities in the economy and society were considered in the works of Collini [11]. G. Rozowski considered the experience of administration at the world-class university and developed practical recommendations for the corresponding effective management [12]. D. Bok analyzed the problems of world-class universities, considered the problems of their commercialization, developed a strategy for the world-class university, including the conservation of its academic climate in accordance with a balance between conservatism and dynamism [13].

At the same time, the issues related to the study of regional aspects of development, the introduction to the global space of higher education and the features of the formation of world-class universities remain insufficiently studied. Insufficient level of development of the topic, the relevance of the problem, its theoretical and practical significance led to the choice of the topic of the paper, the formulation of its aims and objectives. The review of the scientific literature indicates the absence of a comprehensive theoretical and empirical study of integrative processes and phenomena in the field of higher education. These processes could generally reflect the possibilities of formation and development of world—class universities in Russia and its regions.

124.3 Materials and Methods

The global space of higher education and new educational standards determine the general ways of the development of universities in the coordinates of the knowledge economy. An important theoretical and practical problem of the development of the global knowledge economy and international cooperation is to increase the economic, information, and technological homogeneity of different countries, organizations, and companies, ensuring the integration of their activities in the global world. The significance of the existing differences in economic and other systems, such as educational, as well as regulations, rules, methods and methods of economic activity management, is a serious barrier to the development of the knowledge economy. In our opinion, in order to solve this problem it is necessary to use structural-logical, systematic methodological approaches based on standardization, primarily in the field of global educational space to improve its uniformity and, consequently, the formation of a new basis for the future integration of educational systems. To develop the concept of mechanisms of interaction and integration of Russian and regional universities in the global space of higher education, it is advisable to use an interdisciplinary methodology, including general methodological and interdisciplinary approaches related to the theoretical and methodological potential of economic theory, sociology of education, management theory, and innovation mesoeconomics.

In the context of the development of knowledge economy, global factors have a significant impact on the national system of higher education and determine the main trends of its modernization. At the same time, the system of higher education becomes flexible, mobile, and open to meet the pace of scientific and technological changes, the trends of the new international division of labor and the new processes of the knowledge economy. Best global practice confirms that the priority for Russian universities is the development in the coordinates of knowledge economy. However, there are issues where the implementation of this task is much more difficult. The new educational situation firstly provides a change in terms of its multiplicative impact on the formation of the knowledge economy as a whole [14].

In modern conditions, there is an increase in demand for higher education, which has become a necessary condition for entering the global market of intellectual labor. The sharp increase in demand led to the increase of proposals, intense and global competition between different educational programs and universities [15, p. 4]. In the new global situation, Russian universities face global competition from world-class universities, distance learning universities, professional educational organizations, educational consulting firms, and business schools offering innovative educational programs. Under the influence of the information technology revolution, this expansive and dynamic trend is growing. Currently, the international educational community considers internationalization as the basis of its strategic development. Global competitors—universities have innovative, educational, research, and commercial competencies and a strong material and technological base. Every year their role and influence on the sphere of higher education increases. In the last decades of the

twenty-first century, there are world changes and that allows to speak about the emergence of a new phenomenon—the global space of higher education [16]. At the heart of this phenomenon is the economy of knowledge. Here there are relatively stable structural phenomena that have a great impact on the development of higher education. In the new conditions, the paradigm of the organization of higher education is changing significantly: The range of its activity is constantly expanding.

The global space of higher education can be defined in two basic contexts—wide and narrow. In a wide context, the global higher education space is synonymous with the global system of higher education, which covers the entire set of local, regional, and national education systems. The interpretation of the concept in this context narrows the possibilities of historical, political, social, and cultural localization of individual phenomena of education. We believe that it is advisable to focus on the components, the main structural elements of the global higher education space. In such a case, a number of relatively holistic and distinct aspects can be identified. This is a narrow context. The international standard classification of education (ISCED) identifies primary, secondary, and tertiary levels of education [17]. Tertiary education is a broad academic education with theoretical training at the university or college, consisting of two levels: dual education (tertiary B) and higher (tertiary A) [18, p. 99]. One of the ways of orientation in the global space of higher education is the development of new educational standards. At the same time, they significantly differ from traditional standards in their complexity, structure, content, conditions of implementation, and use of special educational technologies. Their characteristic feature is the development of students' creative thinking, new competencies, skills in innovative projects, and participation in international academic mobility programs. Thus, graduates should have new competencies both in the field of scientific knowledge generation and in the sphere of their commercialization.

At the same time, the educational standards of each country have their own specific features. In the coordinates of globalization, it is necessary to adopt a new paradigm of development of Russian universities, including the existing system with its fundamental principle of continuity of education [19].

The formation of a global higher education area “leads to a leveling of differences in the quality of acquired knowledge in different countries and their standardization” [20, p. 86]. In the coordinates of this space, the most promising areas of development of national higher education can be implemented. These are the following:

- (1) effective solution of the problem of globalization and standardization of education and training of highly qualified workers with new competencies in demand in the global labor market;
- (2) creation of a standardization platform for international integration of effective universities and academic mobility;
- (3) ensuring the effective implementation of continuing education based on global standards for knowledge generation and commercialization;
- (4) formation of information infrastructure of open and global higher education;
- (5) unification and improvement of teaching efficiency and professional characteristics of teaching staff with the use of new competencies;

- (6) providing graduates with the opportunity to adapt to the conditions of work in the global economic space.

The global space of higher education is formed by the continuously expanding international cooperation of universities in many countries. A complex of educational resources is being created, accumulated, and developed, as well as resources ever-increasing volume and increasing alternative. These resources are more competitive than individual national higher education systems. Access to global educational resources is a strategic objective and a source of development of national and regional higher education systems.

The unification of educational standards is an important condition for effective entry into the global space of higher education. Taking into account global standards allows choosing the conceptual, methodological, and thematic priorities for higher education more reasonably, concretizes the tasks of development coordination, and determines the optimal directions of international educational integration. Effective solution of these problems is possible when creating global standards using brands of well-known effective universities. The practice demonstrates qualitative changes transforming the global market of higher education. The dominant factors of changes are: (a) significant increase in the demand for highly qualified specialists and their mass preparation; (b) urgent need for specialized programs aimed at a narrow segment of training; (c) changes in the disciplinary structure of the educational program by introducing basic disciplines that guide students in the basics of innovation, generation, and commercialization of knowledge. Universities are faced with the dilemma of growth and differentiation of programs. In the global space of higher education, universities are in the coordinates of a rapidly changing situation. Thus, universities need the inclusion of all new aspects. These are the following:

- (1) the need for mass training for universities with modern material and technological base, providing the first higher education;
- (2) the scope of activities of universities should be expanded, as the competition between them is already at a more global level;
- (3) unification of existing global and national standards in higher education;
- (4) regulatory requirements to professional characteristics of graduates from the global certifying and registering organizations;
- (5) regulatory requirements for educational programs and graduates by international accreditation organizations;
- (6) international and national criteria for accreditation of educational programs;
- (7) regulatory requirements of international and domestic public and other organizations;
- (8) European and national qualifications framework (by professional field);
- (9) regulatory requirements of priority directions of university development;
- (10) requirements of industry professional standards;
- (11) standards' knowledge of strategic partners, requirements of employers' unions and associations;
- (12) growing interest of students and teachers in constantly updated content lectures, innovative technologies and teaching methods;

- (13) employers require universities to have qualitatively differentiated programs for training graduates in the conditions of changing global market.

According to the mentioned aspects, the curricula and teaching methods should be based on innovative global standards. New network technologies constantly modify and optimize them. Teachers should be creative, have the necessary competencies, and be the experts in their field of study. To improve their skills, new standards should be developed for the system of training, retraining, and educational methods. One of the ways of orientation in the global education market is the rating system [9], which serve as a guide for consumers in the market of educational services.

Global standards of higher education and system changes present a platform for cooperation of effective universities. In the global market of educational services, universities compete for the quality of various services, educational programs, diffusion of innovative technologies, prestige, and high rating. They complicate and strengthen interstate, interregional, and global competition in the sphere of higher education. The short-term period of stability in the global space of higher education ended long ago. Universities and research institutions have entered a long-term period of uncertainty and risk, leading to systemic and paradigmatic changes. Most universities are experiencing financial difficulties. The lack of financial support for universities makes them more focused on the market of educational services.

Currently, a very small number of universities are effective. Limited resources slow their development. In these conditions, ineffective universities (usually regional) should adopt a strategy of cooperation with several domestic and foreign effective universities. At present, there are many different university cooperation networks, both regional and global. Integration into such a network gives universities access to new resources. Cooperation network multiplies joint efforts. Universities are given a new approach in helping and supporting each other by sharing best practices, learning, and developing together. The development of joint programs can become one of the effective factors of increasing the competitiveness of Russian universities. It will also provide an opportunity to gain new strength in the coordinated development and active scientific and technological exchange.

Joint programs will allow universities a global monitoring of new knowledge (patents, discoveries, inventions, etc.), innovation and blocking the diffusion of inefficient standards. At the same time, joint programs can be an effective way to counter the growing costs and risks of educational innovation. These programs provide partners with access to new knowledge and modern resources through strategic cooperation. The university community understands the need to modernize higher education with a focus on strengthening international educational connections, including global processes and mutually beneficial exchange in new areas of cooperation. Best global practices indicate a change in the socioeconomic function of the university. Educational and scientific activities of the university are complemented by economic activities, which include the development and transfer of technology, commercialization of scientific results, their implementation in the market, the formation of new businesses, and intellectual property management in order to maximize profits.

In recent decades, the higher education space of North America (USA and Canada) has been very effective. They have formed and operate world-class universities with an entrepreneurial strategy, mechanisms to ensure the practical application of new knowledge, effective tools for the implementation of research results in industry. They are able to act both in the field of knowledge generation and in the field of innovation, actively using the mechanisms of public—private partnership. These universities have been part of the global higher education space since the very beginning of its institutionalization. In the EU, the leading role in the development of the knowledge economy and its competitiveness is assigned to universities—centers of education, research, and innovation. The university that is positioned as a corporate subject of the knowledge economy has the “University – 3.0” title. Digital designation shows the number of university missions: University 1.0 is the only educational institution; University 2.0 is aimed at teaching and research; and University 3.0 has added commercialization of knowledge to the last two missions.

In Russia, a significant part of universities belongs to the model 1.0, a small part operate within the framework of model 2.0. At the same time, there is no full 3.0 model at all. However, for Russia, the development of the University 3.0 is of a strategic nature. At the same time, the level of the innovation index of Russia confirms its capabilities for the development of Universities 3.0. However, Russia has already announced the creation of the University 4.0, capable of solving industrial problems. This model is close to the German concept of “Industrie 4.0” [22, pp. 59–63]. The specific innovative and entrepreneurial nature of world-class universities as an institutional organization on a global scale helps to determine the prospects of the main trends of development of higher education. An important part of the global space of higher education is related to the Bologna process—the process of standardization and harmonization of higher education systems. This resulted in the formation of a single European higher education space. The Bologna Declaration developed the principles of competitive higher education, including:

- (1) adoption of a two-level system of training;
- (2) unified (single) credit transfer system (credit system) as a mean of student mobility;
- (3) promotion of scientific and educational mobility of students and teachers;
- (4) creation of comparable criteria and methods to ensure a high level of quality of education;
- (5) preparation of plans and schemes of inter-university cooperation, etc.

124.4 Research Results

The global information space is a common platform for powerful integration processes and interaction of regional higher education spaces. Many universities have placed all or a large part of resources in the global network. At present, there are different directions of internationalization of higher education depending on the level of involvement of universities in the global higher education space.

For example, the problem of cooperation between universities, located at a large spatial and temporal distance, is solved by creating network partnerships. USA universities are moving from a model of creating business incubators to the scheme of the distributed partnership with the decisive role of the university.

The concept of creating EU excellence networks is based on the idea of combining the scientific environment of universities at the global level into network structures that use the key competencies of the participating universities. At the present time, there is a process of establishment of higher education in the Asia-Pacific Region (APR), where the world-class universities are already in functioning. The universities of Asia-Pacific Region in many countries have opened and organize their offices. Many US universities have created new platforms in China and Hong Kong. Indian universities work on joint programs with US and UK universities [22].

The Shanghai Cooperation Organization (SCO) countries effectively work in this direction. In this regard, the University of the Shanghai Cooperation Organization (USCO) has a great potential. This is an Asian project—an analogue of the system of a Unified European Higher Educational Area. This university was established (including the initiative of Russia) within the framework of the “Bologna transformation of the education system.” The main mission of the university is the implementation of joint training of highly qualified personnel on the basis of agreed innovative educational programs in the fields of study, profiles, programs of priority interest for the economic and social development of the SCO member states.

In 2016, the USCO includes 79 universities from Russia, China, Kazakhstan, Kyrgyzstan, Tajikistan [23]. The USCP should become the basis of world-class universities in these countries. World-class universities are crossing the borders of their country and regions, creating new organizational forms. The phenomenon of world-class universities is found at the regional, national, and global levels. Within this framework, the educational and research space are maximally integrated, have the possibility to acquire a new spirit and to move to a new level of development. These universities are becoming the examples of international consolidation in the structure of the global higher education space.

124.5 Consideration and Conclusion

Education in Russia has historically been of strategic importance [24]. Effective Russian universities that are able to move to the 3.0 model level need to act in accordance with international standards and enter the global higher education space on the basis of competitive partnership programs, educational innovations, and scientific schools [25]. Russia has sufficient potential for the development of model 4.0. At the same time, it is necessary to create effective mechanisms of interaction and integration of Russian universities in the global higher education space and rationally combine the interests of all partners. Changes in the global space of higher education require a new set of university competencies, as the formation of the knowledge

economy, internationalization, integration has significantly changed the conditions of competition and demand in the market of educational services.

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