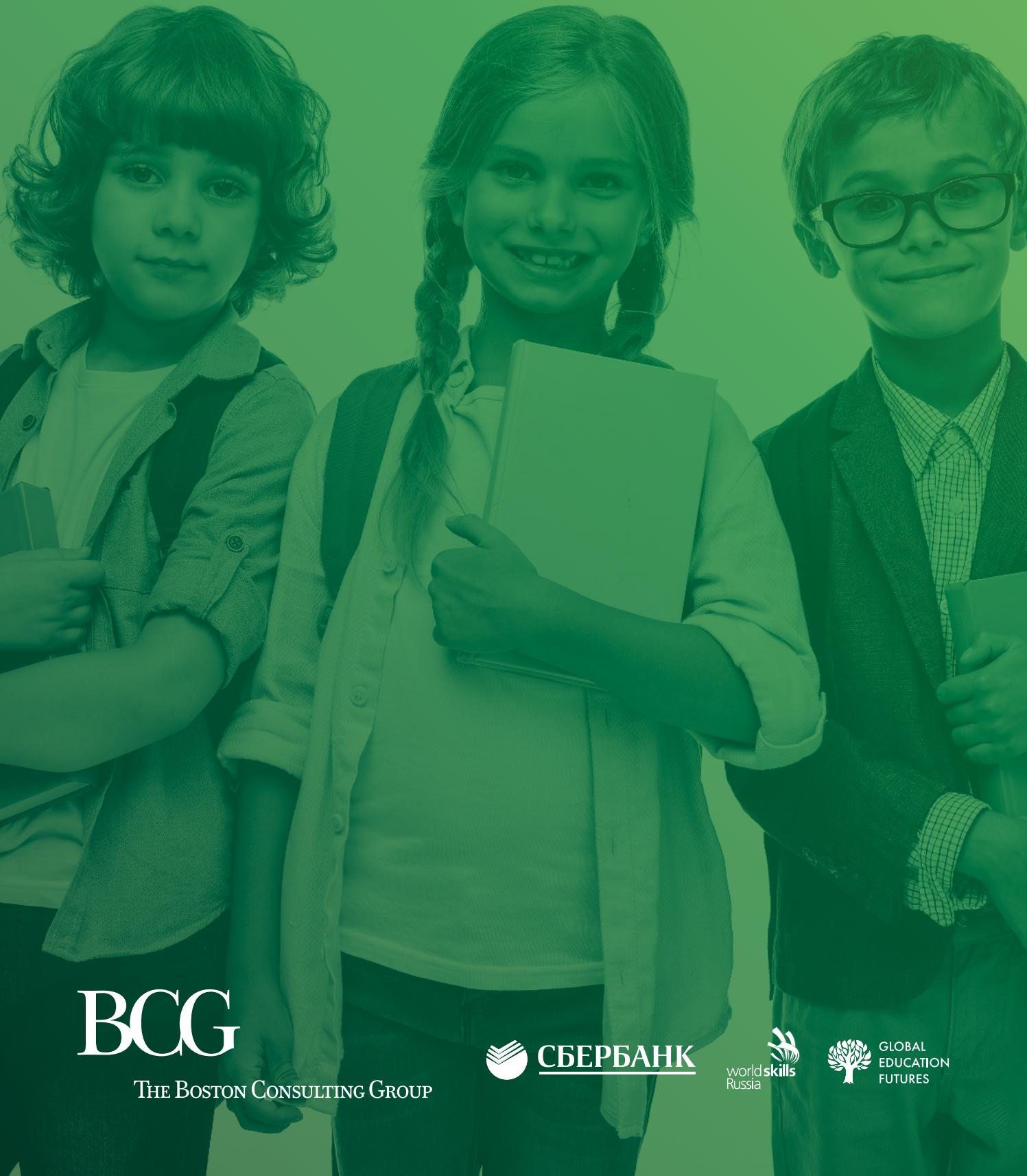


RUSSIA 2025:

RESETTING THE TALENT BALANCE



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RUSSIA 2025:

RESETTING THE TALENT BALANCE

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INTRODUCTION

In Russia today, much attention is paid to discussing innovation, the digital economy, labor productivity and competitiveness. However, these plans cannot work without a systemic approach to the development of human capital, including both acquiring and retaining the best minds, and ensuring conditions for further growth of progressive employer companies. One of the most important tasks of these companies will be to create new highly skilled jobs intrinsic to a technology-based, diversified, creative economy – the Knowledge Economy.

This report serves as the starting point of a major project to develop human capital – one of the key elements of the country's competitiveness. We set ourselves the task of assessing the current environment for human development and creating a platform for ongoing and open public debate on one of the key topics concerning Russia's sustainable development. Our analysis revealed the urgent need to continue this work – to develop a framework that would help tackle the challenges described in this report and to implement these solutions in practice.

What has made this project unique are the more than 90 interviews with top executives of the largest Russian employer organizations. Together they represent 22 industries and provide jobs for more than 3.5 million people. The interviews were held with representatives of boards of directors and shareholders, heads and deputies of strategy and HR departments, HR directors, and also representatives of state administration agencies, the education system, small and medium-sized businesses, start-ups, business associations, and Russian and international experts in human capital development.

In addition to the interviews, we conducted an online survey of Russian employers aimed at gathering views on: each company's priorities and objectives for the period until 2025, development plans and barriers, changes in staffing levels and categories, as well as employee expectations and requirements. The survey also enabled us to forecast the impact of global trends and current realities on the state of the future labor market in Russia.

The official partners of the study are PAO Sberbank and Sberbank's Charitable Foundation "Contribution to the Future", the Union "Young Professionals (Worldskills Russia)" and Global Education Futures. The project is led by The Boston Consulting Group, which is solely responsible for the content of the report and its findings.

INTRODUCTORY WORD



Dear friends,

Every day we see the world around us change. We witness technological, geopolitical, and demographic revolutions. In this context, it is hard not to ask the question “what does it mean for our society, our neighbors, and – most importantly – ourselves?”

Matters of professional achievement and education are among the most important in our lives. And this is no surprise, considering how much time every one of us spends studying and working and how much is at stake. And of course the dramatic change that is unfolding now will certainly affect these spheres as well.

Our report is an attempt to guess, and wherever possible forecast, these changes and project their implications for Russia. What will the labor market look like in 2025? Which professions will be in demand, and who will have to find a new way of earning their living? Is Russia ready for the global shifts and what does it take to remain competitive on an international scale?

Based on the responses from Russia’s leading organizations, BCG in partnership with Sberbank, Worldskills, and Global Education Futures attempted to trace the current development vector of the labor market, identify the key roadblocks that stand in the way of professional talent growth, and define eight potential steps towards improved global competitiveness.

We think that in order to return to an active growth path Russia will need to overhaul not only its human resource management model but also its entire economic model. It will have to forego the current illusion of stability and start shaping an environment that will foster the development and prosperity of its big pool of talent.

We see how the leading economies are aggressively pushing the transformation of their education systems focusing on the development of cognitive skills, instead of the old uploading-of-knowledge approach. They are playing an active part in retraining their national labor resources and helping them to adapt to the changing working environment, attracting the best talent to the educational sphere and making the most of digitalization. We firmly believe that Russia needs to follow the same path.

I hope that this report will help you look on the future development of talent in Russia from a new perspective and participate in the discussion of this highly important topic.

Hans Paul Buerkner
BCG Chairman



Quos Deus perdere vult dementat prius (“Whom God wishes to destroy, he first sends mad”). A country that gives its brains away to other countries is likely to squander its own future. Our chance for future development is to find a way to match the high quality human capital that, despite all kinds of difficulties, our country continues to foster with the Russian economy, which has so far remained a rather primitive imprint of the country’s mineral riches.

I think that the report prepared by BCG and its partners as a starting point for discussion defines the main problem in a very precise and accurate way: the rate of consumption of human capital (i.e. high quality human capital of the “Knowledge” category as defined by Rasmussen) by the national economy and society is the key marker of whether or not we are following the right path. However, to make it happen we need to speak of the demand for this capital shown (or not shown so far) by the country’s economy and the supply partly generated (or not generated) by the industries producing this human capital.

Let us start with demand. I think that the best chance for the Russian economy in the near term lies in the domain of digitalization and the digital economy. Not because it is hype, not because, quite unexpectedly, it matches really well with what we have traditionally been good at, i.e. creative development, unique, small-batch, non-standard products. A digital economy is wholly and fully an economy of individualized and customized products delivered in small batches. And this requires more quality human capital, rather than financial capital.

Regarding the production of human capital, and here I am in agreement with the authors of this report, the focus should be on soft skills: open-mindedness, discussion skills, ability to present results in various ways, communication and team skills. And then we go from asking what we teach, to also where and how we teach, and I do not just mean university or school. Because in reality the various social and cultural characteristics of a nation are a product of the education system, cultural policy, the stealth or open approach to taxation, the ways people serve in the military or are kept in jail. Is it possible to change our inherent risk avoidance and the huge power distance that arrest our development? Of course. Although, in my opinion, not quite with the methods proposed in this report, such as significant differentiation of payment and promoting other success models. I think that it will take more to achieve a shift of this magnitude. But it is possible.

We are a living country that still produces a lot of smart, educated people and we have a good chance for a future. Let us talk about that. And then, following on from this discussion, let us plan our future strategies so that the country and its people are in a position which we will not be ashamed of in the face of generations to come.

*Alexander Auzan
PhD in Economics, Dean of the Department
of Economics of the Lomonosov Moscow
State University*

EXECUTIVE SUMMARY

Over the last few years in Russia, efforts have been made at the government level to diversify the country's economy and transition to an innovative path of development. This ambition is based on a fundamental premise: the world is dominated by global technological, demographic and geopolitical trends undermining the established division of labor and forming a new economic order – the knowledge economy.

The group of countries that have already converted to the knowledge economy is united by a similar labor market structure. An increasingly important role in this market is played by people capable of working in conditions of uncertainty and performing complex analytical tasks that require improvisation and creativity. In this report, we include such jobs in the “Knowledge” category – in the employment structure of advanced countries they already account for at least 25%.

However, creating specific jobs alone is not enough. In our report, we articulate a Target Competency Model 2025. It is a set of key universal competencies without the development of which it will be impossible to reach the appropriate level of efficiency in the 21st century. This includes the ability to think critically, to work efficiently as part of a team and interact with other people, to adapt to change quickly, to make decisions, to organize activities independently, to be able to work with huge amounts of data, and so on.

Russia has not yet had any success in gaining a place in the knowledge economy. The share of high-tech production is small; no more than 17% of jobs in the country can be placed in the

“Knowledge” category; there is also a shortage of universal competencies. This situation is caused by three key factors:

- 1. Demand for knowledge has not reached its critical mass.** In terms of the attractiveness of its labor market for talent, Russia lags behind not only developed countries, but also many developing countries, and continues to lose talent. This is largely due to the fact that the Russian economy is still predominantly commodity-based and focused on the export of natural resources. The demand for labor generally remains primitive; the market is dominated by public sector work. The “social employment” model is encouraged, when even in conditions of diminishing GDP, inefficient jobs are retained. The share of small and medium-sized businesses in the country is growing very slowly (16%), the digital economy is stagnating (2-2.5%), the venture market is still at its fledgling stage (hundreds of times less than the US market, 12 times less than the Israeli market, 6 times less than the Japanese market).
- 2. The education system does not train personnel for the knowledge economy.** The school education system has been unresponsive to change, and teacher training has not kept pace with the modern requirements of educational standards. Higher education in the majority of universities has lost its quality, but has become more “accessible”. Over the period from 1993 to 2015, the number of university slots more than doubled, while the cohort of entrants decreased by 36%. At the

same time, the education system is “turning a deaf ear” to business, as a result of which 91% of employers note a lack of practical knowledge with graduates, while a quarter of those with a diploma go to work in positions that do not require their level of education. In addition, there is no practice of lifelong learning: for the majority of people, learning stops when they reach the age of 25, and professional development is often a mere formality.

- 3. There is no environment to nurture human development and self-realization.** Due to low wages, a significant share of employed persons work in conditions of “labor poverty”, while almost 6.5% of Russia’s working age population (4.9 million people) only earn the minimum wage. Moreover, most jobs in the country receive roughly the same amount of pay (for example, the wage difference between a driver and a doctor in the Russian Federation is 20%, while in Germany the difference is 174%, in the USA – 261%, in Brazil – 172%), which reduces people’s motivation to choose high-skilled professions. As a result, 98% of the Russian population prioritizes job security and stability over growth values. Today, the dominant role model for young people in Russia and their parents is a successful bureaucrat, rather than a highly skilled professional or entrepreneur.

We believe that if these three factors are allowed to continue, it will lead to a situation where, as early as in 2025, Russia will have jeopardized its competitive position in the global knowledge economy, and will most likely have lost the opportunity to catch up with the group of advanced countries.

At the same time, we are confident that implementing the measures suggested in our report Russia 2025: From Human Resources to Talent Management will transform the approach to human capital development in the country and spur the development of knowledge-focused segments of the national economy:

Stimulating mass demand for “Knowledge” category employees.

- 1. Creating a competitive offer of working conditions for professionals from the “Knowledge” category by employers with state participation.**
- 2. Reducing inefficient “social employment”.**
- 3. Creating a system of retraining redundant staff at the national level.**
- 4. Creating a favorable business environment in Russia that would, among other things, support the development of small-sized innovation enterprises and set respective goals for regional administrations and governors.**

Creation of a priority supply of “Knowledge” category employees by the education system.

- 5. A priority supply of employees with required skills and competencies created by the education system.**
- 6. Refocusing the existing education programs from subject knowledge and memorizing to the development of personalized and meta-subject competencies**
- 7. Stimulating an inflow of talent to the field of education.**

Creating an environment conducive to attracting and developing human capital.

- 8. Promoting growth and professional development values both at the national level and within companies.**

Implementing these steps would allow Russia to achieve not only global average growth figures, but also exceptional growth rates, ensuring its successful entry into the group of advanced knowledge economy countries by 2025.



CHAPTER 1.

COMPETENCY MODEL 2025 – THE KEY TO GLOBAL COMPETITIVENESS

In the 20th century, only **25 countries** contributed to the **entire global GDP growth** of an average **2.97%**

In those countries, **“Knowledge” category jobs** account for over **25%** of the labor market

By **2025**, **Generation Zers** (born in 1997 or later) will comprise some **25%** of the entire labor force

Over the next decade, **9–50%** of all existing professions are **likely to become extinct** due to digitalization

19% of all workers are likely to be **replaced with robots by 81%**

In Russia, **robotization** is still nascent with just **1 industrial robot per 10,000 production FTEs in 2017**

Target competency model 2025: cognitive, social behavioristic and digital skills

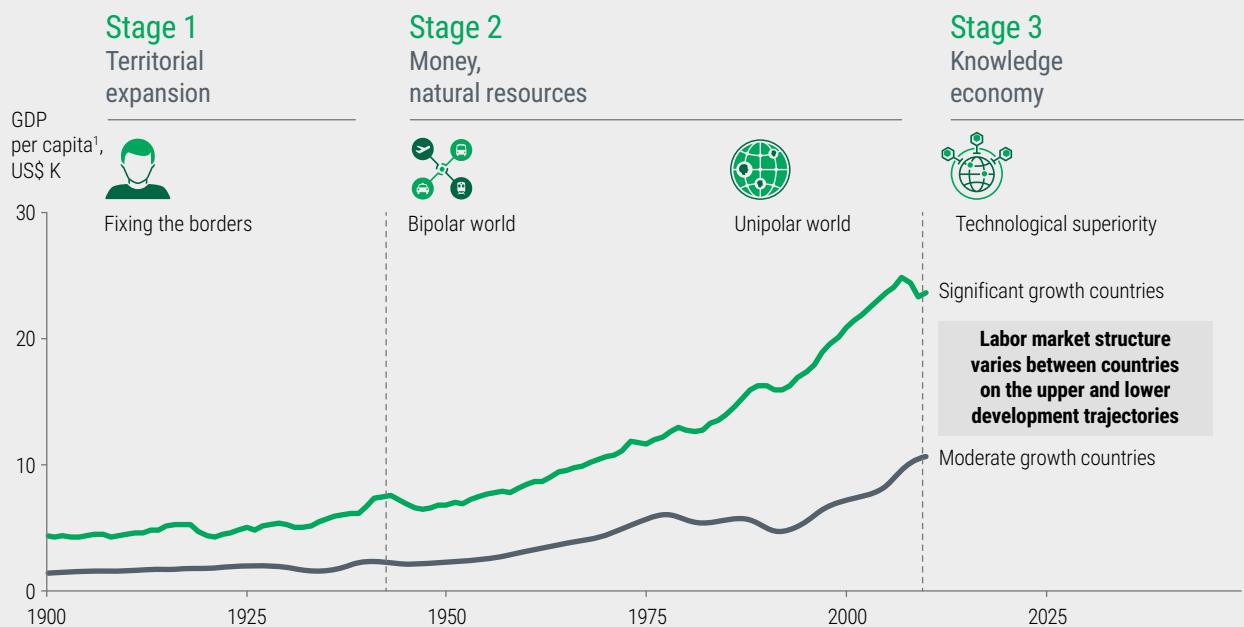
THE PRESENT WORLD: TWO PATHS OF DEVELOPMENT

In the 20th century, humanity reached the highest rate of economic growth in its history. The global GDP grew by an average of 2.97% per annum, GDP per capita – by an average of 1.59%¹. However, only 25 countries² provided most of this growth, setting the upper development trajectory standards (Fig. 1). The development of other countries was characterized either by ad-hoc growth (e.g., Latin America, Africa), or less sus-

tained growth (e.g., Russia/USSR and Eastern European countries). Thus, these countries were not able to move from the “lower” moderate growth curve (the so-called “path dependence” effect³).

In addition to the speed and stability of economic growth in the past, the countries of the upper development trajectory have several features in common that are relevant today:

Figure 1 | Global development stages and GDP growth in the 20th–21st centuries.



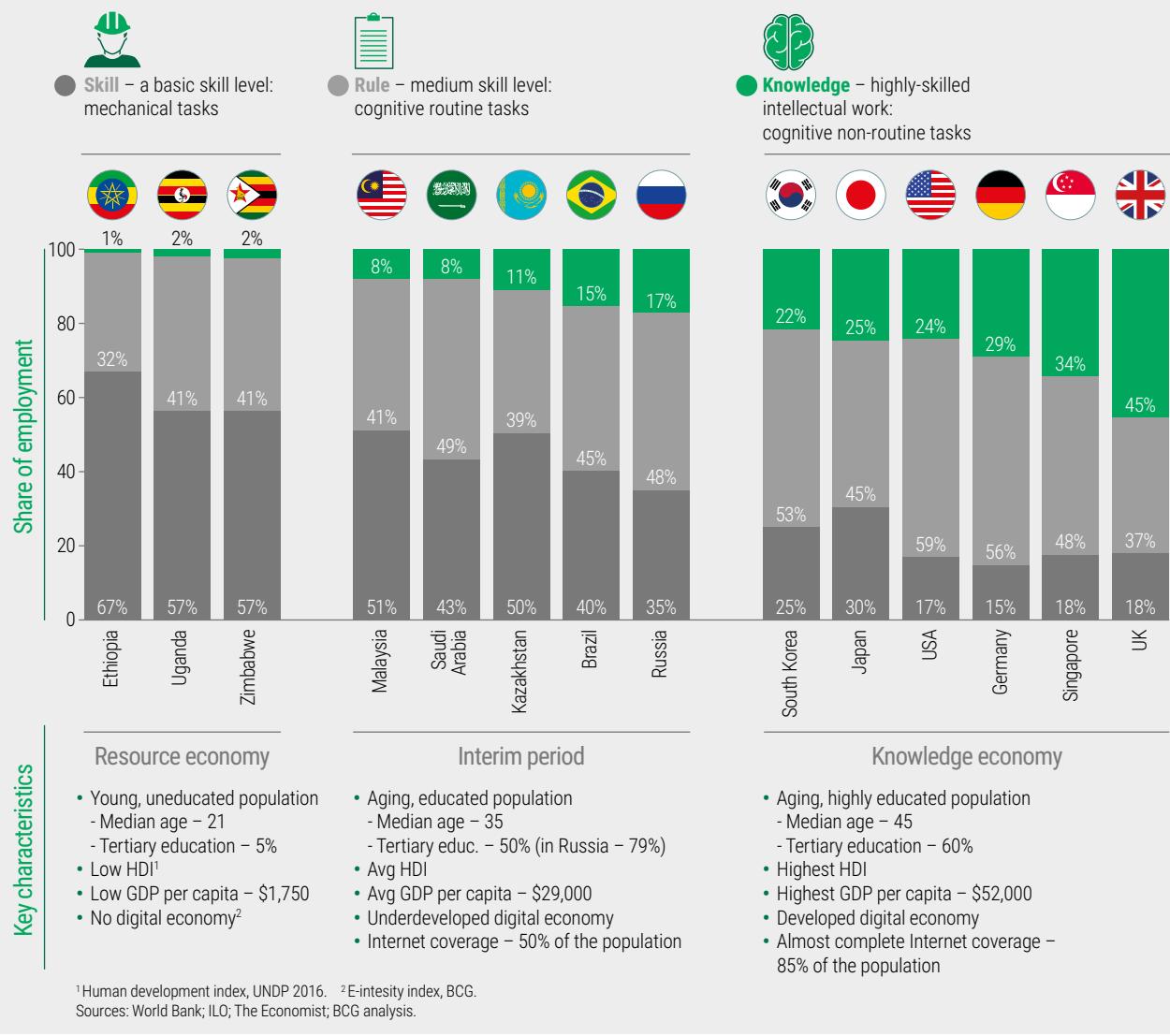
1. Guisan, M. C., Exposito, P., Economic Growth and Cycles in the 20th Century, the University of Santiago de Compostela (Spain).
2. Including Austria, Belgium, the United Kingdom, Germany, Hong Kong, Denmark, Spain, Italy, the Netherlands, Norway, Singapore, USA, Taiwan, Finland, France, Switzerland, Sweden, South Korea, Japan.
3. The path dependence effect – the theory of A. Auzan based on statistical studies of Angus Maddison and a phenomenon called “path dependence”, which was presented for the first time by Paul David in 1985.

- A high level of income – the vast majority of specified countries achieved a GDP per capita in purchasing power parity in excess of USD 50,000 (Russia in 2016 – USD 27,500).
- An aging educated population – the median age of 45 years, the average coverage of the population by tertiary education – 60% (Russia – 69%).
- A high Human Development Index (HDI⁴) – a Top 30 position in the rating (in 2016 Russia was in 49th place).

- A developed digital economy, as evidenced by the country's Top 30 position in the economy digitalization rating based on the E-intensity index⁵ (Russia is in 39th place), and a high (over 85%) level of Internet penetration (Russia in 2016 – 70.4%).

One of the key differences between the modern countries of the upper development trajectory and the other countries is connected to the employment structure. More than 25% of employees in these countries work in the specialist areas of the so-called "Knowledge"

Figure 2 | Upper development trajectory countries have already entered into the knowledge economy



4. The Human Development Index (hereinafter referred to as HDI) is an integral indicator calculated annually for cross-country comparison and measurement of living standards (through GNI per capita at purchasing power parity), literacy and education (the average number of years spent on education, and the expected duration of training) and longevity as the main characteristics of the human potential. (Source: Wikipedia)
5. E-Intensity is an index developed by The Boston Consulting Group, which monitors the development of the digital component of the global economy in 85 countries worldwide.

category (see the box describing the analysis methodology as part of the report and Fig. 2). The proportion of employees in this category is currently one of the key indicators of the countries' global competitiveness, and with time the importance of this factor will only grow.

The volatility of the economic growth in Russia (since 2000 ranging from -7.9 to +10% per

annum) is what prevents our country from becoming part of the group of countries of the upper development trajectory. Viewing the current situation through the prism of labor market development, we believe that the key to Russia's economic competitiveness at the global level is to create the conditions to expand the proportion of "Knowledge"⁶ category jobs in the economy.

JENS RASMUSSEN'S APPROACH TO CLASSIFYING TASKS

For a comparative analysis of the structure of labor markets in different countries, we conventionally divided all persons employed in the economy into three categories – "Skill", "Rule" and "Knowledge", according to J. Rasmussen's¹ approach to the classification of tasks:

- "Skill" category: more than 50% of tasks involve repetitive typical tasks, mainly physical labor. Training is not required or is carried out within a short training cycle.
Examples include: cleaners, sellers, drivers, stevedores, security guards.
- "Rule" category: more than 50% of tasks involve technical, routine work. Decision-making takes place within prescribed rules and instructions. Specialized, applied training is required.
Examples include: locksmiths, accountants, nurses, office administrators.
- "Knowledge" category: more than 50% of tasks involve analytical work, improvisation, creativity, work under conditions of uncertainty. There is a high degree of autonomy in making decisions. A high level of education, a long training cycle, and a broad outlook are required.
Examples include: teachers, doctors, scientists, highly qualified engineers, executives

¹ Jens Rasmussen is a Danish scientist, who is internationally recognized thanks to his studies in the area of human factor-associated risks, as well as the development of the model "Skill", "Rule", "Knowledge" (specifically, in his work *Skills, Rules, and Knowledge; Signals, Signs, and Symbols, and other distinctions in Human Performance models*, 1983).

6. This resonates with one of the "May decrees" of the Russian President (2012) aimed at, inter alia, "the creation and modernization of 25 million high-performance jobs by 2020".

LABOR MARKET IN 2025: THE KNOWLEDGE ECONOMY

In the next 5-10 years, economic patterns and labor markets will be shaped under the influence of key trends that have already had an impact on the employment arrangement in the global economy and will continue to stimulate further significant changes in the medium term. For the purposes of our report, the cumulative result of these factors' impact will be referred to as the "Knowledge Economy".

GEOPOLITICAL TRENDS

In 2025, Russia will compete on a much less centralized global market than today. The role of globalization and access to international markets will remain central to the development of the economy. At the same time, a slowdown in growth, increasing inequality, as well as the country's social and cultural specifics will accelerate regionalization.

The world economic growth slowed from 6.6% in the 1960s to 2.3% in 2016¹. Forecasts for 2018-2019 are slightly more favorable (2.9-3%), but it is important to bear in mind that in recent years such predictions have regularly been adjusted down: specifically, the IMF's global growth forecast for 2011-2015 was revised down by a total of 1.5 p.p.

The changing nature of globalization:

- Protectionism may be observed in the domestic politics of many states: in 2015, G20

countries imposed 644 restrictive trade measures, as a result of which foreign direct investments in developed countries dropped by 40% from the peak level before the financial crunch, while the net inflow of investments to the developing markets was negative for the first time since 1988².

- Countries have been closing off from each other in terms of migration flows: specifically, the Maltese Declaration adopted in 2017 is designed to ensure control of the external border of the European Union and prevent illegal migration flows into the EU.
- Economies and authorities are becoming decentralized: Brexit (the United Kingdom's exit from the European Union), the United States' new focus emphasized in President Donald Trump's inauguration speech by the words "americanism, not globalism", Russia's move to import substitution and so on, are clear examples of regionalization.

Stratification continues to grow between countries and within countries: although inequality is recognized as a serious threat to global stability³, the wealthiest people (1%) currently control 50% of the world's wealth as opposed to 43% in 2010. In the United States, real wages of 70% of employees have stagnated for the past 40 years⁴. A similar situation exists in many other countries, including Russia, where real incomes have been dwindling since 2014.

1. World Bank data.

2. Harvard Business Review, The Globalization Backlash is Reverberating Through Boardrooms (<https://hbr.org/2016/10/the-globalization-backlash-is-reverberating-through-boardrooms>).

3. World Economic Forum, 2013

4. BCG Center of Macroeconomics

DEMOGRAPHIC TRENDS

An increase in competition for jobs will be typical in segments that require a lower level of qualification. At the same time, the workload on highly qualified staff will grow continuously. By 2025, the nature of competition in human resources will change significantly in view of the aging of the population and the entry of young Generation Z employees to the labor market.

The world's population continues to increase: in 2011, the figure reached seven billion, and by 2025, according to UN estimates, it will have passed the 8 billion mark. However, this growth is mainly due to economically underdeveloped countries with a young population (a median age of 21 years), high birth rates and a low level of human capital development (the HDI barely reaches 0.4⁵).

The size of the elderly population of the upper development trajectory countries (an HDI greater than 0.9⁶) will increase by 20% by 2025, while the size of the working-age population will shrink by about 5%. This skewed age pattern in developed countries will lead to a growth in the demographic load on the working-age population by almost 50%.

With the rapid development of new technologies, the experience of older generations will be the least relevant it has ever been to new generations. By 2025, Generation Z (born in 1997 or later) will account for about 25% of the total workforce⁷. They are people that have been using digital technologies since birth (digital natives) and have unlimited access to information. For them, personal growth and a work-life balance are of greater priority than financial gain and career. Unlike previous generations, Generation Zers tend to often change not only employers, but also areas of activity. They usually have a more developed set of digital competencies than their teachers and superiors. In the fight for new staff, organizations will have to adapt to their values.

TECHNOLOGY TRENDS

Along with geopolitical and demographic trends, technological change will have a most profound influence on the global labor market in the 2025 horizon. They will consistently transform the existing market structure, the organization of individual companies and entire industries, and consequently – competency and staff training requirements.

"Universal connectivity"

3.5 billion people (46% of the world's population) were Internet users as of the end of 2016 – the number has increased almost 70 times over the past 20 years. The penetration of the world wide web will continue to grow: according to estimates, by 2025, the proportion of Internet users worldwide will reach 80%⁸. This already has and will continue to have an impact on changes in the forms of employment in the economy:

- Remote employment and freelancing have become the norm for many professions in developed countries, and their share will continue to grow: according to estimates, by 2020, one in two people in the United States will be a freelancer⁹. The development of new technologies will support the expansion of cross-border remote employment capable of easily overcoming migration barriers.
- Remote interactive collaboration technologies will also continue to transform the global education system, expanding training opportunities regardless of the location of the student, and undermining the positions of traditional educational institutions.
- Self-employment, possible thanks to the development of platform solutions (such as Uber, Airbnb, YouDo, Profi.ru) connects service suppliers and consumers without any intermediaries. In Europe alone, the volume of transactions through platforms providing on-demand services (cleaning, hairdressing, training), as well as car and real estate sharing, will increase 20-fold¹⁰ by 2025, raising the level of employment in this segment by at least 17%.

5. For Niger, Central African Republic, Eritrea, Chad, Burundi, Burkina Faso, Guinea, Sierra Leone, Mozambique, and Mali.

6. Norway – 0.949, Australia – 0.939, Switzerland – 0.939, United States – 0.920.

7. According to the estimates of Universum in collaboration with MIT Leadership Center.

8. Olywer Wyman "Digital revolution. New customer experiences, new business models, new transformations"

9. Forbes "The Rise of the Freelancer Economy"

10. PwC "Shared benefits"

AUTOMATION OF PROFESSIONS

The rapid development of technologies, including artificial intelligence and machine learning, raises a logical question: "Will robots and algorithms be able to replace human beings and when will it happen?" Today, there is no consensus-based opinion on this topic. For example, in 2013 researchers Carl Frey and Michael Osborne determined that 47% of jobs in the United States are susceptible to a high risk of automation on the horizon of 10–20 years¹.

Continuing this study in collaboration with Citibank, in 2016 the authors extended their findings to more than 50 countries: on average in OECD countries, humans will be replaced by algorithms in 57% of professions².

WEF experts analyzed 15 developed and developing economies of the world and came to the conclusion that 7.1 million jobs, two thirds of which belong to office and administrative functions, will disappear by 2020³. In Russia, this phenomenon is known as "superfluous people" – a potential unemployed population whose basic level of skills will not allow them to learn "complicated" professions.

An assessment of the automation potential of individual tasks, rather than categories of professions, gives more conservative results: according to an OECD report, only 9% of employees can be replaced by algorithmized solutions⁴.

It is important to note that any new technologies have not only replaced human labor, but also changed its structure, creating new employment. WEF estimates the number of new jobs in 15 countries to total 2 million by 2020. Ayah Bdeir, a graduate of MIT Media Lab and the founder of a technological startup, believes that 65% of the professions that will be sought after in 2035 do not yet even exist (for example, a specialist in the legal regulation of matters related to the use of artificial intelligence and drones, a veterinarian for robots, a biologist growing artificial organs, etc.⁵).

The impact of technology on the labor market has also been assessed in Russia. As part of the "Atlas of New Professions" – a joint project of the Agency for Strategic Initiatives and MSM "Skolkovo" – it is projected that 57 "traditional" professions will disappear by 2030 and 186 new ones will emerge⁶.

¹ Frey, Osborne "The future of employment: how susceptible are jobs to computerisation?"

² Citibank "Technology at Work v2.0"

³ World Economic Forum "The Future of Jobs"

⁴ Arntz, M., T. Gregory and U. Zierahn (2016), "The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis", OECD Social, Employment and Migration Working Papers, No. 189, OECD Publishing, Paris

⁵ 5 strange jobs that could exist by 2030 <http://www.businessinsider.de/strange-jobs-2030-2016-8/?r=US&IR=T#1-robotics-veterinarian-1>

⁶ Atlas of New Professions: <http://atlas100.ru>.

Globalization of demand for some of the most sought-after professions (mainly in the IT field) will continue. Employers seeking to attract the best talent in such areas will have to compete not only with companies in their own region, but also, for example, with the most promising startups in the Silicon Valley. The "sharing economy" will be further developed: an increasing number of assets and consumer items (cars, real estate, etc.) will be shared to reduce individual costs.

Digitalization of business processes

According to various estimates, the automation/digitalization of business processes,

which has already begun, could result in the disappearance of 9% to 50% of all existing jobs within the next decade (please see sidebar). The content of the remaining "traditional" professions will change substantially by integrating new technologies.

The next 5–10 years will see a "polarization of qualifications": professions of the highest ("Knowledge" category) and lowest ("Skill" category) qualification levels will remain the most sought-after. At the same time, the number of jobs of the average qualification level ("Rule" category) will experience the strongest pressure of new technologies. Positions that are even now subjected to reductions due

to digitalization of processes include analysts, accountants, lawyers, traders, recruiters, administrative staff, etc.

Digitalization of business processes will provide an impetus towards an overall complication of all professions, on the one hand freeing up staff time to handle more complex and creative tasks, on the other hand significantly raising their qualification requirements. This will result in a proliferation of a new approach to the allocation of responsibility, as opposed to the long-established “one person – one task” principle: one employee or a small team can be responsible for a complex process/product or several processes in various fields.

The increasing penetration of algorithms and computing solutions will shift labor market needs towards the “human in man”, towards creativity, towards cultural, value aspects of interaction – all things that machines are not able to do.

“IN ORDER TO SUCCEED IN LIFE, FROM NOW ON WE WILL NEED LQ, RATHER THAN IQ. WHAT IS LQ? POTENTIAL TO LOVE, MACHINES WILL NEVER HAVE IT”

JACK MA, ALIBABA FOUNDER,
BLOOMBERG GLOBAL BUSINESS FORUM,
SEPTEMBER 2017

Robotics

We consider robotics as a separate trend, separating it from the automation of business processes, although these two phenomena are closely linked. The reason why they are separated is that a full-scale robotization of processes requires, on average, more substantial and lasting investments than the development of algorithms for digitization. Therefore, we will see a fuller impact of this trend later than the effect of automation. For many industries, the turning point, where the ben-

efits of introducing robots exceeds the costs of their acquisition, has not yet come and is unlikely to do so by 2025, particularly in countries with low labor costs.

The total number of robots in operation worldwide reached more than 1.6 million in 2017; as early as 2 years from now, their number is estimated to grow to 2.5 million. The cost of robotic solutions is rapidly decreasing, but it still remains quite high. For example, in 2005, the cost of a robot welder was USD 182,000, in 2014 – USD 133,000, by 2025 it is estimated to drop to USD 103,000.²⁴¹¹ Therefore, robots have been introduced most widely in labor-intensive industries with a high added value: electronics, the automotive industry, etc.

For Russia, robotics is still exotic: in 2017, there is one industrial robot per 10,000 enterprise employees (in South Korea – 531, in the United States – 176, in China – 49). It is estimated that in terms of this trend, the country lags behind the group of advanced countries by 7–10 years¹². At the same time, examples of robotics are already available in some Russian industries, specifically in the automotive industry and agriculture. For example, at some dairy farms, where 5000 cattle heads used to require 250 milkmaids, today the same number of cattle heads are served by 2 operators and a robot milker¹³.

Looking ahead to 2025, a proliferation of robots capable of doing the job instead of a human poses a job loss threat primarily to the lowest qualification “Skill” category. An estimated 19% of all workers may be substituted by robots in 81% of instances¹⁴. We believe that a wave of substitution of low-skilled jobs will follow the “polarization of qualifications”.

At the stage of mass robotics, the overflow of jobs from manufacturing industries to the service sector that has already been observed will gain further momentum.

One of the most significant consequences of the technological trends in the labor market will be a proliferation of the so-called “superfluous people” phenomenon – those whose basic level of skills and readiness to change

11. BCG “The Robotics Revolution. The Next Great Leap in Manufacturing”

12. Vedomosti. Robots do not take root at Russian factories. <https://www.vedomosti.ru/technology/articles/2016/11/14/664697-roboti-ne-prizhivayutsya>.

13. An interview with a representative of an agricultural company as part of preparation of this report.

14. RBC “Superfluous people of the 21st century”

will not allow them to keep their jobs when competing with robots or algorithms (please see our assessment in the sidebar to this chapter). In today's economy "superfluous people" can work "off the books", or become a source of social tension. The solution is for the state to launch massive retraining programs and even pay an "unconditional basic income" that is not dependent on the type of employment of those who receive it¹⁵.

15. A pilot project involving the introduction of an unconditional basic income from 1 January 2017 is underway in Finland; a similar pilot project is planned in Canada. In 2016, Switzerland held a referendum, during which the majority of the population did not support plans to introduce the payment of an unconditional basic income.

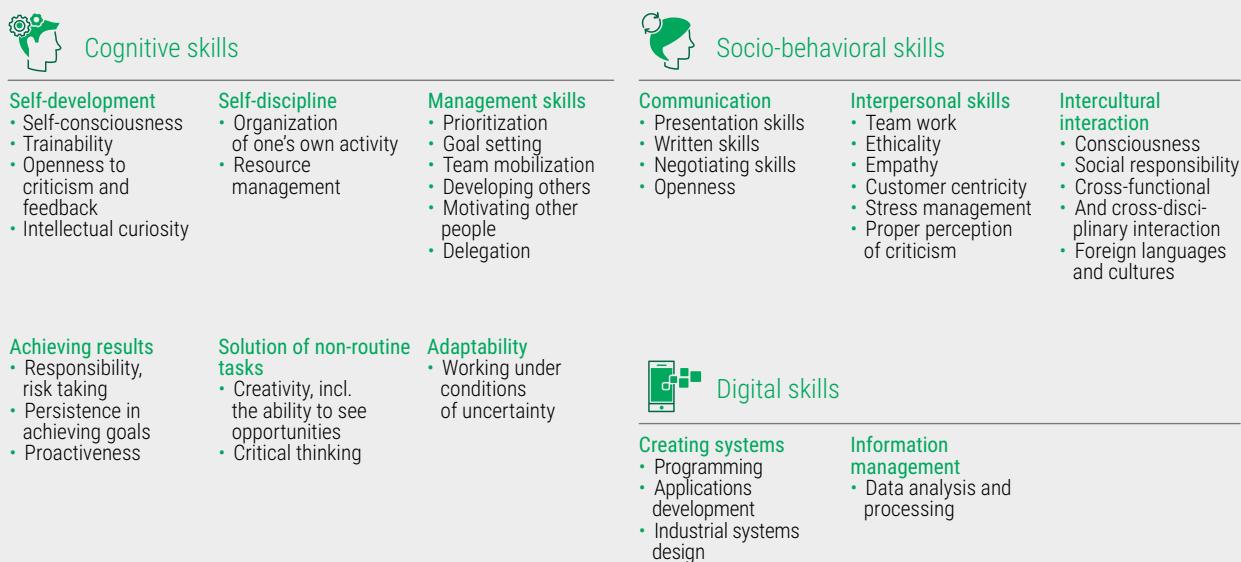
TARGET COMPETENCY MODEL 2025 – THE KEY TO SUCCESS

Geopolitical, demographic and technological trends are creating a new reality for the labor market. Employees increasingly find themselves in conditions of uncertainty, an environment that is rapidly changing and becoming obsolete. The vertical hierarchy is no longer of use, horizontal relationships are becoming more complicated, and the commercialization of ideas and research results is increasingly important. For each labor market player, the area of responsibility is being expanded – responsibility for the result, for oneself, for the team. A new motto for those who want to ensure that they remain competitive in the labor market is becoming more and more popular: “Evolve or become extinct”¹.

We believe that the growing penetration of algorithms and computer solutions will lead to a re-orientation of labor market needs towards the “human in man”: creativity, cultural aspects, individual and collective values, as well as universal “competencies of the 21st century”, which cannot be compensated for by digital technologies.

Lists of such competencies have been presented in recent years by numerous studies and include a similar list of skills that are essential in order to function in the new context: a focus on self-development, self-organization, decision-making and result delivery skills, non-standard task solution, entrepreneurial skills, adaptability, communication skills, inter-

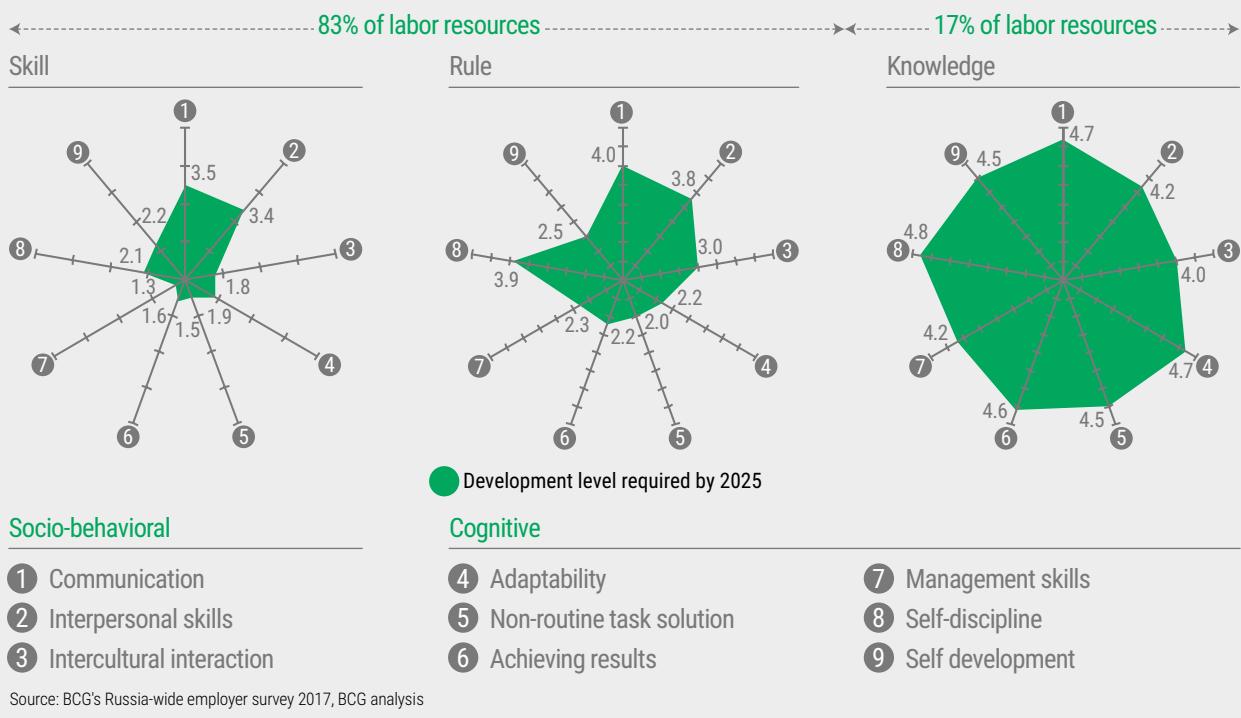
Figure 3 | Target Competency Model 2025



Source: consensus expert opinion of Sberbank, RosExpert/Korn Ferry, Higher School of Economy, WorldSkills Russia, Global Education Futures, and BCG.

1. Herman Gref speaking as part of an open lecture at the Annual convention of graduates of MSM Skolkovo business school

Figure 4 | Employers expect the development of universal competencies primarily with “Knowledge” category staff



personal and intercultural competencies, emotional intelligence, digital skills, and others.

A competency may be considered universal if it is required by a wide range of people, regardless of the area of activities or profession. For example, according to Global Education Futures estimates, entrepreneurial competencies will be essential for at least 30% of the working age population by 2025 due to the proliferation of the self-employment trend and expansion of individual areas of responsibility within the framework of hired labor.

We have combined the approaches of Lominger Library of Competencies, Sberbank, RosExpert/Korn Ferry, Higher School of Economics, WorldSkills Russia and Global Education Futures with a view to developing the Target Model of Universal Competencies 2025 (Fig. 3) based on the consensus opinion of experts.

In preparing the report, this model was used in a survey of Russian employers to identify staff competencies most relevant to them, broken down into “Skill”, “Rule” and “Knowledge” categories (please see the research methodology in Appendix 2). The survey results show that employers consider the development of universal competencies with “Knowledge” category staff as most relevant (on average 4.5 out of 5). The mean value for the “Rule” category based

on survey results is 3.7, with a special focus on communication skills, interpersonal skills, and self-organization (Fig. 4).

The development of Target Model 2025 universal competencies, particularly with professionals from the “Knowledge” category, forms the basis for the competitiveness of countries, organizations and individuals in the knowledge economy. Upper development trajectory countries are currently laying the groundwork for its formation, building relationships between business needs, government priorities and the education system.

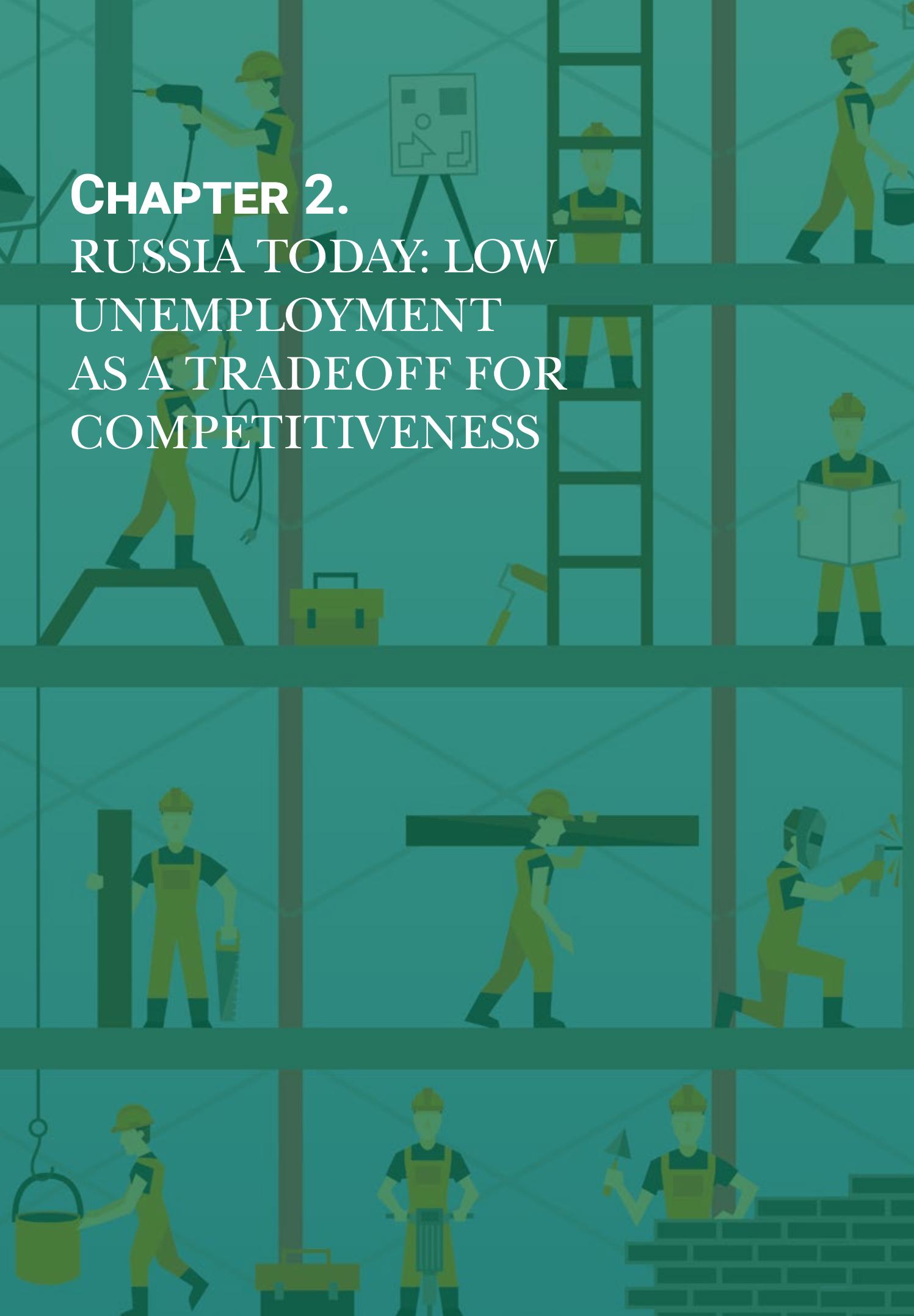
Achieving a similar objective in Russia would involve:

- Redistribution of the national labor market structure in favor of “Knowledge” category jobs
- Development of Target Model 2025 universal competencies with a wide range of people both prior to their entry into the labor market (within the framework of the educational system) and with those employed on the market (within the framework of additional professional education and corporate training).

In our view, the country is not yet in a condition to achieve of both of these objectives. The arguments in favor of this opinion are described in the following chapter.

CHAPTER 2.

RUSSIA TODAY: LOW UNEMPLOYMENT AS A TRADEOFF FOR COMPETITIVENESS



The rate of **unemployment** in Russia is one of the lowest in the world at **5.5%** for the country overall, and not more than **2%** for Moscow and St. Petersburg

Unemployment rates and national GDP dynamics are not related: even **during the peak of the 1990s crisis** the rate of official unemployment never exceeded **12%**

According to the **Global Talent Competitiveness Index** that covers a total of 118 countries, in 2017 Russia stands at **81st** place in terms of attractiveness for talent, and **107th** place in terms of opportunities created for talents

Over **35%** of the employed population in Russia are in low-skill jobs, while only **17%** are **“Knowledge” category employees**

30% of the population is **working** in the public sector (doctors, teachers, civil servants, and public company employees) and another **24%** is employed by large private corporations.

An average **school teacher** is **51 years of age** and has a tenure of **21 years, 15** of which were likely spent in one and the same school

In the time **between 1993 and 2015**, the university admission rates in Russia more than **doubled**, while the number of entrants decreased by **36%**

60% of employers say secondary vocational school graduates are showing a **significant lack** of practical skills required by their profession

In Russia, the difference between a **driver's** income and a **doctor's** income is **20%**, while even in a developing economy such as Brazil the difference is **174%**

“Growth values” are important for only **2%** of Russians, versus **24%** of Western Europeans and **32%** of Northern Europeans

As we have shown above (Fig. 2), in Russia, only 17% of employees currently belong to the “Knowledge” category, while the minimum value of this indicator in the group of upper development trajectory countries is 25%.

The employment balance established during the post-Soviet decades, with a low demand in the economy for “Knowledge” category cadres, the education system’s limited capacity to train such staff and the lack of values in the society required for the cultivation of the target competencies, constitutes a major barrier to Russia’s competitiveness in the knowledge economy. There is currently no reason to believe that by 2025 our country will succeed in catching up with the labor market development level of this group of states and thus become competitive in the knowledge economy.

Let us consider three key reasons for this situation.

REASON 1: DEMAND FOR KNOWLEDGE HAS NOT REACHED ITS CRITICAL MASS

THE LABOR MARKET IS NOT ATTRACTIVE ENOUGH TO TALENT

Despite the fact that Russia has one of the lowest unemployment rates in the world – as low as 5.5%¹, while in Moscow and St. Petersburg it is not more than 2%, the Russian labor market remains unattractive for most talented employees – who possess the universal competencies of the 21st century. In the 2017 annual Global Talent Competitiveness ranking (GTCI), Russia’s position compared to the previous year remained almost unchanged, ranking 56th out of 118 participating countries. However, within the “Attractiveness” criterion the country only came in 81st place, and in terms of creating opportunities for talents things were even worse – 107th place² (Fig. 5).

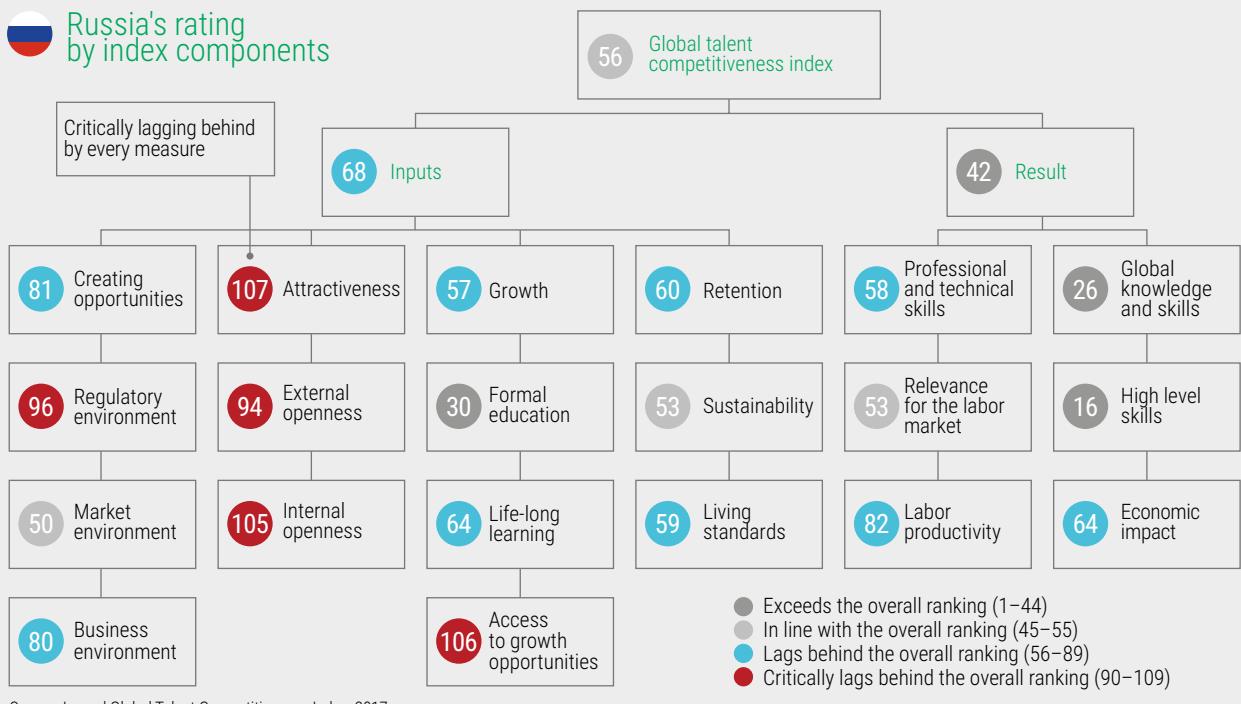
“MANY WONDER WHY SO MANY PEOPLE ARE GOING ABROAD, BUT WITH SUCH LOW LEVEL OF DEMAND, THIS FIGURE COULD HAVE BEEN MUCH HIGHER. WE HAVE QUITE A SETTLED CULTURE, AND I THINK, TO A LARGE EXTENT THIS IS OUR RELIEF”

K. VARLAMOV, DIRECTOR OF THE FOUNDATION FOR THE DEVELOPMENT OF INTERNET INITIATIVES (FDII), BCG REVIEW, MARCH, 2017

1. According to estimates of the Federal State Statistics Service of the Russian Federation based on ILO (International Labor Organization) methodology.

2. Please see <http://www.gtci2017.com>

Figure 5 | Russia's GTCI Rating – lagging behind critically in terms of attractiveness and labor market openness



Source: Insead Global Talent Competitiveness Index, 2017.

Figures such as these are conducive to continuing the “brain drain” from the country. Although the international migration balance has remained positive for Russia since the 1990s (the number of immigrants is higher than the number of emigrants), various sources indicate that people leaving the country principally include the most talented representatives of the “Knowledge” category, while those moving to Russia are less-skilled employees, primarily from the countries of the former USSR.

Official Rosstat statistics, which only take into account emigrants who are de-registered at the place of their residence in Russia, appear to be 3 or 4 times less than real migration flows. In addition, the average emigration flow is characterized by a high educational and professional level and a young age profile.³ The 2015-2016 Global Talent Competitiveness Index examined the emigration of inventors. According to this study, Russia ranked in the Top 10 countries for this category, with 4,300 representatives of this category emigrating to North America and 1,200 to Western Europe in 2013⁴.

Over the past decade, Russia has been making efforts to repatriate talents (“Compatriots” pro-

gram, Skoltech, “Global Education” and other programs). However, the statistical data showing a continued outflow of talented Russians is also corroborated by personal stories of internationally famous innovators of Russian origin. The Google co-founder Sergey Brin, graphene inventors Andrey Geim and Konstantin Novoselov (they were offered work at Skolkovo

“A YOUNG DATA SCIENTIST MAY WELL BE PAID AT THE LEVEL OF A CEO WITH A LONG RECORD OF SERVICE. HOWEVER, HE WILL WORK FOR US FOR ABOUT SIX MONTHS, LEARN SOMETHING NEW AND LEAVE. HE WILL LEAVE FOR DIFFERENT LIVING STANDARDS AND A DIFFERENT LEVEL OF PROJECTS”

TOP MANAGER OF AN INTERNATIONAL IT COMPANY IN RUSSIA

3. The Committee for Civil Initiatives – Analytical report “Emigration from Russia in the late 20th - early 21st century”

4. Please see <http://www.gtci2015-16.com>

after they won a Nobel Prize but declined the offer), Vkontakte founder Pavel Durov, who recently left the country – and the list goes on.

THE RUSSIAN ECONOMY IS FOCUSED ON THE USE OF RESOURCES, RATHER THAN INTELLIGENCE

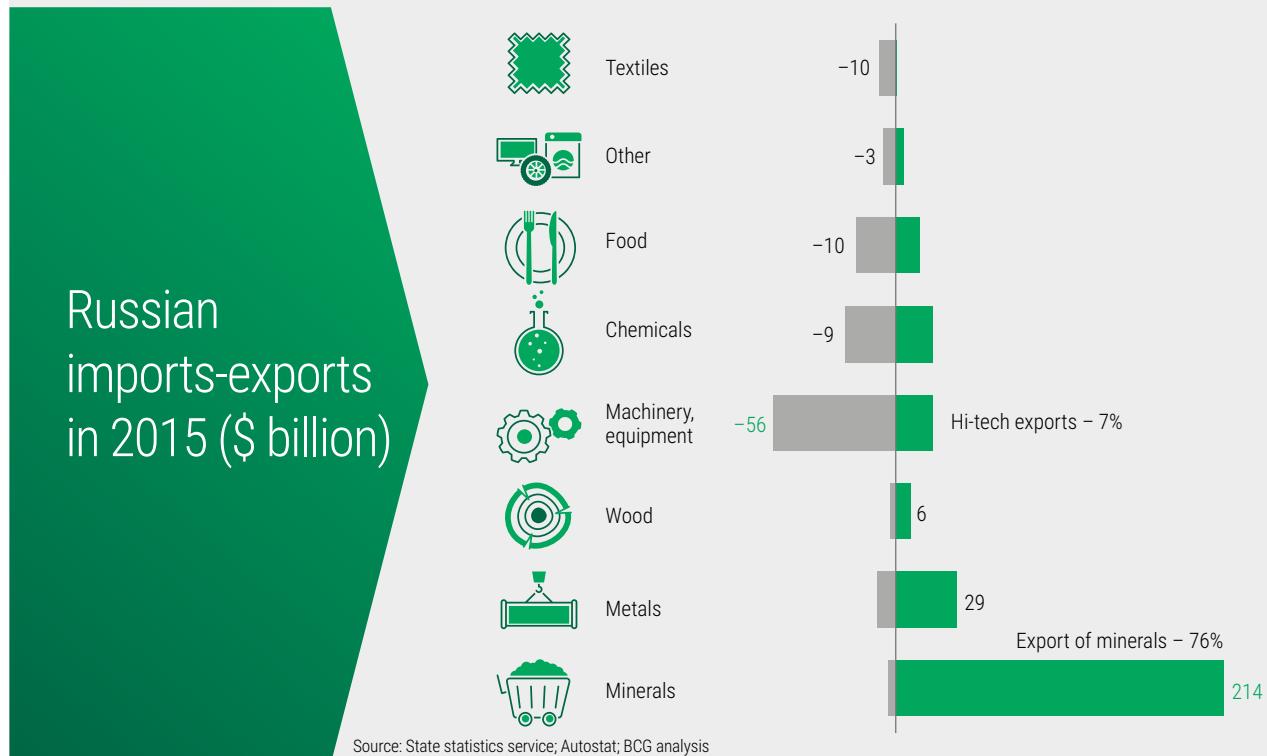
In the international division of labor, Russia long ago assumed the role of exporter of raw materials. Energy resources account for 76% of the country's commodity exports⁵; another 17% include other extractive industry and metallurgy products. Only the aerospace industry and machine building products (7% of commodity exports) can be conditionally at-

REASONS FOR RUSSIA'S LOW POSITION IN THE 2017 GTCI RANKING

- "Attraction" criterion – ability to attract business, people, and openness to social diversity. Russia is extremely unattractive to international talent, the country's ranking is 107 out of 118. The reason for such a low ranking is the results of the analysis of foreign direct investments, foreign assets inside the country, the number of migrants and international students, as well as the disappointing results of an opinion poll on such matters as tolerance towards migrants and social ladder effectiveness.
- "Creating opportunities" criterion – ability to provide conditions for the prosperity of businesses and people. Russia's ranking is 81 out of 118. This result is based on a performance assessment of public administration, interaction between the state and business, political stability, and ease of doing business.
- "Growth" criterion – ability to develop talent and prepare them for participation in the economy. In this group, the category "Access to growth opportunities" critically lags behind: its ranking is 106 out of 118. The score was received on the basis of an analysis of the intensity of virtual, social and professional network use, as well as the freedom of speech in the country. Russia's position in the "Lifelong learning" category is also low – 64 out of 118.

The country's total ranking is also affected by low labor productivity (82 out of 118), based on an analysis of GDP per employee statistics.

Figure 6 | The trade pattern is oriented towards exportation of resources and importation of technologies



5. Federal State Statistics Service, 2015 data

tributed to high-tech exports. Given that engineering products also dominate the structure of imports (45%), it can be said that there is a deficit of competitive Russian-made products in the domestic market as well (Fig. 6).

The commodity-based structure of the Russian economy fosters the spread of primitive employment – 35% of employed persons belong to the “Skill” category (Fig. 7). The most common occupations/activities in Russia are drivers (7.1%), sales assistants (6.8%) and security guards (1.8%)⁶; moreover, the total share of these professions continued to grow in the employment structure over the period from 2000 to 2015.

The Russian digital economy has stagnated after a leap forward in the 2010s

Despite ongoing efforts at the state level to develop the country’s digital economy, its share in Russia’s GDP has stagnated since 2014 at 2.0-2.2%⁷, while the leading countries are moving ahead. For example, the average annual growth rate of the digital economy’s share in the Chinese GDP is 25%, more than double the Russian figure.⁸ Furthermore, in 2010, China significantly lagged behind Russia in terms of the level of digitalization. While this report was being prepared, the Russian Government approved its “Digital Economy” program, which will be in effect until 2024 and aims to change this situation.

The Russian venture market is at a fledgling stage

An equally important factor in the development of the demand for professionals in the “Knowledge” category is the culture of startups and investing in them. However, the Russian venture market, which was a small market in the first place, shrank even further with the 2014 crunch. The focus of venture capitalists, including those in Russia, has shifted to other countries. Today, the Russian venture capital investment market is half the size of the Brazilian market, 6 times less than the Japanese market, 12 times less than the Israeli market, and hundreds of times less than the American market⁹.

THE PERCENTAGE OF EMPLOYERS DEMONSTRATING DEMAND FOR EMPLOYEES WHO POSSESS TARGET MODEL 2025 COMPETENCIES IS EXTREMELY SMALL

The priority of social stability over economic efficiency

The Soviet legacy of total employment and the “shock therapy” of the 1990s with a sharp drop in the living standards of the majority of the population, forced the state to take on the role of a guarantor of stability. That includes retaining even those jobs that do not contribute to economic efficiency: at the peak of the crisis of the 1990s, the official unemployment rate did not exceed 12%. The same policy even a quarter century later continues to affect the economic structure and labor market of today’s Russia. This policy can be illustrated by the lack of dependence of the unemployment level on the dynamics of the country’s GDP (Fig. 8). Unlike the majority of developed economies, the typical response of Russian enterprises in times of recession is to cut salaries, not employment¹⁰.

This pattern of creating and eliminating jobs is a clear sign of stagnation on the Russian

“MOSCOW SAYS: “IF YOU HAVE GOT TO LAY OFF YOU HAVE GOT TO LAY OFF” THE ONLY THREAT OF PRESSURE IS THE GOVERNORS WHO HAVE A JOB CREATION KPI. THEY DO NOT MOVE A MUSCLE THEMSELVES, AND INSTEAD OF CREATING JOBS, THEY ARE PUTTING PRESSURE ON COMPANIES TO FREEZE THE LAYOFFS”

HR DIRECTOR OF A MANUFACTURING HOLDING COMPANY

6. “Kommersant-Dengi”. Capital in retirement. 14% of sales assistants and security guards in Russia have higher education. <https://www.kommersant.ru/doc/3143402>

7. BCG e-intensity index (digitalization index); please see BCG 2016 “Russia Online?” report

8. BCG e-intensity index (digitalization index); please see BCG 2016 “Russia Online?” report

9. Pitchbook database; BCG analysis

10. The Center for Strategic Research – The Russian labor market: trends, institutions, structural changes – 2017

Figure 7 | A third of jobs in the Russian labor market belong to the “Skill” category, which does not require any special education

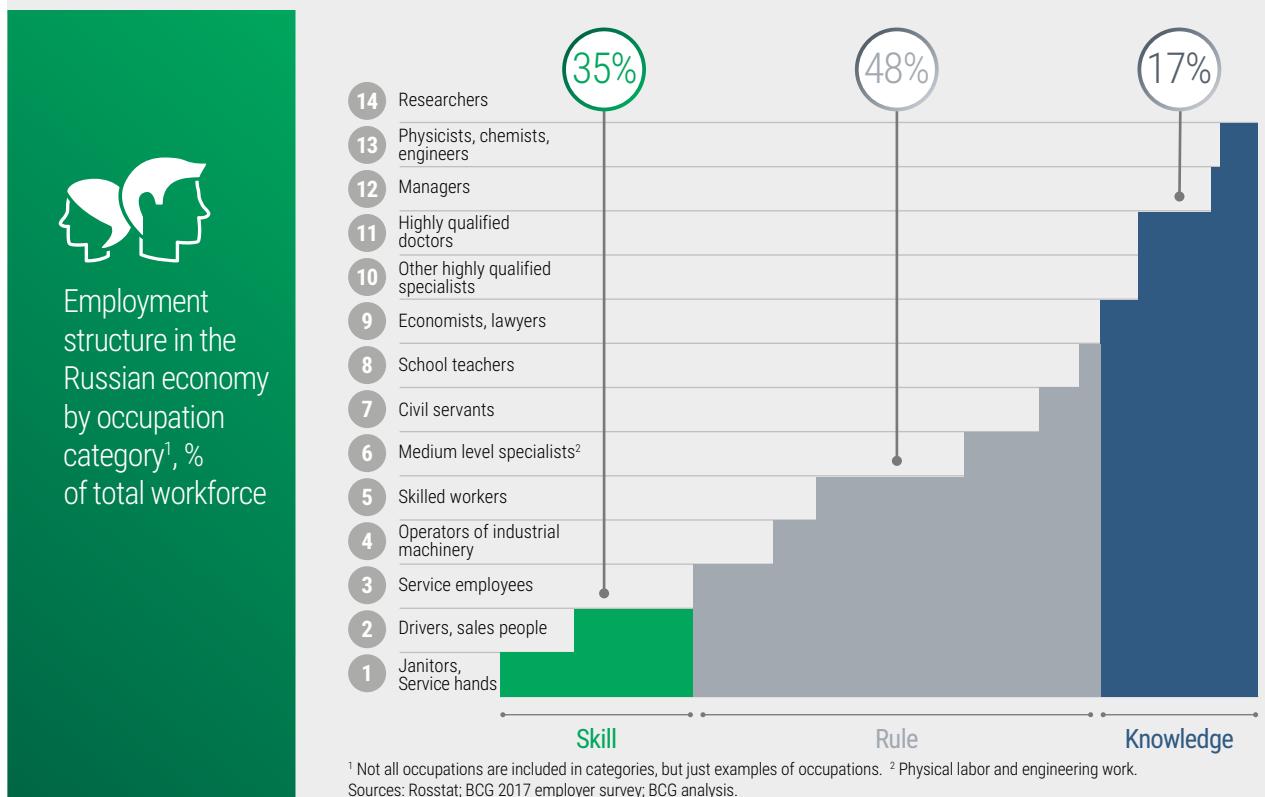


Figure 8 | Unemployment rate in Russia is unrelated to the real economic environment



labor market: in the majority of industries, more jobs are eliminated than created.¹¹ The pace of job creation in the Russian economy in 2008–2015 (7–9% per annum)¹² not only failed to make up for the pace of their elimination (9–12% per annum over the same period), but also significantly lagged behind the world average (creation of around 10–15% of new jobs in a year¹³).

Thus, the pace of job creation in Russia lags behind the catching-up development needs of the transition economy, while a consistent reduction in the total number of jobs is indicative, among other things, of growth in the “off the books” sector.

**“THE GOVERNMENT
CONTINUES TO SUBSIDIZE
SMALL-SCALE INEFFICIENT
OPERATIONS IN ORDER TO
MAINTAIN SOCIAL STABILITY”**

DIRECTOR OF AN AGRICULTURAL
PRODUCER

According to PSEI methodology, in 2015, “off the books” employment (including side jobs) accounted for 20.5% of all persons employed in the Russian economy, while according to BLR methodology, the figure is 25%.¹⁴ All the experts agree on one thing – against the background of the latest crisis, the level of “off the books” employment has risen once again. Thus, according to R&D Institute of Labor estimates, the share of “off the books” employment grew from 17% at the end of 2014 to 22.3% at the end of 2016.¹⁵ In the estimation of the Russian Academy of National Economy and Public Administration under the auspices of the President of the Russian Federation, the current share of “off the books” employment in the labor market is at least 45%.

As a general rule, “off the books” employment involves primitive work and does not contribute to the development of staff competencies

**“DESPITE CLAIMS ABOUT
REFORMS WITHIN THE
COMPANY, NOTHING REALLY
CHANGES. THE COMPANY
CONTINUES TO FULFILL ITS
SOCIAL FUNCTION”**

AN EMPLOYEE OF THE PROFESSIONAL
DEVELOPMENT UNIT OF A STATE-OWNED
CORPORATION

and the country’s human capital as a whole. However, it is important to note that the number of people engaged in “off the books” employment includes not only those who work without formalizing their employer-employee relationship and get paid in cash under the counter, but also the self-employed: entrepreneurs operating without being registered as a legal entity, farmers, freelancers. Increasing the added value of the labor of self-employed, and their withdrawal from the “off the books” sector, may prove to be a major driver for the further development of the Russian economy.

**Over the past 25 years, Russia has
failed to move away from the labor
market structure inherited from the
Soviet Union**

Despite privatization, corporatization of enterprises, development of small and medium-sized businesses, and the arrival of foreign companies, the state, directly or indirectly, is still the principal employer in Russia (Fig. 9a, 9b). The approach to the classification of employer organizations, shown in the figure, is described in Appendix 3.

Companies partially owned by the state, as well as traditional large companies – “children” of the privatization wave of the 1990s, still account for a significant share of the Russian labor market. The sale of some of the state-owned enterprises de jure changed their form of ownership, but in fact preserved the priority of socio-political goals over economic

11. Higher School of Economics – V.Ye. Gimpelson, R.I. Kapelyushnikov, Z.A. Ryzhikova – Dynamics of jobs in the Russian economy: in search of creative destruction – 2012

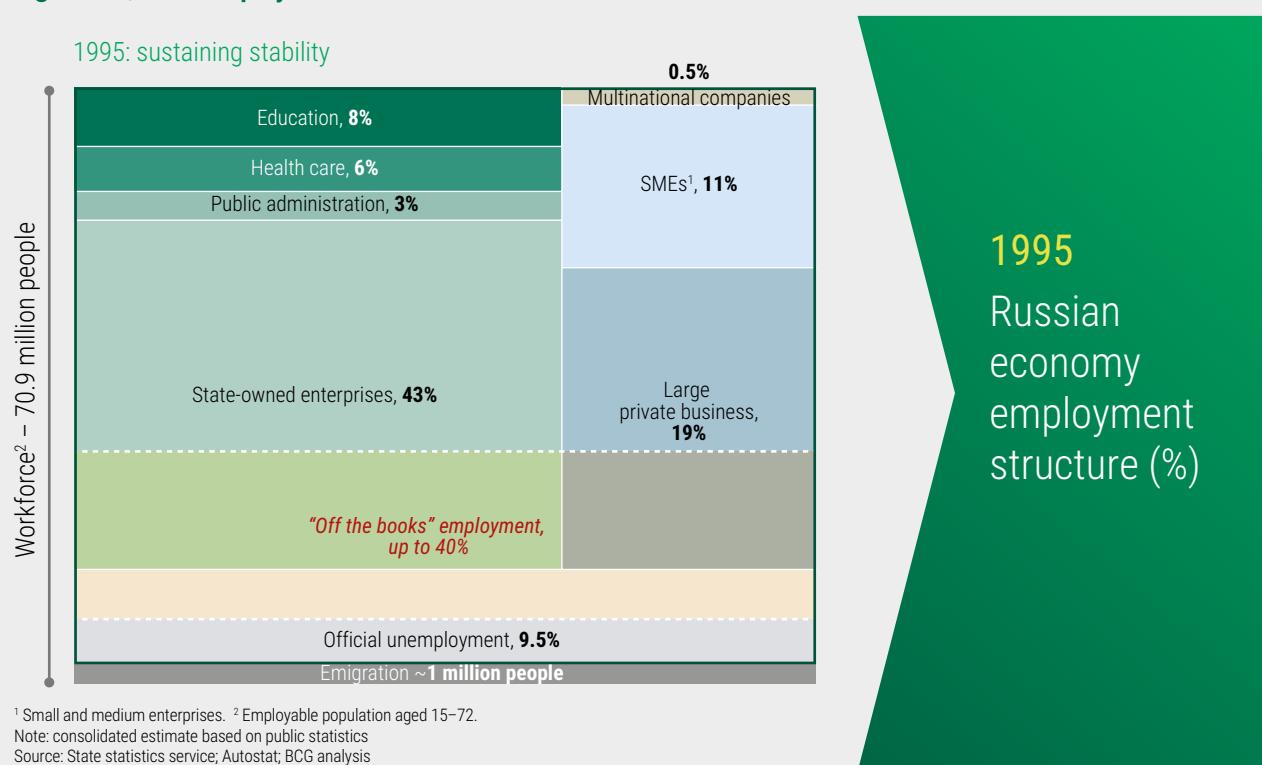
12. The Center for Strategic Research – The Russian labor market: trends, institutions, structural changes – 2017

13. Labour Economics – Cahuc, P. – Search, flows, job creations and destructions – October 2014.

14. PSEI – Population Survey on Employment Issues; BLR - Balance of Labor Resources. Source: The Center for Strategic Research – The Russian labor market: trends, institutions, structural changes – 2017

15. Estimates of the R&D Institute of Labor of the Russian Ministry of Labor, Vedomosti – “One-fifth of employed persons have withdrawn into the shadows”, December 2016

Figure 9a | 1995 Employment structure: new forms filled with old contents



"WE DO NOT COMPETE FOR STAFF WITH RUSSIAN COMPANIES. AND WE DO NOT EVEN COMPETE WITH MULTINATIONAL COMPANIES IN RUSSIA. WE COMPETE WITH GLOBAL ONES – GOOGLE, MICROSOFT AND FACEBOOK"

HR DIRECTOR OF A MAJOR RUSSIAN IT COMPANY

efficiency, and in some cases – their permanent dependence on financial support from the state.

The number of civil servants has increased significantly (from 2.4 to 5.3 million persons in 1995–2015), with their payroll growing accordingly¹⁶.

1995
Russian economy employment structure (%)

"WHEN FREE-THINKING MANAGERS JOIN A [RUSSIAN] COMPANY, THEY ARE IMMEDIATELY PUSHED OUT"

I. ADIZES, ORGANIZATIONAL BEHAVIOR EXPERT

The segment of small and medium-sized enterprises (SMEs), although showing an increase from 11% to 16% of employed persons, continued to be represented mostly in primary, non-capital intensive sectors (trade, private tax service, etc.), which determines the largely primitive pattern of employment. It should be noted that the share of persons employed in the SME segment still lags behind the labor markets of other countries: in India it is 40%, in Brazil – 52%, in China – 80%, in Germany – 63%, and in the United States – 46%.

Large “new” companies, which we conditionally define as private businesses founded after the

16. According to Rosstat, public administration is currently one of the Top 3 best paid sectors in the Russian Federation, along with mining operations and the financial sector.

Figure 9b | 2015 Employment structure: new forms filled with old contents

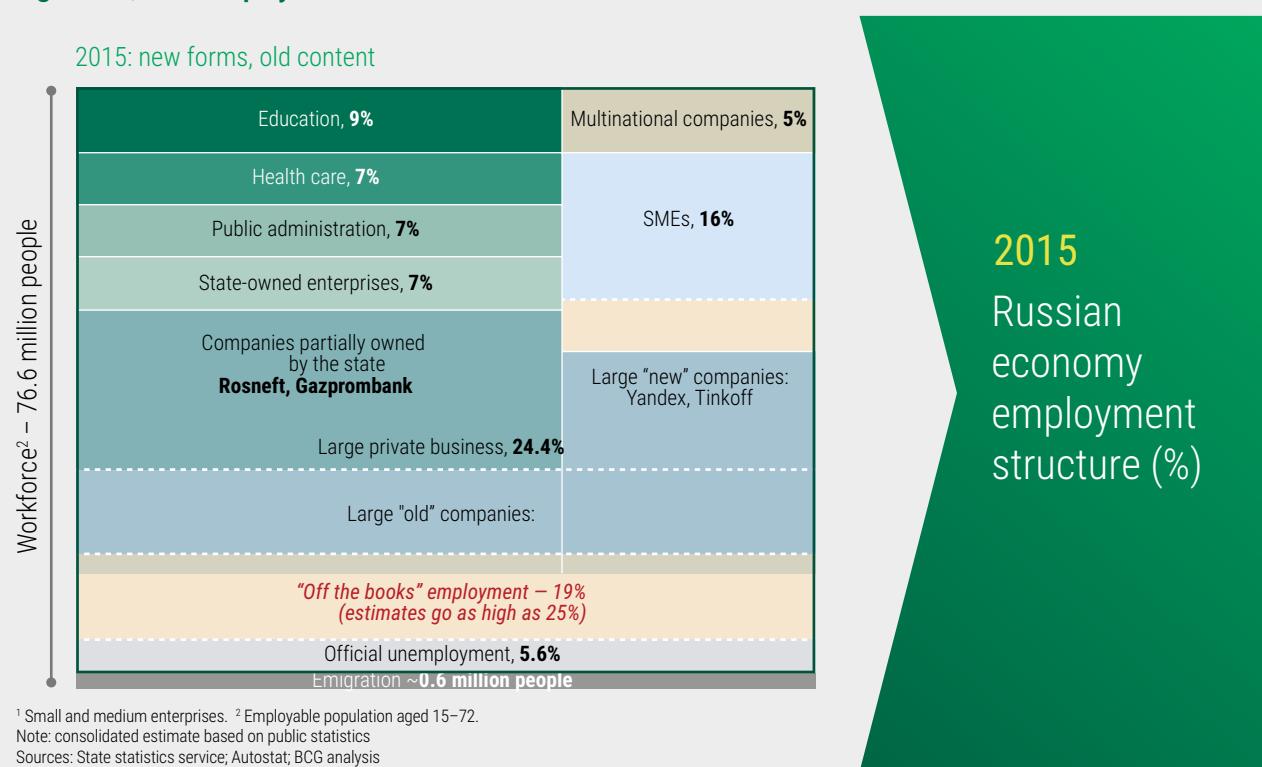
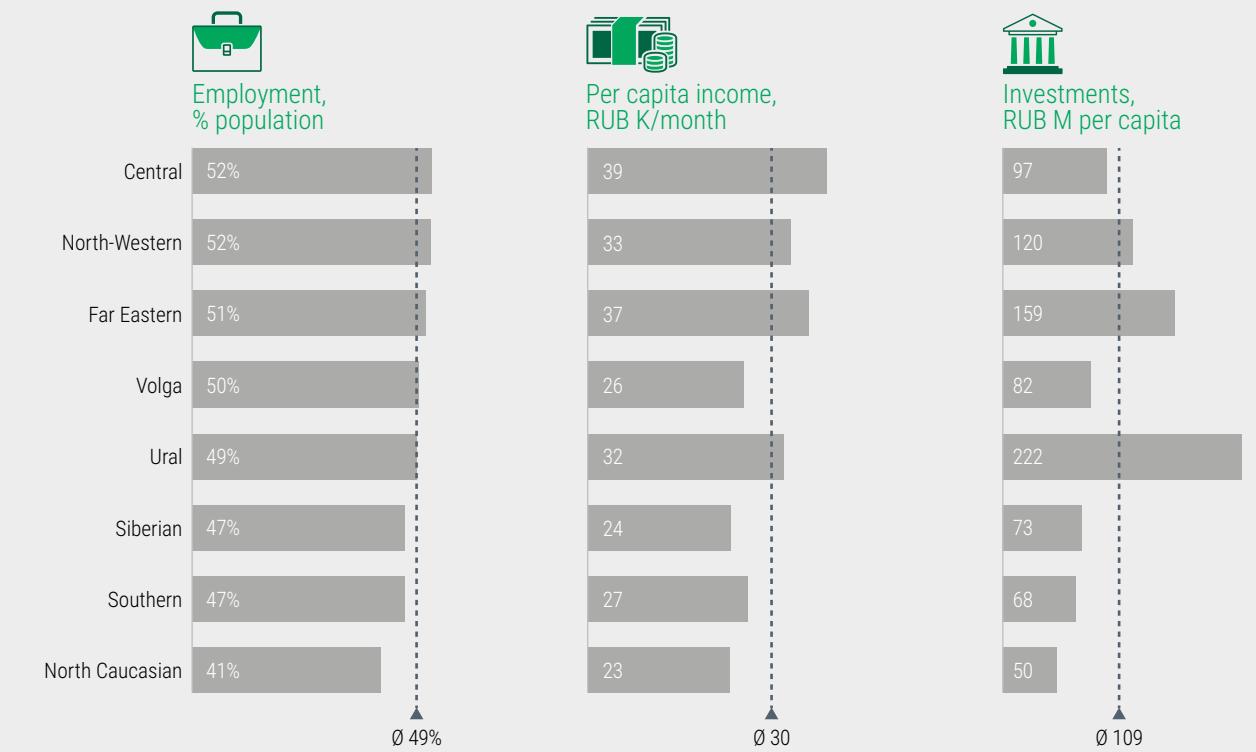


Figure 10 | Differences in living standards between the federal districts (2015)



HOW CHINA REACHED EFFICIENCY IN ITS TRANSITION TO A MARKET ECONOMY

In 1978, the PRC launched economic reforms, which have been dubbed "The Policy of Reforms and Opening". Today, this program is considered to be a successful example of implementing large-scale changes in the economy. The Policy involved strengthening international links, bringing in the expertise and capital of developed countries, promoting foreign trade, supporting small and big businesses, and developing human capital.

Principle 1: Lifting of international cooperation restrictions. Chinese enterprises began to attract foreign partners, learning from their experience and putting it into practice

- In 1985, China set up a joint venture between SAIC (Shanghai Automotive Industry Corporation) and Volkswagen. Back then, the Soviet Union manufactured 1.35 million passenger cars per year, while China only produced 480,000. The country's main goal was to put into practice as many advanced technologies as possible and to create a training platform for the local staff. Currently, the company employs 144,000 people and produces 6.5 million cars per year (in Russia 44,000 AvtoVAZ employees produce 408,000 cars per year). According to forecasts, by 2020, the Chinese automotive industry will be able to provide one third of world market sales;
- Huawei, which has grown from a seller of imported PBX to a leading provider of ICT, owes its success to putting into practice foreign technologies and new engineering solutions. Up to 20% of the company's revenues were invested in R&D activities, and the majority of R&D centers were set up abroad to better capture the latest global trends.

Principle 2: Attracting foreign investors is one of the key drivers of Chinese economic development

- 1980 saw the launch of the first special economic zone in China, the Shenzhen Special Economic Zone, to attract foreign investments. This economic zone transformed the city: from a small fishing locality, Shenzhen grew into a prosperous metropolis (the population increased from 30,000 to 12 million), a financial center with its own stock exchange, as well as a high-tech hub.

Principle 3: Government incentives for the development of small and medium-sized businesses, including manufacturing areas

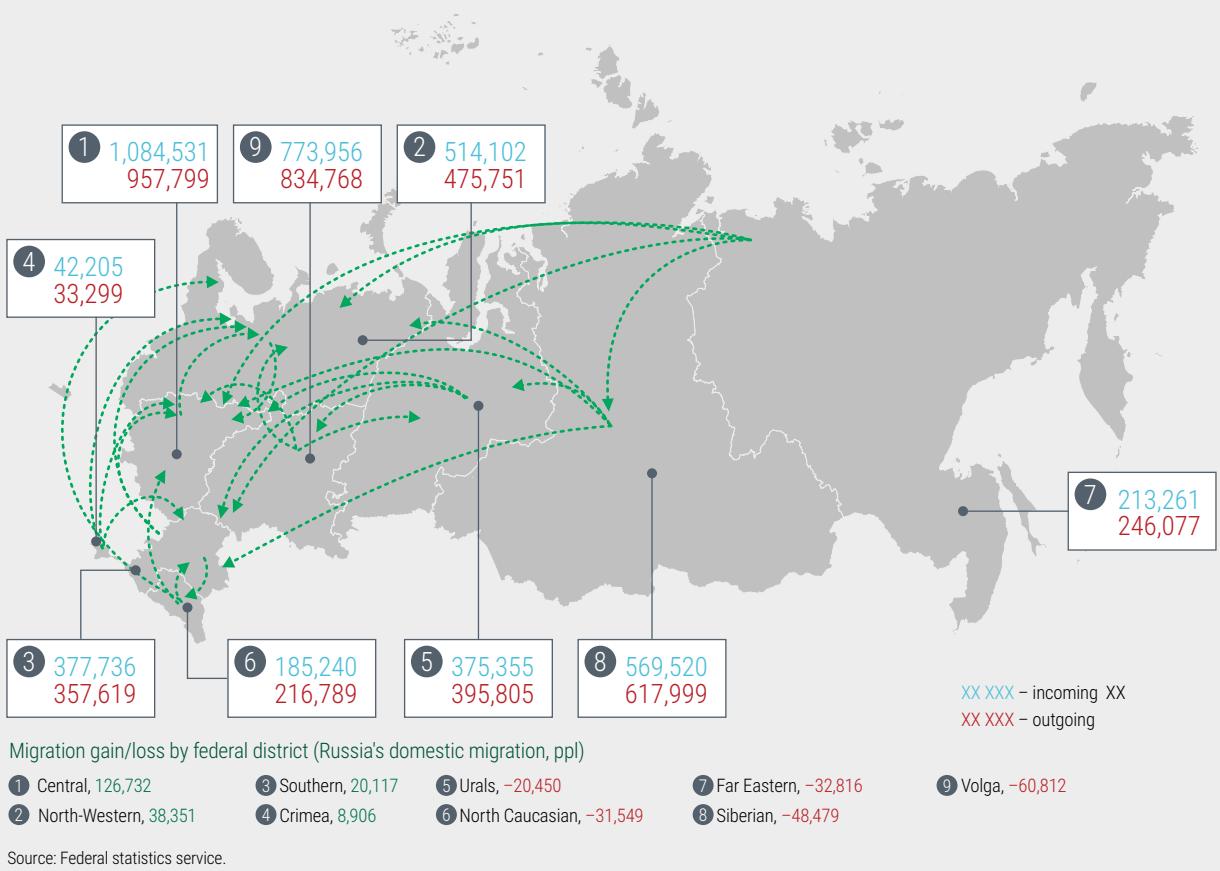
- With the improvement of agricultural performance, a significant amount of manpower was released. The unemployed former peasants, who failed to find a decent job with major enterprises, set up their own small-scale operations. The Government supported this movement by creating business support centers, which, among other things, were charged with organizing trade fairs, assisting with negotiations and contracts, training managers and staff, and providing information and consulting support;
- To date, small and medium-sized businesses provide 60% of industrial production and 80% of jobs in China.

Principle 4: Human capital development through an open education system

- The Ministry of Education provides funding for international exchange programs for teachers and students. Special attention is paid to learning the English language – today it is taught in all schools and is a mandatory component of the national final examination (gaokao).
- In 2015, 534,000 Chinese students went to study abroad – the training is paid for by their parents, while the state plays a regulatory role (licensing of agencies in charge of selecting programs and organizing the training). Despite not having any commitments, 70-80% of graduates who went to study abroad, are seeking employment opportunities in their home country.

Sources: RBC – "The fight of ambitions: how China has caught up with and overtaken Russia in 30 years" (February 2017); European Scientific Journal – "Economic Transition in China and Russia" (May 2015), and other sources

Figure 11 | The result of migrational exchange (migration balance) between the federal districts of the Russian Federation in 2015



collapse of the Soviet Union and not as part of the privatization program of the 1990s (typically, they include non-resource companies), also account for only a small segment of the labor market. It should be noted that such employers originally demonstrated demand for high-quality employees, including in the “Knowledge” category, and were generally able to ensure their efficient use and further development. The alumni of these organizations subsequently join the ranks of companies partially owned by the state (among others), which are interested in their development and attraction of human capital.

Among the “new” companies, technological innovative enterprises stand out from the crowd. It is these companies that have the potential to be “disruptive” change agents in both the economy in general and on the labor market in particular: they have to compete both for sales and for talent on the global market of the knowl-

edge economy. Unfortunately, however, the share of such companies in Russia is extremely small – only ~1% of employed persons¹⁷, and we believe that this is not enough to have much of an impact on the development of the Russian labor market in the period up to 2025.

The segment of international companies, which is generally a source of quality demand for labor, grew from 0.5% in the mid-1990s to 5% of the employed population in 2015. Employees with experience in the international segment are in demand, but usually “land” in private Russian companies. It can be said that the opportunities of using the competencies and practices of top Western companies to develop the domestic human capital and economy have only been partially exploited in Russia. Globally, there are many examples of more intensive use of multinationals to develop local human capital, with the Chinese model being one of the most successful (please see the box

17. Estimation of the number of employed persons was based on rankings of technological innovative companies, such as TekhUs-pekh RVK, RBC's Rating of Russian IT companies, etc.

“How China achieved efficiency in the transition to a market economy”).

STAFF SHORTAGE LIMITS BUSINESS GROWTH IN THE REGIONS

With the collapse of the Soviet Union and during the crisis of the 1990s, the economy of the majority of the Russian regions experienced a period of decline. Bankruptcies, disbanding and closure of regional research institutes (from 1990 to 2003, the number of researchers in Russia declined from 993,000 to 410,000¹⁸) reduced the regional demand for a skilled workforce. The economy was concentrated in the center and in extractive industry regions.

Regional gaps in living standards and investments persist until now, both at the level of individual constituent regions of the Russian Federa-

tion, and at the level of federal districts (Fig. 10). According to experts, the number of “donor regions” decreased in 2006–2016 from 25 to 14¹⁹.

As a result, the balance of internal migration has shifted towards economically prosperous regions, located mainly in the Central, North-Western and Southern federal districts (Fig. 11). This one-way internal mobility has led to sustained population outflow from the less successful regions, primarily from the Siberian, Far Eastern and Volga federal districts, where a decline in demand was followed by a drop in the regional supply of a skilled workforce.

The regional labor shortage has turned into a vicious circle: the existing demand for “Knowledge” category professionals in the regions is low; however, the shortage of such employees is a major barrier to the development of companies outside of major cities.

18. A. Allakhverdyan, N. Agamova. Russian science in the post-Soviet period. M.: 2005

19. Vedomosti. The number of donor regions almost halved in 10 years. April 2017

REASON 2: THE EDUCATION SYSTEM DOES NOT TRAIN STAFF FOR THE KNOWLEDGE ECONOMY

In order to match the rapid pace of the knowledge economy dynamics and remain in demand on the labor market, a person needs to be involved in a lifelong learning process and adapt to continuous, rapid, and unexpected changes.

Employers expect school leavers and university graduates to be prepared for life, work and self-realization in the new context. For this reason, the agenda of upper development trajectory countries in recent years has included a new education program with the focus shifting from obtaining knowledge in subject disciplines to the development of universal “21st century skills”, which correspond to the Target Competency Model 2025 proposed as part of this report (Fig. 3). Russia remains on the margins of these changes.

TEACHER TRAINING DOES NOT KEEP UP WITH THE UP-TO-DATE REQUIREMENTS OF EDUCATIONAL STANDARDS

In 2010, Russia approved a federal state educational standard of basic general education (FGOS OOO), whereby schools are to switch from subject discipline educational results to a model consisting of three components: subject, personalized and meta-subject, which is a prototype for developing universal competencies as part of school education. In particular, “a

student is expected to be able to apply knowledge in practice, in familiar and unfamiliar labor situations. He or she is expected to be able to comprehend his or her experience and draw conclusions on the basis of it”¹. FGOS standards are rather adequately correlated with the universal competency model 2025 proposed in this report (Fig.3).

In the knowledge economy, where technology and knowledge are updated very quickly, a teacher must adapt even more rapidly. The implementation of FGOS clearly implies changing the teacher’s role.

Today, an average Russian teacher is “a woman aged 51, who has a total work experience

“THE TEACHER’S MAIN TASK IS
NO LONGER JUST TO TEACH
THEIR SUBJECT, BUT ALSO
BE ABLE TO ORGANIZE
CHILDREN’S ACTIVITIES.
THAT IS TO SAY, IT’S ABOUT
INVOLVING STUDENTS
IN THE CREATION PROCESS.”

DR. VITALY RUBTSOV, PRESIDENT OF
THE MOSCOW STATE PSYCHOLOGICAL-
PEDAGOGICAL UNIVERSITY

1. Please see FGOS OOO

of ~21 years, 15 of which she has spent in the same school². Without any rotation during such a long period, a person not only fails to obtain new skills³, but also loses their original qualification and susceptibility to any changes. As a result, according to a TEDS-M⁴ study, the average score of an active Russian teacher of mathematics is 340-380 out of 1,000, and 10% of school teachers lack knowledge in Russian language and grammar⁵.

To a large extent, this situation stems from the fact that the current system of professional development for teachers cannot cope with the task. According to the Institute for Statistical Studies and Knowledge Economy of the Higher School of Economics (HSE), less than 40% of educators undergo off-the-job refresher training courses. Unfortunately, this additional education for the most part does not serve the purpose of career development for teachers, but is rather obtained in order to get an appropriate license.

“NEW TECHNIQUES EMERGE, THE CONTENT OF THE MATERIAL CHANGES, ALL OF THIS IS SPELLED OUT IN THE FEDERAL STANDARD. THE PROFESSIONAL DEVELOPMENT SYSTEM MUST ACTUALLY WORK, I.E., IT MUST PRODUCE BETTER PROFESSIONALS RATHER THAN JUST GIVE FORMAL COURSES OR CHECK ANY FORMAL INDICATORS, WHICH OFTEN DO NOT CORRESPOND TO THE ACTUAL STATE OF AFFAIRS”

SERGEY KRAVTSOV, HEAD OF THE FEDERAL EDUCATION AND SCIENCE SUPERVISION SERVICE, ROSOBRNADZOR

“AT THE SAME TIME, TEACHER TRAINING PROGRAMS AND THE PRESTIGE OF THE PROFESSION AS A WHOLE NEED TO BE SIGNIFICANTLY IMPROVED. TODAY, A DEGREE IN PEDAGOGY IS ACQUIRED ACCORDING TO THE LEFTOVER PRINCIPLE ALAS, THE EXISTING PEDAGOGICAL COLLEGES AND UNIVERSITIES PRIMARILY REFLECT THE NEEDS OF A SPECIAL MARKET, THE MARKET OF PARENTAL AMBITIONS, RATHER THAN STUDENTS’ OBJECTIVES TO GET INTO THE TEACHING PROFESSION. AND, MOST IMPORTANTLY, THESE INSTITUTIONS ARE HOPELESSLY BEHIND MODERN EDUCATION, BEHIND SCIENCE, BEHIND THE TIMES”

A.G. ASMOLOV, PRESIDENT OF THE FEDERAL INSTITUTE FOR DEVELOPMENT OF EDUCATION, ACADEMICIAN OF THE RUSSIAN ACADEMY OF EDUCATION, HEAD OF THE PERSONALITY PSYCHOLOGY CHAIR OF THE PSYCHOLOGY DEPARTMENT OF THE MOSCOW STATE UNIVERSITY, MEMBER OF THE PRESIDIUM OF THE RUSSIAN ACADEMY OF EDUCATION)

Successful implementation of FGOS standards requires massive retraining of teachers to help them master the skills of developing meta-subject and personalized results. First and foremost, however, it requires a change in the approach both to the training of new teachers and the re-training/professional development of those who already work as school teachers.

-
2. Tallis, HSE 2014
 3. According to the Institute for Statistical Studies and Knowledge Economy of the Higher School of Economics (HSE), less than 40% of educators undergo off-the-job refresher training courses.
 4. The international study Teacher Education and Development Study in Mathematics (TEDS-M) assesses not only the knowledge of a specific subject, but also motivation
 5. Kommersant 10% of teachers experience a lack of knowledge of the Russian language and grammar. <https://www.kommersant.ru/doc/3351262>

"University lecturers and school teachers receive a miserable, humiliating salary, unworthy of highly educated people. Suffice to say that a rural professor earns a laughably small income of under 500 euro, which is significantly less than unemployment benefits in most developed economies and by an order of magnitude less than the salary of a European professor. This turns Russian teachers into lumpen-proletarians of intellectual labor forced to constantly look for additional sources of income, which pitifully affects both the quality of their work and their health. Moreover, in addition to these ridiculously small salaries, Russian teachers suffer from a number of hidden underpayments. An important mechanism of underpayment to teachers is a monstrous hourly load (overload!) not taking into account the time required for preparation for classes and for scientific research.

an extract from an open letter written by V. Afanasyeva, Professor of Saratov State University, to the Russian Minister of Education in April 2017

It can be said that the general education system is poorly replenished with new staff: each year, no more than 25% of higher education graduates in pedagogy go into teaching, and one of the reasons for this is the mismatch between supply and demand: the school staffing level is currently at 99.2%⁶.

The Russian Government has adopted a program to create more than 6.5 million new school places by 2025⁷. This program can significantly increase the demand for teachers possessing Target Model 2025 competencies. However, current discussions of the program focus mainly on developing the physical infrastructure of schools⁸, while the share of state budget spending on education continues to shrink.

Even the May 2012 decrees of the Russian President, aimed, among other things, at raising the salaries of teachers and bringing them to the level of two average salaries in the region, failed to enhance the prestige of the profession and increase the level of satisfaction among existing teachers. According to a survey of teach-

ers conducted by HSE and the Levada Center, 50% of teachers receive less than 20,000 rubles as their pay for their main job. Such salaries do not leave them any choice – teachers not only have to do two or more jobs, but also actively work part-time tutoring. As many as 43% of teachers go beyond working in just one school. The forced heavy workload, along with the ever-growing list of extracurricular activities, do not leave any time or opportunity for teachers to engage in professional development or learn new techniques and practices.

THE OFFICIAL EDUCATION SYSTEM IS NO LONGER AN EXCLUSIVE SOURCE OF KNOWLEDGE AND COMPETENCIES

Teacher qualification and motivation issues are reflected in parent evaluations. 32% of Russian parents are not satisfied with the state of public schools, 46% believe that the quality of educational services is continuing to decline⁹. Parents are therefore looking for alternative ways to ed-

6. HSE "Education Indicators 2016"

7. "Assistance to creating new slots in general education institutions in the constituent regions of the Russian Federation" in 2016–2025.

8. Please see, for example, a transcript of the real-time conference meeting of the Russian Government dated November 10, 2015: <http://government.ru/news/20476/>

9. FOM "On school education", 2016

Table 1 | Key online education players in Russia

Services	Exact sciences	Natural sciences	Program-ming	Social sciences	Humanities	Economics	Skill improvement	Foreign languages	School program
Lingualeo								+	
Interneturok									+
Bitclass									+
Foxford									+
Yaklass									+
Hexlet			+						
Gaidar Open University	+			+		+			
Uniweb						+	+		
ITMO			+						
Intuit			+						
Lektorium	+	+		+	+	+	+		
Universarium	+	+		+	+	+	+		
Coursera	+	+	+	+	+	+	+	+	

ucate their children: they move them to home schooling (the number of children being home schooled grew almost tenfold from 2008 to 2017 – from 11,000 to 100,000), or hire tutors (the Russian tutoring services market is estimated by HSE's Institute of Education to be as high as almost 30 billion rubles).

The private school and pre-school segment is also growing. Today, there are about 820 private schools in Russia¹⁰. This is not much (1.9% of the total number of schools in the country); however, despite the over-regulation of the general education system in Russia, the number of such schools is growing. The potential demand for them as an alternative to public education is high. 13% of FOM “On school education” survey respondents would prefer to send their children to a private school. 21% believe that the conditions and the quality of education in private schools are better than in public schools.

As the level of confidence and satisfaction with the formal education system is decreasing, alternative education programs are becoming increasingly popular, particularly the additional schooling segment. According to the Russian Minister of Education Olga Vasilyeva, the num-

ber of organizations providing such services grows annually 3.5 times¹¹.

Another widely known and popular format of alternative training is online education as part of a massive open online course – MOOC¹². There are quite a few online education platforms covering different areas currently in operation in Russia (Table 1). However, the international platform Coursera is still the most popular – in 2016, the number of Russian users exceeded 1 million.¹³

“ACCESSIBLE HIGHER EDUCATION” HAS REPLACED LEARNING WITH UNIVERSITY DEGREES

Today, Russian parents make every effort to provide their children with access to higher education – this has become a social norm in Russia. However, this norm is not supported by the existing structure of the labor market – the employment function of the majority of people employed in the economy does not require any higher education (Fig. 13). For example, 14% of Russian sales assistants and security guards have higher education.

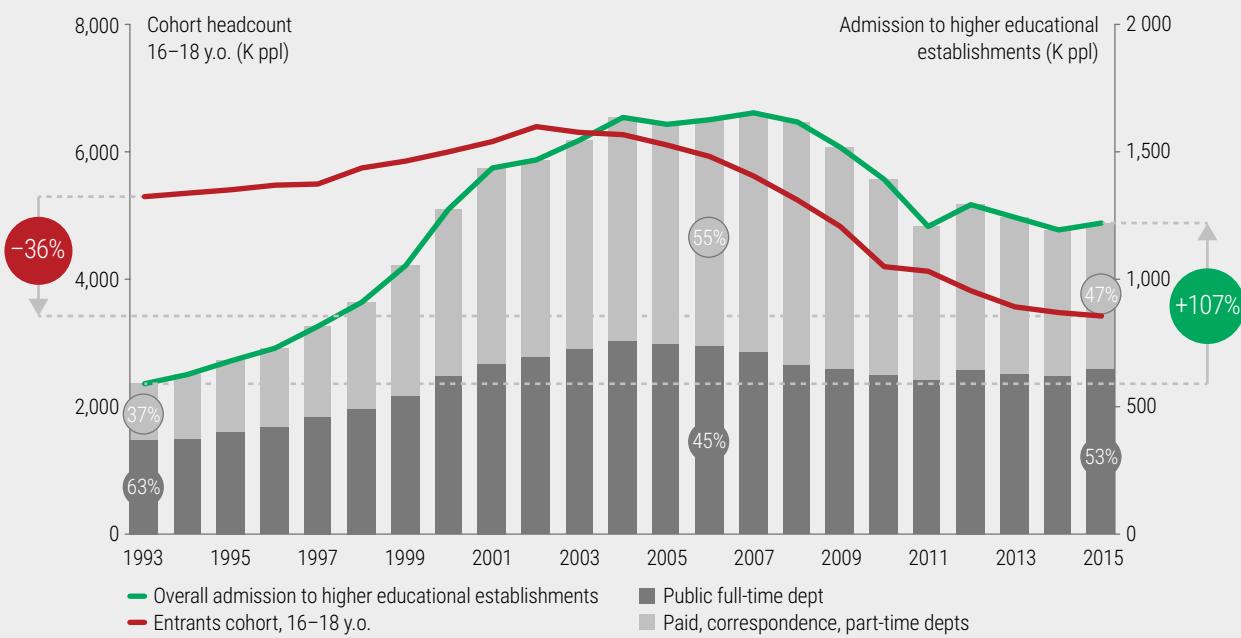
10. Data of the Center for Strategic Studies: <http://csr.ru/news/chastnoe-obrazovanie-v-rossii/>

11. Data of the Center for Strategic Studies: <http://csr.ru/news/chastnoe-obrazovanie-v-rossii/>

12. In English, MOOC stands for Massive Open Online Course

13. Kommersant Education goes online. <https://www.kommersant.ru/doc/3188539>

Figure 12 | Education supply has doubled while the cohort of entrants contracted by 36%



Sources: State statistics service; Autostat; BCG analysis.

"HIGHER EDUCATION HAS BECOME A MUST FOR MAJOR CITIES: OFTEN, WITHOUT HIGHER EDUCATION, YOU CAN NEITHER GET MARRIED NOR GET A JOB, EVEN AS A SECRETARY OR A COURIER. THESE ADDITIONAL FIVE YEARS AFTER SCHOOL ARE LIKE A PASS, A TOKEN OF AUTHENTICATION ATTACHED TO A PERSON. IT'S A SORT OF SIGNAL TO A PROSPECTIVE EMPLOYER THAT THIS PERSON IS ABLE TO WORK IN A TEAM, TO COPE WITH THE JOB. PROFESSIONAL COMPETENCIES, HOWEVER, ARE USUALLY NOT AS IMPORTANT"

YAROSLAV KUZMINOV, RECTOR OF HSE

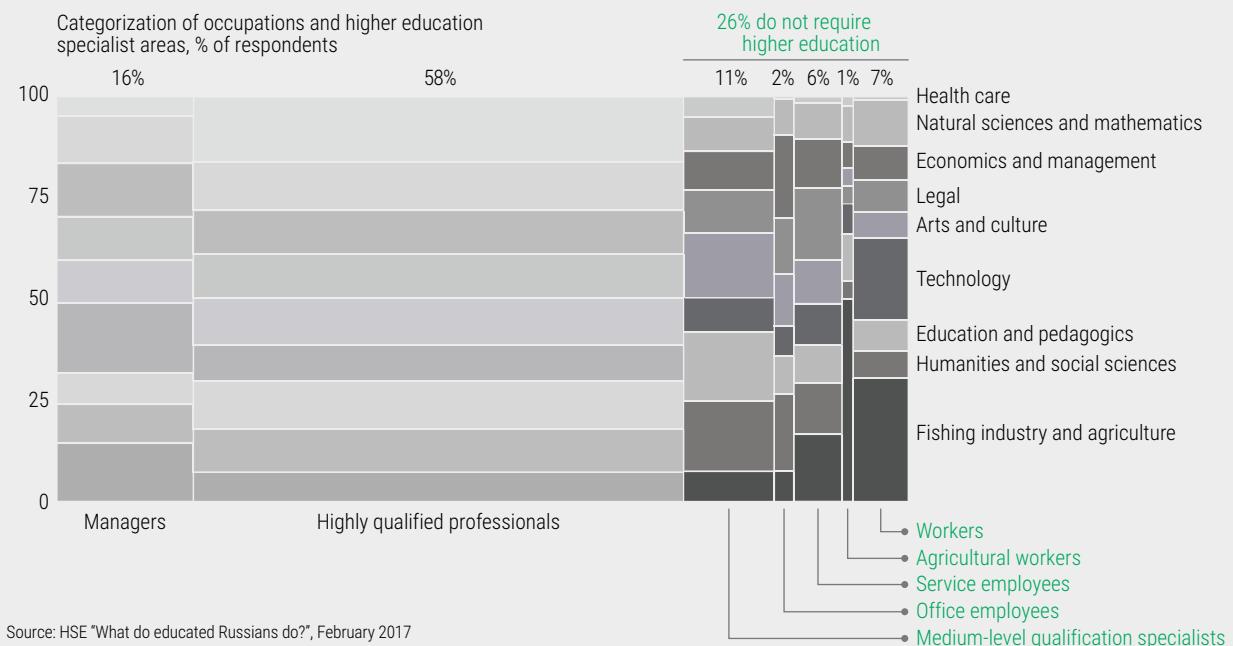
"NOW, STUDENTS CAN EASILY GET INTO UNIVERSITIES WITH DS AND CS. A FEW YEARS AGO, WE CONDUCTED AN IN-DEPTH ANALYSIS OF UNIVERSITY ADMISSIONS IN A NUMBER OF REGIONS. LOCAL TECHNOLOGICAL UNIVERSITIES WERE ADMITTING STUDENTS WITH DS IN MATHEMATICS WITH A VIEW TO TRAINING THEM TO QUALIFY AS ENGINEERS"

YAROSLAV KUZMINOV, RECTOR OF HSE

An additional source of artificial demand for higher education, and one unique to Russia, is universal conscription. Many young men enroll at any university they can, with the belief that the main function of any diploma is to avoid having to join the army.

With the advent of the market economy in Russia, universities quickly responded to the increased demand for their services, and in just

Figure 13 | One in four employees do not need their higher education



over 20 years (1993-2015) admission to higher educational institutions in Russia more than doubled. At the same time, due to the “demographic pit” of the 1990s, the cohort of university entrants decreased over the same period by 36%. As a result, the increase in the number of slots was accompanied by lower competition: in 2015, 18% of potential entrants¹⁴ were admitted into universities against 7% in 1996 (Fig. 12).

According to HSE estimates, 50% of educated Russians work in a specialist field they have not been trained in, and more than 25% of graduates receive excessive education: in other words, they subsequently fill vacancies that do not require the time and money costs that the state, their parents and the students themselves invested to obtain a diploma¹⁵ (Fig. 13).

A separate problem is that Russian graduates lack the expertise, knowledge and skills needed to ensure competitiveness in the labor market in the future. According to the survey, 91% of employers believe that graduates have inadequate practical skills, while 83% perceive the level of training in higher educational institu-

“THE REALITY IS THAT EDUCATION ON ITS OWN IS NOT CONDUCIVE TO A CAREER, IT DOES NOT CONSTITUTE A BASIS FOR SOCIAL SUCCESS, IT IS NOT REVERED, NOT RESPECTED. LEARNING HAS BEEN REPLACED BY UNIVERSITY CERTIFICATES, PROFESSIONALISM – BY THE ABILITY TO SETTLE INTO SOMETHING AND CONFORM”

AN EXTRACT FROM AN OPEN LETTER WRITTEN BY V. AFANASYEVA, PROFESSOR OF SARATOV STATE UNIVERSITY, TO THE RUSSIAN MINISTER OF EDUCATION IN APRIL 2017

14. The entire 15–19 year cohort is meant

15. HSE 50% of educated Russians work in a specialist field they have not been trained in. <https://iq.hse.ru/news/177677848.html>

"IN THE SOVIET UNION, VOCATIONAL SCHOOLS WERE OFTEN AFFILIATED WITH ENTERPRISES. IN THE 1990S, THE ENTERPRISES COLLAPSED, AND SO DID THE EDUCATION"

PAVEL CHERNYKH, WORLD SKILLS INTERNATIONAL TECHNICAL DELEGATE REPRESENTING THE RUSSIAN FEDERATION

tions as medium or low¹⁶.

WITH "ACCESSIBLE HIGHER EDUCATION" IN THE FOREGROUND, THE SECONDARY VOCATIONAL EDUCATION SYSTEM IS UNDERFUNDED AND OUT OF TOUCH WITH BUSINESS NEEDS

Businesses – both private and state-owned companies – are currently the largest consumer of staff with secondary vocational education (SVE); however, the share of the employers' financial support in the total SVE funding amounts to just 2.3%¹⁷. In such circumstances, the impact of the customer on the staff training process is almost non-existent.

The majority of SVE institutions were transferred under the supervision of regional authorities. As a result, the main source of funding has now shifted to regional and local budgets, which obviously vary widely from region to region. The budgets are essentially incapable of covering the costs of upgrading teaching and laboratory facilities, refresher training for teachers and a decent compensation package. They are also unable to cover the social protection of students (in the Soviet era, the vocational technical school (PTU) scholarship allowance was 80% of the minimum subsistence level, currently it is about 5–6%).

The physical infrastructure of SVE has become obsolete: in 2014, 24% of SVE institutions

"SPECIALISTS ARE TRAINED USING HEAVILY OUTDATED EQUIPMENT – THIS IS A REAL FACT. FOR EXAMPLE, MOST OF THE MACHINERY IN RUSSIA IS ANALOG EQUIPMENT. HOWEVER, THE ANALOG DEVICES WERE ONLY IN WIDESPREAD USE UNTIL THE 1980S, NOW WE ARE FACING A RATHER DIFFERENT SITUATION"

ROBERT URAZOV, GENERAL DIRECTOR OF "YOUNG PROFESSIONALS" UNION (WORLD SKILLS RUSSIA)

owned buildings in need of repair; 4% were in disrepair. Training is conducted with virtually no modern digital tools – on average, there are only six Internet-connected computers per 100 students in colleges and vocational schools. As a consequence, 60% of employers note a strong

"TO HIRE 100 EMPLOYEES FOR OUR NEW OPERATIONS, WE HAD TO TEST 2,400 CANDIDATES. MOST OF THEM DON'T HAVE ANY IDEA HOW TO WORK WITH THE NEW EQUIPMENT"

HR DIRECTOR OF A MAJOR MINING COMPANY

Lack of practical professional skills among SVE graduates¹⁸.

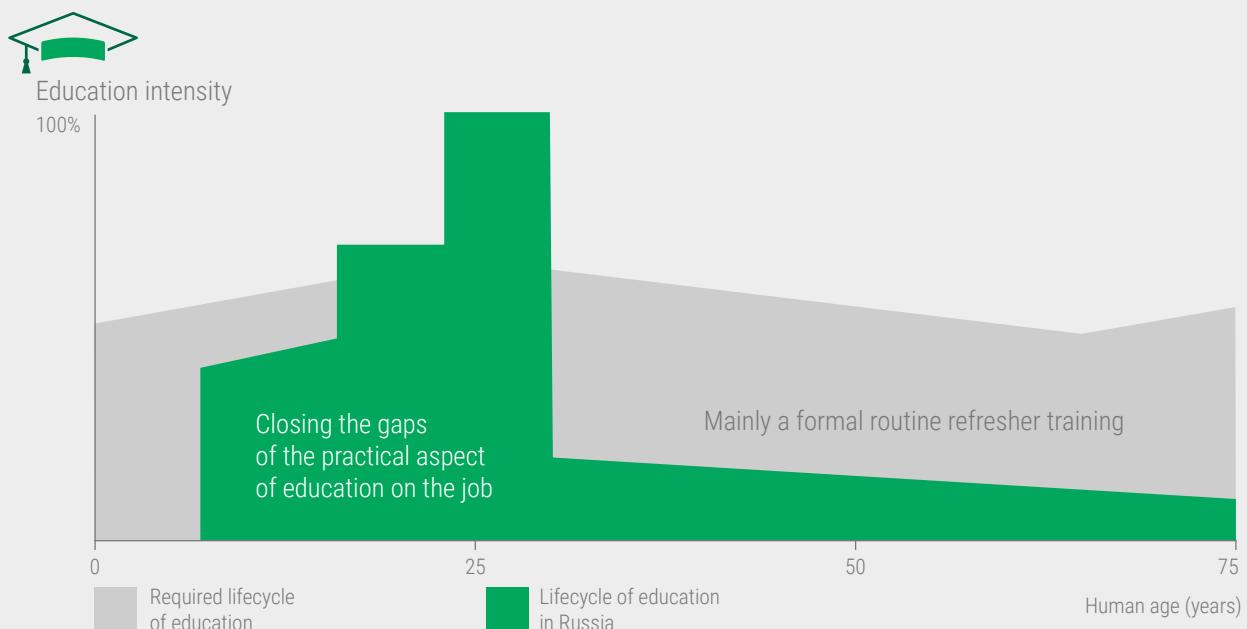
Professional standards – “the voice of demand” for education – have been introduced. The aim is to match business requirements to the qual-

16. All-Russia Public Opinion Research Center, 2016 Please see <https://wciom.ru/index.php?id=236&uid=%20115775>

17. Yaroslav Kuzminov "The likely impact of the economic crisis on the education system and the quality of human resources in Russia"

18. HSE survey of employers, 2016

Figure 14¹ | Education stops almost completely after 25 years



¹ "A Vision of Societal Transformation Through Educational Ecosystems of the 21st Century", Global Education Futures Report by P. Luksha, J. Cubista, M. Popovich, A. Laszlo, I. Ninenko. April 2017.

Sources: Global Education Future Report "A Vision of Societal Transformation through Educational Ecosystems for the 21st Century"; BCG analysis.

fication of graduates and the set of competencies they have upon leaving university. However, many experts note that, in addition to the professional standards, mechanisms of direct interaction between business and education are needed – methods that are more agile, flexible and mutually beneficial than the current impersonal process. This process often takes several years – from the articulation of business requirements to real changes in the curriculum and the graduation of specialists trained under the new standards.

MOST PEOPLE STOP LEARNING AFTER THE AGE OF 25

To succeed in the knowledge economy, it is not enough to gain knowledge or develop skills once – it is essential that you regularly update your knowledge. To this end, upper development trajectory countries have been introducing lifelong training – within the educational system, under the auspices of employers, or independently.

So far, attempts to discuss this agenda in Russia have been unsuccessful. Today, there is no universal solution in the country for continually upgrading skills. Most people's training ends with university graduation, no older than the age of 25 (Fig. 14). Learning in the workplace is often represented either by formal refresher training, which does not involve any real

A number of major companies, aware of the need for large-scale development programs for their employees, provide an exception to this rule by developing their own corporate education systems and corporate universities (e.g. Sberbank, Severstal, MTS, etc.) The most advanced corporate educational centers are now starting to offer the best adult education in the country.

However, in Russia, employers spend 10 times less on staff training than in Europe. Educational programs in the country involve 15% of the working-age population and 1% of pensioners – in developed countries the figures are 40% and 5% respectively¹⁹.

19. Harvard Business Review Russia data.

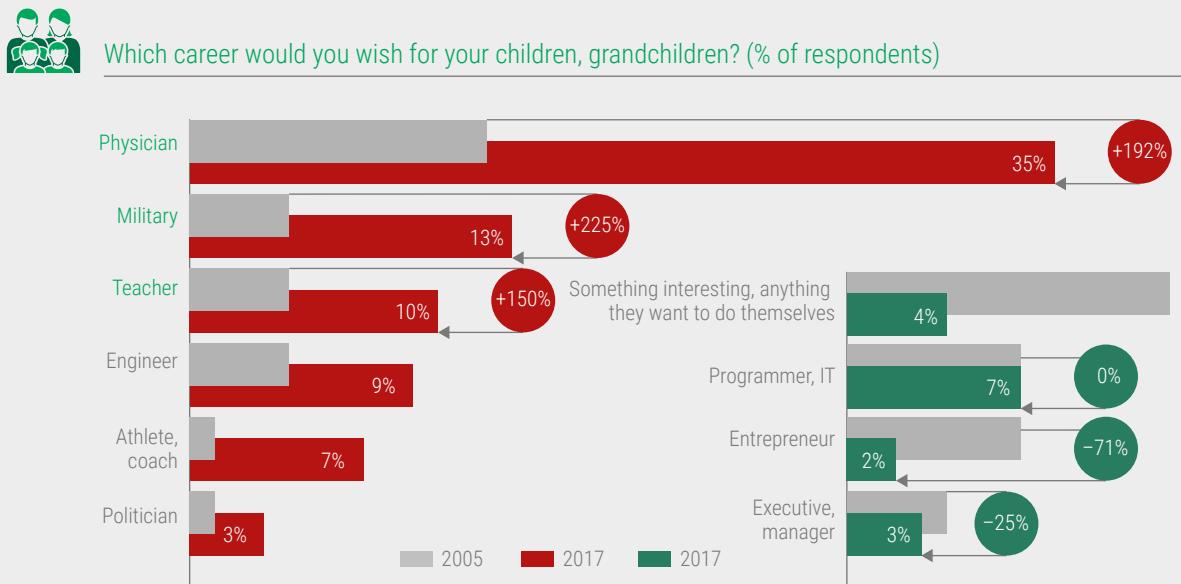
REASON 3: RUSSIAN SOCIETY PREFERS STABILITY OVER GROWTH

Public employers are now not only the most common employers on the Russian labor market (they provide more than 40% of jobs), but also the most attractive (Fig. 9b).

Russian society has firmly associated the public sector with stability, lifetime employment and at least a minimum guaranteed income.

This concentration of human capital in one sector represents a huge opportunity, but also a huge risk and responsibility for Russia. In 2016, an average Russian citizen received 19% of his or her income from the state (in the form of social benefits of various kinds)¹.

Figure 15 | Parents consider the public sector to be the best employment option for their children



Source: VCIOM, VCIOM-Sputnik All-Russia survey, March 21-23, 2017.

1. Vedomosti. The population is increasingly dependent on payments from the budget. . <https://www.vedomosti.ru/economics/articles/2017/02/15/677712-naselenie-zavist-ot-viplat>

CULTURAL PROFILE OF A RUSSIAN CITIZEN: STABILITY AND SECURITY TAKE PRIORITY

Over the course of our study, most of the executives surveyed noted a number of critical personal qualities and mindset characteristics that are typical of an “average Russian employee”:

- Lack of initiative, energy, “drive”, a “nothing depends on me” and “initiative is punishable” attitude – learned helplessness and a lack of desire to change anything: *“We have tested our executives. The results are intriguing. Hyper-responsibility with a very low level of risk tolerance. A focus on security and stability. What breakthrough projects are you talking about?”*
- Focus on the process, not the result: *“The mentality is like this: use a budget. Use, rather than invest. It has always been like this, and continues to this day.”*
- Excessive reliance on well-established (and often outdated) rules and procedures: *“When I interview someone who has worked for more than two years for a state-owned company, I start by saying ‘Well, tell me what you have forgotten how to do...’ It’s not out of spite, it’s just a fact of life.”*
- Lack of flexibility, willingness to change: *“It’s a known fact that after us you won’t be able to find*

a job almost anywhere else... But inside the system you’re almost guaranteed lifelong employment”.

- Lack of customer focus: *“Our key criterion for assessing any solution is whether it will be well received by the chief, not by the client. The priority is to please the internal customer. Why bother about the external one?”*
- Lack of critical thinking; mechanical, execution-type attitude to tasks: *“Not enough basic work culture, basic discipline. A couldn’t-care-less attitude in all things. What requirements? If they are at least sober and wearing helmets... That is all we can hope for...”*

We have heard similar comments from CEOs of large companies in a wide range of industries – from telecommunications to steelmaking and agriculture.

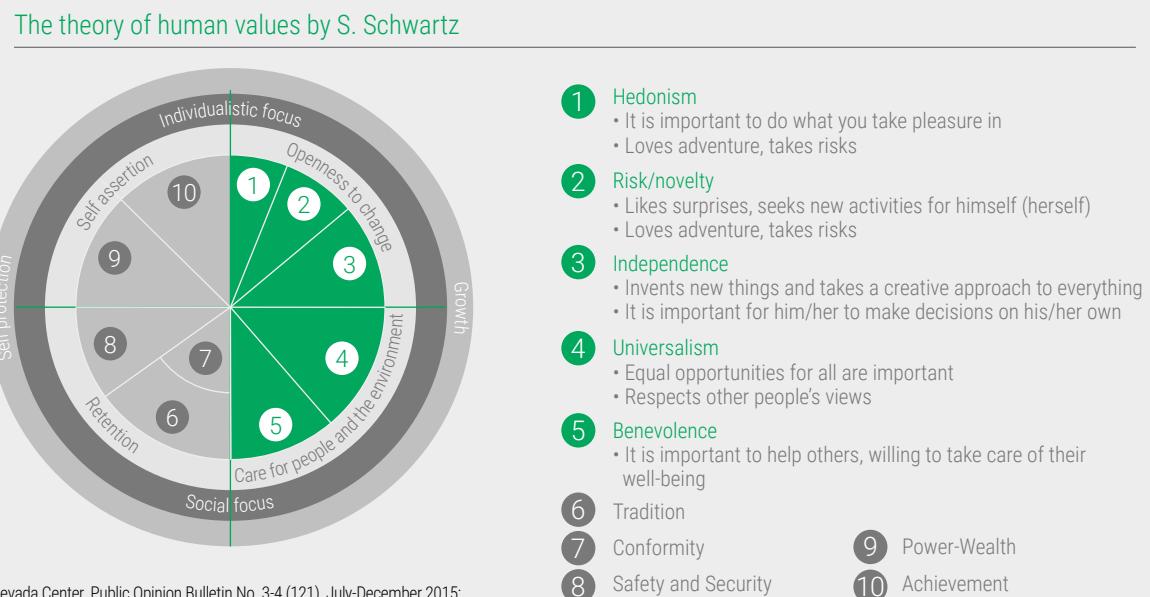
What is the reason for these characteristics among Russian employees?

An ESS study based on the system of values by S. Schwartz (Fig. 17, 18) indicates that “growth values” are extremely poorly represented among Russians (only 2% compared to 24% in Western Europe and 32% in North America).²

“Growth values”, according to S. Schwartz, is a collective term for a combination of core

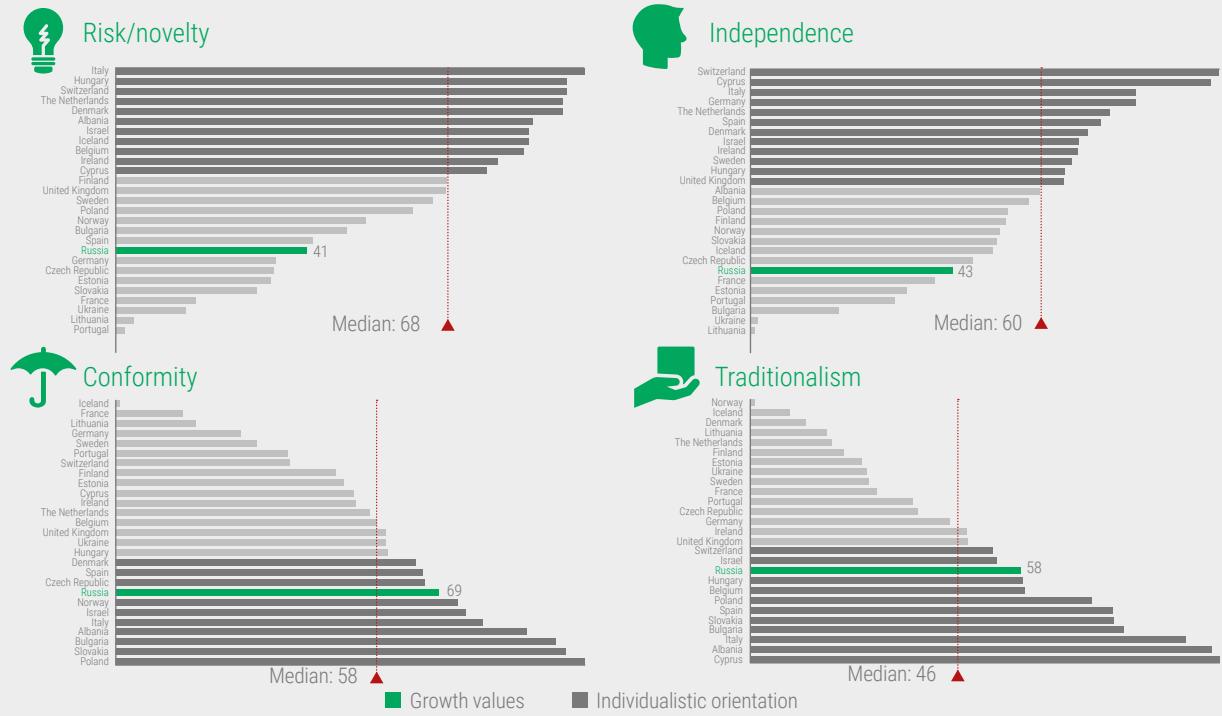
2. Levada-Center – Public Opinion Bulletin No. 3-4 (121), July-December 2015: European typology of values and basic values of Russians

Figure 16 | Schwartz theory of human values



Source: Levada Center. Public Opinion Bulletin No. 3-4 (121), July-December 2015: European typology of values and basic values of Russians

Figure 17 | Comparative results of the ESS country research based on the model of values by S. Schwarz



Source: ESS data; BCG methodology and analysis.

values: risk/novelty, self-dependence, universalism and benevolence. Compared to other European countries (ESS research perimeter), Russia is characterized by low scores in Self-dependence and Risk indicators, and vice versa, high scores in such opposite values as Conformity and Traditionalism³:

- **Risk/novelty – a low score** (41 out of 100, with 68 being the median score). This value is also sometimes called Stimulation, implying the need for diversity and deep impressions in order to maintain an optimal level of activity. It is manifested in the pursuit of novelty and acute experiences.
- **Self-dependence – a low score** (43 out of 100, with 60 being the median score). It is expressed in individuality, independence from the thinking of others, reasoning, decision-making and choice of courses of action, attaching particular importance to creativity and research.
- **Conformity – a higher-than-usual score** (69 out of 100, with 58 being the median score). Schwartz defines this value as a high inclination to prevent actions and motives

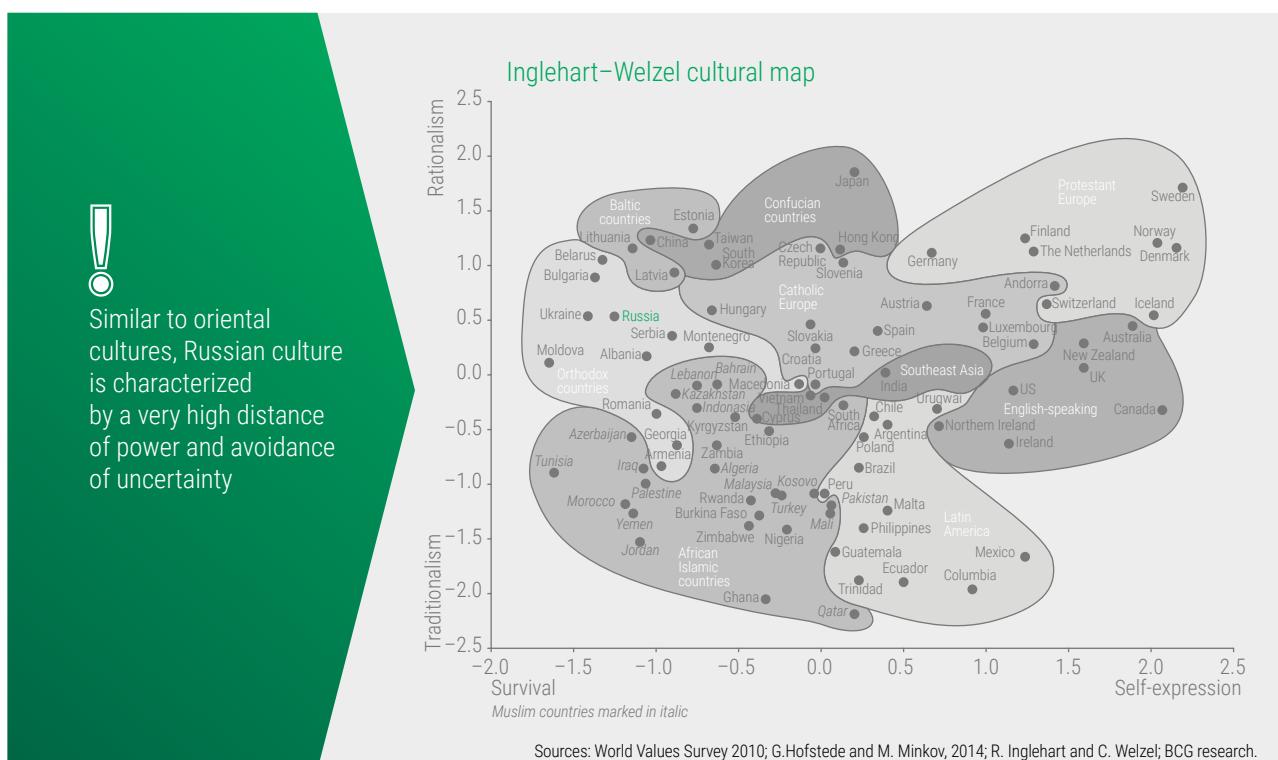
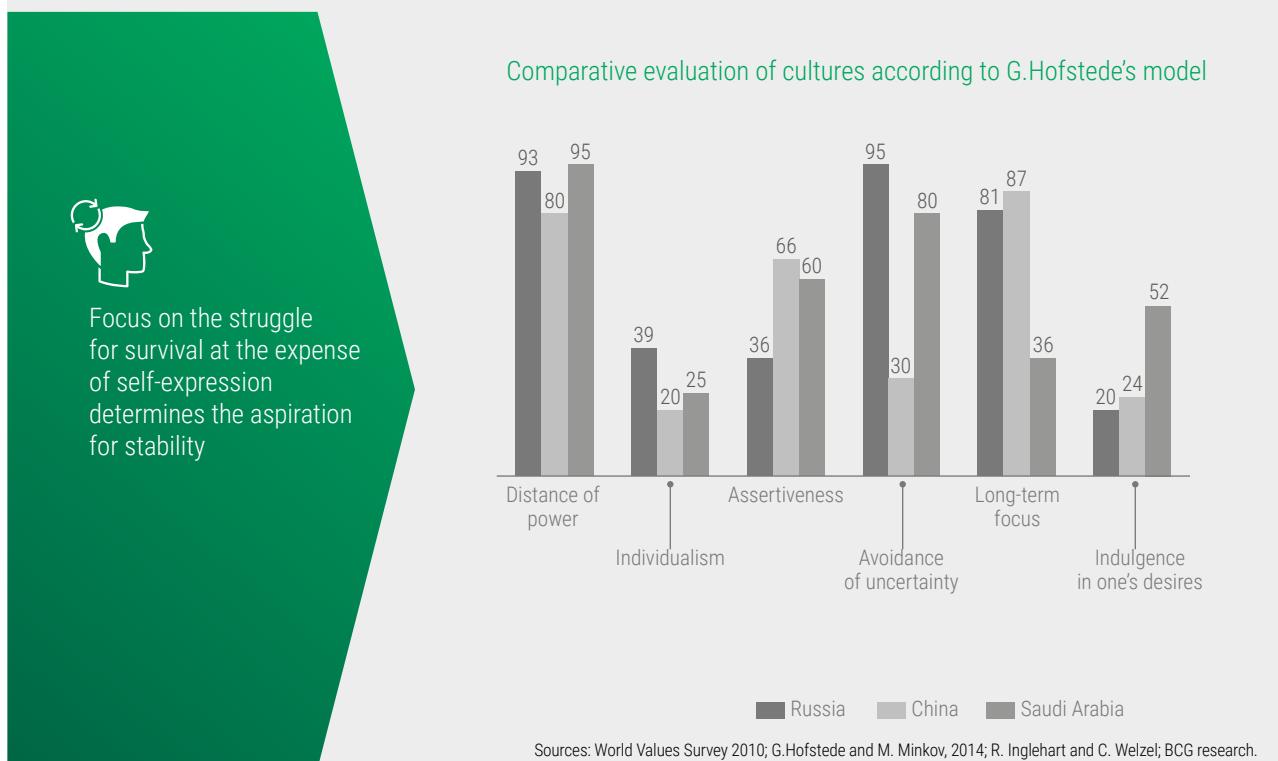
that could bring harm to others or do not match social expectations. This mentality is a derivative of obedience, self-discipline, and politeness requirements.

- **Traditionalism – a higher-than-usual score** (58 out of 100, with 46 being the median score). It is interpreted as respect, acceptance of social customs and ideas existing in the local culture, and willingness to follow them. A traditional mode of behavior – a symbol of group solidarity, an expression of unity and sometimes even a need for survival.

Several studies have corroborated Russia's significantly greater gravitation towards the Asian type of culture as compared to the European culture. Specifically, according to a comparative analysis run by G. Hofstede, as regards the dimension "Power distance" (93 out of 100), Russia sits side by side with Saudi Arabia (95), Iraq (95) and Malaysia (100), while with respect to "Uncertainty avoidance" (95 out of 100), Russia's neighbors include Japan (92), South Korea (85) and again Iraq (85). Even China has a lower "Power Distance" score (80 versus 93 in Russia) and a signifi-

3. According to European Social Survey data, Round 7 (2014)

Figure 18 | Russia: high power distance, uncertainty avoidance and search for stability



“RECENTLY, WE COMPLETED A LARGE-SCALE STUDY OF VALUES IN RUSSIA. THE COUNTRY’S PROFILE CONTAINS A LOT OF GOOD THINGS – YOU SHOULD BUILD ON IT. I SEE TWO BARRIERS THAT NEED TO BE GRADUALLY REMOVED: 1) TOO HIGH A PERCEIVED POWER DISTANCE, AND 2) A VERY HIGH DEGREE OF RISK AVERSION. THESE TWO STORIES CAN REALLY BLOCK ANY CHANGES NEEDED TO MAINTAIN OUR COMPETITIVENESS”

A. AUZAN, DEAN OF THE FACULTY OF ECONOMICS OF MOSCOW STATE UNIVERSITY

cantly higher level of uncertainty tolerance (30 versus 95 in Russia).

In their study, R. Inglehart and P. Welzel also categorized national cultures. According to their interpretation, Russia is characterized by secular-rationalist values and a focus on survival. The latter trait, echoing the uncertainty avoidance characteristic according to G. Hofstede’s interpretation, determines the fundamental desire for stability.

In addition to the specific features of the cultural code, certain endogenous factors should not go unnoticed, since they constitute a barrier to the development and implementation of a competitive competency model. Nearly 6.5% of the working-age population of Russia (4.9 million people) are paid at the minimum wage level – as of July 1, 2017 this amounted to 7,800 rubles, while the amount of the subsistence minimum for the employable population was 10,500 rubles. Olga Golodets, Deputy Prime Minister of the Russian Federation, made the following point: “The type of poverty, which is recorded in the country, is

the poverty of the working population; this is a unique phenomenon: the working poor. We don’t have a qualification level, where 7,800 rubles would be an adequate level of salary”⁴ Such a low level of wages does not allow the population to move from survival to self-expression”.

“MOST JOBS IN THE COUNTRY RECEIVE ROUGHLY THE SAME AMOUNT OF PAY”

The value of human capital in efficient labor markets is translated through the pay level: average income grows with an increase in the professional level. Examples of such countries include Germany and the United States where, for example, the difference between the average income of a doctor (category No. 11 according to Rasmussen’s approach) and a driver (category No. 2) is 172% and 261%, respectively. This dependence sends a signal to the market about the demand for a “Knowledge” category qualification and encourages professionals to select more complex trades and develop their competencies.

In Russia, the state, which assumed the role of guarantor of stability in the 1990s, historically supported the functioning of socially important spheres – education and healthcare, but was able to offer them only the minimum pay level.

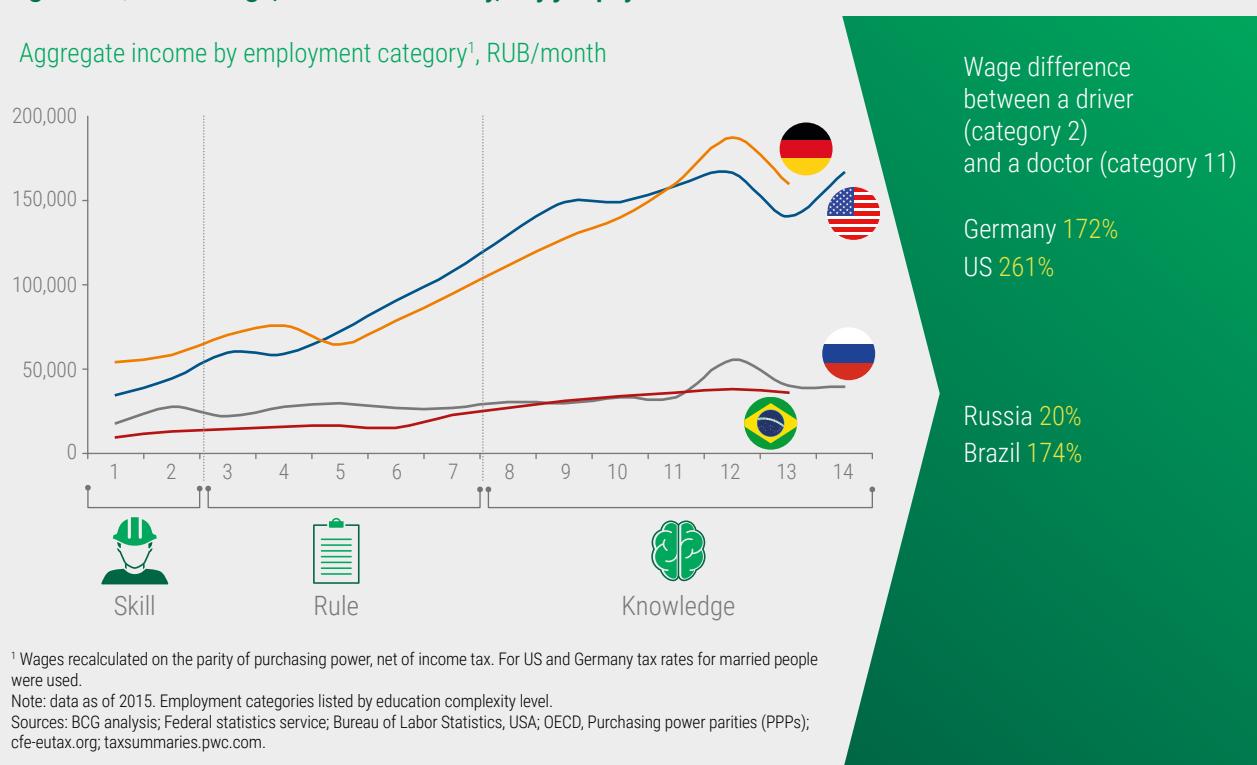
Despite the economic growth of the 2000s and efforts to restore a decent pay level (in 2013, teachers’ salaries exceeded the average salary in 52 regions of the country⁵), the wages of these categories of employees – key categories for human capital formation – does not match the level of global practices. The difference in the earnings of a doctor and a driver in Russia is 20%. Meanwhile, even in developing Brazil, the difference is 174% (Fig. 19).

The “budget” nature of income for highly-skilled occupation categories (8 – school teachers, 11 – highly skilled doctors, 14 – researchers) largely determines the flat shape of the revenue curve at the country level and gives most people a negative signal indicating that there are no significant incentives to engage in their own development.

4. Vedomosti Work without earnings: one in four employees in Russia is below the poverty line. <https://www.vedomosti.ru/economics/articles/2017/03/15/681200-rabota-bez-zarabotka>

5. RIA Novosti – “Teachers’ salaries exceeded the regional average in 52 constituent regions of Russia” – July 2013

Figure 19 | “On average, across the country, any job pays the same”



Meanwhile, within the limits of individual entities, especially private/commercial enterprises, the dependence of employees' income on their skills is very significant, and the income gap often exceeds the difference for similar occupations in developed countries. This reflects the problem of strong income stratification, which is typical of developing economies and inherent in Russia.

ROLE MODELS OF CAREER AND LIFE SUCCESS ARE IN SHORT SUPPLY

Countries seeking a place in the knowledge economy tend to actively contribute to publicizing information on success role models – images and stories of entrepreneurs, public and political figures, or directors of major companies. All available communication channels are used for this: business literature and fiction, film, television, the Internet, and social networks.

The fact that such role models exist sends a signal telling people what sort of success may be reached and how it can be achieved, in

many respects shaping the public attitude to work, as well as the preferences of parents and their children.

In Russia today, there are no major role models that could create a positive image of complex professions, entrepreneurship, science, etc. In their place is a generalized character of a Russian bureaucrat employed by government authorities. Reflecting the cultural context and the aspirations of the people, this official is guaranteed a stable lifelong job, a good benefits package, and opportunities for promotion (albeit slowly) (Fig. 20).

According to a survey conducted by the portal Career.ru, among 1,500 young professionals, 38% consider a professional career with government agencies as the most attractive⁶.

Interestingly enough, even the most “advanced” segment of the Russian youth is dominated by foreign role models. For example, according to a survey conducted by Innopolis University among 7–11th grade students, 81% of whom participated in school curricula-related skills contests and competitions, 70% intend to become involved in IT, and the list

6. Vedomosti. Young people prefer government entities to private companies – Career.ru. <https://www.vedomosti.ru/management/articles/2016/06/07/644411-molodezh-predpochitaet>

Figure 20 | In Russia, a national success role model has been replaced by a generalized character of a Russian bureaucrat



Elon Musk



SPACEX
TESLA
PayPal

Passion and community service

“ I would like to die thinking that humanity has a bright future. If we can become multi-planetary species with a civilization on another planet – then everything will be fine

Risk and belief in success

“ I invested all my money in the 4th launch, became bankrupt



Jack Ma



Alibaba Group
淘宝网
Taobao.com

Alipay

Persistence

“ You are poor because you have no ambition
“ Harvard rejected me 10 times

Global ambitions

“ Chinese brains are just as good as theirs, and this is the reason we dare compete with Americans



Generalized character of a bureaucrat



Key reasons to choose among young people

- Stability and consistency – 71%
- Bonuses, benefits and a social package – 63%
- Career growth opportunities – 54%

The main resource is social capital rather than knowledge

“ I was appointed to the region, because I know people in Moscow

National mentality associates risk and initiative with profiteering

Sources: media; career.ru.

of their role models includes Steve Jobs, Bill Gates, Mark Zuckerberg, and Elon Musk.

Russia could certainly offer its own heroes to its citizens and to the world; however, this would require focused efforts at community level and in the media space, factoring in all the cultural characteristics of Russian nationals.

CHAPTER 3.

COMPETITIVENESS OF RUSSIA 2025: DEVELOPMENT SCENARIOS



By 2025 Russia will need **5.8** to
9.2 million “Knowledge” category
employees

At that, up to **10 million** less skilled
employees will be **laid off**

New private companies, small and medium enterprises, and multinationals will provide the **key sources of growth**, along with increased contributions from public companies and partly state-owned corporations

Impact: up to **1.5%** of Russian GDP growth
by 2025

THE TIME IS RIPE FOR THE TRANSFORMATION OF THE LABOR MARKET

Without addressing the reasons described in Chapter 2, which present obstacles to the development of the Target Competency Model 2025, Russia will not only be unable to draw closer to upper development trajectory countries, but in all likelihood it will not even be able to retain its position in the sector of countries making the transition from a resource to a knowledge economy (Fig. 2).

The current state of the labor market renders impossible the extensive retooling and modernization required by the national economy, and impedes productivity growth and expansion into new technology markets.

Those employers interviewed by us, who plan to implement large-scale development projects and achieve growth in competitive markets in the 2025 horizon, consider a shortage of staff with the required competencies to be a key obstacle on this path (Fig. 21).

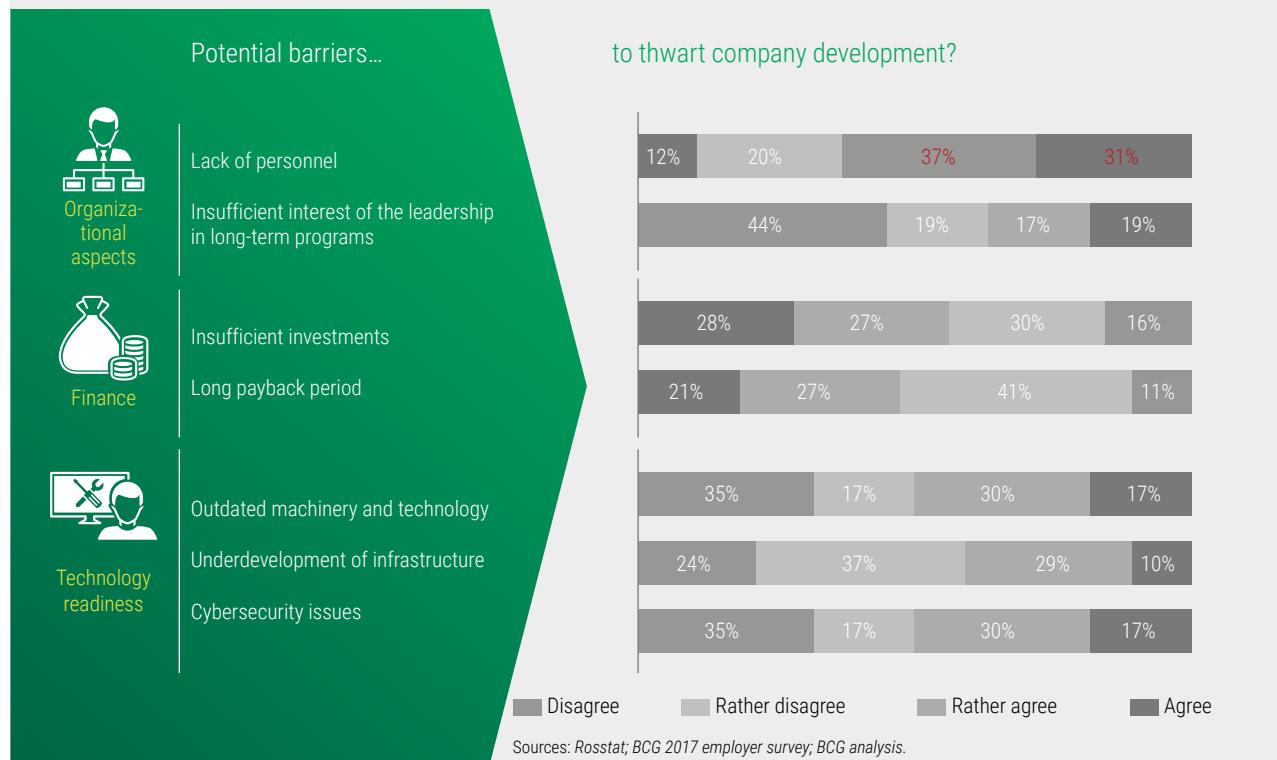
The lack or low pace of change in Russia compared to upper development trajectory coun-

tries would inevitably lead to a deterioration in the country's competitiveness and create conditions for further privatization of its economy, making the existing gap insurmountable in the horizon of only 5–10 years. Reductions in the price of technology over this period, increased volatility, and potential "Black Swans" increase the likelihood of a "precipice" scenario, i.e. a dramatic deterioration of the economic situation in the country.

This threat highlights the competitiveness enhancement issue as a development priority at the government level. Programs such as the National Technology Initiative, the Strategy for Scientific and Technological Development of Russia, the "Digital Economy" program, the Education Development Program, and the Concept for the Development of Supplementary Education for Children are designed to help build a competitive economy capable of converting the high potential of Russian human capital into value creation.

In order to successfully implement these plans and programs, we need to focus on the development of Target Model 2025 competencies and strive to increase the share of "Knowledge" category jobs and professionals in the economy.

Figure 21 | Lack of staff is barrier number 1 to company development



75. Труднопрогнозируемые и редкие события, которые имеют значительные последствия.

Even today, the labor market structure of upper development trajectory countries includes at least 25% of “Knowledge” category jobs. To achieve a similar target (implementation of catching-up development), during the period from 2017 till 2025, the Russian labor market needs to go all the way from about 12 million professionals currently in the “Knowledge” category to 18 million¹ in 2025.

We suggest considering two human capital development scenarios in Russia by 2025 – baseline (catching-up) and outrunning modernization scenarios. The former is based on the current growth and development plans of existing employer organizations. The latter envisages public and major “old” private companies shifting their focus toward boosting their efficiency and competitiveness on both domestic and external markets.

BASELINE (CATCHING-UP) SCENARIO OF TRANSFORMATION

In the 2025 horizon, a considerable number of surveyed employers, specifically in the private sector, intend to increase the number of “Knowledge” category staff with Target Model 2025 competencies. The implementation of these growth and development plans² provides additional demand for “Knowledge” category professionals to the tune of 4.5 million by 2025. Drivers of this demand will specifically include:

- Growth in the originally quite small “new private companies” segment of 40% thanks to their development on new regional and product markets.
- Employment growth in the sector of small and medium-sized businesses of 25% thanks to the development of segments related to new technologies and the active popularization of entrepreneurship. Due to a low baseline (16%) this significant growth will result in a minor increase of the SME segment itself, and by 2025 the SME employment will not exceed 20% of the total working population.
- Increased presence of international corporations in Russia with growth in the total number of these companies of 27% by 2025.

“WE CAN AND WE WILL
STRIVE TO DOWNSIZE.
TREMENDOUS DIGITALIZATION
OPPORTUNITIES ARE
AVAILABLE IN OUR INDUSTRY –
WE WANT TO BE THE BEST AND
HENCE, EFFICIENCY COMES
BEFORE EVERYTHING ELSE”

EXECUTIVE DIRECTOR OF A CHEMICAL COMPANY

“EVERY YEAR, WE DOWNSIZE.
AS A RESULT, WE GET A NET
GROWTH, ALBEIT SMALL.
THE LIFELONG EMPLOYMENT
SYSTEM GOES AGAINST
COMMON SENSE.”

HR DIRECTOR OF A COMPANY
IN THE ENGINEERING INDUSTRY

Once again though, due to the currently low employment rates in the segment, by 2025 it will hardly account for 6.5% of the total working population.

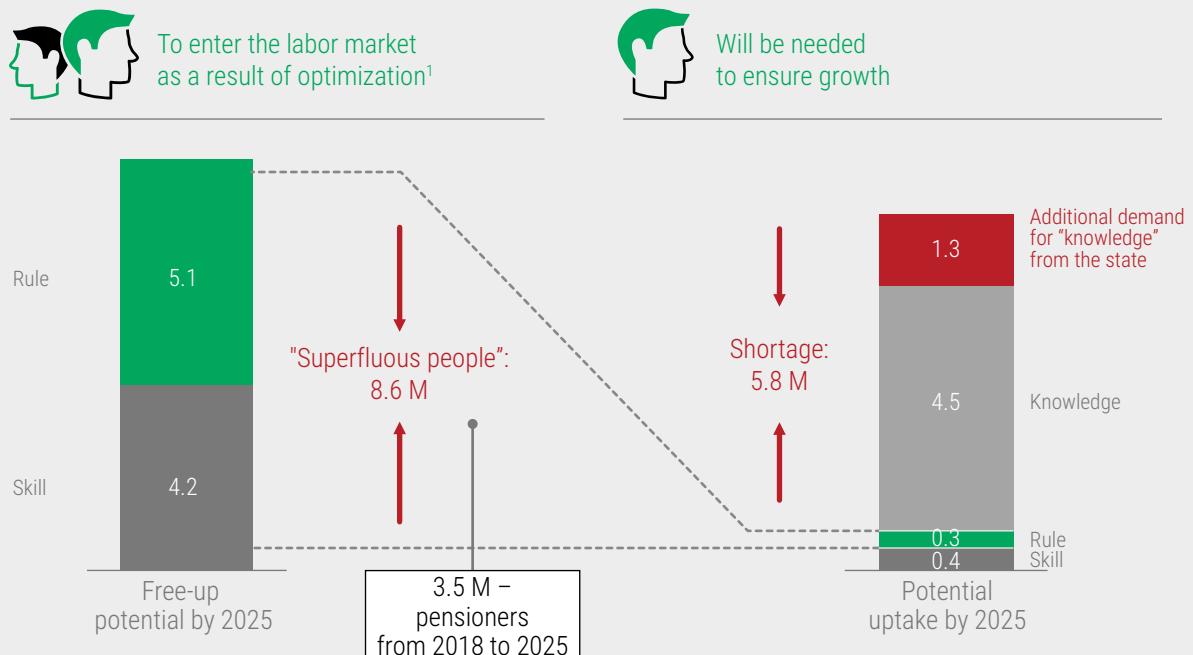
In addition to the initiatives of private companies mentioned above, it can be assumed that the demand for “Knowledge” category employees will grow in selected segments of civil servants as well. For example, according to estimates of the Charitable Foundation “Contribution to the Future”, the existing new school construction programs will result in the creation of at least 1.3 million teaching jobs.

As far as optimization plans are concerned, even now a certain portion of “old” private, public and state-controlled companies are voicing their intentions to cut down on inefficient employment to improve performance. These plans are still on the conservative side with the expected cuts not to exceed 20% over a seven-year period, and provided that these

1. Hereinafter, in our headcount estimates we rely on the current Rosstat data and a projected small natural reduction of the Russian working age population to be compensated by external migration.

2. To assess growth/reduction in the number of jobs, the sample of employer organizations involved in the survey was extrapolated to the entire volume of the labor market (please see a more detailed description of the methodology in Appendix 2).

Figure 22 | Labor market imbalance – base case (catching up) scenario



¹ In case of 20% layoffs in public, quasi-public, and "old" private companies.
Sources: employer research; BCG analysis.

are greenlit by the regulator. Implementation of these plans will result in the layoffs of 5.1 million employees in the "Rule" category and 4.2 million employees in the "Skill" category (Fig. 22)

Economic effect of the baseline (catching-up) scenario

Implementing the catching-up scenario on the labor market will contribute to the efforts to overcome economic stagnation that are currently being undertaken by Russia. However, the labor market under this scenario is doomed to stagnate, while the leader countries will demonstrate strong growth, development and rejuvenation of their economies. Not only will the baseline scenario fail to reduce the gap between Russia and the leaders, but it will actually increase this gap. In spite of the obvious lack of balance (with the "release" of 8.6 million people in the "Skills" and "Rules" categories and a deficit of 5.8 million people in the "Knowledge" category), there will be no meaningful change in the Russian market. 45% of employment is still provided by the public sector, another 23% comes from traditional "old" private companies. Which means that the so-called "agents of change", those agile and easily adapting companies that put their stakes on hu-

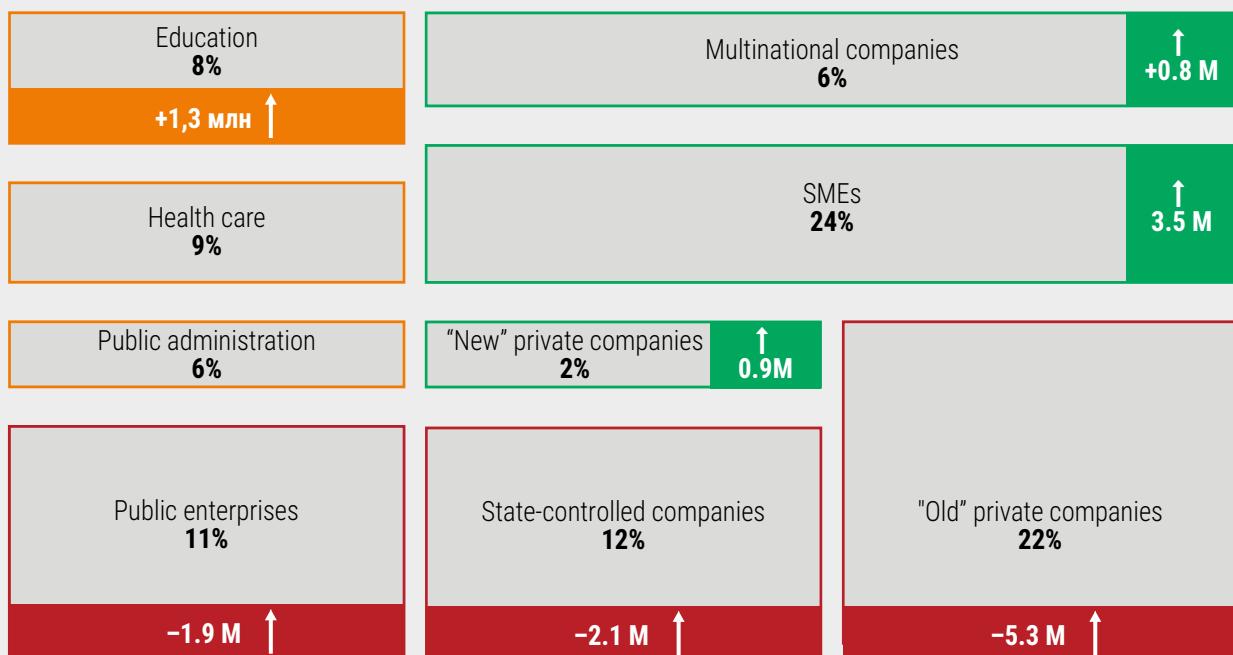
man capital, innovation, and technologies are left with a mere 32% share (Fig. 23).

OUTRUNNING MODERNIZATION SCENARIO

Unlike the baseline (catching-up) scenario, the outrunning scenario implies a more active role of the state, and companies partially owned by the state, in transforming the labor market by increasing the number of "Knowledge" category jobs. In addition to implementing the business initiatives listed in the preceding scenario, this involves companies partially owned by the state meeting the demand for 4.7 million new "Knowledge" category employees by 2025. We treat this demand as "dormant" because:

- The staff recruitment plans of the majority of employers surveyed who are partially owned by the state cover a horizon period of no longer than 1 year;
- This category of employers has very specific business processes and organizational culture, i.e. obsolete processes and regulations, overly strict infrastructure requirements, the use of outdated management practices and information transmission systems, the

Figure 23 | Labor market structure under base case (catching up) scenario



Source: employer research; BCG analysis

need for maintaining social employment in the regions. All of this entails hugely inefficient employment in the “Rule” category and prevents demand forming for “Knowledge” category professionals supported by market conditions.

The existing successful practices of public administration and IT system transformation – for example, municipal IT departments (more than 1,200 people in the “Knowledge” category in Moscow), project management offices in the Government of Moscow and in the regions, etc. – show that supporting such a demand is feasible. However, the nationwide realization of this “dormant” demand would only be possible if inefficient processes are reviewed, bureaucracy is completely eliminated, manageability standards are improved at all organization levels, full use is made of existing automation opportunities, competencies of existing staff are developed, the organizational culture is transformed, and an attractive market offering is presented to candidates.

The effect of the outrunning modernization scenario: the need for mass layoffs

These measures will not only increase the number of jobs in the “Knowledge” category,

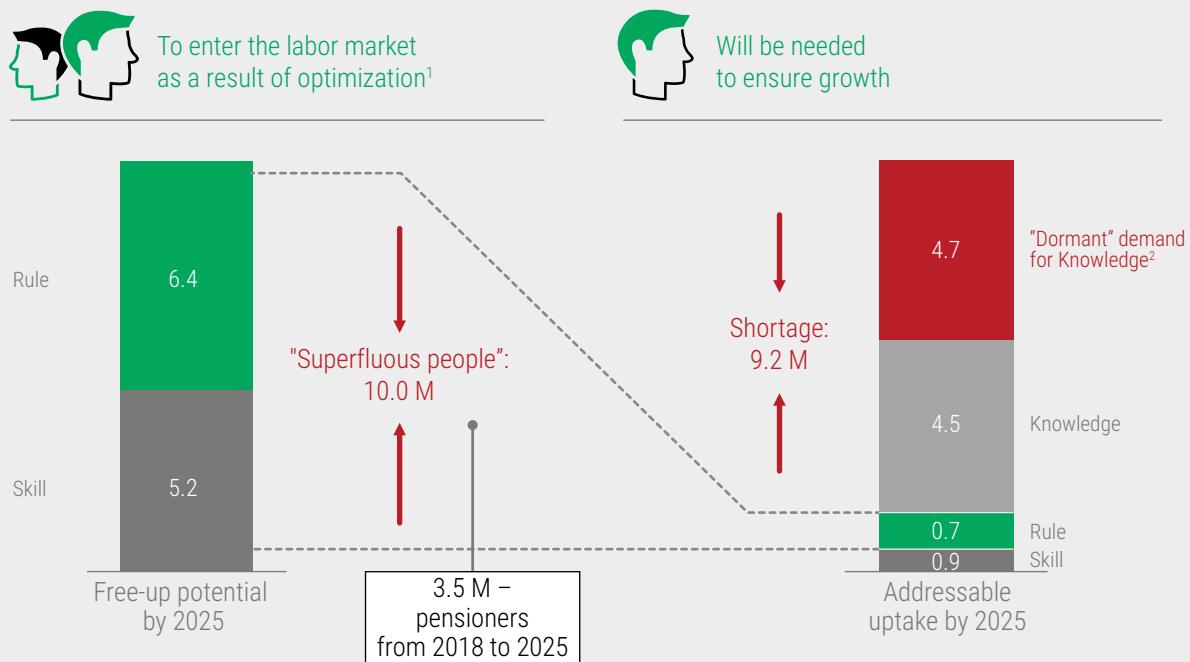
but will also result in a significant reduction of employment in the less complex “Skill” and “Rule” categories. Processes will be optimized and the need for the previous headcount will disappear, while the potential of internal corporate mobility will be limited.

Among the employers surveyed, the total potential for reducing the number of inefficient jobs is 30% of the headcount at state-owned entities, companies partially owned by the state, and “old” private companies. In total, we estimate that the potential for downsizing on the Russian labor market will be 11.6 million employees, including 6.4 million in the “Rule” category and 5.2 million in the “Skill” category.

Implementing these plans will result in the laying off of 10 million employees: 5.7 million in the “Rule” category and 4.3 million in the “Skill” category. Taking into account the opportunities of a gradual optimization of organizational structures related to staff retirement (the above-mentioned 3.5 million people by 2025), a further optimization of 6.5 million working age employees will be required (Fig. 24).

Thus, the realization of the outrunning modernization scenario implies:

Figure 24 | Outrunning modernization scenario: labor market imbalance



Sources: employer research; BCG analysis.

- The emergence of 9.2 million new jobs in the "Knowledge" category (4.5 million – private employers, 4.7 million – employers partially owned by the state, the latter including 1.3 million from additional government initiatives listed in the description of the baseline scenario).
- Headcount optimization in the "Skill" and "Rule" categories by 10 million people, including 6.5 million of working age.
- Successful competition of employers partially owned by the state in the labor market in attracting "Knowledge" category professionals with Target Model 2025 competencies.

At that, employers are not expecting to address the growing demand for professionals with Target Model 2025 competencies on their own (Fig. 25).

It is feasible to develop this "Knowledge" category supply by retraining staff within the country or by attracting foreign experts and encouraging highly skilled emigrants to return to Russia.

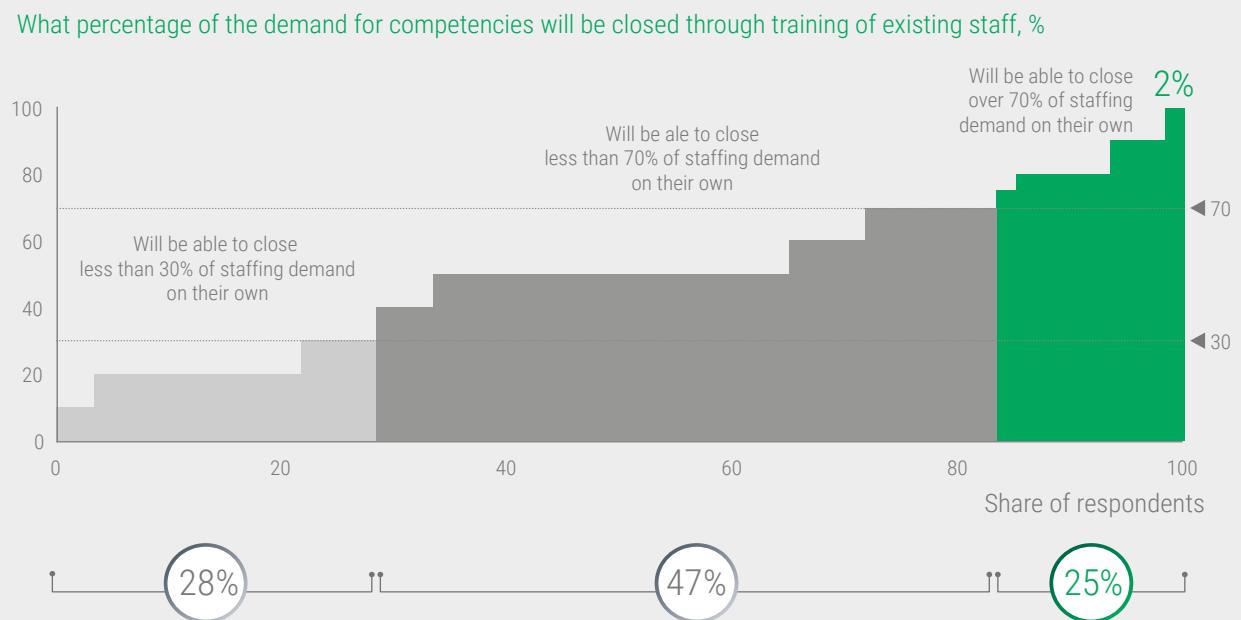
Addressing the problem of retraining and returning redundant people to productive activity, while also training "Knowledge" category staff so as to meet the potential demand are daunting tasks that require preparatory work, a clear plan, and a change of the context in which companies, employees and the state exist.

Economic effect of the outrunning modernization scenario

Ensuring Russia's global competitiveness poses a real challenge for the government, society, and the business community. What should be done to simultaneously increase the supply of, and meet the demand for a skilled workforce. In other words, how can one move from employment balance management to competency balance management.

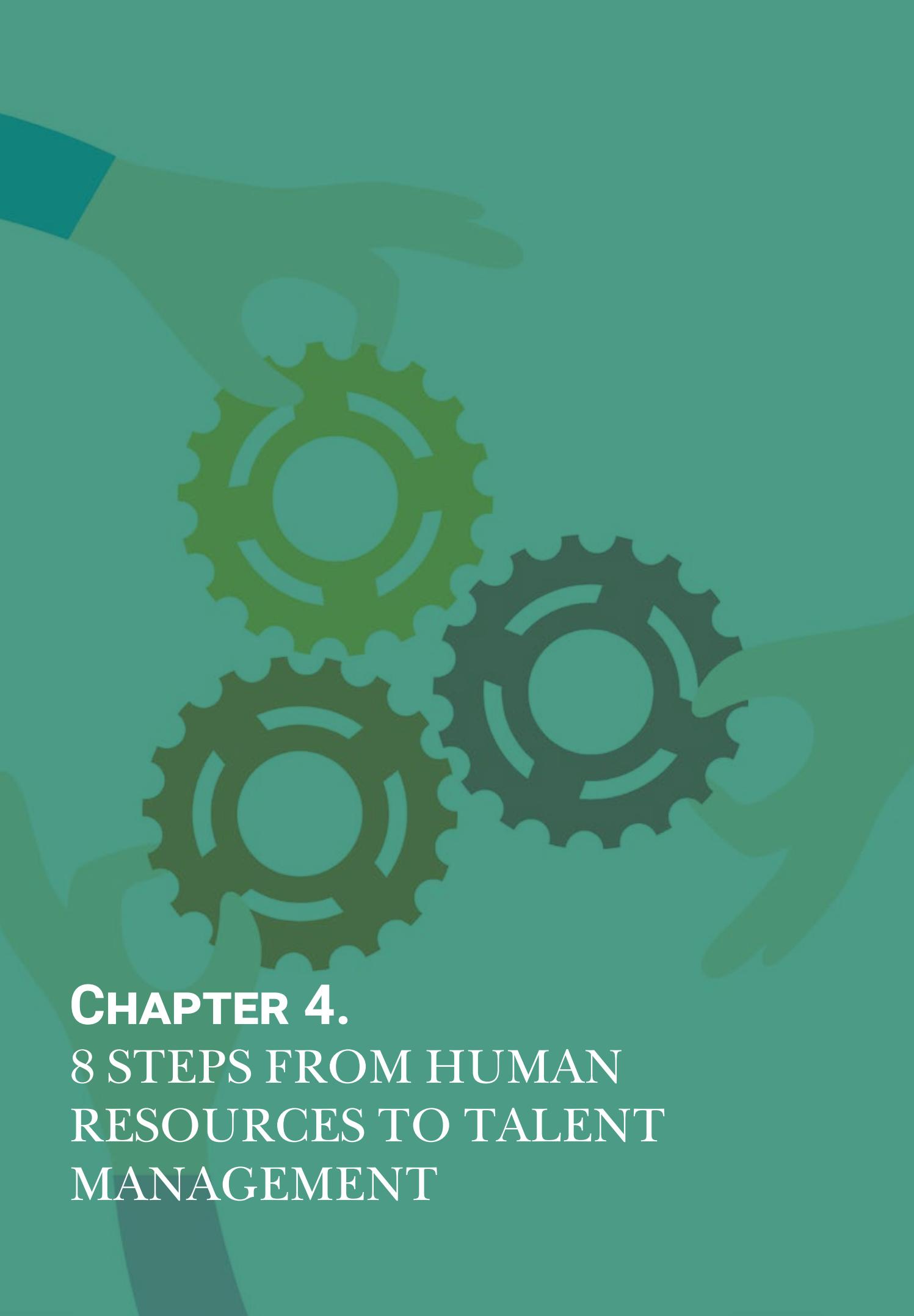
Implementing the outrunning modernization scenario, including addressing the challenge of attaining simultaneous rapid growth in "Knowledge" category employment and the reduction of employment in the "Rule" and "Skill" categories, may give the Russian economy a further boost. We estimate that its effect will be +1.5% to GDP per annum or in aggregate, +10 trillion rubles, at current prices, by 2025.

Figure 25 | Employers not able to close the staffing gap by themselves



Sources: BCG 2017 employer survey; BCG analysis.

Achieving sustainable GDP growth may propel Russia to the group of upper development trajectory countries as early as by 2025, ensuring its competitiveness in the knowledge economy.



CHAPTER 4.

8 STEPS FROM HUMAN RESOURCES TO TALENT MANAGEMENT

Russia will not be able to compete in the global economy without globally competitive talent – “Knowledge” category employees.

Under the influence of technological and macroeconomic trends, even today and on the horizon of 2025, employee competitiveness is governed not by “hard” skills and knowledge, but rather by the development of universal competencies, a model of which is synthesized in Fig. 3 of this report.

Thus, Russia’s new competitiveness is governed by its ability to create, attract and retain those employees with key competencies.

The scenarios described in this report may only be implemented subject to the creation and implementation of a human capital development concept, which would include not only educational and staff training aspects, but also such topics as stimulating the demand for “Knowledge” category staff and creating an environment conducive to human development.

There are 8 steps for human capital development in Russia that form the basis of such a concept:

Establishing a system of measures aimed at stimulating mass demand for “Knowledge” category staff

1. A competitive offer of working conditions for professionals from the “Knowledge” category created by employers with state participation:

- Introducing targets in the area of optimization and digitalization of key internal and external business processes.
- Transforming the organizational culture towards greater flexibility, transparency of staff evaluation objectives and criteria.
- Attracting a critical mass of “change agents” to the segment – mid and high-level executives with “Knowledge” category competencies and successful experience of implementing tasks in the commercial sector.

2. Reducing inefficient “social employment”:

- Creating a transparent mechanism to determine headcount optimization approaches in cooperation with the state regulator and employers.

- Optimizing inefficient FTEs to the target level with adherence to social responsibility principles.

- Bringing the pay rates of “Knowledge” category staff to a competitive level relative to commercial employers.

3. Creating a system of retraining of redundant staff at the national level:

- Defining the areas of responsibility of the state, key employers, public and private educational institutions within the framework of the new retraining system.

4. Creating favorable conditions for doing business in Russia, including incentives for the development of innovative small businesses and goal setting for regional governors and leadership.

A system of measures aimed at creating a priority supply of “Knowledge” category employees established by the education system

5. Creation of a priority supply of employees who possess target competencies by the education system:

- Enhancing the educational system’s flexibility by means of significantly mitigating the regulation of educational activities and ensuring that graduates of higher and secondary vocational education institutions meet the real needs of the labor market.
- Stimulating more in-depth cooperation between educational institutions and employers as customers, including by means of widening the range of joint educational programs and introducing dual education practices.
- Encouraging the development of a segment of non-government educational institutions.

6. Shifting the focus of educational programs from developing subject knowledge and memorizing information to developing personalized and meta-subject competencies.

7. Encouraging inflow of talent to the education sector:

- Real, not nominal wage increases in the education sector.

- Transforming the culture of educational institutions to ensure greater flexibility and susceptibility to “external” ideas and cadres.
- Reforming the system of training and refresher training of teachers taking into account the priority development of target competencies.

Creating an environment conducive to attracting and developing “Knowledge” category staff

8. Promoting growth and professional development values at the country level, particularly within companies:

- Consistently communicating “growth values”, promoting the role models of “Knowledge” category professionals and entrepreneurs.
- Promoting the value of self-development and the “lifelong learning” concept.
- Creating a system for gaining hands-on experience with key professions for

highschool seniors and students, with the involvement of employers in various fields.

- Ensuring priority development of “Knowledge” category staff.
- Increasing staff development expenditure to at least 3% of the payroll on average.

This report has demonstrated the urgent need to address the issue of imbalance of competencies in the labor market – a precondition for decent economic growth. Implementing this task will only be possible with the active involvement and cooperation of all stakeholders: the state, business, the education system, and public figures. We invite all the participants to take part in the debate to discuss and detail the action plan proposed in this report.

We sincerely hope that timely and coordinated actions of all stakeholders, effective dialogue and a focus on achieving real results will help create the conditions for accelerated human capital development in Russia.

APPENDIX 1:

RESEARCH

METHODOLOGY

Below are the assumptions, the methodology and the data sources which were used to produce the calculations used in this report.

1. Labor market analysis is based on J. Rasmussen's task classification approach set forth, in particular, in his article "Skills, Rules, and Knowledge; Signals, Signs, and Symbols, and other distinctions in Human Performance
2. Allocation of jobs in different countries by "Knowledge", "Rule" and "Skill" cate-

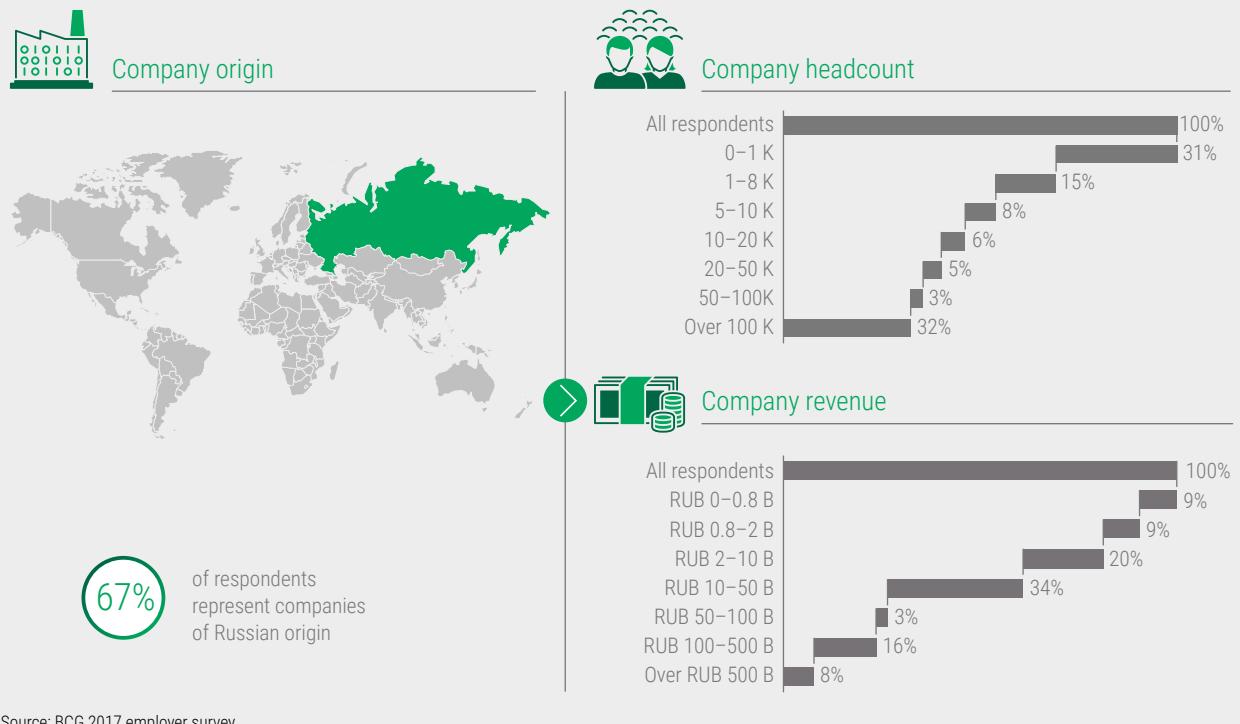
models". According to this approach, all employees are divided into three categories based on the nature and degree of autonomy of their work, as well as the duration of the learning cycle required to perform the tasks (Fig. 26).

Figure 26 | Application of Rasmussen's approach to labor market analysis: three categories of tasks for all types of employment

	Nature of work	Knowledge requirements	Occupation examples
 Skill	More than 50% of tasks include: Recurring standard tasks Physical labor	Requires no training or rather brief training	<ul style="list-style-type: none"> ① Unskilled workers, cleaners ② Drivers, sellers
 Rule	More than 50% of tasks include: Technical, routine work Decisions made based on a fixed set of rules and directions	Requires no training or rather brief training	<ul style="list-style-type: none"> ③ Skilled service/agricultural workers ④ Industrial plant operators ⑤ Skilled workers ⑥ Medium level specialists ⑦ Civil servants
 Knowledge	More than 50% of tasks include: Analytical work Improvisation Work with uncertainty Decision-making autonomy	High education level Broad range of interest	<ul style="list-style-type: none"> ⑧ Teachers ⑨ Economists, lawyers Other top level specialists ⑩ university professors ⑪ Highly qualified doctors ⑫ Managers ⑬ Physicists, chemists, engineers ⑭ Researchers

Sources: J. Rasmussen, 1983: "Skills, Rules, and Knowledge; Signals, Signs, and Symbols, and Other Distinctions in Human Performance Models"; BCG analysis.

Figure 27 | Survey respondents – Summary statistics



Source: BCG 2017 employer survey.

gories (Fig. 2) is based on an employment structure analysis by occupation according to the Federal State Statistics Service (Rosstat) and the consolidated database of the International Labor Organization (ILO).

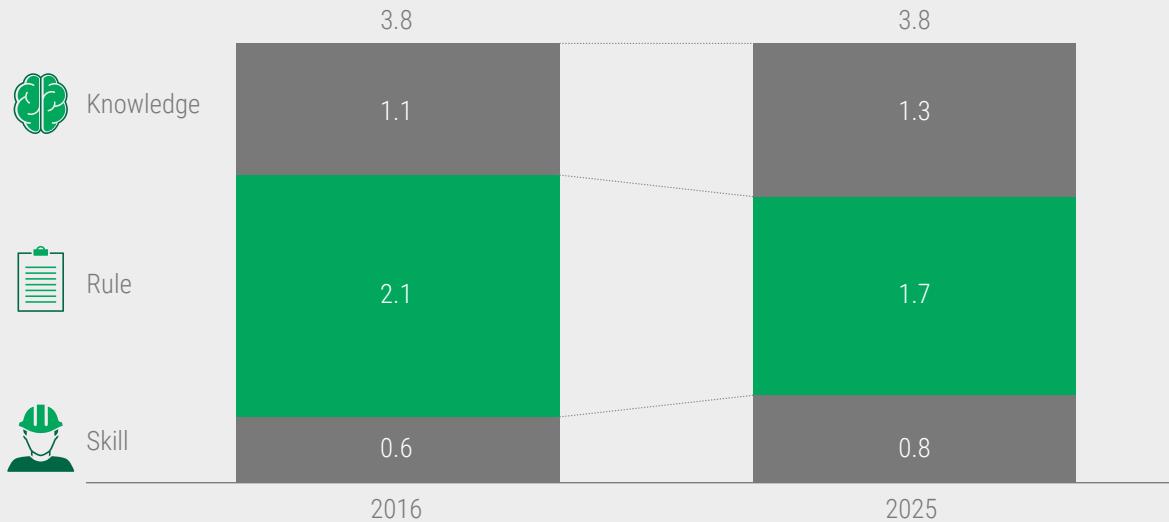
3. For the segmentation of employment in the Russian labor market (Fig. 9a, 9b), a suprasectoral classification of employers set out in Appendix 2 is offered.
4. During the period from February to May 2017, BCG conducted a survey of employers, which was aimed at gathering views on each company's priorities and objectives for the period until 2025, development plans and barriers, changes in staffing levels and categories, as well as employee expectations and requirements. The survey also enabled us to forecast the impact of global trends and current realities on the state of the future labor market in Russia.

Respondents constituted a representative sample of more than 280 large and medium-sized Russian and international companies operating in Russia in all key industries, which employ a total of 3.5 million people (Fig. 27).

5. Questions that respondent employers were asked covered the following areas:

- Description of the respondent (industry, headcount, revenue, ownership).
- Assessment of the relevance and applicability of key global trends (Chapter 1) to the organization's activities projected for the period until 2025.
- Assessment of the current and future (by 2025) headcount in the context of Ras-mussen's approach (broken down into "Knowledge", "Rule" and "Skill" categories).
- Assessment of the current and future level of development of Target Model 2025 competencies with employees (Fig. 4).
- 6. For the purpose of forecasting the overall changes in the labor market, the absolute values of the current and projected (by 2025) headcount within the sample of employers surveyed, were extrapolated to the current total number of jobs by segments set out in Appendix 3 and broken down into "Knowledge", "Rule" and "Skill" categories (an example of an employer segment forecast is presented in Fig. below).

Example



7. The evaluation of the financial impact of labor market transformation under the accelerated modernization scenario is based on the assumption that, if this scenario is implemented, Russia achieves a

level of GDP (at purchasing power parity) matching the average level of upper development trajectory countries with a labor market structure comparable to the proposed scenario.

APPENDIX 2: APPROACH TO SEGMENTATION OF EMPLOYERS / THE LABOR MARKET

The core and the key feature of our study is a survey we conducted among employers. Despite the large number of organizations involved in the study (see Appendix 2), we did not initially set out to ensure that it represented particular industries.

Therefore, to describe the labor market segments (Fig.9a, 9b), we use the conditional suprasectoral classification presented in Table 2:

Table 2

No.	Type of organization	Brief description	Examples of organizations
1.	Public enterprises	Organizations that are fully or mainly owned by the State	Russian Post, Russian Railways
2.	Quasi-public companies	Joint stock commercial companies controlled by the State through corporate governance instruments	Gazprombank, Aeroflot, Rosneft
3.	Large "old" private companies	Organizations with underlying assets that existed during the Soviet era and were obtained by their new owners in the process of privatization (mostly resource companies)	Lukoil, Surgutneftegaz, NLMK, Severstal, Basic Element
4.	Large "new" private companies	Private businesses established outside the privatization of Soviet assets, developing on a competitive market, including the international market.	MTS, X5, Alfa-Bank, Yandex, SPLAT, Kaspersky Lab
5.	Multinational companies	Companies with headquarters abroad, operating in Russia	Danone, P&G, Unilever, Citibank, Toyota
6.	Small and medium-sized businesses	Private companies with a headcount of less than 100 (small-sized) and not more than 250 (medium-sized) employees.	
7.	Educational institutions	Mostly public entities (about 80% of the market)	Moscow State University, Skolkovo, secondary schools
8.	Healthcare organizations	Mostly public entities (90-95% of the market)	Public clinics, MEDSI, EMC
9.	Government authorities	State and municipal administrative bodies, security agencies	Government of Moscow, Russian Finance Ministry, Russian Guard

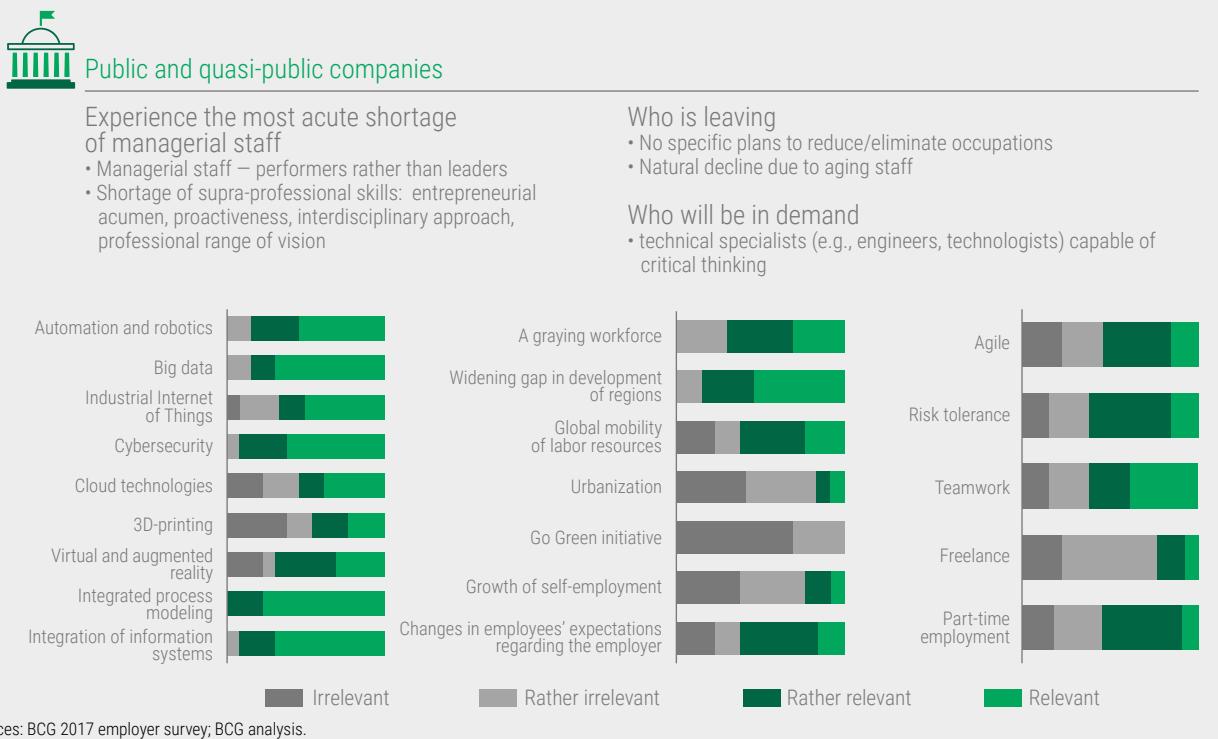
The estimated number of jobs/employees by segments listed in the table is based on Rosstat's official statistics: by type of economic activity, form of ownership, organization headcount. To avoid dou-

ble counting of jobs (for example, in the segments of large "old" private companies and companies partially owned by the state), additional interviews with Russian labor market experts were conducted.

APPENDIX 3:

EMPLOYER SEGMENT PROFILES WITHIN THE FRAMEWORK OF THE STUDY

In the survey, each employer assessed the applicability of the technological and demographic trends most widely discussed today for their company.

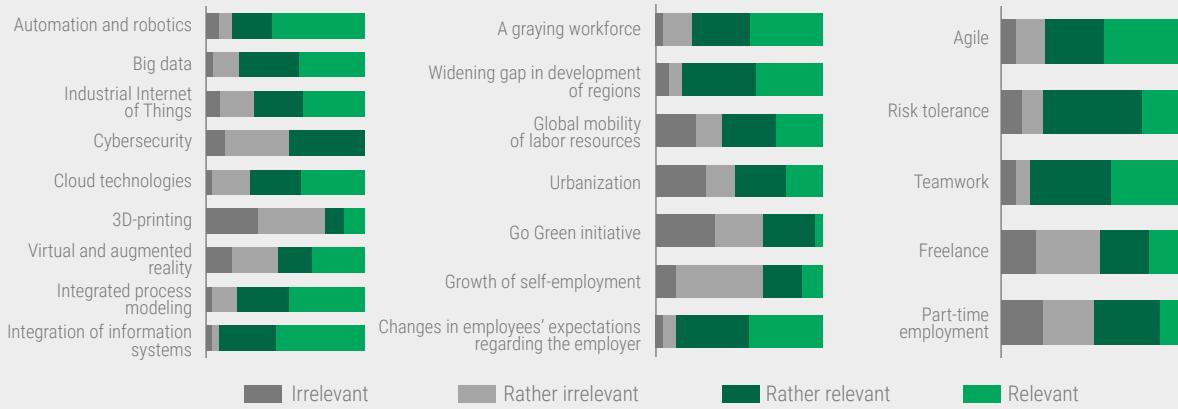




Multinational companies

Experience the most acute staff shortage in market promotion of products

- Growing complexity of tasks – product management throughout the entire life cycle, requiring multidisciplinary approach, management skills
- Promotion channel changes require of specialists adaptability, quick learning capabilities



Sources: BCG 2017 employer survey; BCG analysis.

Who is leaving

- Automation of routine production processes (e.g., packaging)
- Automation of routine back-office tasks (accounting, basic analysis)

Who will be in demand

- Product owners – specialists involved with the product from the day of its inception and until the end of its life cycle
- Digital marketing specialists



Large "old" private companies

Experience shortage of skills at all levels

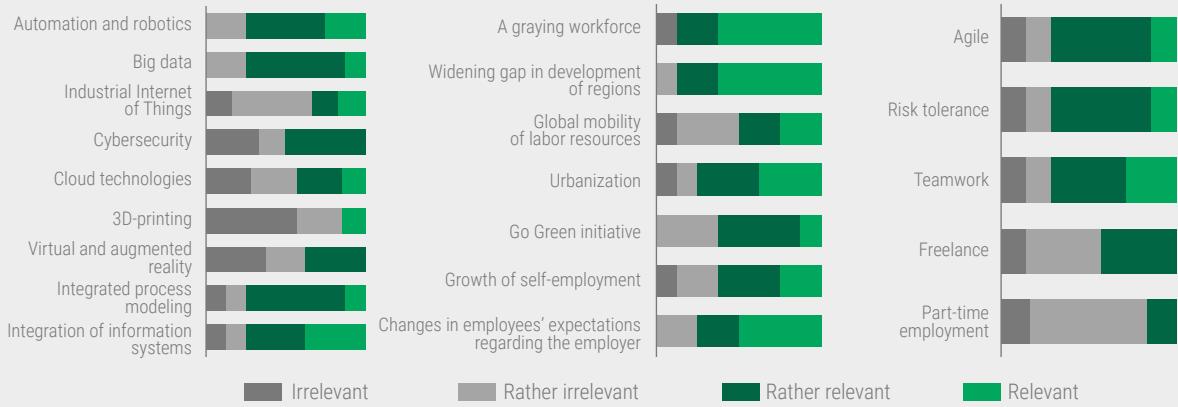
- Lack of skills and staff becomes an apparent burning issue when attempting transformation or opening new modern production facilities
- The corporate culture doesn't allow staff to be attracted and retained

Who is leaving

- The main large-scale optimization lever is in the elimination of "hidden unemployment" rather than the introduction of new technologies and professions

Who will be in demand

- A new type of managers, technologists



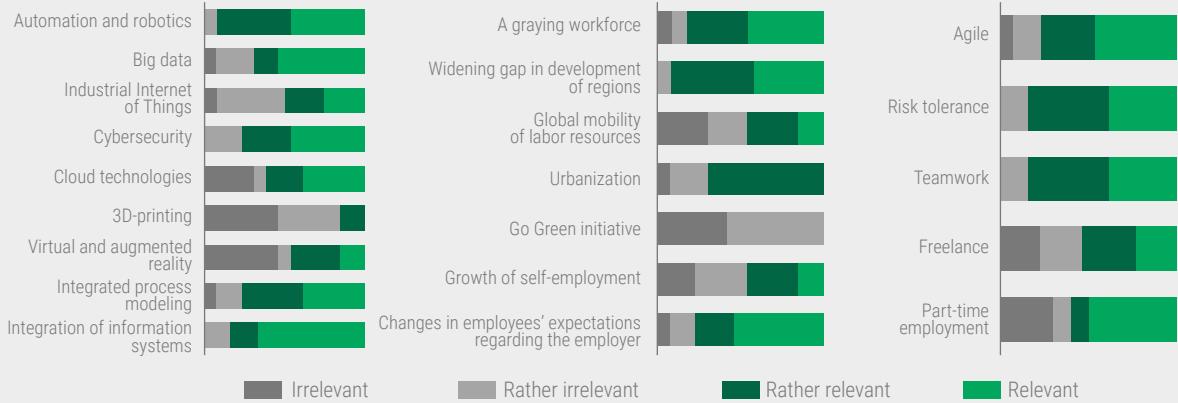
Sources: BCG 2017 employer survey; BCG analysis.



Large "new" private companies

The main difficulty in staff recruitment and HR management is the cultural component

- All employers speak about the need for personnel with a new "mindset"
- Availability of technical skills
 - There are appropriate specialists on the market, but they are few; a strict selection filter is applied
 - Problems arise in those specialist fields where major State-supported companies overheat the market for such workforces



Sources: BCG 2017 employer survey; BCG analysis.

Who is leaving

- Routine professions and basic analysis: pricing analyst, call center operator

Who will be in demand

- Product manager



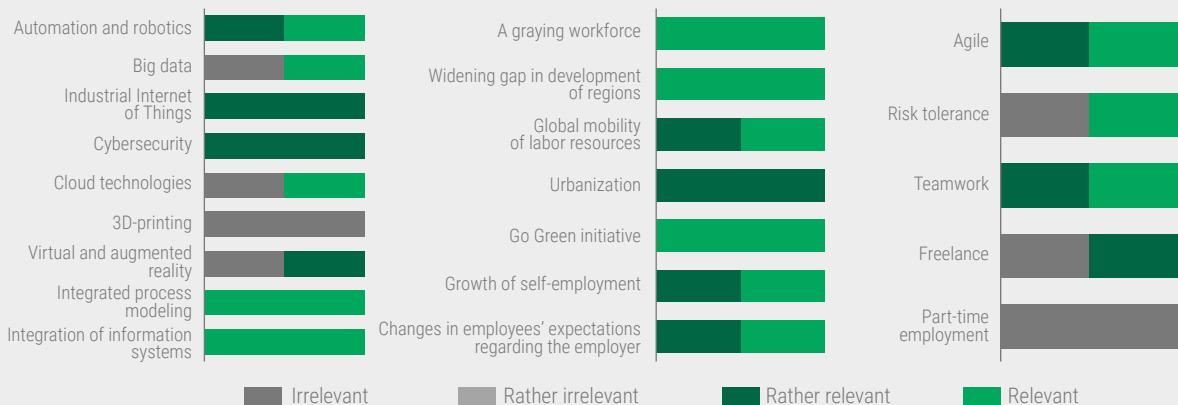
Healthcare & Education

Experience the most acute shortage of English language and decision-making skills

- Health care is still largely dominated by opinions, rather than proof.
- English language skills constitute issue #1, international articles and conferences are unchartered waters for the majority of doctors

Who is leaving

- Natural decline due to aging staff
- Increasing rates due to population aging and growth with a constant number of medical staff



Sources: BCG 2017 employer survey; BCG analysis.



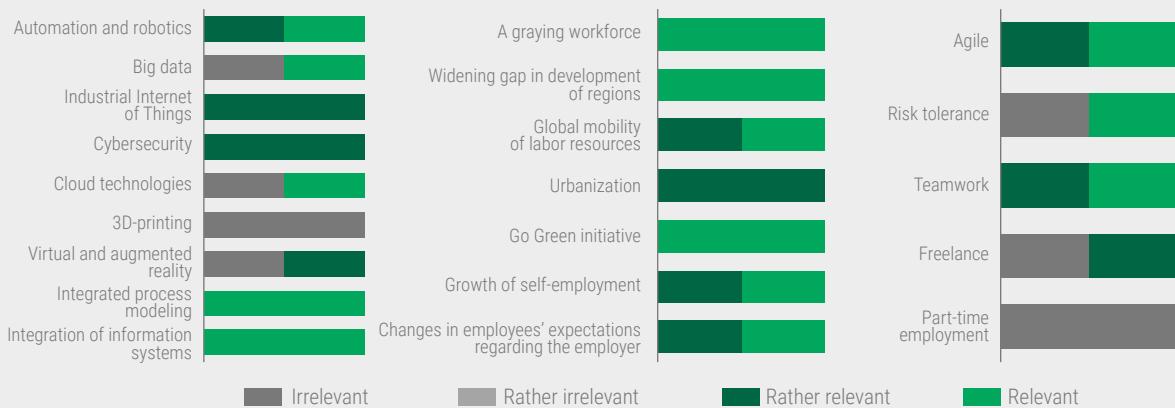
Public administration

Experience the most acute shortage of managerial staff

- Shortage of supra-professional skills: entrepreneurial acumen, proactiveness, interdisciplinary approach, professional range of vision

Who is leaving

- No specific plans to reduce/eliminate occupations
- Natural decline due to aging staff



Sources: BCG 2017 employer survey; BCG analysis.



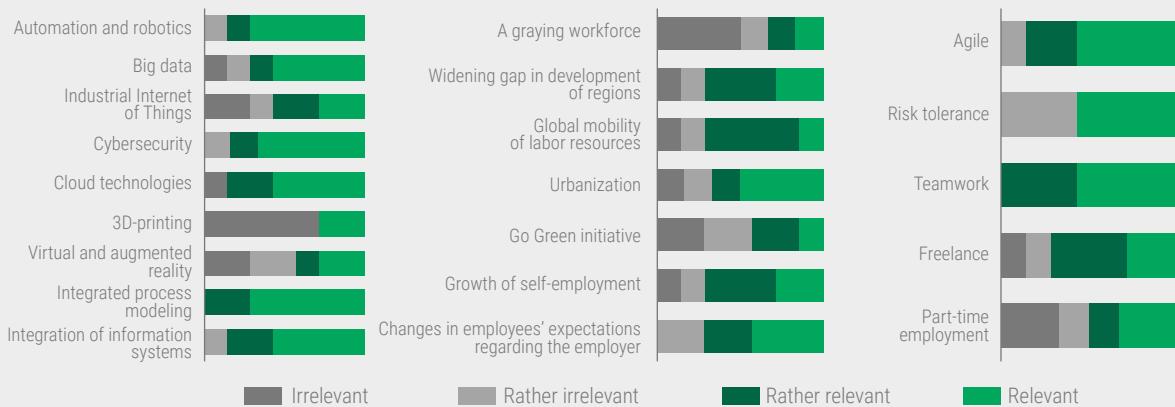
SMEs

Experience the most acute shortage of skilled workforce in technical specialist fields

- There are no specialists willing to prioritize breakthrough technology solutions

Who is leaving

- No specific plans to reduce/eliminate occupations
- Natural decline due to aging staff



Sources: BCG 2017 employer survey; BCG analysis.

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