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Journal of SECURITY AND SUSTAINABILITY ISSUES

International Entrepreneurial Perspectives and Innovative Outcomes

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Introducing peer reviewed scientific
Journal of Security and Sustainability Issues
The General Jonas Žemaitis Military Academy of Lithuania

Let me congratulate all the readers of this first edition of the *Journal of Security and Sustainability Issues*. I am very pleased that the The General Jonas Žemaitis Military Academy of Lithuania have decided to launch this ambitious academic project and succeeded in attracting so many foreign partners. We hope that through the involvement of academics and practitioners from so many institutions of high international standing as well as through the peer review process the editors will be able to ensure continuous high standard of this publication.

While the Journal is first and foremost designated for the professionals and academics working in security policy area, I hope that the publishers will find ways to reach wider audience. To my regret, international security and defense matters are increasingly becoming the issue for narrow professional circles, and largely separated from our societies. However, the foundations of our security lie within our societies. It is therefore paramount that our public has sufficient awareness and understanding of the issues and stakes involved when we discuss Lithuania's commitments to NATO, or deployment of our troops in Afghanistan, or energy security matters.

Furthermore, I am pleased to note that the title of the *Journal* as well as the content of the first edition implies a comprehensive approach to the international security agenda. Indeed, in the current security environment, economic, energy, environmental, demographic and national security issues are increasingly interrelated and the lines between them are increasingly blurred. Therefore the analysis of risks and threats to national and international security is impossible without understanding those complex interrelations.

Last but not least, I hope that the *Journal of Security and Sustainability Issues* will help to widen the discussions and teaching curriculum in the Lithuanian Military Academy. It is very important that future officers of the Lithuanian Armed Forces have broad understanding of the security issues and develop necessary skills to operate in the future environment, which is going to be ever more complex and ever more international.

With best wishes

RASA JUKNEVIČIENĖ
Minister of National Defence
of the Republic of Lithuania

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The *Journal of Security and Sustainability Issues* is a peer-reviewed journal which publishes original research papers. It is the international journal published cooperating with the institutions indicated on the cover of the journal. It is published quarterly.

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EDITORIAL FOREWORD FOR THE FIRST ISSUE OF THE *JOURNAL OF SECURITY AND SUSTAINABILITY ISSUES*

We all aim to have secure lives. The security of our homes, our families, our habitats and our networks, all have meaning and value that stretch beyond those that are circumscribed by our personal limitations. In our search for security we find sustainability. For to be secure is to engage in processes, activities and with institutions that can afford us lasting value with which to sustain our beliefs, structures, cultures and friendships. In a fragmented, consumption-oriented world riddled with inequalities between the rich and the poor, between one country and another, between regions and societies, much of what we see as security is a bulwark against threats to our well-being and even our daily lives. From national security to threats to the environment, financial crashes and almost surreal forms of cyber security, we seek as much protection of the flesh as we try to organise safe passage in the corridors of virtual power. With our codes, laws, institutions and technologies we create systems and ammunitions that can help to sustain the values of our evolving civilisations. To secure is to sustain. Much of what human kind need to cohere as a species is to ensure the drawing of boundaries within which to survive, develop and stretch our imaginations.

Yet, as we have seen well within a decade of this new century, countries and homes have been battered by financial excesses, while social and economic values have been scuttled by the ravages of unending war, by continuing hatred of the 'other' in ethnic, gender, and tribal terms. We continue to raise the stakes of our fight against environmental degradation. Economic growth and its largesse have been accompanied by rising levels of inequality and personal insecurity that endanger the very basis of our search for security and sustainability.

Our survival cannot simply be equated with protection and damage limitation against every twist and turn of fortune for which we are not prepared. Moreover, the break up of systems and practices with which we are familiar are often part of the process of forging new alliances, carving out new vistas of knowledge and well-being through unusual combinations. The destruction that is obtained in turbulence can lead to the creation that we find in the possibilities of change. That is why the identification of opportunity and the empowerment of people through creative forms of destruction, design and renewal lie at the heart of our real quest for security for a sustainable future. This translates into the realisation of the values of entrepreneurship, the identification and realisation of opportunity for economic, social, cultural and personal value creation by way of new ventures in business, government and society. It is this mission that drives the creation of this unique new journal which will play at the frontiers of research rigour, policy insights and innovation in practice. It will provide a forum for the generation of new ideas for security and sustainability that can be converted into experiments and sustainable implementation in the form of new activities and new ventures.

In leading this journal we aim to give expression to the essential duality of our lives – to protect what we have through individual and collective means and to create new pathways and opportunities in the public and private arenas. Over time we will explore micro and macro level initiatives, projects and policies that articulate this duality as they manifest themselves in both local efforts of, for example, green growth, or in the sustenance of global networks of organisations, in social enterprises that crystallise community actions as well as social movements that bring hope to people around the world. For this we need the engagement of your critical eye and your unbridled mind, of rigour and passion with which to change our lives and how we take actions to do so. We hope you will support us in this endeavour to secure a sustainable future.

Joint Editor-in-Chief Prof. Jay MITRA

Professor Jay Mitra is the Founding Professor of Business Enterprise and Innovation, Director of the Centre for Entrepreneurship Research at the University of Essex, and Head of the School of Entrepreneurship and Business, at the University of Essex, Southend, UK. He is also the Director of the Scientific Committee on Entrepreneurship for the OECD (Organisation for Economic Co-operation and Development) and its LEED (Local Economic and Employment) Programme, in Paris, France, and in Trento, Italy.

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STRATEGY AND EFFICIENT MECHANISMS TO IMPROVE SECURITY AND SUSTAINABILITY OF NATURAL GAS SUPPLY IN THE BALTIC STATES

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Abstract The share of natural gas as an efficient resource in the deficient Baltic primary energy balance is and will be significant (power generation, district heating, households, industry, etc.). Therefore, in the paper the risk of gas supply is evaluated and appropriate actions are recommended to assure reliable availability of affordable and sustainable energy in the Baltic States. Macro-region's base (including supply and transit countries), risk and cost assessments, timely introduction of non-market measures, high cyber security level of information processing and management systems are the components of the security strategy. The extension of Incukalns UGS, interlinked pan-Baltic LNG receiving terminal and upgrade of cross-border trunk pipelines are recommended as the most efficient tools. Complex realization of all instruments and solidarity of the countries are the key issues to implement proposed strategy.

Keywords: Energy Policy, Sustainable Energy, Gas Supply, Security of Gas Supply, Gas Storage, Estonia, Latvia, Lithuania.

Reference to this paper should be made as follows: Karnitis, E. 2011. Strategy and efficient mechanisms to improve security and sustainability of the natural gas supply in Baltic States, *Journal of Security and Sustainability Issues* 2011 1(1): 5-17.

JEL Classifications: F10, F15, F21, F43, F51, F52.

1. Introduction: Energy Policy and Energy Balance

It is well-known and even evident that energy is not only a sector of the economy. The EU classification, which includes energy supply in the services of the general economic interest, clearly shows their significance. Energy has always been a category of basic level of Maslow's hierarchy of human needs, particularly for the Baltic region (the second coldest EU macro-region following Scandinavia). Nowadays sustainable energy supply is becoming a significant (even the most significant) component of the national security of any country. Energy security is not a synonym for energy independence, natural or closed economy is not a model for today likewise.

Therefore, increasing regulation of the processes in the energy sector in the interests of society is going on worldwide including the EU (e.g., recently approved normative acts EC 2009a, EC 2009b, EC 2009c, EC 2010b).

To achieve adequacy of the regulatory activities with current political, economic and social situation, the EU energy policy is based on three closely interlinked pillars (Fig. 1a) including sustainability and security of supply. An indicative feature in the previous years (EC 2008) is the reduction of energy costs; naturally, competitiveness includes costs issues but it was not a primary issue for the welfare of the Western society. Presently the EU energy policy is updated (EC 2010a) in accordance with the current global economic situation. The policy points out that the prices for the energy products and services should be affordable for all the consumers. The policy model is slightly modified to increase the significance of the energy costs (Fig. 1b). The shift also relates to the energy security costs.

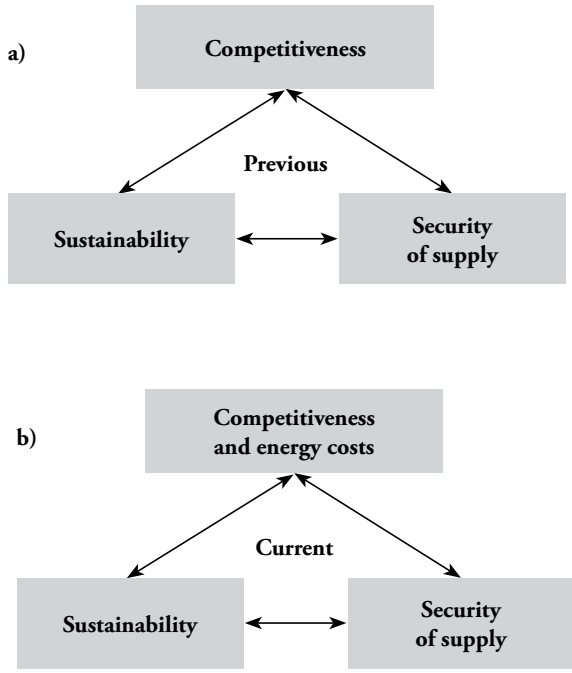

Fig. 1. Models of energy policy.

The policy of the Baltic States' always was consistent with the modernized policy model. The costs of energy have been much more significant for the society and business due to the economic situation.

An important priority of the updated energy strategy is turning towards much more general accent on low carbon energy (instead of swift development of the renewables only) due to the ongoing economic crisis and necessity to invest in recovery and jobs on one hand and slow global progress in the climate matters (low willingness of the US, China, Russia, etc.) on the other hand. According to this objective, natural gas as the economically efficient and comfortably used energy source, as the fuel, which CO_2 emission is only 60% of wood and 51% of coal emission, as a backup for renewables "will continue to play a key role in the EU's energy mix in the coming years" (EC 2010a), thereby balancing affordability and environmental demands.

The share of natural gas in the EU primary energy balance currently is significant (power generation, district and local heating, industry, households), nevertheless it is far from the dominant position (Fig. 2). The proportions of the Latvian and Lithuanian balances are quite similar (here and further statistical data of Eurostat are used), however, the proportions of the Estonian balance are much smaller (due to the Estonians' oil shale). All energy mixes are quite balanced (Kaderjak P. *et al* 2007); Herfindahl-Hirschman Index for the EU energy balance was 2452, for the Latvian balance – 2683 in 2009. But gas consumption per capita in the Baltic States remains significantly lower than in the EU – only 44% of EU27 level in Estonia, 58% in Latvia and 70% in Lithuania (2009). One can see that populists' expressions like "the Baltic States are sitting on the Russian gas needle" are not based on facts.

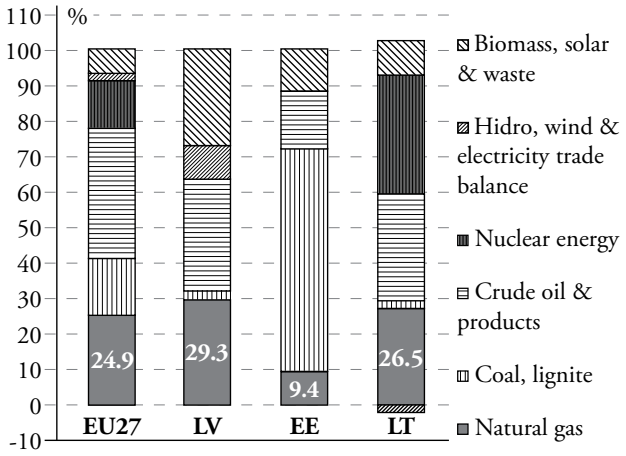

Fig. 2. Energy balance (Latvia, 2009)

The future expectations on the EU gas market development are very different (e.g. instabilities during the crisis), even up to 32% share in energy balance in 2020. The baseline scenario (EC 2010c) shows 7-12% increase till 2020 in Estonia and Latvia and much more in Lithuania (more than 40% increase) that is related to the replacement of nuclear energy, especially in the mid-term. Liquefied natural gas (LNG), unconventional and deepwater gas consolidate conventional gas sector. In any case gas sector will be of strategic significance for the economy and social life of the EU and the Baltic States.

The EU gas import dependency is high (more than 60%) and it will increase (up to 85% in 2030). Hence the importance of the security of gas supply (SoS) problem.

The approval of the special EU Regulation (EC 2009c) was intensified by the recurrent gas crises (2006, 2009) due to the disputes between Russia and Ukraine. But it is impossible to solve the problem only by the activities in consuming countries without strong partnership, supply and transit countries. For the exact reason strengthening the external dimension is another priority of the updated EU energy strategy.

2. The Baltic States: Individualities of Gas Supply

There are very different and mutually unlinked security levels in various EU regions. The gas crisis in 2009 affected 18 European countries, some of them significantly, some countries could withdraw gas from their underground gas storages (UGS) or switch to another sources. Whereas the Baltic States as well as Spain, Portugal, UK, Scandinavia were not confronted with the problem.

Therefore, macro-regional approach to the improvement of the SoS is one of the key issues of the EU position. Is fully acceptable; the security problem cannot be solved at the national level as countries themselves cannot develop necessary infrastructure. Security tools are transnational instruments; they are effective if they are based on the transnational cooperation and solidarity of the neighbouring countries. Equal general principles (mainly at the political level) should also be implemented throughout Europe.

The gas fields are not discovered in the Baltic region. Unlike many EU countries, the Baltic States depend 100 % on Russia as it is the only gas supplier. The region's (incl. Kaliningrad) peak demand is 40 Mcm/day. The supply is provided by two trunk pipelines (EEGA 2008) with the capacity adequate to the current consumption. One pipe is direct, the other is a transit one via Belarus (Fig. 3). The capacity of each pipe is 30 Mcm/day. There are two bidirectional pipelines: Estonia – Latvia (2 Mcm/day) and Latvia – Lithuania (5 Mcm/day). Two old small pipes (St. Petersburg – Estonia and Belarus – Lithuania) are not used but can be activated. The system of gas supply is fully isolated from the EU system. This individuality of the Baltic region is unique on the EU scale.

Fig. 3. Baltic gas supply grid

Isolation of the Baltic gas system is linked with the following historical causal relationships and consequences:

- From the very beginning (1960s), the Baltic natural gas system has been integrated into the system of Russia – trunk pipelines, centralised dispatching, supply to Kaliningrad via Lithuania.
- The Eastern Baltic region countries (Latvia, Estonia and Finland) are the only ones that have border with Russia; direct gas import without transit routes is a substantial advantage.
- Russia is the owner of the richest gas reserves. It has been a reliable gas supplier since the restoration of the Baltic States' independence in 1990 despite the complicated interrelations with Russia. Nevertheless, the problem of supply would arise if domestic market increased sharply and the Eastern export developed in the future (ИЭС 2009).
- Development of gas infrastructure in Russia is a crucial issue. The new pipeline from Yamal gas fields as well as Nord Stream and Shtokman pipelines can have an impact on the supply to the Baltic region in the future. It depends on the actual operational

capacity of all pipes (Nord Stream will be connected with Yamal trunk pipes).
- Technical skills and know-how of the Russian specialists are recognized internationally; the Baltic gas companies also exploit their knowledge potential.
- *Gazprom* is the shareholder in all Baltic gas companies;
- *Incukalns UGS* (delivery capacity 24 Mcm/day) is the third supply source that is an extremely significant security guarantee for the most substantial – winter – period (injection is taking place during summer). The use of the UGS is practical experience of solidarity as Estonia, Lithuania and even Russia exploit the capacity of the UGS during winter.
- Following the Romanian consumers, the Lithuanians enjoy the lowest gas prices in the EU (Estonia – 69%, Lithuania – 72%, Latvia – 60% of EU27 average price for domestic consumers in 2010S1).

These individualities have to be taken into account during the evaluation of the risks that could affect gas supply to the Baltic consumers. Nevertheless, the major problem regarding the only gas supplier is evident.

Diversification of the suppliers and supply routes is a cornerstone of the EU policy (Bilgin 2009). In addition to the major suppliers (Russia – 33.2%, Norway – 28.8%, Algeria – 14.7% of total EU27 gas import in 2009), there are a large number of smaller sources. In addition, 18% of total gas import was covered by the LNG; it was provided by Algeria, Qatar, Nigeria and some other countries. Nowadays the EU is searching for additional sources of gas supply from the Caspian and Middle East countries.

Diversification of the gas suppliers, sources and routes is the strategic task for the Baltic gas sector to increase its sustainability and security.

3. The Baltic States: Risk Assessment

There are a lot of interpretations of the gas supply security in the political documents and scientific publications. The essence summarized is "the guarantee that all the gas volumes demanded by non-interruptible customers will be available at a reasonable price" (Luciani 2004).

In any case, the SoS is a multi-dimensional issue, it includes energy aspects (source security), availability aspects (security of delivery) as well as aspects of affordability (economic security). More detailed analyses include a number of components (see, e.g., Jansen *et al* 2004, Jansen, Seebregts 2010, World Energy Council 2008). The problem includes very different sets of aspects, which form the base for the assessment:
- European, regional and national issues;
- Short-term and long-term aspects;
- Evaluation of disruption risks vs economic reasonability, security costs;
- System risk – centralized vs distributed/networked system;
- Stakeholders' impact – private (quoted in stock exchange?) and state owned actors;
- Unbundling / market measures vs vertical integration / non-market measures.

Disruption of the gas supply far exceeds the losses of suppliers and consumers (Umbach 2010). They affect inflation and payment imbalances, unemployment and broadening social programmes. At the same time the care of security on national scale should not exclude problems of any household supply security.

It is very popular in the Baltic States to speak on political risk and Russian energy policy supervised by the political interests. This approach nowadays is characteristic of any country (the called *resource nationalism*). In Russia, the US and China economics, particularly energy, is not separated from politics (Linde 2007). Not only superpowers have implemented such policy, the governments of the Baltic States have adopted the policy as well.

Stability (lack of investments, political and social instability) in the transit countries is highly evaluated and is very important for the SoS, particularly because these countries usually are not direct partners of the gas supply contracts (Hetland, Gochitashvili 2004). Some problems of small supply in the Baltic region also have arisen due to the transit pipe only, e.g., in 2010 a short (24 hours long) sharp partial reduction (up to 40%) took place in the supply to Lithuania via Belarus. Interconnection Lithuania – Latvia was ready for use but there was no necessity to do it (small consumption because of the summer time).

Quantitative criteria, which characterize various security aspects, also are different (see, e.g., Kruyt *et al* 2009). In addition, remote authors not always are very familiar with the past and present situation in the Baltic gas sector. The result is very different and sometimes subjectively assessed.

Detailed analysis of the risk (Ramboll 2009) can be

evaluated as the most comprehensive, detailed and well-grounded. In a large measure it was used as the basis for development of the BEMIP – Baltic Energy Market Interconnection Plan (EC 2009d). The security of Latvia is evaluated as high and comparable with Norway primarily due to the existing Incukalns UGS (Fig. 4). Other security components for Latvia are assessed as higher ones. Estonia and Lithuania are assessed as lower security countries because of weekly diversified supply – only one pipe of the main supply to each country and small capacity of pipes from Incukalns (Lithuania's situation is evaluated as better – higher pipe's capacity in comparison with Estonia). In addition, the geopolitical risk decreases Lithuania's SoS due to transit via Belarus. Nevertheless, it should be mentioned that partial supply to Estonia from Incukalns during winter is a normal process but one of the short-time problems for Lithuania caused by Belarus – Russian relations was operationally solved exactly by the gas delivery from Incukalns.

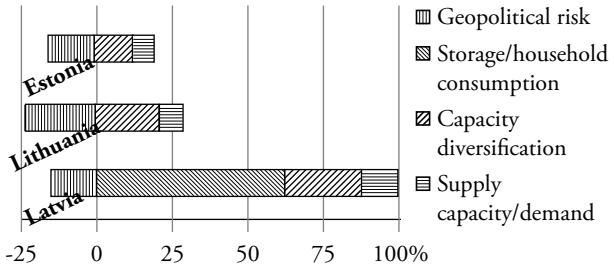

Fig. 4. Ramboll SoS index

Preliminary calculations of n-1 parameters (EC 2009c) reflect the possibilities of the gas supply to non-interruptible consumers if there is a failure of the largest supply infrastructure or source. It has been done for the Member States according to the core postulate of the gas security Regulation (EC 2010b). N-1 is significantly over 100% for Latvia (163%) and Estonia (144%), while Lithuania (57% only) is the least secure of the three.

Academic analysts also offer various security evaluations. Because of the incomprehensible reasons, their approaches sometimes are one-sided. E.g., special risky index is developed by combining import dependency risk and economic importance of gas (Coq le, Paltseva 2009). Another proposal is based only on the ability of a country to replace all the disrupted gas supply by alternative gas and/or alternative fuels (Findlater, Noel 2010). In contradistinction to the described above, the assessment find a low level of gas supply security in all the Baltic States. Latvia is evaluated as the least secure of the three (Table 1).

Table 1. Comparison of the risk assessment results in the Baltic States

	Evaluated security level		
Source	*Best*	*Medial*	*Worst*
Ramboll	Latvia	Estonia	Lithuania
n-1	Latvia	Estonia	Lithuania
Coq le	Estonia	Lithuania	Latvia
Findlater	Estonia	Lithuania	Latvia

In general, the risk of supply in the Baltic States could be evaluated comparatively low although quite differently. Due to several aspects, it can and should be decreased further. There are several well-known basic tools to increase the SoS, let us analyse them shortly in the context of the Baltic States.

4. Extended UGS System: Stability of Supply

Underground gas storage is one of the most efficient instruments to increase the SoS. It serves as a secure gas storage facility near customers (shortened supply chain decreases supply risks; the UGS can be used in emergency case) or even equivalent of terminated own gas field for the import countries. The last-mentioned advantage is extremely important for the Baltic States (UNECE 2007). Unique, concentrated geological formations in Latvia (porous sandstone with a good collector capacity in an optimal depth 700-800 m that is covered by gas impenetrable carbonate stratum layer) and Lithuania (definitely there are no storage possibilities in Estonia and Finland) enables the Baltic States to expand efficient use as well as further development of the UGS.

Currently the Incukalns UGS, which is one of the largest storages (4.5 Bcm; active volume – 2.3 Bcm) in Europe, is already exploited for the gas supply during many years. Gas is injected in the low-demand summer period (available and/or cheaper gas) and is withdrawn during high-demand winter period. Evaluation of the gas supply using local Incukalns UGS shows a radical decrease of the supply disruption probability (statistical data of the emergency situation have been used) – around 200 times lower in comparison with the use of more than 3000 km long trunk pipeline from the gas fields in Russia (Davis *et al* 2009).

Operation of the UGS is an excellent example of the

existing long-term successful regional solidarity. Gas is delivered not only to the Latvian customers; partial winter season supply is provided to Estonia and NW region of Russia and occasionally to Lithuania (Fig. 5). Tariff payment for the Incukalns UGS services is approved by the National Regulator Authority of Latvia (16 EUR/1000 cm).

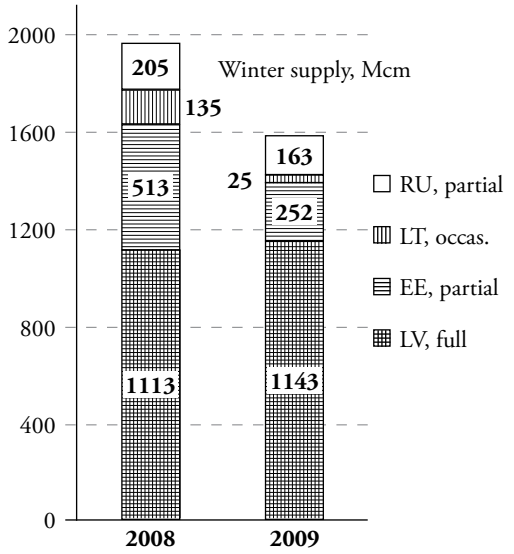

Fig. 5. Delivery of gas from Incukalns UGS (Latvia, 2009)

Natural question arises – can the volume of gas storage guarantee high SoS in the whole Baltic region including Finland and Kaliningrad? Estimating the growth of the annual winter volumes that should be delivered from the UGS till 2020 (up to 3 Bcm), currently existing peak demand (up to 60 Mcm/day) and the growth of the total annual consumption of the isolated Baltic region (up to 15 Bcm), one can find that current capacity is sufficient only for partial supply (even taking into account the planned development of volumes in the Russian Nevskoye and Gatchinskoye UGS) and cannot guarantee perfectly secure supply for the Baltic States.

The actual possibilities to increase significantly the volume of the gas storage in the Baltic region are as follows:

- The extension of Incukalns storage is the major and immediate activity. Technical project of the extension has been elaborated to increase the volume of the storage to 6.2 Bcm including the increase of the active volume to 3.2 Bcm. The evaluated investments for the extension (0.9 Bcm active volume) is 160 MEUR/Bcm (here and further investment figures from Ramboll 2009 and EC 2009d).
- Latvia has at least 11 storage facilities with the total active volume of up to 50 Bcm. Dobele and Blidene are the most explored (including studies and analysis of storage potential and the number of drilled wells) and the perspective UGS. Their active volume would be up to 10 Bcm. The evaluated investment for the Dobele UGS (6 Bcm active volume) is 400 MEUR/Bcm. The development is not reasonable for the Baltic demand only but it would be real and even the best solution for the Central and Western European countries (connection with some trunk pipeline is necessary).
- The exploration of the geological structure in Syderiai (Lithuania) was started in order to determine the suitability of Syderiai to store the natural gas. (potential active volume up to 0.5 Bcm). The evaluated costs are very high – up to 700 MEUR/Bcm. Taking into account previous options, these investments are unreasonable for such a small UGS.

5. Liquefied Natural Gas (LNG): Real Diversification of Supply Sources

LNG supply is a more revolutionary instrument in comparison with the UGS. New gas resources and suppliers (Algeria, Nigeria, Qatar, Trinidad & Tobago) are available for the EU countries on the basis of the natural gas infrastructure (only non-principal technological actions are necessary) and market demand. All LNG technologies are being developed and the costs are decreasing rapidly. Global LNG production capacity is growing (current forecast is 130 Bcm/year till 2013). LNG supplies to EU27 have increased by 23% in 2009. It is forecasted that the increase till 2030 will be 3-6 times bigger.

Furthermore, the *Medgaz* gas pipeline Algeria – Spain (currently LNG covers 60% of Spain gas demand) started operating. It is possible to forecast growing LNG supply possibilities in other European regions. If Russia develops the planned Shtokman and Yamal LNG export terminals, there will be extra options. In general LNG sector is more flexible, it was adjusted to the uncertainties of demand and spot proportion is much higher in comparison with natural gas market.

Therefore, the LNG market is well adjusted to the role of the diversified supplier when gas shortage is in the Baltic States and/or to soften supply conditions. Even high-ranking *Gazprom* officials have admitted that in case of development of additional purchasing capacities on 1/3 of *Gazprom* volume scale (total volume for the three Baltic States is 6 Bcm) by means

such as LNG terminal, *Gazprom* will take actions to reduce prices and/or offer other more attractive supply conditions.

Nevertheless, there are several specific individualities that will make the LNG supply to the Baltic States more expensive in comparison with Northwest Europe. The price premium would be around 8 EUR/1000 cm higher than the UK prices (Ramboll, 2009) because of the following factors:

- Longer transportation distance;
- The Baltic Sea is quite shallow, the capacity of vessels will be less than 50 000 cm of the LNG (30 Mcm of gas); transportation by small vessels is more expensive and reloading (e.g., in Zeebrugge) from typical 145 000 cm ocean vessels is necessary;
- The Baltic Sea is colder; therefore additional regasification costs are involved.

The investments in the LNG terminal (related to 1 Bcm capacity) are reverse to the total capacity of the terminal. The terminals with the capacity of less than 2.5 Bcm/year become unprofitable. Considering the consumption of the Baltic Sea region, one joint terminal has to be constructed. Unfortunately, current plans remain uncoordinated, a lot of terminals are recommended even in the BEMIP (Finland, Lithuania, Estonia, and Latvia).

The target costs for 2,5 Bcm/year terminal are around 500 MEUR including storage volume that costs nearly 200 MEUR; therefore, it is unambiguous that the Baltic States has to take up the opportunity to exploit Incukalns UGS as a storage volume and to interlink terminal with the expanded UGS (BEMIP also directly indicates project dependency of all potential LNG terminals with expandability of the UGS). Because of the very similar conditions in the Eastern coast of the Baltic Sea, the port of Riga becomes the top destination for the LNG terminal (onboard re-gasification on ships cannot be evaluated as a possible option for peak and emergency cases).

6. Network Configuration: To the Single Mesh Network via Baltic Ring

Sustainability and security of supply depends very much on the configuration of the supply system (both transmission and distribution networks). Perfect network configuration should ensure several gas flow ways to the consumers; thus delivery will not be cut in the case of pipe damage.

Current configuration of the Baltic gas system (Fig. 3) is a mix of bus-, star- and zipper-style systems (Fig. 6). Sometimes they are hierarchical ones. Low security level characterizes all the systems; any defect creates an outage for some or even many consumers and network configuration does not provide the ways for reserve supply. Only in Estonia there is some kind of imperfect ring transmission system (reverse flows are not technologically feasible).

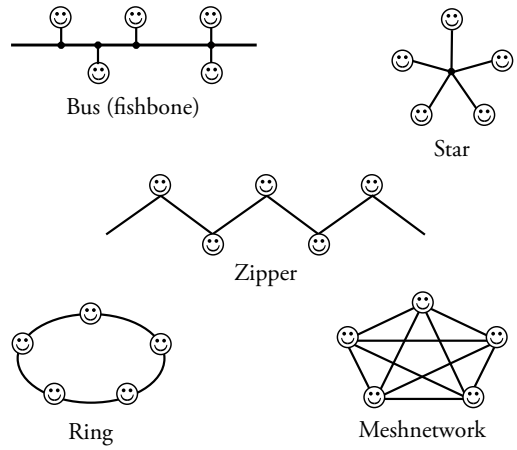

Fig. 6. Types of networks

The Baltic trunk pipeline ring is the first substantial step in order to increase the security of supply although it will be incomplete; reverse gas flows will be feasible to integrate all income gas flows.

Several projects have been included in the BEMIP to increase cross-border capacity and thus to form the Eastern segment of the *Baltic Ring* and to increase security on macro-regional scale. These recommendations are fully acceptable. The upgrade of the Lithuanian – Latvian and Latvian – Estonian trunk pipes is the substantial and cost-efficient activities. Next step – the trunk pipes Finland – Estonia (*Balticconnector* project, cost – 120 MEUR) and Poland – Lithuania (*Amber* project, cost – 300 MEUR). The significance of the last project for the Baltic States will sharply increase if the test drilling for the shale gas near Gdansk will be successful (1000 Bcm capacity of the shale gas field in Poland has been prognosticated).

Mesh networks form the most secure and sustainable supply system. They have already become the basic ones for the electronic communications sector. It is also a trend for a step by step development of the electricity infrastructure. Huge investments are necessary to implement this principle in the gas infrastructure. Careful risk assessment and cost-benefit analysis should be made to evaluate expediency of a

system segment conversion into the mesh network; it also relates to the networks of local distribution.

Synchronous increase of security on national/internal level in general is as much important for consumers as macro-regional security. Duplicate access to the Incukalns UGS, connection of the LNG terminal, and feasibility of reverse flows in distribution network are substantial issues for any consumer.

7. Implementation: Complexity of Actions

Complex and comprehensive implementation of the mentioned infrastructure instruments is a key topic in order to ensure efficiency, sustainability and security of the gas sector. All tools are closely interlinked and interdependent – the LNG terminal and the UGS, LNG terminal and pipelines, UGS and reverse flows, cross-border and national development, etc.

Furthermore, the coordinated systems of electricity and gas supply (e.g., BEMIP projects), networked power supply, that is an advanced basis for the CHP generation (the most efficient technology for the relatively cold Baltic Sea) should become a mainstream for the development of the energy infrastructure in order to modernize the energy sector (e.g., Weisser 2007).

There are several issues that have to be taken into account for the successive implementation. Some of them require modernized political and normative environment.

Risk assessment is an extremely substantial individual activity for any country and/or macro-region to be prepared for crisis situations. It should contain qualitative and quantitative evaluation of risk factors for the specific country/region and their probability. 100% security of technological system cannot be achieved in principle, real security level from consumer's position will be individual and in close compliance with economic situation and possibilities. Contingency and emergency planning that contains all measures and necessary investments is also individual as it is coming out of risk assessment and financial situation. The top-down n-1 principle established in Regulation (EC 2010b), which is binding for all the Member States, is contradictious in terms of the logical bottom-up approach (based on risk assessment).

Investment is a serious precondition for the SoS, the amount of necessary funding is directly linked with the chosen degree of the reasonable security level. Energy policy and security have become top issues in the national security policy; however, it does not always coincide with the interests of the energy companies (Umbach 2010). The focus on market development and competition is resulting in low business interest and responsibility for the SoS as well as the necessity for the adequate financing model that includes public investments. Good intentions and activities of gas supply companies are of crucial importance; public participation will also increase the motivation for the private investments.

There are some findings on the huge investment gap (EC 2010d) and the necessity to partly finance the security infrastructure projects from the EU and national public funds. Unfortunately, the connection between the strategic projects and investment sources on the EU and national level are vaguely defined. One of the possibilities to be discussed is the matching financing of the SoS projects from the national security budget.

Consumers are the most vulnerable stakeholders in the gas market. One of the basic tasks for the regulation is to ensure that the gas price is affordable. Statistics show that low income households (1st quintile) substantially limit the use of gas expending larger share of their comparatively small budget (Fig. 7).

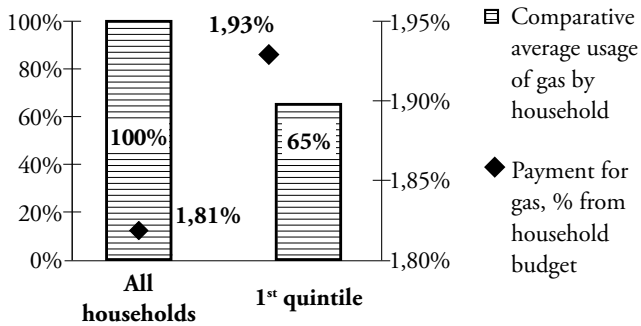

Fig. 7. Households' costs for gas supply (Latvia, 2009)

The EU normative acts have determined special protection rules for the low income and remote customers: „The shared values of the Union in respect of services of general economic interest … include in particular … a high level of quality, safety and affordability … and the promotion of universal access." (EU 2007). "Member States … shall, in particular, ensure that there are adequate safeguards to protect vulnerable customers… They shall take appropriate measures to protect final customers in remote areas who are connected to the gas system." (EC 2009a).

The universal service principle is regarded as a real instrument for the availability of various services throughout the country for any individual. The introduction of this instrument in the gas sector should be considered as a component of the security programme.

All security measures are directed mostly to the protection of non-interruptible customers; security level of customers will become different. Unanswered question is – should the tariffs be different too?

Growing volatility and unpredictability of the gas prices during previous years has initialized discussions on the optimum payment system – on spot or long-term contract basis; the main reason is the lowered prices of spot since the middle of 2008.

But nobody knows how long and how low they will remain Analysing the past situations, one can find alternating situations, e.g., in 2005-2006 and 2007-2008 the spot prices were higher. In addition, large and sudden price spices are typical for the spot market; however, it is not an issue for contract prices. The forecasts prices of spot even for 2011 are highly uncertain (within 100 – 500 USD/1000 cm).

Existing long-term contracts (Estonia and Lithuania – till 2015, Latvia – till 2030) are additional substantial aspects of the SoS for theBaltic States. They increase reliance on the sustainability of the gas supply. Therefore, contract basis should not be changed. Another topic is the achievement of the more balanced and better structured contracts, advanced shift from oil linkage to gas-to-gas (LNG and unconventional gas) competition.

Theoretically competitive environment provides lower gas prices. It could be achieved in stable periods (see, e.g., Kalashnikov, Kalashnykova 2008). It is also mentioned that "each player maximizes his profit under certain capacities constrains". Market practice shows that even the reduction of the small supply causes sharp increase of price. In emergency situations (e.g., if the significant reduction of supply takes place), constrain of competitors decreases or even disappears completely, in reality it means flashes of prices.

Traditionally in *force majeure* and even pre-emergency situations the market is not evaluated as preferable tactics. The Regulation (EC 2009b) also provides for the non-market based measures as the last resort in emergency situations that clearly accepts their higher efficiency in comparison with everyday market measures. The pre-emptive introduction of the non-market measures in alert or early warning situation would prevent this groundless increase. In addition, the proposed typical huge bureaucracy has to be revised: even in the emergency case 10 days are necessary for decision-making procedures.

The relevant and politically sensitive topic is the issues of the third party access to the gas infrastructure. Similar tactics has already been applied during the last few years in the electricity networks. This experience has to be taken into account.

It is the demand of the updated EU gas legislation (EC 2009a, EC 2009b) to facilitate the entry for the new suppliers to the gas market. Derogation of the corresponding articles has been approved for Estonia, Finland and Latvia because of the isolated infrastructure of the gas supply. There is no legal pressure on these countries to unbundle networks. Lithuania has not asked for derogation (reasons are not completely clear).

The owners of the infrastructure are not very interested to invest in transmission and distribution capacity reserve because they are not in the direct contacts with the consumers. Furthermore, sometimes it would be more profitable to ensure less than 100% peak demand (not speaking of the security demands) in order to cut down investments. The result is inadequate and ageing European electricity infrastructure (lot of blackouts in last years). Integrated company is more interested in the security and sustainability of supply.

The same relates to the third party access. It is also not an end in itself; it should be a tool to improve quality and security of supply as well as the affordability of the prices. If the vertical integration is the encouraging factor for the stability and sustainability of the oil markets (Hafner 2010), why would not it be acceptable to the similar gas markets (see also concerns in Ming-zhi 2009)?

It is necessary to evaluate the introduction of the mentioned open market instruments when the possibilities of the real competition exist (e. g. the LNG terminal will be constructed or interconnection with the European gas system created). While it is impossible to import gas from elsewhere than *Gazprom,* there is no practical sense to do it.

The shareholders' interest of *E.ON* and *Gazprom* is a closely related. Well-balanced composition of the shareholders (gas supplier and experienced manager

of the Western style gas business) in combination with the high-skilled regulation is the advantage of the Baltic countries (sustainable supply and the lowest gas prices throughout the EU in the non-competitive environment). We can add close cooperation factor of the shareholders in the European scale projects. Long term review of the processes in *Latvijas gaze* shows radical increase of the company efficiency and reliable gas supply. Naturally, both shareholders are already very dissatisfied with the political decision on currently premature unbundling activities that will decrease value of the assets in Lithuania and Estonia. It will lower neither the supply risks, nor the gas price.

The gas networks similarly to the electricity ones have gradually become more *intelligent* (management of flows, dispatching, process efficiency, etc.) due to the electronic information processing and management. Security and reliability of information systems in full measure determine the security of the gas supply. The high level of the information system cyber security is of the same importance. Physical harm of the infrastructure is of low-probability but to attack networked information system is comfortable in comparison with the damaging pipes and storages. The *cyber attacks are highlighted as the greatest security threats for the infrastructure.*

Intelligent energy grids are vulnerable to cyber attacks. Potential danger is expected not only from the terrorists,, political or economic reasons may also harm. *I*n April 2009 the reports were made that the foreign spies had infiltrated the US electrical grid and installed software to be used to disrupt the system.

The issues of the cyber security in the critical infrastructure are now the top international priority; they should be included in the programme of the gas supply security.

8. Solidarity and Partnership of the Countries

Solidarity, partnership and conformity of the countries in policy, actions, investments is one of the strategic pillars to implement recommended strategy and instruments, and ensure efficient, sustainable and secure gas supply (EC 2010a). The security problem cannot be solved on the national level. The security of supply is a macro-regional problem and the above described security tools (interconnection of the pipeline systems, diversification of supply, LNG terminals, UGS) are transnational instruments. On the other hand, the global or European scale is not purposeful for the identical tools and measures due to very different situations.

Macro-regional priority of the security policy (EC 2010b) is the only way to achieve energy-efficient and energy-secure Europe. Despite the accumulated solidarity practically related to the exploitation of Incukalns UGS, some reasonable doubts remain on the capability of the Baltic States to cooperate in the energy sector. There are several unsuccessful cases, e.g., liquidation of the common dispatch centre *DC Baltija*, long-term stochastic activities related to *Visaginas Nuclear Power Plant* project. The evaluation of the current policy of the sector and shift to the more balanced cooperation and competition of the Baltic States is necessary for achieving reliable gas supply.

At the same time the macro-regional principle established as legally binding by the Regulation (EC 2010b) is too narrow. Internal market depends very much on the external supply. Let us remember the import of 60% in the EU current natural gas balance. Both 2006 and 2009 gas crises clearly showed that the EU cannot solve the problem alone. The Strategy (EC 2010a) shows the right way – harmonized external energy policy, consolidation of the gas supply, transit and consuming countries (adding Russia and Belarus to the Baltic macro-region). The expansion of the macro-regions and solidarity (centralized dispatching, coordinated and solitaire investments, etc.) will ensure more reliable supply (see also Roze 2007).

Recently approved EU Regulation EC 2010b provides a political and normative base only for the EU Member States as the long-term discussions with Russia were not very successful (e.g., Energy Charter and Transit Protocol). To incorporate third countries, a conjunctive political environment is necessary. Political contacts between the EU, Russia and Ukraine were the primary steps to solve the crises.

The United Nations regional branch the United Nations Economic Commission for Europe (UNECE) could become the right institution to manage this job. It corresponds to the major action line of the UNECE: promotion of the pan-European economic integration, policy advice and assistance to governments, cooperation with other players and key stakeholders, notably business community. The UNECE has already become a venue for:

- Dialog,

- Common position development,
- Coordinated policy and activities,
- Monitoring trends,
- Developing legally-binding international agreements and instruments,
- Assistance in implementation.

The UNECE is very qualified for this kind of work because it unites all the countries and sustainable energy supply is the major activity (see, e.g., UNECE 2010). The Commission has power to launch a wide range of activities (including diplomatic ones) that is necessary for successful implementation of the recommendations. The UN also has the experience that has to be learned from as it has started global activities related to the Internet security according to the resolution of the World Information Society Summit 2003-2005.

The National Regulatory Authorities have to become the basis of the experts delegated to the working groups. The experts have a long experience in reconciling the interests of the gas suppliers, consumers and the national interests. At the same time participation and cooperation with the gas providing companies is absolutely necessary. United expertise, experience and capacity will help to find optimum cooperation between the countries and optimum unified instruments on macro-regional level. Close cooperation with the councils of the European energy regulators will be very useful. It relates especially to the ERRA (that unites non-EU countries too) as well as to the newly established EU regulatory group ACER. It will also become possible to eliminate inconsistency of the regulatory environment in various EU as well as non-EU countries.

Conclusions

Current gradual shift in the EU energy policy is favourable for the Baltic States. The more pragmatic approach to energy costs, strengthening cooperation with the supply countries, huge investments in the infrastructure are relevant issues for the Baltic States. The role and significance of the stable, secure and sustainable natural gas supply is accented in the modernized strategy and accompanied by the normative documents.

Careful and comprehensive risk assessment shows high but different security level in the Baltic States; nevertheless, security level has to be improved further. Latvia enjoys the best situation of the three, mainly due to the existing Incukalns UGS. Other countries also exploit the capacity of this UGS. The Baltic States have already accumulated the practice of significant solidarity.

Only smart energy policy and associated advanced comprehensive instruments ensure more secure and sustainable gas supply for the affordable prices. Complex implementation of economically efficient infrastructure instruments, updating normative environment, strong partnership with the partners of supply and transit and their involvement in common activities is the right strategic way. Projects and measures for the increase of the SoS in the Baltic States are planned and first steps for their implementation already has been made.

The macro-regional principle is an advantageous one for the small Baltic States. The comparison of the potential infrastructure developments shows that the most efficient option is the pan-Baltic LNG terminal that is interlinked with the expanded UGS (Findlater *et al* 2010). Naturally, the upgrade of the cross-border pipes is necessary. Security tax on gas would be around 5% (Fig. 8). Any national-scale LNG project will be more expensive, especially those in Estonia and Lithuania. Figures show that Latvia is not interested to invest in the Baltic pipe because this option is more expensive in comparison to the national LNG terminal.

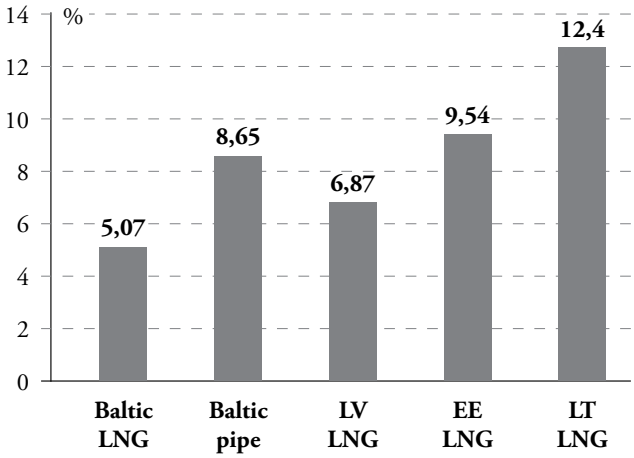

Fig. 8. Security tax on gas (%): options (Latvia, 2009)

The Baltic trading hub, which is based on the Baltic LNG terminal and Incukalns UGS, could be gradually developed in the future.

The pan-Baltic political and economic cooperation, efficient partnership of the gas companies is the cornerstone for success, some existing bottlenecks for the Baltic cooperation has to be overcome. But the

UNECE as a political venue for all the European countries would be very catalytic for the achievement of progress because of the UN plans to declare the year 2012 as "The Year of Energy Access".

References

1. Bilgin M. 2009. Geopolitics of European Natural Gas Demand: Supplies from Russia, Caspian and the Middle East. *Energy Policy* 37(11): 4482-4492.

2. Coq Le C.; Paltseva E. 2009. Measuring the Security of External Energy Supply in the European Union. *Energy Policy*, 37(11): 4474-4481.

3. Davis A.; Jesinska A.; Kreslins A.; Zebergs V.; Zeltins N. 2009. Evaluation of Risk of Gas Supply to the Baltic Countries and Risk Criteria of UGS. Paper of the 24th World Gas Conference. Available on the Internet: <http://www.igu.org/html/wgc2009/papers/docs/wgcFinal00497.pdf>.

4. EC 2008. Communication "Second Strategic Energy Review. The EU Energy Security and Solidarity Action Plan", COM(2008) 781. Available on the Internet: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0781:FIN:EN:PDF>.

5. EC 2009a. Directive 2009/73/EC Concerning Common Rules for the Internal Market in Natural Gas. Available on the Internet: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0094:0136:en:PDF>.

6. EC 2009b. Regulation (EC) No 715/2009 On Conditions for Access to the Natural Gas Transmission Networks. Available on the Internet: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:036:0054:EN:PDF>.

7. EC 2009c. Regulation Concerning Measures to Safeguard Security of Gas Supply; Impact Assessment SEC(2009)979. Available on the Internet: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SEC:2009:0979:FIN:EN:PDF>.

8. EC 2009d. Baltic Energy Market Interconnection Plan. Available on the Internet: <http://ec.europa.eu/energy/infrastructure/events/doc/2009/2009_11_25_hlg_report_170609.pdf>.

9. EC 2010a. Communication Energy 2020; Strategy for Competitive, Sustainable and Secure energy, COM(2010) 639. Available on the Internet: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0639:FIN:EN:PDF>.

10. EC 2010b. Regulation (EU) No 994/2010 Concerning Measures to Safeguard Security of Gas Supply. Available on the Internet: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:295:0001:0022:EN:PDF>.

11. EC 2010c. EU Energy Trends to 2030. Available on the Internet: <http://www.energy.eu/publications/Energy-trends_to_2030-2.pdf>.

12. EC 2010d. Communication Energy Infrastructure Priorities for 2020 and beyond, COM(2010)677/4. Available on the Internet: <http://www.energy.eu/directives/com-2010-0677_en.pdf>.

13. EEGA 2008. Gas Pipelines of the Baltic States and Finland. Available on the Internet: <http://www.eegas.com/baltmap.htm>.

14. EU 2007. Treaty of Lisbon; Protocol on Services of General Interest. Available on the Internet: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2007:306:SOM:EN:HTML>.

15. Findlater S.; Noel P. 2010. Gas Supply Security in the Baltic States: Qualitative Assessment. *International Journal of Energy Sector Management*. 4 (2): 236-255.

16. Findlater S; Noel P; Chyong Chi K. 2010. The cost of gas supply security infrastructure in the Baltic States. *The 11th IAEE European Conference "Energy Economy, Policies and Supply Security: Surviving the Global Economic Crisis"*. Vilnius, Lithuania 25-28 August. Available on the Internet: <http://www.iaee2010.org/?q=node/81>.

17. Hafner M. 2010. Preliminary main conclusions and policy recommendations of the EC "SECURE" project". *The 11th IAEE European Conference "Energy Economy, Policies and Supply Security: Surviving the Global Economic Crisis"*. Vilnius, Lithuania 25-28 August. Available on the Internet: <http://www.iaee2010.org/?q=node/48>.

18. Hetland J.; Gochitashvili T. (ed) 2004. *Security of Natural Gas Supply through Transit Countries*. NATO Science Series. Dordrecht, Kluver Academic Publishers. 420 p.

19. Jansen J.C.; Arkel van W.G.; Boots M.G. 2004. Designing Indicators of Long-term Energy Supply Security ECN-C-04-007. The Energy Research Centre of Netherlands. Available on the Internet: <http://www.ecn.nl/docs/library/report/2004/c04007.pdf>.

20. Jansen J.C.; Seebregts A.J. 2010. Long-term Energy Services Security: What is it and how can it be measured and valued? Energy Policy, 38(4): 1654-1664.

21. Kaderjak P.; Cameron P.; Toth A.I. 2007. Unilateral Natural Gas Import Dependence: A New Supply Security Issue for Europe. *European Review of Energy Markets,* 2 (2): 55-91.

22. Kalashnikov V.; Kalashnykova N. 2008. A Strategic Model of European Gas Supply. *International Business & Economics Research Journal*, 7 (5): 43-50.

23. Kruyt B.; Vuuren van D. P.; Vries de H. J. M.; Groenenberg H. 2009. Indicators for Energy Security. *Energy Policy*, 37(6): 2166-2181.

24. Linde van der C. 2007. The Geopolitics of EU Security of Gas Supply. *European Review of Energy markets*, 2(2): 207-231.

25. Luciani G. 2004. Security of Supply for Natural Gas Markets; What is it and what is it not? INDES Working paper, N2. Available on the Internet: <http://www.ceps.eu/book/security-supply-natural-gas-markets-what-it-and-what-it-not>.

26. Ming-zhi Gao A. 2009. The third European Energy Liberalization Package: Does functional and legal unbundling in the gas storage sector go too far? *Competition and Regulation in Network Industries*, 10(1): 17-44.

27. Ramboll Oil & Gas 2009. Future Development of the Energy Gas Market in the Baltic Sea Region. Available on the Internet: <http://ec.europa.eu/energy/infrastructure/doc/2009_bemip_ramboll_bemip_final_report.pdf>.

28. Roze J. 2007. Security of Gas Supply for Europe. *European Review of Energy Markets,* 2 (2): 145-174.

29. Umbach F. 2010. Global Energy Security and the Implications for the EU. *Energy Policy*, 38(3): 1229-1240.

30. UNECE 2007. The Outlook of Latvian Potential Underground Gas Storages and Prospects of Utilization of this Potential for Securing of Reliable Gas Supply to Europe. Available on the Internet: <http://www.unece.org/energy/se/pdfs/wpgas/session/17_countr/latvia.pdf>.

31. UNECE 2010. Review of Activities of the Subsidiary Bodies of the Committee; Energy Security Dialogue. Available on the Internet: <http://www.unece.org/energy/se/pdfs/comm19/ECEENERGY.2010/1_e.pdf>.

32. Weisser H. 2007. The Security of Gas Supply – A Critical Issue for Europe? *Energy Policy*, 35 (1): 1-5.

33. World Energy Council 2008. Europe's Vulnerability to Energy Crises. Available on the Internet: <http://www.worldenergy.org/documents/vulnerabilityesfinal_1.pdf>.

34. ИЭС 2009. Энергетическая стратегия России на период до 2030 года. Available on the Internet: <http://www.energystrategy.ru/projects/energystrategy.htm>.

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2011, 1(1): 19–26

TOWARDS MEASUREMENT OF SUSTAINABLE DEVELOPMENT: SYSTEMS OF INDICATORS

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Abstract. The aim of the paper is to review the international organizations' approaches to the measurement of sustainable development and explore the system of indicators provided by the considered organizations. The systems of proposed indicators to measure sustainable development are being juxtaposed, specific features, advantages and disadvantages revealed. Organizations for sustainable development were founded to review progress at the international, regional and national levels in the implementation of sustainable development policy, to take part in legislative process, to control balance between economic development, social development, and environmental development.

Keywords: Sustainable Development, Indicators, Strategy, Organizations.

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JEL Classifications: O1, O19, O40, O47.

1. Introduction

A lot of opinions related to the estimation of sustainable development in scientific literature can be found. Separate group of scientists deals with the issues of analysis of the chosen system of indicators (e.g. Tvaronavičienė *et al.* 2008, Grybaitė, Tvaronavičienė 2008). Systematisation of prevailing approaches serves as the purpose of presented publication. The ultimate aim of systematisation is seen as a step towards partial unification of sustainable development estimation, which in its turn, would serve as a premise of more efficient process control. Speculations about applicability of any system of currently available institutional indicators are seen as the urge towards further accomplishments. On the institutional level, the concept of Sustainable development was introduced in 1980 and appeared in the World Conservation Strategy. "For development to be sustainable it must take account of social and ecological factors, as well as economic one". (The World Conservation Strategy 1980). The concept was developed by the World Commission on Environment and Development (WCED) in its report *Our Common Future*, more commonly known as "the Brundtland Report" (Brundtland 1987). It was defined as "ability of humanity to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development is not a fixed state of harmony but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional changes are made consistent with future as well as present needs" (Brundtland 1987). It was emphasized that the economic growth is not enough. Sustainable development involves more than growth. In its broadest sense, the strategy for sustainable development aims to promote harmony among human beings and between humanity and nature. Sustainable development requires that societies meet human needs both by increasing productive potential and ensuring equitable opportunities for all. (UN 1987). In the 1992 UN Conference on Environment and Development in Rio de Janeiro (the "Earth Summit"), it was emphasized that "sustainable development can be defined simply as a better quality of life for every-

one, now and for generations to come. It is a vision of progress that links economic development, protection of the environment and social justice, and its values are recognized by democratic governments and political movements the world over" (UN Conference on Environment and Development 1992). Sustainable development is a big challenge for the societies and the main goal. Strategies, plans, policies and processes are crucial in achieving this. The European Union presented the sustainable development strategy in 2001, which was renewed in 2006. The main purpose of the strategy is to provide the EU-wide policy framework to deliver sustainable development, i.e. to meet the needs of the present without compromising the ability of future generations to meet their own needs (The Council of the European Union 2006). Not going into discussion about various aspects of Sustainable development comprehension, we point out that a multitude of facets of considered category has been reflected in the sets of indicators composed by various institutions. The aim of the paper is to reveal similarities and, even more, differences of institutional approaches towards Sustainable development. A range of institutions tackling the issue of sustainable development has been established. From analytical point of view, the system of indicators is required for estimation and later provision of policy recommendations. Let us take a closer look at the systems of indicators, suggested by the considered international institutions. To monitor sustainable development, the set of indicators are needed. They have to reflect three aspects of sustainable development: economic, social and ecological. In 1992 the United Nations Conference on Environment and Development emphasized the importance of sustainable development indicators, which can help the countries to make informed decisions concerning sustainable development. The indicators can help measuring the progress towards sustainable development and providing early warning to prevent social and environmental setbacks, leading to better decisions and more effective actions (United Nations 1992).

2. Estimated Facets of Sustainable Development

Multi-effort trials to provide definition of Sustainable development on the institutional level (even more ample on scientific one, which is not being considered within the framework of given paper) verify complexity of estimation task. Naturally, complex phenomenon can be characterized only by a system of indicators. The European Commission emphasizes, "the indicators selected should not be seen in isolation but rather as different elements of the same picture" (European Commission 2000). Hence, composing of appropriate in terms of all relevant facets reflection, indicators' system is seen as an ultimate aim. It is worth to notice that a question "how" to integrate extended system is not being raised. Before going to the latter question, let us have a look at the systems of indicators introduced by different institutions. The European Union institutions use systems of indicators, which could be seen as three sets. The set of *Short-term indicators* is supposed to be used for the assessment of cyclical situations and performing of forecasts. The most *Short-term indicators* are collected to provide frequent and up-to-date reflection of the economy development processes. Short-term indicators' set is considered as not suitable for comparison of the countries' development level. Short-term indicators are divided into eight areas: balance of payments, business and consumer surveys, consumer prices, external trade, industry, commerce and services, labour market, monetary and financial indicators and National Accounts (EUROSTAT). The set of *Structural indicators* are supposed to be more suitable and are actually used (Tvaronavičienė *et al.* 2008, Tvaronavičienė *et. al.* 2009)) for the countries' comparisons as they embrace main macroeconomic indicators and cover such policy domains as general economic background, employment, innovation and research, economic reform, environment and social cohesion (European Commission, Eurostat 2010). The set of structural indicators are being revised depending of the main strategic goal. In 2000 the European Union set a strategic goal „of becoming the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion " (European Council 2000). In 2005 a greater focus was on growth and jobs. From 2010 a revised set of structural indicators has been presented to monitor the progress towards the goals defined in the Lisbon Strategy. The main attention focus on the three main goals: „creating value by basing growth on knowledge, empowering people in inclusive societies, creating a competitive, connected and greener economy" (EU 2020 Strategy). The structural indicators reflect the main themes: general economic background; employment; innovation and research; economic reform; social cohesion; environment. The systems of indicators are not stable and are being

changed according to the main goals. The indicators are being improved and some indicators are replaced by better ones, some new added. For better convenience, a short list of 14 indicators is used. The set of *Sustainable development indicators* resembles *structural indicators*' set. They have the same periodicity as *Structural indicators* and are partly overlapping (including e.g. GDP per capita, unemployment, poverty rate). The impression is that the indicators of sustainable development can be treated as a variation of structural indicators. The main difference is that these two sets put emphasis on different aspects of development. While the indicators of sustainable development tackle social and environmental facets, structural indicators put stress on economic development. Here it is worth mentioning that some indicators attributed either to *Sustainable development indicators* or to *Structural* ones in some cases are interrelated and the performance of one affect value of other. The series of such estimations are being performed (Tvaronavičius, Tvaronavičienė 2008; Tvaronavičienė 2006). The systems of institutional indicators, as a rule, do not pay attention to factor of overlapping. On the contrary, the impression is that the increase in a number of facets embraced serves as an ultimate goal, while the issues related to any kind of analysis of provided information are not being taken into account.

3. Sustainable Development Indicators

As it was mentioned above, *Sustainable development* indicators reflect environmental, social and economic aspects of development. Nevertheless, 5 main compositions of *Sustainable Development indicators* can be distinguished:
EUROSTAT Sustainable development indicators;
United Nations indicators;
European Environment Agency;
OECD indicators;
SIBIS indicators.

Sustainable development indicators (EUROSTAT) are divided into 10 themes: socio-economic development**;** Sustainable consumption and production; Social inclusion; Demographic changes; Public health; Climate change and energy; Sustainable transport; Natural resources; Global partnership; Good governance. The purpose of the indicators is to display a picture of the countries' achievement towards sustainable development. In every indicator group several tracks or sub-groups have been distinguished. The indicators are attributed to different sub-groups taking into account their content. Some indicators characterize specifically, e.g. females, males, different age, education and other groups. As was mentioned above, the systems of indicators are not stable and are being changed according to the main goals. The indicators are being improved and some indicators are replaced by better ones, some new added. As shown below, a number of indicators changing and new contextual indicators have been added to the system. The first indicator group is named *Socio-Economic development*. This group is being composed of 3 sub-groups: Economic development, Innovation, Competitiveness and Eco-efficiency and Employment. *Socio-Economic development* group contains 16 indicators (previously – 15). The second group is *Sustainable Consumption and Production*. This group contains 18 indicators (previously – 17), which are being attributed to the following sub-groups: Resource use and waste, Consumption patterns, Production patterns and two Contextual indicators. The third indicator group is *Social inclusion* that also contains 3 sub-groups that, in their turn, have 20 indicators (previously – 15), plus 1 contextual indicator. The fourth group's *Demographic changes* sub-groups are: Demography, Old age income adequacy and Public finance sustainability, which altogether contain 8 indicators and plus 4 contextual indicators. The fifth group *Public health* is comprised of Health and Health inequalities, Determinants of Health (12 indicators) respectively. The sixth group *Climate change and energy contains 2 sub-groups.* Those Sustainable development facets are being reflected by 12 indicators. The seventh group *Sustainable Transport is of 2 sub-groups: Transport and mobility and Transport impacts (instead of former 3 -* Transport growth, Transport prices and Social and Environmental impact of transport) (12 indicators) and 1 contextual indicator)) that are seen as urgent issues. The eighth group N*atural resources* contains the following sub-groups: Biodiversity, Marine ecosystems, Fresh water resources, Land use (11 indicators, previously – 13). The ninth group is *Global partnership*, it embraces the following three aspects or subgroups: Globalisation of trade, Financing for Sustainable development, and Global resource management; the group contains 11 indicators (previously - 13 and 3 contextual indicators). And the last, the tenth group is *Good governance*, characterized by Policy coherence and effectiveness, Openness and participation and Economic instruments sub-groups, including 6 indicators. This classification

adopts specific approach, when division of indicators into groups and, later, into subgroups, let rather easily perceive aspects of Sustainable development under consideration. Again, interrelationship between indicators within one group, or those, attributed to different groups (e.g. between governance and innovations, (Tvaronavičienė, Korsakienė 2007) and many other interrelations (Tvaronavičienė, Grybaitė 2007; Tvaronavičius, Tvaronavičienė 2008; Tvaronavičienė, Tvaronavičius 2006)) are not being considered.

United Nations indicators' system cover 15 themes (Poverty, Governance, Health, Education, Demographics, Natural hazards, Atmosphere, Land, Oceans, seas and coasts, Freshwater, Biodiversity, Economic development, Global economic partnership, Consumption and production patterns), which can be divided into 4 general groups: Social, Environmental, Economic, and Institutional. The first two sets of sustainable development indicators developed between 1994 and 2001. The larger set of indicators contains 96 indicators and the shorter core set – 50. The set of 96 indicators provide more comprehensive assessment of sustainable development. Similar approach, as in the case of *Eurostat* Sustainable Development indicators, has been adopted: in each theme specific aspects or subthemes are distinguished. The first theme, *Social* indicators, highlights the following facets: Health, Education, Poverty, Demographics, and Natural hazards. In their turn, those facets are composed of sub-themes. Poverty facet is composed of Income poverty, Income inequality, Sanitation, Drinking water, Access to energy and Living conditions sub-themes. *Health* facet contains 4 subthemes: Nutritional Status, Mortality, Health care delivery, Health status and risk. *Education* is seen as composition of Education level (4 indicators) and Literacy aspects. Demographics facet is reflected by Population and Tourism sub-themes. Natural hazards facet contains two sub-themes: vulnerability to natural hazards and Disaster preparedness and response. *United Nations Social* indicator group is very different from other classifications: *Eurostat* classification has *Poverty and social exclusion*, *Ageing society* and *Public health groups*. *United Nations* provide more information about health and about poverty than education. Distinctive feature of *United Nations* is attention to natural hazards. It is obvious that emphasis on different aspects of social side of Sustainable development is being put. The second general group of *United Nations* Sustainable development indicators is *Environmental* indicators. That group emphasizes 5 facets: Atmosphere, Land, Oceans, Seas and Coasts, Fresh water, Biodiversity. Atmosphere facet is reflected by 3 sub-groups: Climate change, Ozone layer depletion, Air quality. Land facet includes 4 sub-groups: Agriculture, Forests, Desertification, and Land use and status. Oceans facet has 3 sub-groups: Coastal zone, Fisheries and Marine environment. Fresh water facet contains 2 subgroups: Water quantity (2 indicators), Water quality (3 indicators). Biodiversity is composed of 2 sub-groups: Ecosystem (4indicators), Species (3 indicators). To conclude, *United Nations* classification has the largest list of indicators. *Eurostat* classification introduces Climate change and Energy. Considered institutions do not divide *Environmental* indicators into sub-groups, i.e. specific aspects are not distinguished. Hence, *United Nations* Sustainable development *Environmental* indicators seem to be more extensive and thoroughly systematized.

The third general group is *Economic* indicators. The following facets of economic development are distinguished: Economic development, Consumption and Production patterns and Global economic partnership. Economic development is represented by 5 subthemes, such as Macroeconomic performance (indicators: GDP per capita, Investment share in GDP, Gross saving, Adjusted net savings as percentage of GNI, Inflation rate (again, many theoretically grounded and quantitatively estimated interrelations (Tvaronavičienė, Grybaitė 2007; Tvaronavičius, Tvaronavičienė 2008; Tvaronavičienė, Tvaronavičius 2006)) are not being taken into account), Sustainable public finance (Debt to GNI), Employment (Employment-population ratio, Labour productivity labour costs, Share of women in wage employment in the non-agricultural sector), Information and communication technologies (Internet users per 100 population, Fixed telephone lines per 100 population, Mobile telephone subscribers per 100 population), Research and Development (Gross domestic expenditure on R&D as a percent of GDP)(impact of stare policy on the latter indicator is not being taken into account (Tvaronavičienė, Korsakienė 2007)), Tourism (Tourism contribution to GDP). The Tourism sub-theme in Social Theme, Demographics subtheme contains different indicator - Ratio of local residents to tourists in major tourist regions and destinations. Global economic partnership contains two sub-themes: Trade and External financing. Consumption and production patterns include the following

sub-themes: Material consumption, Energy use, Waste generation and management, Transportation. Notably, those economic indicators are being emphasized. If not consider the mentioned interrelations between the indicators (Tvaronavičienė, Grybaitė 2007; Tvaronavičius, Tvaronavičienė 2008; Tvaronavičienė, Tvaronavičius 2006; Tvaronavičienė, Korsakienė 2007), the provided system could be characterized as a rather comprehensive one. The last general group is *Institutional* indicators. It consists of one theme – Governance that contains two sub-themes: Corruption (Percentage of population having paid bribes) and Crime (Number of International homicides per 100,000 population). *Eurostat* classification measures good governance and global partnership. The themes distinguished by Eurostat and United Nations contain different indicators. Global partnership and public participation are not being taken into account in the United Nations system of indicators.

European Environment Agency's indicators are devoted exclusively to the environmental issues. The European Environment Agency is an agency of the European Union, which started its functioning in 1994. The European Environment Agency's indicators are grouped into 23 (previously – 24) main themes. As the system of structural indicators was changed, *the European Environment Agency* changed the system of indicators: some new indicators were added to the system, the names of some of them were changed, i.e Air to Air pollution, Biodiversity change to Biodiversity, Households to Household consumption, Policy analysis to Policy instruments, Waste to Waste and material resources. The new ones added: Environment and health, Environmental scenarios, Land use, Noise. The indicators removed from the system: Regions, Nature, Air quality, Ozone depletion, Human health. The remaining indicators: Agriculture, Chemicals, Climate change, Coasts and seas, Energy, Fisheries, Industry, Natural resources, Population and economy, Soil, Tourism, Transport, Urban environment, Water. Not going into all the themes, just take a look at major characteristics of the system. Hence, in this system sub-groups are not distinguished; indicators are attributed to the listed facets. After considering indicator systems provided by other institutions, it would seem that approach adopted, e.g. by *United Nations* is more acceptable. Recall, that *United Nations Environmental* indicators presented facets reflected by the following sub-themes: Atmosphere (Climate change, Ozone layer depletion, Air quality), Land (Agriculture, Forests, Desertification, and Land use and status), Oceans, Seas and Coasts (Coastal zone, Fisheries and Marine environment), Fresh water (Water quantity, Water quality), Biodiversity (Ecosystems, Species). Juxtaposition of *United Nations Environmental* and *European Environment Agency's* classifications leads to a conclusion that the latter is rather poorly structured. In some cases facets under consideration overlap (e.g. *Air* and *Air quality*, each related to various kinds of emissions and pollution). Distinguished facets of households, nature waste leave a vague impression about issues being tackled. The impression is that *European Environment Agency's* indicators could be better structured. This institution does not provide sufficient information for each year, what makes adopted system inappropriate for analytical purposes (Tvaronavičienė *et al.* 2008). On the other hand, the advantage of this classification lies in providing given policy issues and its' assessment for each *Environmental* facet. E.g. *Transport* indicators are related to pollution, energy, and access to services, fuel, and transport infrastructure, age of vehicle, costs of transport, freight transport, passenger transport, and traffic noise; i.e. transport theme provides a wide range of indicators. *Water* indicators embrace accidents by ships, water quality, and classification of water, pollution, drinking water, use of water, water prices. Some indicators are attributed to Water facet, but they could be included into Coasts and seas facet equally successfully, we reckon. 13 Indicators represent Agriculture facet. Climate change, Air and Air quality (the latter two already mentioned above) are distinguished into separate facets. Climate change is being estimated by the following indicators: Global and European temperature, Atmospheric greenhouse gas concentrations, Greenhouse gas emission projections, Greenhouse gas emission trends, Transport emissions of greenhouse gases by mode, North Atlantic Oscillation, The North Sea cod (Gadus morhua) stock. Natural resources indicators should be included into Nature theme, which is represented by 8 indicators. Natural resources theme has only 2 indicators and overlap with Nature theme indicators. Human health theme contains 3 indicators: Emissions of primary particles and secondary particulate precursors, Transport contribution to air quality and Transport accident fatalities. The more coherent approach would be achieved if those indicators were attributed to Transport theme. Tourism indicators are: Tourism eco-labelling, Tourism intensity, Tourism travel by transport modes, Household expenditure for tourism and recreation. Hence, given

indicators show the impact of tourism on environment. Notably, some indicators from Urban environment themes (e.g. municipal waste generation, water uses by sectors, drinking water quality) overlap with Waste, Agriculture, Households themes of indicators. To conclude, environmental issues are thoroughly discussed in the European Environment Agency classification but facets and indicators attributed to each of the facet could fall under criticism.

The Organization for Economic Co-operation and Development (OECD) was established in 1947. It helps its member countries to achieve sustainable economic growth and employment. The OECD, similarly to European Environment Agency is concentrated on environment issues of Sustainable development. In 2001 the OECD established a short list of indicators to meet countries' need to inform societies and to support wider communication with the community. The OECD classification embraces the so-called, *Issues*, *Available* indicators and *Medium term* indicators. *Available* indicators are indicators for which data are available for a majority of the OECD countries. These indicators are: CO2 emission intensities index of greenhouse gas emission, Indices of apparent consumption of ozone depleting substances, SOx and NOx emission intensities, Waste water treatment connection rates, Intensity of use of water resources, Intensity of use of forest resources, Intensity of use of fish resources, Intensity of energy use, Endangered species. *Mediumterm indicators* are indicators that require further specification and development (availability of basic data sets, underlying concepts and definitions). *Mediumterm indicators are*: Index of greenhouse gas emission, Indices of apparent consumption of ozone depleting substances plus aggregation into one index of apparent consumption of ozone depleting substances, Population exposure to air pollution, Total waste generation intensities and indicators derived from material flow accounting, Pollution loads to water bodies, Intensity of water resources plus sub-national breakdown, Intensity of forest resources, Intensity of use of fish resources plus closer link to available resources, Energy efficiency index, Species and habitat or ecosystem diversity area of key ecosystems. All the presented indicators could be divided in two major groups: natural resources and pollution. Notably, despite the fact that the considered classification presents 10 facets, it looks sufficiently comprehensive. It is a specific feature that more attention is paid to air quality than to other environmental spheres, such as water and land (coasts, rivers, seas, soil are not being considered). The *Organization for Economic Co-operation and Development' (OECD)* classification is suitable for analytical purposes when only basic indicators are being considered. On the other hand, conciseness of this classification in some cases may be seen as an advantage.

SIBIS (Statistical Indicators Benchmarking the Information Society) is a project in the "Information Society Programme" of the European Commission which was running from January 2001 to September 2003. SIBIS has taken up the challenge of developing innovative information society indicators and to enable the benchmarking of the progress in the EU Member States. SIBIS indicators are social. Each group of indicators has its facets or "sub-domains". *Telecommunications & Access* group has 7 sub-domains: Technology, infrastructure, Access – choice, Use, Access – quality, Access – cost and Market, reflected by 38 indicators related to Internet, cable TV, mobile telephones and other technologies. *The Internet for R&D* group has three sub-domains: Infrastructure, Research processes, R&D collaboration. 21 indicators are included into the group. They express the Internet importance to research and development: E-mail communication for R&D purposes, Effects of computer skills on R&D, etc. *Trust and Security* group has only one sub-domain – Trust and security – and 25 indicators. These indicators are related to computer crimes, security spending, and security controls. *Education* group does not have subdomains, but it has 4 parts: A – Policy and strategy; B – Economy & infrastructure; C – Use and access; D – Competencies. There are 49 indicators in education group. They are related to ICT implementation at school, the Internet use and access, specialist ICT teachers, expenditure on ICT, etc. *Work, employment and skills* indicators embrace into thematic domain sub-domains, indicators. Every given Work, employment and skills indicator also has sub-indicators. E.g. *Labour productivity* indicator of Output of employment sub-domain has 2 sub-indicators: Labour productivity (statistic) and Labour productivity growth, etc. The sixth group of SIBIS indicators is *Social inclusion*. This group is divided into three parts:

1. Identifying the vulnerable change.
2. Access to ICTs and accessibility.
3. Rationale for participation in the IS.

This group is represented by 55 indicators. The seventh group is *E-commerce*. It has three groups:

E-commerce readiness, E-commerce intensity and E-commerce impact. The eighth group is *E-government*. These indicators aim at measuring the use of government service online, the use of the Internet and its access from home, consider the level of sophistication of specific online services. The last group of SIBIS indicators is H*ealth*. These indicators are divided into 2 groups: System quality and System usage. System quality has six sub-domains: Background of system developers, Purpose of the application, Content of the application, Confidentiality procedures, Design of the website, Evaluation of the website. System usage group has three sub-domains: Barriers to system usage, Patients and public usage of E-health systems, Practitioners usage of E-health systems. SIBIS indicators are specialized. They all are related to ICT, information system, so they can be used just in a specific way. They are considered as being sufficiently comprehensive.

4. Conclusions

The concept of Sustainable development on the institutional level was introduced in 1980. The key role of evaluating the countries' progress towards sustainability plays the sustainability indicators. The system of indicators is required for the estimation and later provision of policy recommendations. Trials to define the system of indicators illustrate the complicity of the task itself, no single definition could be accepted as accomplished. The international organizations have introduced the systems of indicators composed for Sustainable development measurement and management purposes. Despite general agreement on the main aspects of Sustainable development (economic, social and environmental), the main international organizations use rather differing systems of indicators. In the paper institutional approaches towards Sustainable Development were considered, the systems of indicators juxtaposed. It appeared that each classification emphasizes different Sustainable development facets and is differently composed. It was observed that the systems of indicators are not stable and are being changed. The systems of institutional indicators, as a rule, do not pay attention to overlapping and interdependence of some indicators (Tvaronavičienė, Grybaitė 2007; Tvaronavičius, Tvaronavičienė 2008; Tvaronavičienė, Tvaronavičius 2006; Tvaronavičienė, Korsakienė 2007, Tvaronavičienė *et. al.* 2009). On the contrary, the impression is that the increase in a number of facets embraced serves as an ultimate goal, while the issues related to any kind of analysis of provided information are not taken into account. Applicability of any system of currently available institutional indicators is seen as the urge towards further accomplishments. As scientific practice witness (Tvaronavičienė *et al.* 2008*, Tvaronavičienė et al.* 2009*)),* any task-oriented analysis requires a short-list of indicators otherwise comparisons of the countries and sustainable development management process are hardly feasible.

References

Brundtland, G. (Ed.). 1987. *Our common future.* The World Commission on Environment and Development. Oxford: Oxford University Press. 416 p.

Commission of the European Communities. 2003. Communication from the Commission. Structural indicators. Brussels. 585 p.

Council of the European Union. 2006. Available on the Internet <http://register.consilium.europa.eu/pdf/en/06/st10/st10117.en06.pdf>.

European Commission. 2000. Communication from the Commission on Structural indication, COM(2000), 594 final.

European Environment Agency. Available on the Internet: <http://www.eea.europa.eu/data-and-maps/indicators/#c7=all&c5=&c0=10&b_start=0

European Council. 2000. Available on the Internet: <http://www.europarl.europa.eu/summits/lis1_en.htm>.

EU 2020 Strategy. Available on the Internet: <http://ec.europa.eu/europe2020/index_en.htm>.

European Commission, Eurostat 2010. Available on the Internet:< http://epp.eurostat.ec.europa.eu>.

IUCN, WWF, UNEP. 1980. The World Conservation Strategy. Switzerland. 354 p. Available on the Internet: http://data.iucn.org/dbtw-wpd/edocs/WCS-004.pdf

Grybaitė, V.; Tvaronavičienė, M. 2008. Estimation of sustainable development: germination on institutional level, *Journal of Business Economics and Management* 9(4): 327–334.

Monitoring report of the EU Sustainable development strategy. Measuring progress towards a more sustainable Europe.

Available on the Internet: <http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-77-07-115/

EN/KS-77-07-115-EN.PDF>.

OECD. 2008. Key environment indicators. Available on the Internet: <http://www.oecd.org/dataoecd/20/40/37551205.pdf>.

SIBIS. Statistical indicators benchmarking the information society. Available on the Internet: <http://www.sibis-eu.org/research/domain.htm>.

Tvaronavičienė, M. 2006. Investment driving forces affecting Lithuanian economic growth, *Journal of Business Economics and Management* 7(2): 69–77.

Tvaronavičienė, M.; Ginevičius, R.; Grybaitė, V. 2008. Baltijos šalių išsivystymo palyginimas: praktiniai kompleksinio požiūrio taikymo aspektai, *Verslas: teorija ir praktika* [Business: Theory and Practice] 9(1): 51–65.

Tvaronavičienė, M.; Grybaitė, V. 2007. Impact of FDI on Lithuanian economy: insight into development of main economic activities, *Journal of Business Economics and Management* 8(4): 285–290.

Tvaronavičienė, M.; Korsakienė, R. 2007. The role of government in implementation of innovations: a case of Lithuania,

Verslas: teorija ir praktika [Business: Theory and Practice] 8(1): 9–14.

Tvaronavičienė, M.; Tvaronavičius, V. 2006. Kai kurie Lietuvos ekonominio augimo aspektai, *Verslas: teorija ir praktika* [Business: Theory and Practice] 7(4): 232–236.

Tvaronavičius, V.; Tvaronavičienė, M. 2008. Role of fixed investments in economic growth of country: Lithuania in European context, *Journal of Business Economics and Management* 9(1): 57–65.

Tvaronavičienė, M.; Grybaitė, V.; Tvaronavičienė, A. 2009. If institutional performance matters: development comparisons of Lithuania, Latvia and Estonia, *Journal of Business Economics and Management* 10(3): 271-278.

UN Documents Gathering a body of global agreements. Our Common Future, Chapter 2: Towards Sustainable Development. Available on the Internet: < http://www.un-documents.net/ocf-02.htm>.

UN Conference on Environment and Development in Rio de Janeiro. The Earth Summit. Rio de Janeiro, 1992. 364 p.

United Nations. 2007. Indicators for sustainable development. Available on the Internet: <http://www.un.org/esa/sustdev/natlinfo/indicators/guidelines.pdf>.

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PLAUSIBLE FOREIGN DIRECT INVESTMENT' IMPACT ON SUSTAINABLE DEVELOPMENT INDICATORS OF DIFFERENTLY DEVELOPED COUNTRIES

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Abstract. The aim of this article is to formulate hypotheses about the impact of the foreign direct investment (FDI) on sustainable development indicators of differently developed countries with reference to the relevant scientific literature. The impact of foreign direct investment on development and facets of sustainable development has been discussed in this article. After the review of the relevant scientific literature some consistent patterns have been identified, what, finally, led to the formulation of initial hypotheses. The countries were grouped according to the level of their development. A set of sustainable development indicators reflecting different facets of sustainability and sensitive to countries' development level has been distinguished. The following indicators have been considered as relevant for inclusion into the set, which would be used for estimation of FDI impact on enhancing well-being in the unevenly developed countries: GDP, exports, inflation, population, life expectancy at birth, primary school pupils, infant mortality, total health expenditure per capita, total tax rate, internet users, and residential consumption of electricity). As this article is focused for the long-term perspective of FDI impact on sustainable development, it was based on three aspects of sustainable development: economic, social and environmental. Series of hypothesis have been formulated in this paper.

Keywords: Foreign Direct Investment (FDI), Development, Sustainable Development, Sustainable Development Indicators, Gross Domestic Product (GDP), Developed, Developing and Underdeveloped Countries.

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JEL Classifications: F15, F21, F23, F42, F59.

1. Introduction

The term "sustainable development" emerged in the context of development and growing awareness of the imminent ecological crisis. This concept became rather widespread at the end of the 20th century. It was realized that the economic growth is of vital importance, but it has to be of a different kind, .i.e. targeted to the combined needs of the environment and people. Development has to be sensitive to the needs of environment and people. Sufficiency but not economic efficiency becomes an ultimate priority. A distinction has to be made between the growth – quantitative change – and development – qualitative change (Du Pisani and Jacobus 2006).

At the same period of time the concept of the foreign direct investment (FDI) emerged. As their inflows have been increasing during the last three decades, the issue of their performance gradually has been transforming into more urgent issue tackled in scientific discussions. Now almost every region of the world is revitalizing the long and contentious debate about the costs and benefits of the FDI inflows (Hansen and Rand 2006). On one hand, given the appropriate policies and basic development, the FDI can play a key role in the process of creating a better economic environment (Armbruster 2005; Lee and Tcha 2004). On the other hand, the potential drawbacks do exist. They include the deterioration

of the payment balance as the profits are repatriated having negative impacts on the competition in the national markets (Tvaronavičienė and Kalašinskaitė 2010). Some countries even eased the restrictions on the repatriations of dividends by the foreign companies (Tarzi and Shah 2005).

There are many attitudes towards the performance of the foreign direct investment and their determinants (Bedell 2005; Head *et al.* 2005; Hoi Ki Ho and Tze Yiu Lau 2007; Ismail and Burak 2009; Jackson and Markowski 1996; Robertson 2006; Tvaronavičienė and Grybaitė 2007). Furthermore, if the FDI seems to be beneficial in one country, it does not mean it will be beneficial and in another one (Pecaric *et al.* 2005; Vissak and Tonu Jun2005). There are many discussions in the relevant scientific literature about negative or positive impact of the foreign direct investment on the host countries' development (e.g. Tvaronavičienė and Kalašinskaitė 2010). Moreover, if foreign direct investment, as it is indicated in many literature sources (e.g. Nunnenkamp 2004), more or less contribute to the improvement of the countries' development, what will their influence be in terms of sustainable development? The above mentioned two issues are very popular nowadays, so what possible consequences of the FDI performance on sustainable development could be? We are interested in the impact of the foreign direct investment on sustainable development of differently developed countries (Changwen and Jiang 2007; Hermes and Lensink 2003; Jensen 2006; Lall and Bora 2002; Sumner 2005; Sylwester 2005). Our objective is to formulate the hypotheses about the impact of the foreign direct investment on the selected indicators of sustainable development.

2. Impact of the Foreign Direct Investment on Sustainable Development Facets

2.1. Foreign Direct Investment

Before the World War II, direct investment had been considered as a special case of portfolio investment, i.e. appeared when parent companies were lending (investing) to (into) subsidiaries. However, when such flows of funds began to cross national boundaries to the foreign territories, markets, and cultures, this phenomenon acquired a different significance. There were many difficulties, which the source firms encountered: distance, language, culture, market, time, personnel, currency, government and other obstacles which all favour the local competitors under normal circumstances. The theory of the foreign direct investment, then, must explain why firms can, do and go against this tide of market elements to conduct business in the foreign markets and nations. The portfolio investment theory did not reflect the above mentioned issues. It was need for a creation of a new theory, and the foreign direct investments theory emerged. The FDI theory has been evolving over the past 30 years(Rayome and Baker 1995).

The inflows of the foreign direct investment increased rapidly during the late 1980s and the 1990s in almost every region of the world revitalizing the long and contentious debate about the costs and benefits of the FDI inflows (Hansen and Rand 2006).

Foreign Direct Investment (FDI) addresses the investment in one economy by a multinational or transnational corporation based in another economy. It involves a long-term relationship and either full or partial managerial control of real assets, i.e. production facilities, real estate or an equity investment exceeding 10% of the market funds of the firm. The FDI include all funds provided by an investor, either directly or through an affiliate; the retained profit comprise a large part of these inflows. It also includes low interest rate loans provided by the parent enterprises, which are usually rolled over, thereby forming a part of the affiliate's funds base. Another form of the FDI is long-term trade credits. In rare cases, investment comprises licensing or management/subcontracting arrangements without equity participation.

The FDI stock indicates the value of the share of the affiliate enterprise at book value or historical cost (prices at the time when investment was made), plus reserves (including retained profits) attributed to the parent enterprise, as well as the net indebtedness of the affiliate to the parent company.

There can be three types of the FDI distinguished according to their objective performance in the host country:

a) 'Horizontal' or market-seeking FDI, which contains building duplicate production facilities in the host country for supplying local and/or regional markets. The main criteria of such investments are market size, growth prospects, tariffs and transport costs.

b) 'Vertical' or asset-seeking FDI is usually export-oriented and entails relocating parts of the production chain to low-cost locations. Available cheap labour force, natural resources or raw materials (not available in the home country) are the prime drivers, particularly in the manufacturing sector when

transnational corporations invest directly instead of exporting into particular country. Thus factor-cost considerations are of major importance.

The output is mainly exported to the investor's home market and other industrialized countries, therefore, the export oriented FDI are not affected by the host country's market size.

c) Efficiency-seeking FDI occurs when the direct investors can benefit from the common governance of geographically-dispersed activities in the presence of economies of scale and scope (Campos and Kinoshita 2004).

The expected side of the investment' profitability plays a significant role while distinguishing the type of the FDI. Potential 'market-seeking' investors target a country with a large and vibrant local market. 'Asset-seeking' investors prefer a country with abundant natural endowments. Whereas 'efficiency-seeking' investors are largely influenced by the geographical proximity to their home country, in order to minimize transportation costs (Lall and Bora 2002).

Attraction of the foreign direct investments is one the essential indicator in the countries' development. Investment encouraging policy is one of the major state policy aspects in every country.

2.2. Foreign Direct Investment' Impact on Development

Most generally, the economic development is perceived as the increased standards of living and the sustained growth. That perception of economic development is valid for both, underdeveloped and to the modern, high-income economy. Its scope includes the processes and policies by which a country improves the economic, social and political well-being of its people.

The economic development embraces extensive (output enlargement using more resources) and intensive (increase of productivity, implementation of innovations) economic growth. Economic development is a process which can be defined as the mobilization of appointive human, financial, organizational, physical and natural resources in order to expand the quality and quantity of the provided competitive services and products for the community. The main goal of the economic development is to enlarge the speed of the asset creation (Clarc 1990).

Foreign direct investment is supposed to contribute to the countries' development.

There are two general attitudes towards the foreign direct investment' impact on host countries' economies. The most widespread and known one is presented below. Demand for the foreign direct investment is conditioned by its 'expected impact on gross domestic product (GDP), income, unemployment level, poverty, total productivity, quality of services, incentives for innovation, manufacturing trends, funds mobility, trade, exports orientation, etc. Investment is considered to be a very important factor, encouraging competitive ability of the manufactured production or provided services in every country. Moreover, it is commonly supposed, FDI dynamic tendencies reflect the prospects of the countries' development perspectives.

According to another attitude, FDI have a controversial or even negative impact. Short-term effect on the indicators of the countries' development is considered as more plausible. It is emphasized that FDI may crowd out domestic investments, repatriate profits to home-country add up to the inflation rate, increase negative balance, political instability, force fluctuation in exchange rates, etc. To generalize, both approaches and variety of effects has to be taken into account. Ppeculiarities of the FDI performance in countries of different development have to be tackled in order hypotheses about consistent patterns could be formulated.

Following the United Nations private international funds flows' accounts, foreign direct investment appear to be vital, as they complement to national and international development efforts. Approach represents the idea that foreign direct investment contribute towards sustained economic growth in the long run. They are remedy of big importance, which facilitate knowledge and technology transfer, create jobs, boost overall productivity, enhance competitiveness and entrepreneurship, and ultimately eradicate poverty through economic growth and development (Nunnenkamp 2004).

Since the debt crisis in the 1980s, the main trend of the development theories have been closely associated with the market liberalism. It emphasizes the development policies directed towards the strengthening of the market forces in order to create open free economy and allow participation in the global trade flows. This development way has been promoted by the series of agreements (Washington Consensus, World Trade Organization agreements stipulating adherence to the global trade norms, etc.). Successful

cases of the late industrialization represent USA and Germany in the 19th century, and the more recent - first generation of the East Asian Tiger economies- used funds control, periods of trade protectionism and backward engineering strategies to foster national development capabilities – instruments which are now tightly related. The international development agenda has conditioned the need for the increased trade liberalization and private funds in order to create the economic development. Therefore, one of the main resources of the private funds of development inputs is seen to rely on foreign direct investments.

During the Conference on Financing for Development held in Monterrey in 2002, Mexico proposed foreign direct investments as one of the main supplements for successful development and the combat against poverty. The conference asserted that the inflows of the foreign direct investment could facilitate the transmission of knowledge and technology, improve employment, boost productivity and enhance entrepreneurship as well as ultimately contribute to the alleviation of poverty by encouraging economic development and growth (Fink 2006). To generalize, official countries' and institutions' position coincides with the first, simplistic approach towards FDI role in sustainable development.

3. Sustainable Development Implications

3.1. Sustainable Development

By the late 1960s and early 1970s the melting pot of different ideas about progress, sustainability, growth and development which have developed over years started pointing in a new direction – sustainable development (Du Pisani and Jacobus 2006).

The concept of sustainable development is more profound and comprehensive than the concept of economic growth.

The essence of sustainable development most generally is perceived as economic development meeting human needs at present and not reducing its wealth opportunities in the future (Ciegis and Ramanauskiene 2009). According to the definition of the World Bank of the year 1992, "sustainable development is development that continues". Another source describes sustainable rather similarly: "sustainable development is development that meets the needs at present without compromising the ability of future generations to meet their own needs" (Du Pisani and Jacobus 2006). Robert Allen (1980) defined sustainable development as "development that is likely to achieve lasting satisfaction of human needs and improvement of the quality of human life". J. Coomer (1979) provided the definition of sustainable society – a society that recognized the limits to growth and looked for the alternative ways of growing.

The first publications on the theory and practice of sustainable development have emerged because of the conjunction of negative effects of human evolution and development progress (Stanciu *et al.* 2010). These changes influence negatively the human health, life duration and economic development. These statements prove that the society has reached the critical point that can be followed by the irreversible processes able to put in danger the existence of the mankind. To avoid this sombre perspective and assure the mankind's survival and wealth, more and more representatives of the society get the conviction that it is necessary to solve the problems of the environmental protection and economic development in the reciprocal correlation with the interest of the entire contemporary and future human society (Ciegis and Ramanauskiene 2009).

The concept of sustainable development has been created for more sophisticated society which cares about the wellbeing of the next generations. There are some opponents about that issue. The term "sustainable development" is criticized by others because of its vagueness. According the philosopher Luc Ferr the term is obligatory but also absurd or vague, and says nothing. He added that "sustainable development"is trivial by a proof, by contradiction and presented the idea of sustainable development as untenable development, as this term is more charming than meaningful (Ruchi 2009).

Another approach is represented French geographer Sylvie Brunel. He claims that the ideas of sustainable development can hide a will of protectionism from the developed country, what consequentially can impede the development of other countries. He holds the idea that sustainable development serves as a pretext for the protection and contributes perfectly to the capitalism ideas denial as. Contrary, another scientist sees sustainable development as the ultimate test of a moral society and the kind of the world that it leaves to its children (Ruchi 2009).

In the declaration of the United Nations Conference on Human Environment held in Stockholm in 1972

as the first in a series of international conferences on the threatening ecological crisis, it was stated: "A point has been reached in history when we must shape our actions throughout the world with a more prudent care for their environmental consequences. Through ignorance or indifference we can do massive and irreversible harm to the earthly environment on which sustainable development – historical roots of our life and well-being depend. Conversely, through fuller knowledge and wiser actions, we can achieve for ourselves and our posterity a better life in an environment more in keeping with human needs and hopes . . . To defend and improve the human environment for present and future generations has become an imperative goal for mankind" (United Nations 1972).

3.2. Facets of Sustainable Development

Sustainable development means different things to different people. Five typical views of sustainable development depending on adopted philosophical platform can be distinguished: socialist (humanity is just a part of nature and completely depends on it; everybody should take responsibility for the planet and its health), ecologist (humans are the species that depend on environment, everybody should realize the humanity's place in the universe), realist (humanity is totally dependent on nature, and has responsibility to manage; everybody should take responsibility for solving the environmental problems), futurist (humanity is totally dependent on nature; everybody should take long-term responsibility for the wellbeing of the planet to ensure the survival of humanity), individualist (nature is a resource to achieve quality of life, everybody should maintain the supply of resources) (Byrch *et al.* 2009).

Concept of sustainable development can be used in a broader sense. Some authors introduce concept of sustainable world instead of sustainable country (Clifton 2010)

The main threats, which are being tackled by putting emphasis on sustainable development are presented below.

- *The accentuated poverty* that involves one person from five in the developing countries, enclosing diseases, delinquencies and drug abuses that are increasing in many countries; the medium income of the 30 richest countries surpasses 37 times the one of the poorest 20 countries (World Development Report).

- *The political instability* that sometimes brings violent conflicts, impeding the socio-economic progress in different countries and regions. After 1990, the questions related to the international peace and security have perished ample transformations compared to the period of the Cold War, and made important new approaches and solutions that need the reinforcement of the international institutional mechanisms and the international communities' abilities to combat threats. The concepts rarely used in the past are circulating intensively nowadays, as well as the conflict prevention, pacification of peace keeping operations, or post-conflict rehabilitation and peace construction.

- *The continuous deterioration of environment* - the exhaustion of the natural resources can be distinguished (erosion of soil, deforestations, destruction of habitats and biodiversity, exhaustion of fish resources, decline and exhaustion of the global oil resources in 25-30 years) as well as the issue of pollution for the majority of countries; influencing the surrounding environment and extinction of many species of plants and animals, leading to the deregulation of the nature's balance.

- *The threat of the climatic changes* (tropical cyclones, floods, draughts and heat waves from some parts of the world). Developing countries are the most vulnerable to the effects of the climatic changes worldwide, even though it contributes little to the problem. The threats can affect the rain level and wind orientation, transform the climacteric areas and lead to the increase of sea level. Such changes might have a devastating effect on the natural ecosystems and the humankind.

- *The HIV/SIDA virus* and other serious illnesses influence directly the well-being of humans and make social relations fragile.

- *The isolation.* Many countries fight against the effects determined by the slow economic growth and external overwhelming debt, corruption, violent conflicts and social uncertainty (Stanciu *et al.* 2010).

Referring to the idea that sustainable development can prevent some less developed countries from reaching the level of the developed countries, for further formulation of hypotheses we will focus on the countries of different development. The objective of sustainable development differs across differently developed countries. The developed countries are mostly concerned with the GDP growth with the least negative impact on the environment and environment protection. The developing countries target

economic growth and their concerns about environment are quite vague or only verbal. The underdeveloped countries tackle more serious problems, such as poverty alleviation and treatment of different diseases (e.g. Barnes 2010).

The preoccupations regarding sustainable development in the countries of any level focus on complex problems, such as poverty, unemployment, education, inflation, tax rates, population, etc. (Stanciu *et al*. 2010).

In the relevant scientific literature the conception of sustainable development is being analysed from the economic, social and environmental prospective (e.g., Ciegis and Ramanauskiene 2009, Ciegis *et al.* 2009, Ciegis and Simanskiene 2010). In other words, sustainable development is a certain compromise among environmental, economic and social goals of the community, claiming necessity of the wellbeing for the present and future generations. Ghosh (2008) the concept of sustainable development can be presented as a geometric shape, i.e. a triangle encompassing three main areas: economic, social and environmental.

The objective of this article is to focus on the long-run implications of the FDI impact on sustainable development; therefore, we will focus on all three its facets. We rely on the idea that the analysis of sustainable development should be based on the assumption developed by H. R. Jiliberto (2003). He indicates that sustainable development is not based on the economic, social and environmental dimensions separately; it is based on the system integrating all the dimensions (Ciegis and Ramanauskiene 2009).

4. Scientists' Attitude towards the Peculiarities of the Foreign Direct Investments Performance

Scientists and politicians unanimously admit that the objective of all the economies worldwide is to ensure the developmental impact of the FDI. In order to reveal consistent patterns and peculiarities of the processes related to the FDI impact on host economies, a vast amount of relevant scientific literature has been critically reviewed focusing on the scientists' attitude to the issue.

Ample experiences of the developed countries lead to the following ideas. A fairly comprehensive survey was made by De Mello concluding that the country must be highly developed for foreign direct investment to have a beneficial impact on the economic growth. Several other studies (Hermes *et al.* 2003; Alfaro *et al.* 2004) investigated the role of the economic markets in the FDI and economic growth and discovered that well-developed countries' economies gained significant benefits from the FDI (Jackson and Markowski 1996). The impact of the FDI depends on the development stage of the country in which the FDI take place. Blomstrom et al. (1994) finds that the positive impact of the FDI on the economic growth is confined to the higher-income developing countries. Borensztein et al. (1998) concludes that the FDI enhance growth only in the countries with sufficiently qualified labour force while other researchers claim that countries with cheaper labour force are more competitive in attracting the FDI (Tvaronavičienė *et al.* 2008). Researches performed by Alfaro et al. (2001) suggest that the FDI is associated with the faster growth in host countries with comparatively well-developed economic markets. Likewise, Hermes and Lensink (2003) observe positive growth effects of the FDI only after developing host countries have improved their domestic economic systems (Nunnenkamp 2004).

The following ideas are most commonly spread while talking about the countries of lower development level. Blomstrom et al. (1994) states that the FDI have no positive impact on the economic growth mostly in what these authors define as "low-quality data" countries (Campos and Kinoshita 2002). The main observation is that it is much more difficult for the poor developing countries to derive macroeconomic benefits from the FDI. African countries may serve as example, where the FDI it is supposed to have limited effects on the economic growth and poverty alleviation (Nunnenkamp 2004).

Referring to the above presented scientists' statements, some consistency can be noticed. *We presume that the influence of the foreign direct investment differs in the developed, developing and underdeveloped countries and depends on the development level of the country: the developed countries benefit most, developing ones benefits less and underdeveloped benefits least.*

5. Countries Representatives and Sustainable Development Indicators used for the Hypotheses Formulation

As it was indicated, in this particular article, we will not focus on sustainable development in the international context; we will concentrate mainly on sustainable development in the countries of different level of development, i.e. on sustainable development at distinguished groups of countries. In order to raise the following hypotheses, the countries have

to be grouped according to chosen criterion or criteria. For classifying countries, e.g. the World Bank uses income indicator. With reference to the above mentioned criteria, chosen countries will be grouped for further research. High-income economies will be attributed to the developed countries group, upper-middle-income and lower-middle-income to the developing countries group and low-income economies, attributed respectively, to the underdeveloped countries group (see Appendix) (World Bank).

The efficiency of the FDI policies also depends on the fact whether or not they are a part of a broader strategy to improve the developmental impact of the FDI. Critical elements include the development of the local complementary factors of production (e.g., education and skills, local suppliers, infrastructure and business services, approach to innovations (Tvaronavičienė and Degutis 2007) and institutional performance (Tvaronavičienė et al. 2009). Before we start raising the following hypothesis, the indicators of sustainable development have to be distinguished. Here an important note has to be made: sustainable development is a complex and differently treated notion. On one hand, it is very broad as may be related to competitiveness of the country (Balkytė and Tvaronavičienė 2010). On the other hand, various organizations and institutions, actually standing on slightly different philosophical platforms, offer a very broad array of indicators' sets devised for sustainable development estimation (Grybaitė and Tvaronavičienė 2008).

The stages by which the evaluation sequence of sustainable development is possessed consist of: formulation of reasonable objectives for sustainable development evaluation, means, and feasibility of their adoption. One of the means used for the evaluation of sustainable development is the index of sustainable development that is used in some of the scientific articles (e.g. Čiegis and Ramanauskienė 2008, Čiegis and Šimanskienė 2010). However, in this article we adopt different approach. We join opponents, who claim that specific indicators can be affected differently by certain processes. Hence we will select specific indicators embraced by various sets of sustainable development indexes and estimate their reaction to the FDI inflows. Hence, we adopt approach, according which the following six main facets of sustainable development have to be taken into consideration: economy, population, education, innovation, infrastructure and environment (Corina *et al.* 2009). In this article focus is put on the indicators, which can measure features and processes of living conditions improvement influenced by foreign direct investment. Indicators which are considered to have a positive impact on the long term sustainable development in the fields of economic, human and environment will be selected.

Hence, for our hypotheses formulation we selected indicators, which are sensitive to the development level of a country and obtain rather differing values in the developed, developing and underdeveloped countries. The below listed selected indicators, which in this case would let introduce differences in the countries' development through particular sustainability facets. The following indicators were chosen as the ones capable of reflection the FDI impact on enhancing well-being in the unevenly developed countries: GDP, exports, inflation, population, life expectancy at birth, primary school pupils, infant mortality, total health expenditure per capita, total tax rate, internet users, and residential consumption of electricity. As it was mentioned above, selected indicators are seen of vital importance while reflecting the differences between the developed and underdeveloped countries in economic, social and business environment fields.

6. Foreign Direct Investments Influence on Sustainable Development Indicators of Differently Developed Countries

The FDI more or less contribute to the developed, developing and underdeveloped countries' economic growth.

According to Asheghian, the FDI had a significant impact on the United States' economic growth (Asheghian 2004). The positive influence of the FDI on the economic growth in Spain was revealed as well (Rodriguez and Pallas 2008). Moreover, foreign direct investments affected the Lithuanian economic growth (Tvaronavičienė 2006). The effect of the FDI on economic growth in transition economies is positive and statistically significant in Europe (Hannula *et al.* 2004). Several other literature sources indicate that the growth from FDI in developing countries is not generally significant, and is lower than in the developed countries (Wu 2001). Moreover, the rules created in the developed economies cannot be efficiently applied in the developing economies (Akhter 1993). Another scientific article states that the FDI does not have an obvious booster effect on the devel-

opment of China's economy (Changwen and Jiang 2007). Eventually, it is supposed, that the FDI may have limited effects on the economic growth and poverty alleviation in the underdeveloped countries (Nunnenkamp 2004).

From the above presented affirmations the following hypotheses could be raised.

We hypothesize that sustainable development level enhancement is strongly dependant on GDP growth. Impact of the FDI on the GDP growth differs in the developed, developing and underdeveloped countries.

Exports reflect competiveness of a country in the international market and are a related to GDP growth. Bigger inflows of the FDI contribute to the growth of quality and quantity of labour resources, capital availability, therefore can affect exports growth. Moreover, most of the literature sources indicate positive FDI impact on the export growth. That can be detected in each group of countries. The FDI played an important role in leading Chinese export growth (Haishun 1999), they also contributed to the competiveness of the Polish exports (Tiits 2007). *We assume that the FDI have a strong impact on the exports growth.*

Empirical evidences could be found that lower inflation rates coincide with higher FDI inflows into countries (Makki and Somwaru 2004). *We assume that the FDI inflows have an indirect significant influence on lowering inflation rate.*

Overall, the evidence tends to suggest a potentially important role of the FDI in countries' living standards benevolence (Ting 2004). Countries' living standards will be expressed in terms of population and life expectancy rates. *We assume that the FDI have an indirect positive impact on population augmentation. Furthermore, we assume that the FDI inflows have a beneficial influence on the elongation of life expectancy rates.*

The Millennium Development Goals commit the international community to an expanded vision of development, one that vigorously promotes social development as the key to sustaining social and economic progress in all countries, and recognize the importance of creating a global partnership for the development. The goals have been commonly accepted as a framework for measuring development progress.

The second Millennium Development Goal encourages achieving universal primary education (World Bank). Under usual circumstances, if the FDI contribute to the benevolence of people's living, it should also contribute to the increase in number of primary school pupil. *We assume that the FDI have a benevolent impact on the increase in number of primary school pupils*.

The fourth Millennium Development Goal tackles reducing of child mortality (World Bank). Under normal circumstances the improvement of living should be expressed in the given way as well. *We assume that the FDI inflows have a beneficial impact on decrease of occurrences of infant deaths***.**

Taking into account the fifth Millennium Development Goal which strives to improve maternal health and the sixth which encourages combating HIV/AIDS, malaria and other diseases, we make the following hypothesis**.** *We assume that the FDI inflows have a positive influence on the total health expenditure increase.*

The theoretical and empirical evidence stress out the following three main qualitative relations between the FDI and growth (UN Commission for Europe, 2000a, 2000b): FDI-led growth, growth-driven FDI and bi-directional causal process (Akhter 1993).Business environment is one of the location factors taken into account by the investors while investing abroad (Witkowska 2007). We will consider if there is a growth-driven FDI or bi-directional causal processes, higher estimated FDI inflows should indirectly make total tax rates diminish under normal circumstances. *We assume that the FDI inflows might have a beneficial impact on the total diminution of the tax rate.*

The created well-being should also force people to involve into business and communicate more. The above mentioned operations cannot be conceived without the Internet. *The heavier FDI inflows, the bigger number of the Internet users is expected.*

The reached welfare should force higher energy consumption. *We assume that bigger FDI inflows contribute to the increase of the residential electric power consumption.*

Basing on critical analysis of provided sources, the following of hypothesis might be formulated. W*e hypothesize that maintaining adopted theoretical approach in terms of the listed aspects of sustainable development the indicators of sustainable development improve in the developed, developing and underdeveloped countries due to the FDI. Nevertheless, developed countries benefit most, developing less and underdeveloped least.*

7. Conclusions

Economic development is perceived as the increase of the countries residents' standards of living with long term growth from a simple, low-income economy to the modern, high-income economy. The essence of sustainable development is economic development meeting human needs at present not reducing its wealth opportunities for future generations.

Foreign direct investment affects countries' economic growth and sustainable development.

After the relevant scientific literature review towards the FDI impact on development and their performance peculiarities, some consistency has been noticed. FDI impact on the following sustainable development indicators was considered: GDP, exports, inflation, population, life expectancy at birth, primary school pupils, infant mortality, total health expenditure per capita, total tax rate, internet users, and residential consumption of the electricity.

The main hypotheses have been formulated. To conclude, *FDI impact on GDP growth differs in the developed, developing and underdeveloped countries. Summing up, developed countries benefit most, developing less and underdeveloped least.*

References

Acuter, Syed H. 1993. FDI in the developing countries: the openness hypothesis and policy implications, *International Trade Journal* 7 (6): 655-672.

Armbruster, W. 2005. Foreign investment spurs economic growth, *Shipping Digest* 82 (4306): 90.

Asheghian, P. 2004. Determinants of economic growth in the USA: The Role of Foreign Direct Investment, *International Trade Journal* 18 (1): 63-83.

Balkyte, A.; Tvaronavičienė, M. 2010. Perception of competitiveness in the context of sustainable development: facets of "Sustainable competitiveness", *Journal of Business Economics and Management* 11(2): 341-365.

Bedell, D. 2005. The Investment Magnet, *Global Finance* 19 (9): 91-94.

Byrch, C.; Kearins, K.; Milne, M. J.; Morgan, R. K. 2010. Sustainable development: what does it really mean?, *University of Auckland Business Review* 12(1): 1-7

Barnes, A. 2010. Poverty eradication, Millennium development goals and sustainable development in Nigeria, *Journal of sustainable development*, 3(4): 138-144

Changwen, Z.; Jiang D. 2007. Causality between FDI and economic growth in China, *Chinese Economy* 40 (6): 68-82

Clark, J. R. 1990. Macroeconomics for Managers. *Boston: Allyn and Bacon*, INC

Ciegis, R.; Ramanauskiene, J. 2009. Sustainable development and its assessment. *Applied Economics: Systematic Research* 3(2): 143-153

Ciegis, R.; Ramanauskiene, R.; Martinkus, B. . 2009. The concept of sustainable development and its use for sustainability scenarios, *The economic conditions of enterprise functioning*, (2): 28-37

Ciegis, R.; Simanskiene, L. 2010. The concept of sustainable economic development and indicators assessment, Management theory and studies for rural business and infrastructure development, 21(2): 34-40

Dunning, J. H. 1993. The Globalization of Business. *London: Routledge*

Du Pisani, Jacobus A. 2006. Sustainable development- historical roots of the concept, *Environmental Sciences*, 3(2): 83-96

Clifton, D. 2010. Representing a sustainable world - a typology approach, *Journal of sustainable development*, 3(2): 40-50

Fink, Philipp. 2006. FDI-led growth and rising polarisations in Hungary: Quantity at the expense of quality, *New Political Economy*, 11 (1): 47-72

Grybaite, V.; Tvaronavičienė, M. 2008. Estimation of sustainable development: germination on institutional level, *Journal of Business Economics and Management* (9)4: 327-335. ISSN 1611-1699.

Hansen, H.; Rand, J. 2006. On the Causal Links Between FDI and Growth in Developing Countries, *World Economy* 29 (1): 21-41.

Haishun, S. 1999. Impact of FDI on the foreign trade of China, *Journal of the Asia Pacific Economy* 4 (2): 317.

Hannula, H.; Mannik, K.; Varblane, U. 2004. 3. Research method, *University of Tartu - Faculty of Economics & Business Administration Working Paper Series* 27: 20-29.

Head, Thomas C.; Sorensen Jr., Peter F. 2005. At-

tracting Foreign Direct Investment: The Potential Role of National Culture, *Journal of American Academy of Business*, *Cambridge* 6 (1): 305-308.

Hermes, N.; Lensink, R. 2003. Foreign Direct Investment, Economic Development and Economic Growth, *Journal of Development Studies* 40 (1): 142-163.

Hoi Ki Ho, D.; Tze Yiu Lau, P. 2007. Perspectives on Foreign Direct Investment Location Decisions: What Do We Know and Where Do We Go from Here?, *International Tax Journal* 33 (3): 39-48.

Ismail, C.; Burak, C. 2009., *E-Journal of New World Sciences* 4 (3): 3C0015

Jackson, S.; Markowski, S. 1996. The attractiveness of countries to foreign direct investors, . *Australian Journal of Management* 21 (2): 113-139.

Jensen, C. 2006. Foreign Direct Investment and economic transition: Panacea or pain killer?, *Europe-Asia Studies* 58(6): 881-902.

Lall, S.; Bora, B. 2002. Part III: Analytical and policy issues: FDI and development, *Foreign Direct Investment:* 325-345.

Lee, M.; Tcha, M. 2004. The Color of Money: The Effects of Foreign Direct Investment on Economic Growth in Transition Economies, *Review of World Economics* 140 (2): 211-229.

Makki, Shiva S.; Somwaru, A. 2004. Impact of Foreign Direct Investment and Trade on Economic Growth: Evidence from Developing Countries, *American Journal of Agricultural Economics* 86 (3): 795-801.

Nunnenkamp, P. 2004. To What Extent Can Foreign Direct Investment Help Achieve International Development Goals? , *World Economy* 27 (5): 657-677.

Nunnenkamp, P. 2004. How to Improve the Developmental Impact of Foreign Direct Investment: A Review, *Review of World Economics* 140 (3): 526-534.

Pecaric, M.; Fredotovic, M.; Nikolic, N. 2005. FDI and growth-what is missing? *Conference Proceedings: 2005 International Conference Enterprise in Transition. P. 1257-1272*

Rayome, David; Baker, James C.. 1995. Foreign direct investment: a review and analysis of the literature, *International Trade Journal*, 9 (1): 3-37

Robertson, J. C. 2006. Nation-States and the Multi-National Corporation: A Political Economy of Foreign Direct Investment**,** *Journal of Social, Political & Economic Studies* 31 (3): 370-371.

Ruchi, M. 2009. Sustainable development- how far is it sustainable? *Proceedings of World Academy of Science: Engineering & Technology* (51): 754-757

Sumner, A. 2005. Is foreign direct investment good for the poor? A review and stocktake, *Development in Practice* 15 (3/4): 269-285.

Sylwester, K. 2005. Foreign direct investment, growth and income inequality in less developed countries. Preview, *International Review of Applied Economics* 19 (3): 289-300.

Stanciu, M.; Mangra, M.; Daea, A. 2010. The concept and the strategy of sustainable development, *Young Economists Journal* Special Issue (8): 125-136

Tarzi, S. 2005. Foreign Direct Investment Flows into Developing Countries: Impact of Location and Government Policy, *Preview Journal of Social, Political & Economic Studies* 30 (4):497-515.

The three types of FDI explained. 2007. *Middle East*, 376: 34

Tiits, M. 2007. Technology-intensive FDI and economic development in a small country- the case of Estonia, *A Journal of the Socialities & Social Sciences* 11 (3)**:** 324-342.

Tvaronavičienė, M. 2006. Investment driving forces affecting Lithuanian economic growth, *Journal of Business Economics & Management* 7 (2): 69-76.

Tvaronavičienė, M.; Degutis, M. 2007 . If approach to innovations differs in locally and foreign owned firms: case of Lithuania, *Journal of Business Economics and Management* 8(3): 195-203. ISSN 1611-1699.

Tvaronavičienė, M.; Grybaitė, V 2007. Impact of FDI on Lithuanian economy: insight into development of main economic activities, *Journal of Business Economics and Management* 8(3): 285-290. ISSN 1611-1699.

Tvaronavičienė, M.; Grybaitė, V.; Korsakienė, R. 2008. Foreign capital destinations: Baltic States versus India, *Journal of Business Economics and Management* (9)3: 227-235. ISSN 1611-1699.

Tvaronavičienė, M.; Grybaitė,V.; Tvaronavičienė, A. 2009. If Institutional Performance Matters: Development Comparisons of Lithuania, Latvia and Estonia, *Journal of Business Economics and Management* 10(3):

271 – 278. ISSN 1611-1699.

Tvaronavičienė, M., Kalašinskaitė K. 2010. Whether globalization in form of FDI enhances national wealth: empirical evidence from Lithuania, *Journal of Business Economics and Management* 11(1): 3-18. ISSN 1611-1699.

Vissak, T.; Tonu, R. 2005. The Negative Impact of Foreign Direct Investment on the Estonian Economy, Problems of Economic Transition 48 (2): 43-66.

Wu, X. 2001. The impact of foreign direct investment on the relative return to skill, *Economics of Transition*. 9 (3):695.

Witkowska, Janina. 2007. Foreign Direct Investment in the Changing Business Environment of the European Union's New Member States, *Global Economy Journal* 7 (4): 1-30.

World Bank database [online]. [Accessed on 19 May 2010]. Available on the Internet: <www.worldbank.org>

Appendix

Classification of the countries

Low-income economies

Afghanistan	Guinea-Bissau	Rwanda
Bangladesh	Haiti	Senegal
Benin	Kenya	Sierra Leone
Burkina Faso	Korea, Dem Rep.	Somalia
Burundi	Kyrgyz Republic	Tajikistan
Cambodia	Lao PDR	Tanzania
Central African Republic	Liberia	Togo
Chad	Madagascar	Uganda
Comoros	Malawi	Uzbekistan
Congo, Dem. Rep	Mali	Vietnam
Eritrea	Mauritania	Yemen, Rep.
Ethiopia	Mozambique	Zambia
Gambia, The	Myanmar	Zimbabwe
Ghana	Nepal	
Guinea	Niger	

Source: World Bank database [online]. [Accessed on 19 May 2009].Available on the Internet: <www.worldbank.org >

Lower-middle-income economies

Albania	Honduras	Paraguay
Angola	India	Philippines
Armenia	Indonesia	Samoa
Azerbaijan	Iran, Islamic Rep.	São Tomé and Principe
Belize	Iraq	Solomon Islands
Bhutan	Jordan	Sri Lanka
Bolivia	Kiribati	Sudan
Cameroon	Kosovo	Swaziland
Cape Verde	Lesotho	Syrian Arab Republic
China	Maldives	Thailand
Congo, Rep.	Marshall Islands	Timor-Leste
Côte d'Ivoire	Micronesia, Fed. Sts.	Tonga
Djibouti	Moldova	Tunisia
Ecuador	Mongolia	Turkmenistan
Egypt, Arab Rep.	Morocco	Ukraine
El Salvador	Nicaragua	Vanuatu
Georgia	Nigeria	West Bank and Gaza
Guatemala	Pakistan	
Guyana	Papua New Guinea	

Source: World Bank database [online]. [Accessed on 19 May 2009]. Available on the Internet: <www.worldbank.org >

Upper-middle-income economies

Algeria	Grenada	Peru
American Samoa	Jamaica	Poland
Argentina	Kazakhstan	Romania
Belarus	Latvia	Russian Federation
Bosnia and Herzegovina	Lebanon	Serbia
Botswana	Libya	Seychelles
Brazil	Lithuania	South Africa
Bulgaria	Macedonia, FYR	St. Kitts and Nevis
Chile	Malaysia	St. Lucia
China		
Colombia	Mauritius	
	St. Vincent and the Grenadines	
Costa Rica	Mayotte	Suriname
Cuba	Mexico	Turkey
Dominica	Montenegro	Uruguay
Dominican Republic	Namibia	Venezuela, RB
Estonia	Palau	
Fiji	Panama	

Source: World Bank database [online]. [Accessed on 19 May 2009]. Available on the Internet: <www.worldbank.org >

High-income economies

Andorra	France	New Caledonia
Antigua and Barbuda	French Polynesia	New Zealand
Aruba	Germany	Northern Mariana Islands
Australia	Greece	Norway
Austria	Greenland	Oman
Bahamas	Guam	Portugal
Bahrain	Hungary	Puerto Rico
Barbados	Iceland	Qatar
Belgium	Ireland	San Marino
Bermuda	Isle of Man	Saudi Arabia
Brunei Darussalam	Israel	Singapore
Canada	Netherlands Antilles	
Cayman Islands	New Caledonia	Slovak Republic
Channel Islands	New Zealand	Slovenia
Croatia	Northern Mariana Islands	Spain
Cyprus	Norway	Sweden
Czech Republic	Oman	Switzerland
Denmark	Portugal	Trinidad and Tobago
	Puerto Rico	United Arab Emirates
Equatorial Guinea	Qatar	United Kingdom
Faeroe Islands	San Marino	United States
Finland	Saudi Arabia	Virgin Islands (U.S.)
	Singapore	

Source: World Bank database [online]. [Accessed on 19 May 2009]. Available on the Internet: <www.worldbank.org >

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TALENT ACQUISITION AND RETENTION IN SOCIAL ENTERPRISES

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Abstract Over the years there has been a phenomenal growth in the number of social enterprises in India. This is partly a consequence of a new policy of the government to gradually withdraw from social development activities. The gap thus created is being filled by social enterprises. A social enterprise can be a for-profit or not-for-profit venture engaged in income-generating activities with an agenda of bringing positive change in the society. While social enterprises are engaged in the development of people, it is rather paradoxical that they experience a variety of problems with respect to the management of human resources within their enterprises. It is common knowledge that social enterprises perennially struggle with various critical human resources issues such as getting employees at low rates of compensation, providing growth opportunities for employees within the organization, retaining talent especially in the middle management, providing clearly defined roles and tasks to employees, leading to high attrition and increasing the cost of acquiring and training new employees. Thus, it becomes critical for social enterprises to think out-of-the-box and try a variety of innovative strategies to overcome these problems. This paper discusses a few such innovative HR strategies adopted by social enterprises to attract and retain talent, such as offering jobs to people with vision and value congruence, enhancing the credibility of the organization through brand building, providing opportunities for personal growth, creating a sense of ownership among employees through participation in decision making, creating sense of ownership among employees by giving equity shares, creating entrepreneurial opportunities within the organization, finding employees from among beneficiaries, attracting employees to serene lifestyle in peaceful and scenic location and providing attractive fringe benefits to the employees. Collectively these strategies seem to suggest that social enterprises adopt a 'partnership paradigm' for managing their employees.

Keywords: Social Enterprise, Social Entrepreneurship, Human Resources Management, Talent Acquisition, Talent Retention

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JEL Classifications: I30, J0, J18, J28, J53, J60.

1. Introduction

Social development in the developing countries has traditionally been viewed as the responsibility of the governments because of the massive scale of its operations and the limited or no capacity of its beneficiaries to pay for the services. While the need for social development in developing countries is enormous, the resources available even with the governments are limited. Besides, the government machinery and the bureaucracy are ill-equipped to monitor the implementation of the social development projects at the grass-root level. Hence, over the years, governments in the developing countries adopted a policy of gradual withdrawal from the various social development activities. This has created multiple voids in the social realm which have been filled by the nongovernmental agencies commonly known as the nonprofits. They play an increasingly important role in providing services, for which the public and the private sector lack time, information, resources and inclination. They advocate for a variety of social, political, environmental, ethnic, and community interests and concerns, contribute to the social and cultural life of the society, and actively participate in the community building (Salamon & Sokolowski 2004).

They combine economic and market forces with the social goals (Vigoda & Cohen 2003) and their employees are expected to fulfill business requirements as well as strictly adhere to ethics, accountability, and equity in services. The nonprofit organizations, in the course of their service, face several challenges in terms of reductions in government funding, decline in charitable contributions, competition from for-profit providers of certain services, and demands for the increasingly higher levels of accountability.

In recent years, however, an increasing number of the non-profits have been seeking additional revenues by behaving more like the for-profit organizations. According to Dees, Emerson & Economy (1998), the nonprofits are scrambling to find commercial opportunities for a number of reasons. First, a new pro-business *zeitgeist* has made for-profit initiatives more acceptable. With the apparent triumph of capitalism worldwide, market forces are being widely celebrated. There is a growing confidence in the power of competition and the profit motive to promote efficiency and innovation in development organizations. Second, many social enterprises believe that institutional charity can undermine beneficiaries' self esteem and create a sense of helplessness and dependence; self-reliance is the new mantra. Third, the sources of funds available to the nonprofits tend to favor more commercial approaches. There is a greater availability of money for operating on a more commercial basis. Lastly, and most importantly, social enterprises view income-generating activities as a more reliable funding source than donations and grants. Many of them now consider extensive dependency on donors as a sign of weakness and vulnerability.

Social enterprises generally are heavily dependent on individual and/or institutional donors for funding specific projects or initiatives. It is but natural for the donors to closely monitor the use of funds donated by them. In order to regulate and control the spending of social enterprises, the funding agencies put various restrictions on the use of funds. One such restriction is spending on human resources within the organization in the form of salaries, benefits, incentives, training and the like. This situation is paradoxical, as these organizations experience a variety of human resources issues within their own organizations while taking up the ultimate goal of augmenting the human development in the larger society.

All social enterprises - irrespective of their size, type, sector or profit-orientation - experience human resources management issues of one type or another. As a talent is rare, valuable, difficult and hard to substitute, organizations that attract, select and retain better talent outperform those that do not (Barney & Wright 1998). Social enterprises, like other organizations, compete with each other to attract better talent, which is further intensified by the fact that the talent pool available to social enterprises is often limited, since the sector is not perceived to be glamorous and remunerative as the corporate sector. The high turnover of qualified employees in social enterprises has increasingly negative impact on recruitment, training, and service effectiveness. Filling a position in a social enterprise poses a significant challenge, given the lack of competitive incentive systems in the sector. Vacant positions may eventually be filled with reduced chances of obtaining qualified candidates, additional costs for employee training and development, and higher chances of service disruption.

The 21st century has witnessed an explosive pace of technological advancement, facilitating global sourcing and the consequent global operations, which are the main drivers of change in the employment patterns, leading to intense competition among employers to attract and retain talented workers (Osborn-Jones 2001). Without doubt it can be said that today an organization's success is directly linked to the talent it can recruit and retain. Recruitment is critical not only for sustaining competitive advantage but also for basic organizational survival (Taylor & Collins 2000). Escalating demand for highly talented and skilled employees coupled with limited supply makes the acquisition and retention of the talented employees a major priority for the organizations (Fegley 2006) especially for social enterprises. The nature of the social enterprises and their socially desirable goals create an expectation that the employees work for the cause rather than for the paycheck. Furthermore, social enterprises especially the nonprofit ones are unable to compete with for-profit organizations in providing good pay and incentives to the employees (Brandel 2001). Hence it is almost impossible for them to survive without innovations in the field of human resources management, especially for acquiring and retaining the talent.

This paper attempts to understand the various types of social enterprises and their nature of work with a view to appreciating the human resources issues faced by them. The paper examines the different strategies and practices adopted by social enterprises to innovatively deal with various human resources-related issues faced by them, especially those relating to talent acquisition and retention within the organization.

2. Social Enterprises: Nature and Types

The term 'social enterprise' evokes various kinds of images and impressions among researchers and practitioners. According to Alter (2000), social enterprises are driven towards innovations primarily by two forces: first, the nature of the desired social change often benefits from the innovative, entrepreneurial or enterprise-based solutions; second, the sustainability of the organization and its services is dependent on the innovations in identifying various streams of income generating activities so as to diversify its funding sources.

Social enterprises are hybrid organizations that have mixed characteristics of philanthropic and commercial organizations in several aspects, such as motives, methods, goals and key stakeholders (Dees et al. 1998). Building upon this perspective, Dees proposed an organizational spectrum (Exhibit–1) where pure forms of nonprofit and for-profit organizations are placed at the opposite ends of a continuum and the social enterprise, having characteristics of both, is placed somewhere in between.

Exhibit–1: The organizational spectrum: positioning of social enterprises on a continuum ranging from philanthropic to commercial.

		Purely philanthropic	**Social Enterprises** ← →	**Purely Commercial**
Motives Methods Goals		-Appeal to goodwill -Mission driven -Social value	-Mixed motives -Mission & market driven -Social & economic value	-Appeal to self interest -Market driven -Economic value
Key Stakeholders	Beneficiaries	Pay nothing	Pay subsidized rates or a mix of full payers and non-payers	Market – rate prices
	Capital	Donations and grants	Below market capital or a mix of donations and market rate capital	Market–rate capital
	Workforce	Volunteers	Employees retained at below-market wages or mix of volunteers, part-time and fully paid staff	Employees retained at market-rate compensation
	Supplies	In-kind donations	Acquired at special discounts or are a mix of in-kind donations and fully paid facilities	Acquired at market-prices

Source: Adapted from (Dees et al. 1998)

In a view of the difficulties to clearly define a social enterprise as it incorporates the features of non-profit and for-profit organizations, (Alter & Children 2000) attempted to place it on a continuum, which he called the 'hybrid spectrum' (see Exhibit–2). The Hybrid spectrum identifies social enterprises as combining the features of non-profit and for-profit organizations. On the spectrum, hybrid organizations are defined and positioned by the degree of variations in their motives, accountability, and use of surpluses/profits.

Exhibit-2: The hybrid spectrum: the non-profit/for-profit continuum

← →

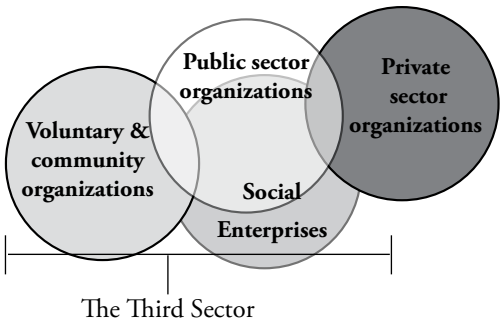
Traditional nonprofit organizations	Nonprofit with incomegenerating activities	Social enterprise	Socially responsible business	Corporation practicing social responsibility	Traditional for-profit organizations
• Mission motive • Stakeholder accountability • Income reinvested in social programs or for meeting operational costs			• Profit-making motive • Shareholder accountability • Profits distributed to shareholders		

Source: Adapted from (Alter & Children 2000)

On the right side of the spectrum, there are for-profit entities that may also create social value but whose main motives are profit-making and distribution of profits to shareholders. On the left side of the spectrum, there are the nonprofits that may or may not undertake commercial activities to generate economic value which is used to fund social programs as their main motive is to serve the economically weaker sections of the society and/or to bring about a culture-change in the society rather than to generate profits for the stakeholders. Once again, it should be pointed out that social enterprises would combine the features of both.

Since it is easy to understand the nature of organizations by specifying the sector they belong to, Westall & Chalkley (2007) made an attempt to specify the sectoral affiliation of voluntary organizations and social enterprises. As these organizations do not fully belong either to the public or private sector but combine features of both, they preferred to call it the 'third sector' (see Exhibit-3) even though this is not a fully homogeneous sector. It is possible to identify at least two major subtypes of organizations within this sector, namely (i) voluntary and community organizations, and (ii) social enterprises.

Exhibit-3: Voluntary/community organizations sector and social enterprises in the Third Sector



Source: Adapted from (Westall & Chalkley 2007)

Westall & Chalkley (2007) maintain that 'it is not always easy to differentiate voluntary organizations from social enterprises. With this attempt to de-emphasis the differences between voluntary organizations and social enterprises, they seem to suggest that there is a rather homogenous 'Third Sector', which is debatable for the reasons we have mentioned above. While 'Third Sector' organizations may be similar in terms of their larger purpose, they do have substantive differences in terms of their stake-holder objectives as well as the nature of their activities.

It appears that there is a widely held misconception that the primary distinction between a volunteer/community organization and a social enterprise is that the latter is entrepreneurial and the former is not. As Bornstein (2007) has pointed out, most of the volunteer/community organizations are entrepreneurial and innovative in developing new and more effective ways of achieving their social objectives and sites, e.g., the case of Childline International. Therefore, the critical difference is whether the innovations are used for designing and implementing income generating activities as a source of funds for achieving their social objectives (Nicholls 2006). For social enterprises, the major part of their funds comes from such income-generating activities, whereas for volunteer/community organizations the major source of funds is donations from individuals or organizations. Among the social enterprises which have income generating activities, there are two types based on their profit-orientation – the not-for-profit and for-profit social enterprises. This difference is illustrated with some examples (see Exhibit-4)

Exhibit-4: Differentiating voluntary/community organizations from social enterprises based on their funding sources

Name of organization	Social objectives	Type (non-profit or SE)	Funding/ Income source
Greenpeace	Developing environmental awareness and promoting environmental activism	Nonprofit–activist organization	Donations from individuals
Actionaid	Poverty alleviation	Nonprofit organization	Individuals, corporations and governments
SEWA (Self-Employed Women's Association)	Creating employment and livelihood opportunities for unorganized woman labourers	Social Enterprise	Donations and income from commercial activities
Aravind Eye Hospital	Providing eye-care to the poor and the aged	Social Enterprise	Full-paying customers, who subsidize the services for two thirds of the total patients
FAB India	Helping artisans with the marketing of their handicraft products	Social Enterprise	Income from commercial activities

3. Human Resources Issues of Social Enterprises

Human Resources Management (HRM) is of utmost importance to social enterprises mainly for three reasons. First, the personal services provided by social enterprises mean that these organizations cannot replace employees with investment in physical facilities and equipment. In most cases, the service-providers employees are equated with the services and there-

fore are the single most important asset of nonprofits and social enterprises (Barbeito & Bowman 1998); (Hall & Banting 2000). Second, more than in other organizations, employees of social enterprises are attracted and motivated by intrinsic factors such as a belief in the organization's mission and values and an opportunity to actualize their individual values, and participation in decision-making (Brandel 2001; Brown, Yoshioka, & Munoz 2004; McMullen, Schellenberg, & Networks 2003). Obviously, these factors have an impact on the recruitment, retention and motivation of people in social enterprises (Brown et al. 2004). Third, from the perspective of the need for professional delivery of services and accountability requirements of the new funding environment, employees are arguably the most critical stakeholders in the strategic positing of social enterprises.

It could be argued that the employees of social enterprises are more likely to experience job dissatisfaction if: (a) they find out that their organization is not achieving the public good that attracted them; (b) the mission is de-emphasized or derailed by other considerations and (c) the espoused values are inconsistent with the practical ones in the organization. It has been observed in the study by Howe & McDonald (2001), that the increased accountability requirement has become a source of stress and job dissatisfaction among employees of a child welfare organization. Similarly, Peters & Masaoka (2000) found that disgruntlement among employees, particularly relating to the lack of participation in the decision-making process contributed to the increased unionization in the nonprofit organizations. The HRM influences and is influenced by the context within which it exists (Belcourt & McBey 2010). Social enterprises often get pulled towards opposing directions: on one hand, there is an urgency to do more of what they already do in achieving their social objectives: on the other hand, there is pressure to become more effective and efficient (Barbeito & Bowman 1998). This has resulted in the drastic changes in the operating environment of social enterprises over the past two decades (Hall & Banting 2000); (Reed, Howe, & Canada 2000); (Smith & Lipsky 1993). Because human resources are the primary assets of social enterprises (Barbeito & Bowman 1998), the need to adapt to change and the pressure to do more are causing a lot of strain in the management of human resources in these organizations.

Ban et al.(2003) maintain that recruitment, retention, and workforce diversity are some of the major problems being faced by the HR managers in the nonprofit organization. In addition, they found that it is difficult for the nonprofits to recruit in certain areas, such as information technology and business development as the salaries prevalent among these professionals are too high for them to afford. The third sector organizations with limited resources are trying hard to balance the expectations of the top talent in the globally networked economy while pursuing their donors and persuading them to provide flexibility in spending on human resources so that they can retain them effectively and efficiently bring about a change in the larger society. Though the donor-dependency is relatively low for social enterprises, they too are not in a position to offer high salaries and perks to their employees.

Brown et al.(2004) argue that compensation is an important factor that influences employee turnover in social enterprises. Even though employees are attracted by the mission of the social enterprises and are satisfied with their work, they do not find the compensation attractive enough for them to remain in the organization for long.

While it is often claimed by the researchers that the individuals who choose to work in the non-profit sector are differently motivated than those who work in the for-profit sector (Frederickson & Hart 1985); (Houston 2006); (Rainey 1983); (Wittmer 1991), it is not unreasonable for the employees of the third sector to expect a decent compensation for their work career growth opportunities, though not on a par with those in business and commercial enterprises.

The lack of investment in human resources leads to various critical problems for the third sector organizations, such as low motivation, high frustration, quick job shifts, etc among employees, which act against the growth and development of the organization. On the other hand, social enterprises spend large portions of their scarce resources on recruiting and training new employees from time to time. This is a paradox that makes observers wonder if the resources spent on recurring recruitment and training could be spent more beneficially towards compensating the employees adequately so that they would stay longer with the organization and ensure smooth and continuous operations, and thereby leading it to the higher levels of effectiveness.

4. Talent Acquisition in Social Enterprises

It is widely recognized that human resources plays a significant role in enhancing organization's performance and effectiveness (Huselid 1995). No wonder there are persistent efforts by the organizations – irrespective of their size, age, type sector, etc – to attract the best talent available. Talent has become the key differentiator for performance management and for leveraging competitive advantage especially in the knowledge-based organizations (Bhatnagar 2007). With better talent acquisition and development, the employee engagement improves and so does the productivity. Maximizing team engagement, motivation, and retention through due diligence in talent acquisition is vital in today's highly competitive environment. Only a talent resourcing process that is well defined and well-executed from start to finish yields consistent and compliant results which will in turn yield a competitive advantage in the war for talent (Srivastava & Bhatnagar 2008).

For recruiting employees at the lower levels, especially for jobs requiring knowledge of local language and familiarity with local conditions, social enterprises often use employee referrals and local newspaper advertising - methods that are relatively inexpensive and have a local focus. Although referrals are highly effective, the tendency of people to recommend individuals like themselves or recommend them for non-professional reasons can potentially lead to the reduction in diversity as well as quality among the workforce (Ban et al. 2003). However, there could be an advantage for the employee referral system that the employees with their thorough knowledge of the organization would be able to bring in the most appropriate candidates, especially in terms of ideological congruence with the organization. This is of particular relevance for the social enterprises according to the fact that research studies have consistently shown that a better match between the values of employee and organization predicts employee commitment and satisfaction of the job (O'Reilly III, Chatman, & Caldwell 1991).

As social enterprises have limited resources to spend on recruitment, most of them now-a-days use the Internet and campus recruitment mechanisms for recruiting large numbers, especially those with specialized knowledge and skills. For example, microfinance organizations such as BASIX and FINO (Financial Information Network Organization) regularly go through campus recruitment. For the specialized skills and sourcing from wider areas, social enterprises generally use the available web-based job portals to advertise their organizations and post the job profiles of the vacant positions. Usually these organizations prefer dedicated development-sector job-portals such as *devnetjobs.org*, *barefootjobs.com* etc, rather than general job portals such as *naukri.com* or *monster.com*. While it is difficult for social enterprises to mobilize job applications, it is even more difficult for them to process these applications due to the lack of the HR specialists. Such difficulties are aggravated by the indiscriminate applications of the candidates who apply without looking at the profile and the nature of the job.

Over the years, the number of corporate executives looking for a career shift has drastically increased. Although this talent pool is a very good source of recruitment for the social enterprises, the latter find it tough to tap this growing potential employee pool because of their limited capability to meet the high expectations of this group. Notwithstanding this, there are some social venture-funds organizations such as *Aavishkaar,* based in Mumbai, who make use of this trend as an opportunity to attract the corporate talent at a relatively low cost. For recruiting fresh graduates, however, the volunteer program that is becoming increasingly popular is used (Acumen Funds). It is an apprenticeship scheme for those interested in the field. In a volunteer program, the candidates get experience and training of the actual work. This reduces the cost of training and development of the employees and also helps them to assess the interest and suitability of the candidates 'on the job' and recruit and retain them at a significantly low cost. The candidates would also benefit from the volunteer program as it gives them an opportunity to assess themselves vis-à-vis their 'future' job and organization before committing themselves to it.

5. Talent Retention in Social Enterprises

Retention of non-leadership staff in social enterprises deserves special attention since the loss of such staff is costly in terms of new recruitment, training and development, interruptions service, and decreased employee morality (Ban et al. 2003); (Lynn 2003). Researchers maintain that the most important goal of the contemporary human resources systems is not to recruit the finest professionals but to create congruence between people and organizations so that they would stay and work in the organization (Lynn 2003); (Vigoda & Cohen 2003).Watson & Abzug

(2005) refer to it as the process of creating "fit and embeddedness". Value and goal congruence positively affect employee performance, job satisfaction, tenure, and career success. In the absence of such congruence, an employee cannot reach the expected level of performance, and tends to accuse the organization of being politically discriminative and inequitable. In order to avoid such a potentially destructive situation, there has to be a continuous assessment of the interface between the employees and their work environment and the development of the advanced HR strategies for the recruitment and retention (Vigoda & Cohen 2003). This is particularly relevant for the current situation when the retention rates for social enterprises especially the nonprofit organizations continue to decline with more workers turning to the for-profit corporate sector as an alternative (Light 2000); (Salamon 2002).

Against this background, it is not surprising to see that social enterprises, many of which are also not-for-profit organizations, undertake the HR innovations almost on a continuous basis, particularly in the areas of employee retention. In the ensuing section of this paper, we provide a brief description of a few such innovative employee retention strategies used by social enterprises and illustrate them with examples.

5. 1. Offering Jobs to People with Vision and Value Congruence

There are many social enterprises which work on sensitive issues such as HIV, gay rights, child abuse, women's empowerment, disabilities, etc. Employees in these organizations are mostly either of unfair treatment relating to such issues or feel strongly about them. Hence they are naturally motivated to bring a change in the society. These organizations act like religious institutions where devotees have faith in the ideology and therefore do selfless service. They treat their jobs as an opportunity to actualize their ideologies and get them accepted by the society (see Exhibit-5).

Exhibit-5: Offering jobs to people with vision and value congruence: the case of *Mirakle* Courier

Mirakle Courier is a for-profit socially oriented courier company started in 2008 by the Oxford alumni Dhruv Lakra with the tagline of *'Delivering possibilities'*. The vision of the organization is to provide a platform to deaf people to utilize their potential effectively and thereby become economically independent. The company's mission is to provide gainful employment to deaf adults. The deaf gets trapped in the vicious circle of poverty since there is low awareness of their problems and limited education facilities for them, which seriously affect their employability. The organization aims at providing better service to its clients at competitive prices by enlisting the services of deaf people as employees. Naturally the deaf employees would also benefit immensely from this arrangement.

Mirakle courier has difficulties in finding suitable employees for managerial positions, who have patience and skills to manage deaf employees. These managers will have to work hard or design superior strategies for competing with other courier companies. Talented managers have high expectations of compensation and are always in demand from competitors.

The top management of *Mirakle* Courier service consists of committed individuals, who have the passion for the cause and are committed to bring about a change in the lives of deaf people all over the world. There is a sense of purpose attached to the work done by the employees of *Mirakle* Courier, and this is perhaps the biggest reason for the sense of satisfaction they derive from their work. The organization is able to retain competent employees because of high level of job satisfaction flowing from the sense of accomplishing their mission and actualizing their ideology.

Source:
Mirakle Courier website:
http://www.miraklecourier.com (September 2010)
http://www.thebetterindia.com/1330/mirakle-couriers-career-haven-for-the-deaf/ (November 2010) http://blog.ennovent.com/2010/04/empowering-deaf-adults-mirakle-couriers/ (November 2010)

5. 2. Enhancing the Credibility of the Organization through Brand-building

It is not difficult for the large and reputed social enterprises to retain their employees since these organizations have a brand name. Employees feel a sense of pride and recognition by associating themselves with such organizations. These are mostly international social enterprises or large social enterprises for whom the acquisition and retention of talent is apparently not a problem. However, organizations do not grow large overnight, nor are they started as large ones in the first place. Along with the growth in size, some organizations make deliberate attempts to enhance their brand image. While the image-building exercise is relatively easy for social enterprises because of the generally acceptable nature of their social objectives, it is the consistency and commitment with which they promote such social objectives that builds the image of the organization. This is adequately illustrated by the case of Aravind Eye Hospital (see Exhibit -6).

Exhibit-6: Enhancing the credibility of the organization through brand building: the case of *Aravind* Eye Hospital

Aravind Eye Hospital was founded in 1976 by Dr Govindappa Venkataswamy (affectionately known as Dr V). Almost 30 years later, Aravind's innovative eye care delivery system is renowned worldwide for its technical excellence, operational efficiency and pioneering community work. Aravind follows the ideal of providing, high quality service at very affordable prices to a large number of clients.

The hospital collectively performs over 250,000 surgeries every year. The organization gives utmost importance to ensuring that all patients are provided the same level of care and high quality service, regardless of their economic status. As a result of a unique fee system and effective management, Aravind is able to provide free eye care to two-thirds of its patients from the revenue generated from the other third - its paying patients. It is this unswerving commitment to serve the poor that has built Aravind's brand image even from its early difficult years.

Aravind Eye Hospital has a strong mission of eradicating needless blindness. The organization puts strong emphasis on operational efficiency and effectiveness to make the services affordable to the poor people. During the initial days the organization attracted talented doctors by announcing that doctors will get much more exposure of doing surgery than they would get in any other hospital. Also they induced feel-good factors in the doctors and staff that they are serving the poor, especially the old people.

Over the years, the organization has built a strong credibility among the common people as well as international development organizations such as WHO, Bill & Melinda Gates Foundation, and so on. This has given them the strategic advantage of being a known and respected organization in the health sector. The organization has the policy of not giving any kind of advertisement for jobs. In spite of this, a large number of applications for all kinds of jobs keep coming to the organization from different parts of the world, which is obviously a testimony to the power of brand image created by Aravind.

Sources:
Aravind Eye Hospital: website http://www.aravind.org (September 2010); Tidd et al, 2010; Sharma 2010

5. 3. Providing Opportunities for Personal Growth

Unlike the large social organizations like Aravind Eye Hospital, the smaller ones are unable to attract talented employees because they are not widely known amongst people. To attract and retain talented employees, some of the social enterprises create opportunities for their employees to participate in the conferences and workshops within and outside the organization so that they could develop and perform effectively the job and career. For the employees interested in pursuing studies abroad, some organizations provide support in the form of information and references and facilitation of sponsorship. They also encourage the employees to write papers and case studies which could be presented in the national and international conferences and seminars. Some organizations have tie-ups with various national and international funding agencies such as Ford Foundation, UNDP, Bill & Melinda Gates Foundation, Sudha Murthy Foundation, etc which sponsor promising students as well as employees of the social development organizations to pursue studies abroad. In some cases these funding agencies also sponsor travel expenses for the employees to attend international conferences (see Exhibit -7).

Exhibit-7: Providing opportunities for personal growth: the case of Grassroots

Grassroots, also known as Pan Himalayan Grassroots Development Foundation, was established in 1991. The organization focuses on the ways and means to improve the quality of life of the rural communities. The organization empowers the rural communities by successfully running various projects for sustainable development of the region such as watershed management, bio-gas plant, sanitation and forest management.

The organization also focuses on income generating activities to provide means of livelihood to the poor establishing a producer company called *Umang*, managed and run by 2,200 women from 148 SHGs (Self Help Groups). *Umang* is an 'umbrella' organization that houses several small manufacturing units, which generate revenues by producing and selling various items such as woolen knitwear, pickles, jams, honey, organic fruits and vegetables to various consumer groups in India and abroad. Currently the turnover of the organization is around Rs 7.5 million and plan to scale up to Rs 100 million in the next 4 years. Surpluses from *Umang* are also used for supporting the sustainable development projects.

The organization is always in the lookout for socially conscious employees who are efficient as well as service-minded. Since the organization is situated in the Himalayan region, it is very difficult to get good quality management graduates who are willing to live in an isolated locality at low compensation for the long periods (more than 2 years).

Grassroots encourages employees to go for foreign degrees or short term courses and support them through a tie with Ford Foundation, which provides scholarships to students in developing countries to study at the foreign universities. The organization also seeks to market itself by

encouraging its employees to write working papers and case studies on their various programs and projects and provide the employees with the opportunities and support to attend national and international conferences and seminars. At Grassroots, the employees have a feeling that they are growing with the organization, which acts as motivation to continue with the organization in spite of the isolated locality of mountainous terrains as well as low financial compensation.

Sources:
Grassroots website: http://www.grassrootsindia.com /Anurag Prasad (Outlook, September 05,2009) available at: http://business.outlookindia.com/article.aspx?261366

5. 4. A. Creating a Sense of Ownership among Employees through Participation in Decision Making

Highly networked organizations like Grassroots are able to provide learning and development opportunities to their employees through the support of their associates which becomes a powerful retention strategy. However, when the organization is low on networking, they sometimes adopt a strategy of providing autonomy and entrepreneurial opportunities to the employees within the organization. In other words, they create a sense of ownership in their employees in various other ways such as giving them freedom to choose a specific project or issue, permitting flexible timings of work, inviting them to participate in decision making, providing support for the employees to start new ventures under the umbrella of the parent organization and encouraging employees to work in other organizations and get more hands-on experience for developing new skills, which they could utilize in their subsequent work. Needless to state that such policies serve as the influential retention strategy, as employees feel a sense of ownership and importance within the organization and continue to work for it (see Exhibit-8).

Exhibit-8: Creating a sense of ownership among employees through participation in decision making: the case of *Aarohi*

Aarohi was established in the Himalayan region of India in 1992 with a view to creating opportunities for rural communities in the hills to lead a more self-dependent existence. The area in which *Aarohi* has been set up was underdeveloped with little government infrastructure, livelihood opportunities or access to basic health and education facilities. Government-aided development was sporadic and hardly benefited for the ordinary hill family.
Aarohi addresses various issues of poverty through activities related to forest management, health care, livelihood, drinking water and sanitation, women's empowerment and education.
The main source of funding for these activities is the revenue generated by selling various types of forest products used in body care, fragrance and culinary services in high end markets in India and abroad.

Aarohi's area of operation is spread over 100 villages in the Nainital and Almora districts of Uttarakhand. There are about 50 full time staff and over 250- associate staff from all over the world working for it. The organization does experience some HR related issues such as the inability to attract good talent in the middle management, high attrition rate in talented staff because of low compensation and lack of growth possibilities. The organization tries to address these issues through employee empowerment and participation schemes.

At *Aarohi*, the employees especially the middle management and top management are provided with the sense of ownership towards the organization. They are invited to all meetings of the organization irrespective of their area of operations with a view to seeking their advice on various day to day issues relating to their operations. The employees are also given the freedom to choose their working time. The organization encourages young staff to go for industrial visits to understand the practices and functioning of various other organizations and implement those practices in the organization.

Source:
Aarohi website: http://www.aarohi.org (September 2010)
Aarohi blog: http://blog.aarohi.org (October 2010)
http://ayanam.blogspot.com/2006/12/aarohi-satoli.html (November 2010)

5. 4. B. Creating a Sense of Ownership among Employees by Giving Equity Shares

Some social enterprises create the sense of ownership in their employees by giving them an equity stake in the organization or elevating some employees as co-founders. Such strategies have multiple benefits, e.g. the employees sharing the risk and burden of the organization and at the same time going extra mile to achieve results since they are directly affected by the future of the organization (see Exhibit-9).

Exhibit-9: Creating a sense of ownership by giving equity shares: the case of *Sattva*

Sattva is a social enterprise located in Bangalore which was established in 2008 by four social activists. It is basically a consulting organization and has three main divisions: media, research, and consulting. The media division aims to be a strong voice in the development through highlighting key issues and mobilizing people on various aspects of the social development. The research division provides

relevant, actionable insights to social organizations and enterprises. They publish case studies, white papers and impact assessment reports. The third division - *Sattva* Consulting - delivers consulting and program management services to the NGOs, corporations, investors, donors and foundations.

The organization currently generates revenues through its consulting and research activities and aims at enhancing its visibility and acceptance through publishing an online magazine by its media division. Sattva needs high quality employees with management background and deep interest in social development. This being a rare combination, *Sattva* got very few applicants for its jobs, and found it difficult to retain the ones that have joined them, as they were unable to offer the high salaries and the career growth expected by management graduates. Hence they introduced an innovative retention strategy, which was to elevate some of the early employees as founders and giving equity shares to others. This has turned out to be a win-win situation to both the organization and the 'employee-owner'. The organization is able to attract and retain good talent for longer periods, and the employees are motivated to work hard to achieve better performance and thereby enhance their share of the financial and non-financial outcomes.

Source:

Sattva website http://www.sattva.co.in (September 2010) NGO Gateway website: http://ngogateway.com/interview/vikram-rai-sattva/ (October 2010) ITIHAS website: http://www.itihas.org.in/sattva.html (November 2010) MINT: http://www.livemint.com/2009/06/02004831/A-social-consultancy-takes-aim.html (November 2010)

5. 5. Creating Entrepreneurial Opportunities within the Organization

An innovative practice of some social enterprises for retaining their employees is to create career or entrepreneurial opportunities within the organization. Employees are given the freedom to execute projects as entrepreneurs. This brings out their creativity and enables them to try new things, which in turn encourages them to set higher goals for themselves. In some cases the freedom given is large enough to enable and empower them to work on multiple projects and issues at the same time (see Exhibit-10) which they would not have been able to do in a structured job. Besides, the employees are also given the freedom of choice to work in different sectors/areas such as green technology, agriculture, microfinance, handicraft etc, according to their own special interest and competencies. The system also creates a network of entrepreneurs, which provides them with opportunities to work with different entrepreneurs and thereby create an ecosystem for helping the poor.

Exhibit-10: Creating entrepreneurial opportunities within the organization: the case of *Aavishkaar*

Aavishkaar was established in 2002 and aims to support rural and semi-urban entrepreneurs in India through appropriate financial investment and by providing management support, professional expertise and other resources. Aavishkaar looks for start-ups and functioning enterprises that impact the average rural or semi-urban population in India and offers financial assistance to these enterprises. The organisation aims at making the social entrepreneur self-sustaining, often by helping them to obtain funding from larger institutions.

Aavishkaar was started with the investment of Rs 0.1 million (USD 2400) and in 8 years it has built the corpus fund of more than Rs 1650 million (USD 35 million). The funds are generated from commercial banks, institutions and private investor at lower interest rates and invest these funds into small socially oriented organizations which are incapable of getting money from banks and large institutions.

Aavishkaar is an entrepreneurial organization which hires enterprising people who may or may not be entrepreneurs themselves but understand various aspects of entrepreneurship. At *Aavishkaar* each employee is treated as an entrepreneur and there is no hierarchy within the organization. The organization gives freedom to their employees to choose the project or issue in which they want to work and provides them with all kinds of support to design and implement the project. In providing such support, there is an implicit expectation that the entrepreneur would complete the project as planned in spite of any constraints.

Source:

Aavishkaar website: http://www.aavishkaar.in (September 2010) Aavishkar : http://smblog.changemakers.com/transcript-our-interview-with-vineet-rai (November 2010) http://www.dare.co.in/people/featured-investor/vineet-rai-aavishkaar-venture-management-services.htm (November 2010)

5. 6. Finding Employees from among Beneficiaries

Social enterprises all over the world often recruit their own clients or beneficiaries as employees. This strategy of developing beneficiaries-employees is particularly suitable for organizations that provide subsidized or free services to their clients. Since the 'clients' have received free or subsidized service from the organization, they would be willing to work for it for low pay or no pay. There is the case of a hospital that picks up sick and abandoned people from the streets and treats them to health. Once they are restored to health, many of them do not have a place to go to

and so decide to work for the hospital. The home for mentally challenged children is a similar case. Here mothers of the children work as nurses and care-givers. The needless have strong loyalties for the organization and stay with it for life. Retention strategies of this kind may not have many parallels. Such employees are among the most committed and empathetic as they are aware and sensitive to the mental and physical agony of the clients because of their own experience of having gone through the same situation. Besides, they do have thorough understanding of the organization functioning (see Exhibit-11).

Exhibit-11: Finding employment from among beneficiaries: the case of Jaipur Foot

Jaipur Foot was established in 1968 by Dr. P.K. Sethi to provide light weight, low cost hand-made artificial foot and lower limb prosthesis for which he borrowed the technology from the Indian Army. The product was designed to facilitate the Indian Style of living (which involves squatting, cross-legged sitting and barefoot walking). Though the product had several advantages over its western counterpart, its movement in the market was rather sluggish. In 1975 there was a drastic turnover in the fortunes of this product that was adopted by the non-profit social enterprise for large scale fabrication and marketing BMVSS (Bhagwan Mahaveer Vikalang Sahayata Samiti) Jaipur. In the last four decades, the BMVSS has served around 1 million patients by successfully running 10 marketing centers and a number of mobile camps every year in various parts of the country. The Jaipur Foot is fitted to approximately 16,000 patients annually while allied services such as sourcing spare parts, aids and appliances are provided to more than 60,000 patients in India. In addition to this, Jaipur Foot camps are located in 19 other countries such as Afghanistan, Bangladesh, Dominican Republic, Honduras, Indonesia, Malawi, Nigeria, Kenya, Panama, Papua New Guinea, Rwanda, Somalia, Trinidad, Vietnam, Zimbabwe and Sudan.

The BMVSS does not face many problems in finding the right kind of employees who are recruited primarily from the clients. The employees work hard to meet the requirements of each and every customer and provide a complete solution within a day. The whole process of providing an amputee with prosthetic limb is a very labour intensive requiring high level of skills. In fact the labour component of the product costs around 34% of the total cost. The major strength of the BMVSS lies in its committed employees who work hard and go extra mile to bring smiles on the clients' faces at the dirt cheap prices. And the world also recognized the product and services by conferring the Ramon Magsaysay Award to Dr Sethi.

Sources:
BBVSS website: http://www.jaipurfoot.org/ Case study on Jaipur Foot by Scott Macke, Ruchi Mishra and Ajay Sharma under the supervision of Professor C.K. Prahalad available at: http://www.nextbillion.net/lib/assets/documents/JaipurFoot.pdf

5. 7. Attracting Employees to Serene Lifestyle in Peaceful and Scenic Locations

The social enterprises which are located in the picturesque locations in India such as the hilly regions, the North Eastern plains or Andaman Nicobar Islands are able to retain their employees because of their geographical locations. Employees working in these areas like the scenic beauty and serene life style that are characteristic of these areas. Employees build a family kind of relation with local inhabitants and get deeply attached to these people and their lifestyles. Having lived in these areas for some time, the employees find it difficult to adjust themselves to the crowding and the rat race in cities or busy areas. Moreover, in these areas the cost of living is low and along with the moderate spending habits makes a low compensation acceptable to the employees (see Exhibit-12).

Exhibit-12: Attracting employees to serene lifestyle in peaceful and scenic locations: the case of CHIRAG

CHIRAG is a rural development organization based in the Kumaun region of Uttarakhand in India. It was started in 1987 with the mission to improve the quality of life of the rural families – with a special emphasis on women, children and the poor – residing in the villages of the Central Himalayan region, with an integrated approach of improving the lives of people in various ways. The activities of CHIRAG include community forestry, soil and water conservation, development of watersheds, increasing the availability of fodder, animal husbandry, agriculture and horticulture, provision of drinking water, primary health care, primary education and the development of knowledge and skills amongst young people.

In order to develop synergies with the work of other organizations and to support them in their work, CHIRAG provides technical support to other organizations in different regions of the country. It also generates revenue by selling handicrafts and other agricultural commodities. CHIRAG also has its share of the typical HR related issues faced by social enterprises, such as high attrition because of the low compensation and the difficulties in attracting people to work in mountainous terrains. Besides, there is perennial scarcity of talented and efficient managers who can also understand various issues affecting the lives of rural people.

CHIRAG works in over 250 villages in Nainital, Bageshwar, Pithoragarh and Almora districts. These places are known throughout the world for their scenic beauty and close proximities with nature and are inhabited by very simple and friendly people. Many of the CHIRAG employees get in spired by the lifestyle of the local population and start cherishing the natural beauty and simple lifestyle. Then it becomes easier for the organization to retain these nature-lovers within the organization.

Source:
CHIRAG website: http://www.chirag.org (September 2010)

5. 8. Providing Attractive Fringe Benefits to Employees

Since small social enterprises cannot afford to pay high compensation to their employees, they try many different methods to compensate their employees. One of them is to provide fringe benefits. Such benefits may be offered in many ways, e.g. as a support for the employees to pursue higher studies at foreign universities, provide opportunities to do part time consultancy work for other organizations which could supplement their income, encourage employees to go for various national and international conferences, provide all kinds of support to the employees if they want to change their work profile to other areas so that their interest can be retained, etc (see Exhibit-13).

Exhibit-13: Providing fringe benefits: the case of Dream a Dream

Dream a Dream is a social enterprise founded in 1999 with a mission to empower children from vulnerable backgrounds by developing their life skills at the same time sensitizing the community through active volunteering and thereby creating a non-discriminatory society where unique differences are appreciated. Dream a Dream provides children with non-traditional educational opportunities designed to allow them to explore, innovate and build important life skills. The organization also provides consultancy and life-skills development support in various private schools, it acts as one of the sources of income. Since the organization is based in Bangalore, it finds tough to attract talented staff because of its inability to pay high compensation. Organization also suffers with high attrition rate because of large number of options available for the employees.

Dream a Dream tries to provide various fringe benefits to its employees such as encouraging them to do part-time consultancy, inviting various bankers and tax planners to advice its employees on the investment and tax planning issues, etc.

Source:
Dream a Dream website: http://www.dreamadream.org (September 2010)

South Asian change makers: http://www.fyse.org/2010/11/asias-social-changemakers-vishal-talreja/(November 2010)

6. Conclusions

There is no doubt that the world is currently experiencing major social, environmental and ethical crises and no institution in the government, civil society or private sector can effectively deal with crises of such magnitude alone. It is essential for all the stakeholders of the society to come together and deal with the growing concerns of the world. Over the years there has been a huge rise in the number of the social enterprises - both the for-profit and the not-for-profit varieties - which aim at serving the poor and disadvantaged groups through revenues generated from commercial activities. The major challenge faced by social enterprises is to stick steadfastly to their social mission while pursuing commercial activities and the revenues generated by them.

Inadequacies in the availability and management of human resources have been among the most critical reasons for the failure of many social enterprises, which continue to be as critical as ever. It is a paradox that the social enterprises, who work on various human development issues, are not able to cater to the issues of human resources management within their own organizations. Social enterprises are hence looking at various ways to reduce the severity of this issue.

As the traditional source of funding the activities of the social development have been the grants and donations from government and private agencies. It is but natural that they impose restrictions on the use of such funds for the employee salaries and perks. It is the quest for reducing grant-dependency of social development activities that has given the rise to a new form of organizations, namely social enterprises, whose main funding source is the revenues generated by commercial activities. While this new form of organization would have greater financial autonomy, the resources generated are not large enough for them to afford market-rate compensation and perks for their employees. Hence their HR strategies have to be designed around a different paradigm than the traditional one based on salaries and perks.

In the analysis of the people-management practices of the commercial organizations, it was observed by Manimala (2010) that the philosophical assumptions underlying these practices can be described as

the 'outsider paradigm', where the employer treats the employee as an outsider to the system. Under this paradigm, the ultimate responsibility for achieving the organizational objectives rests with the employer, who therefore has to motivate his 'uninterested' and 'uninvolved' outsider-employee through financial compensation, perks and incentives. Hence the dominant basis of the HR strategies in the commercial organizations is monetary compensation.

Social enterprises, on the other hand, seem to operate on the basis of a 'partnership paradigm' (Manimala 2010) of the human resources management. Apparently, this is a matter of necessity rather than the choice in spite of the fact that the ideology of inclusiveness is fundamental to the creation of the social development organizations. The reason why an employee of a social enterprise has to be a partner is the fact that social enterprises are mostly service-providers, where it is extremely difficult to separate the service from the person providing the service. Hence, the employee has to be fully integrated with the organization and thereby imbibe its service ideology to be effective in his/her work. The second reason why the partnership paradigm is more suitable for social enterprise is that the risks and responsibilities are shared and, therefore, the work is perceived as more important than the monetary rewards associated with it. Thus, the employees are prepared to work for the relatively low compensation and that could become a significant factor contributing to the long-term survival of the most social enterprises. These are the theoretical reasons why social enterprises are likely to adopt the partnership paradigm for managing their employees.

In the empirical exercise of analyzing a few cases of social enterprises to identify the HR strategies frequently used by them, the findings strongly support the above mentioned theoretical perspective - social enterprises tend to adopt a partnership paradigm for managing their employees which is especially relevant for acquiring and retaining them. Out of the eight identified strategies, the majority are about developing partnership with employees. In this context the following strategies are of special relevance: building vision and value congruence, brand building of the organization, developing a sense of ownership among employees through participation in equity as well as decision-making, providing learning and development opportunities to the employee so as to better equip them for their service-tasks, and creating entrepreneurial opportunities for the employees within the organization. It is, therefore, legitimate for us to propose that the theoretical paradigm governing the HR strategies of social enterprises can be described as a partnership paradigm.

References

Alter, S. 2000. *Managing the Double Bottom Line: A Business Planning Reference Guide for Social Enterprises*: Pact Publications.

Ban, C, Drahnak-Faller, A, & Towers, M. 2003. 'Human resource challenges in human service and community development organizations', *Review of Public Personnel Administration*, 23: 2, 133.

Barbeito, C, & Bowman, J. 1998. *Nonprofit compensation and benefits practices*: John Wiley & Sons Inc.

Barney, J, & Wright, P. 1998. 'On becoming a strategic partner: The role of human resources in gaining competitive advantage', *Human Resource Management*, 37: 1, 31-46.

Belcourt, M, & McBey, K. 2010. *Strategic human resources planning*: Nelson Education.

Bhatnagar, J. 2007. 'Talent management strategy of employee engagement in Indian ITES employees: key to retention', *Employee Relations*, 29: 6, 640-663.

Bornstein, D. 2007. *How to change the world: Social entrepreneurs and the power of new ideas*: Oxford University Press, USA.

Brandel, G. 2001. 'The truth about working in not-for-profit', *CPA Journal*, 71, 10-13.

Brown, W, Yoshioka, C, & Munoz, P. (2004). 'Organizational mission as a core dimension in employee retention', *Journal of Park and Recreation Administration*, 22: 2, 27–42.

Dees, J, Emerson, J, & Economy, P. (1998). 'Enterprising nonpro ts', *Harvard Business Review*, 76: 1, 54–67.

Fegley, S. 2006. 'Talent management survey report', *SHRM Research*.

Frederickson, H, & Hart, D. (1985). 'The public service and the patriotism of benevolence', *Public Administration Review*, 45: 5, 547-553.

Hall, M, & Banting, K. 2000. '«The Nonprofit Sector in Canada: An Introduction»', *The nonprofit sector in Canada: Roles and relationships*, 1-28.

Houston, D. 2006. '" Walking the Walk" of Public Service Motivation: Public Employees and Charitable Gifts of Time, Blood, and Money', *Journal of Public Administration Research and Theory*, 16: 1, 67.

Howe, P, & McDonald, C. 2001. 'Traumatic Stress, Turnover, and Peer Support in Child Welfare', *Washington: Child Welfare League of America*.

Huselid, M. 1995. 'The impact of human resource management practices on turnover, productivity, and corporate financial performance', *Academy of management journal*, 38: 3, 635-672.

Light, P. 2000. *Making nonprofits work: A report on the tides of nonprofit management reform*: Brookings Institution Press.

Lynn, D. 2003. 'Symposium', *Review of Public Personnel Administration*, 23: 2, 91.

McMullen, K, Schellenberg, G, & Networks, CPR. (2003). *Job quality in non-profit organizations*: CPRN= RCRPP.

Manimala, MJ 2010.Paradigms of People Management: Resource Strategies During an Economic Downturn, Paper presented at the 32nd Annual Conference of the Japan Creativity Society, Kinki University, Osaka, Japan, 15-17 October .

Nicholls, A. 2006. *Social entrepreneurship: new models of sustainable social change*: Oxford University Press, USA.

O'Reilly III, C, Chatman, J, & Caldwell, D. 1991. 'People and organizational culture: A profile comparison approach to assessing person-organization fit', *Academy of management journal*, 34: 3, 487-516.

Osborn-Jones, T. 2001. 'Managing talent Exploring the new psychological contract'.

Peters, J, & Masaoka, J. 2000. 'A house divided: How nonprofits experience union drives', *Nonprofit Management and Leadership*, 10: 3, 305-317.

Rainey, H. 1983. 'Public agencies and private firms', *Administration & Society*, 15: 2, 207.

Reed, P, Howe, V, & Canada, S. (2000). *Voluntary Organizations in Ontario in the 1990s*: Statistics Canada Ottawa.

Salamon, L. 2002. *The state of nonprofit America*: Brookings Inst Pr.

Salamon, L, & Sokolowski, S. 2004. *Global civil society: dimensions of the nonprofit sector*: Kumarian Press.

Smith, S, & Lipsky, M. 1993. *Nonprofits for hire: The welfare state in the age of contracting*: Harvard Univ Pr.

Srivastava, P, & Bhatnagar, J. 2008. 'Talent acquisition due diligence leading to high employee engagement: case of Motorola India MDB', *Industrial and Commercial Training*, 40: 5, 253-260.

Taylor, M, & Collins, C. 2000. 'Organizational recruitment: Enhancing the intersection of research and practice', *Industrial and organizational psychology: Linking theory with practice*, 304–330.

Vigoda, E, & Cohen, A. 2003. 'Work congruence and excellence in human resources management', *Review of Public Personnel Administration*, 23: 3, 192.

Watson, M, & Abzug, R. 2005. 'Finding the ones you want, keeping the ones you find: Recruitment and retention in nonprofit organizations', *RH Associates, The Jossey-Bass Handbook of Nonprofit Leadership and Management*, 623-659.

Westall, A, & Chalkley, D. 2007. 'Social enterprise futures', *The Smith Institute, London, available at: www. smith-institute. org. uk/pdfs/sociaL_enterprise. pdf (accessed May 2007)*.

Wittmer, D. 1991. 'Serving the people or serving for pay: Reward preferences among government, hybrid sector, and business managers', *Public Productivity & Management Review*, 14: 4, 369-383.

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FACTORS IMPACTING SUSTAINABLE INTERNATIONALIZATION: A CASE OF MULTINATIONAL COMPANY

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Abstract. Presented paper aims to investigate internationalization of multinational company by exploring the main proactive and reactive factors impacting internationalization process. The authors strive to reveal the patterns of internationalization taking into account the aspects of the main theoretical models. The research is based on the main ideas of stage, learning and contingency approaches. The main proactive and reactive factors impacting internationalization process are based on the previous studies. The authors develop a research methodology and discuss main findings of the case study and survey. Results of the empirical investigation allow concluding that internationalization of a multinational company was initiated by several factors, namely environment, market, home and production.

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Introduction

Globalisation of economy and intense competition stimulate companies to seek for the ways of internationalization and significantly contribute to the economic development of nations, industries and productivity. Hence, during the last few decades internationalization as a phenomenon has been researched by various scholars and from different points of view. Multinational companies expand their market share through internationalization and studies indicate that multinationals internationalize in order to growth large. However, the success of internationalization depend on factors motivating and restricting internationalization process.

Independence of the Baltic States and liberalization of economies have attracted multinationals from Western Europe and especially from Scandinavian countries. Sugar producing sector of the Baltic countries attracted to invest *Danisco Sugar*, a Danish multinational company. Notably, production of sugar in the Baltic countries was attractive until 2004. The situation has changed dramatically when the Baltic countries joined the EU. Sugar industry is controlled by the EU Commission and the EU Sugar Regime. Hence, the regulation impacts sugar producing companies' internationalize in the EU and outside the EU.

The purpose of the paper is to investigate the factors impacting internationalization of *Danisco Sugar* in the Baltic countries. The paper is organized into five sections. The second section analyses internationalization theories and models. The factors impacting internationalization of companies are discussed in the third section. The fourth section presents methodology applied by the authors. The fifth section provides findings of the case study and survey. Finally conclusions based on the research are presented. The authors strive to reveal the reactive and proactive factors of internationalization taking into main theoretical models and approaches.

Internationalization Theories and Models

The scholars analysing internationalization as a phenomenon have put a lot of attempts to define "internationalization" concept. Hence, the literature focusing on the internationalization is vast and comprises various aspects. Some scholars claim that internationalization means a changing state. Hence, the growth of the firm provides a background to internationalization and the concepts of internationalization and growth are interrelated (Buckley and Ghauri 1993). However, Ruzzier et al. state that "some features are unique to internationalization or, at least, there are significant degrees of difference between growth at home and growth internationally" (Ruzzier et al. 2006).

One stream of scholars, striving to define internationalization, put emphasis on process, through which firms are increasingly involved in the international markets. (Johanson & Vahlne 1977; Welch & Luostarinen 1988). For instance, Welch and Luostarinen state, that the internationalization process is seen as gradual and sequential, through which firms become increasingly committed to, and involved in, international markets.

Meanwhile, Johanson and Vahlne emphasise the development of "networks of business relationships in other countries through extension, penetration and integration" (Johanson & Vahlne 1990). Hence, a network analysis is seen as another point of view to the firm's international activities (Johanson and Matson 1993).

Calof and Beamish, defining internationalization, emphasise the adaptation of the firms operations to the international environments (Calof & Beamish 1995). For instance, B.Petersen et al. claim that due to the globalization of industries, domestic firms can be subject to an increased pressure to internationalize rapidly in order to repel attacks from global competitors (Petersen et al. 2001). These authors state that domestic firms are driven into internationalization process even though they lack knowledge about international ventures. However, Ahokangas, inspired by resource based view, claims that internationalization is seen as "the process of mobilizing, accumulating, and developing resource stocks for international activities" (Ruzzier et al. 2006).

Despite the various approaches to the definition of internationalization, the authors of this paper adopt the view that internationalization is the expansion of firm's operations to the foreign markets and agree with the notion that internationalization could result from punctual and independent actions. On the other hand, in order to show the complexity of the phenomenon, it is important to discuss the main internationalization theories and models.

It should be noted that the internationalization studies are based on several approaches to internationalization, namely stage, learning, contingency and network approaches.

Stage approaches are seen as the earliest group of theories explaining the internationalization process. The scholars supporting this approach state that firms start with the mode of entry which require the least commitment of resources and with experience in the market increase their commitment of resources to international activities. For instance, this approach was supported by Cavusgil (1980) and based on progressive reduction of uncertainty. Additionally Reid (1991) has stated that the firms moved from awareness (of export potential) to the evolution (of the result of initial exporting) and acceptance (of exporting as a good thing).

Another group of scholars apply learning theory and state that internationalization is a dynamic process. The studies of Johansson and Wiedersheim-Paul (1975) have laid theoretical framework for the Uppsala model, proposed by Johansson and Vahlne (1977). The model highlights the resource commitment to the foreign markets, market commitment, decisions to commit resources and the performance of current business activities (Johansson and Vahlne 1977). On the other hand, the model has highlighted the relevance of psychic distance in international business decisions. The psychic distance concept was defined as "the sum of factors preventing the flow of information from and to the market" (Johansson and Vahlne 1977). The scholars referring to learning theory have focused on evolutionary and sequential building of foreign commitments over time (De Burca et al. 2004). According to Wiedersheim-Paul et al., firms start their international activities in the nearby markets via an intermediary and then on a direct basis. The establishment of the sales subsidiary could be followed by some form of production in the international markets (Wiedersheim-Paul et al. 1978).

Contingency approach to internationalization assume that the firm evaluates and responds to an opportunity as it occurs regardless of whether the market is close in psychic distance terms or whether an advanced mode of entry is required (Okoroafo 1990).

Network approaches emphasise the role of the linkages and relationships in the internationalization process (Johanson and Matson 1993). Chetty and Blankenburg-Holm (2000) state that internationalization takes place in three ways: through creating relationships with partner in new countries, rising commitment in already established foreign networks and integrating their positions in networks in various countries. Hence, the success of the firm in entering new markets depends on its position in the network and relationships within current market.

However, in order to explain the phenomenon of firm's internationalization, the studies support the integration of several approaches. According to the scholars, the integration of stage approach, network approach and foreign direct investment theory (including transaction cost analysis) allow us understand better the SMEs internationalization (Covielo and McAuley 1999; Coviello and Martin 1999). In the same way, Etemad and Wright suggested combining a variety of theoretical models, including stage approach, FDI theories and network approach (Etemad and Wright 1999). Bell et al. incorporating stage and network approaches recognise "the explanatory value of contingency approach and allied resource-based theories" (Bell et al. 2003). Likewise, Ruzzier et al. have proposed the integration of the process models, innovation models, network approach, resource-based view and international entrepreneurship theory (Ruzzier et al. 2006). Hence, an integrative approach is seen as a new stream in the research of firm's internationalization.

Factors Impacting Internationalization

Expanding to the international markets presents an important opportunity for growth and value creation and exposes unique challenges in addition to common challenges in the domestic markets (Lu and Beamish 2001). Therefore, the scholars focusing on the issues of internationalization have strived to define the main stimuli and barriers of internationalization.

The scientific literature concerned with the main motives of internationalization distinguishes several broad areas: decision-maker characteristics; firm-specific factors, environmental factors and firm characteristics (Katsikeas and Piercy 1993). Notably, internal and external stimuli in the decision for internationalization of the SMEs are emphasized (Cavusgil and Godiwalla 1982). It is agreed that firms are likely to be motivated by different stimuli that depend on the stage of internationalization.

Lu and Beamish emphasize that many challenges of internationalization are associated with the liability of foreignness and newness (Lu and Beamish 2001). These challenges are seen of higher importance if the target market is dissimilar to the domestic market and if new subsidiaries are established. Hence, firms are fostered to acquire new resources and capabilities when entering a foreign market. Notably, as a firm expands its activities into the international marketplace, managers usually have to tackle with the increasing risk and decreasing profits. According to Czinkota et al. there is a learning curve that every company follows, even with the best planning. Hence, expertise is developed gradually, and during that process there is a high degree of uncertainty (Czinkota et al. 2004). Over the longer term, the company's activities stabilize as the firm becomes more experienced, obtain more knowledge but for the short term the situation may become more complicated. Notably, the scholars point out that successful performance can be achieved in three ways: *effectiveness, efficiency, and competitive strength* (Czinkota et al. 2004*). Effectiveness* is characterized by acquisition of market share abroad and by increased sales. *Efficiency* is manifested by rising profitability. *Competitive strength* is reflected by the increased market share. Hence, the factors and motivations which stimulate a company to react proactively are named as proactive and factors which stimulate a company to react to external environment are indicated as reactive. In other words proactive firms expand to international markets because they want to, while reactive ones internationalize because they have to (Czinkota, Ronkainen 1994).

The studies focusing on barriers of internationalization by exporters and/or non-exporters distinguish such broad areas: financial, managerial, market – oriented (including both national and international markets), and characteristics of industry and the firm (Leonidou 1995; Morgan 1997). It is agreed that the barriers of internationalization exist at any stage of the internationalization process. On the other hand, barriers may differ in intensity depending on the level of internationalization of the individual firm (Cavusgil 1984; Katsikeas and Morgan 1994).

Fletcher concludes that the scientific literature focusing on the main factors impacting internationalization is exhaustive and distinguishes management characteristics, organization characteristics, exter-

nal impediments or external incentives to engage in business overseas (Fletcher 2001).The researches concerned with the management characteristics emphasize knowledge of the international business, international transactions experience, planning orientation or having strategic approach (Cavusgil and Godiwalla 1982; Fletcher 2001). Meanwhile, the focus on the organizational characteristics embraces willingness to develop products for the overseas markets, technological advantage, and willingness to research the overseas markets (Bilkey, 1985; Evangelista, 1994; Cavusgil, 1984). Notably, external impediments are marketing activities by competitors in the overseas markets and perception of the higher risk in the overseas markets, knowledge of the market and how it operates, cost issues, lack of export training and government assistance (Johnston and Czinkota 1985; Bilkey 1985). Finally, the most important external incentives are the availability of export incentives from government, oversees demand factors, fall in domestic demand or excess capacity and reduction in costs of production (Kaynak and Kothari 1984; Johnston and Czinkota 1985; Reid 1983).

Methodology

The mentioned discussion leads to research the questions comprising factors impacting internationalization of multinationals. Notably, the analysis of scientific literature focusing on the business internationalization theories allows us to distinguish a number of possible explanatory factors of internationalization patterns and decisions. The quantitative and qualitative research methods are applied in order to perform a research. Hence, the aim of the research is to conduct a case study and survey which allows us to analyze factors of internationalization at *Danisco Sugar Company* in the Baltic countries. Following recommendations proposed by other scholars, qualitative research contains data collected that originates from the non-quantifiable sources such as attitudes, values and perceptions (Yin 1994). The case of *Danisco A/S* was investigated using the data from previous case studies, articles in the international press, company's publications and annual reports. Notably, the research was carried out before the acquisition *of Danisco A/S* by *Nordzucker*. Additionally, the quantitative research that allows us to conduct the systematic scientific investigation of the quantitative properties and phenomena was applied. In order to carry out the survey, a framework based on the main theoretical findings was developed (Table 1). The framework has served as a basis for the questionnaire investigating internationalization factors.

Table 1. The framework of internationalization factors

A - Market Factors	B - Environmental Factors
Competitive pressure (R)	**Political, legislative, economic environment (P)**
• *Price*	• *EU policy*
• *Networking capabilities*	• *Food safety and quality and legislative requirements*
• *Product assortment*	• *Economics and living standards*
• *New competitors in the market*	• *Taxes*
Distance and geographic closeness (R)	**Climate change (R)**
• *Communication infrastructure*	**Effects of natural disasters and accidents (R)**
• *Access to waterways and rails*	**Cultural environment (P)**
• *Transportation infrastructure*	• *Different languages*
• *Time zone*	• *Different ethnicities*
Product image in the market (P)	• *Different religion*
• *Brand image*	• *Different social norms and traditions*
• *Package*	
• *Marketing & advertising skills*	
• *product functionality*	
C - Production Factors	**D - Home Country Factors**
Overproduction (R)	**Saturated domestic market (R)**
Profitability (P)	**Declining domestic sales (R)**
Technological advantage (P)	**Dependence on raw materials and suppliers (R)**
• *Skilled staff*	**Currency differences (P)**
• *Product safety and sustainability*	
• *R&D and innovations*	
• *know-how*	

The framework allows us to distinguish four groups of factors: market factors, environmental factors, production factors and home country factors. Referring to studies conducted by Czinkota and Ronkainen (1994) factors of these four groups are divided into proactive (P) and reactive factors (R). Proactive factors mean anticipating events such as problems, markets, trends, and consumer demands and planning ahead for them. Reactive factors mean - reacting to events when they occur with little

to no anticipation of events. The questionnaire was distributed in the year 2009 among 25 managers directly involved into internationalization process in Denmark, Lithuania and Latvia.

Results and Discussion

Case study

Danisco A/S is the Danish company established in 1989 after the three companies (*AS Danisco*, *Danish Distillers* and *Danish Sugar*) merged together under the same name. Notably, the defined strategy was "to be a first class supplier to the international food industry on the global market and be a supplier of high quality foods and branded goods on selected European markets" (Meyer 2006). Finally, the company has developed from the sugar-based conglomerate to world leader in food ingredients, enzymes and biotechnology.

By 1995, *Danisco* had sold off all of its technology and machinery companies as well as those in „other" business sectors. Thus, the company maintained three lines of business activity: food and beverage (including sugar), food ingredients and packaging (Meyer 2006). The strategic actions taken by *Danisco* were seen as Denmark's largest business reconstruction ever. Between 1989 and 1995, foreign sales of the *Danisco* group in Western Europe increased from 43% to 60% of the turnover and thus, *Danisco* became a regional European MNE. The internationalization of *Danisco A/S* started in 1954.

From 2001 to 2004, *Danisco* grew its new core: the ingredients business spread all around the world. Expansion in Europe, North America and Australia occurred mainly through acquisitions, while business in the emerging markets grew organically to a larger extent. The main internationalization stages of *Danisco* group and entry into different markets are presented in Table 2.

Table 2. The main internationalization stages and entry into different markets

Germany	USA	Mexico	France	Spain	Brazil	Malaysia	Sweden, Chile	Czech resp.	Lithuania	Finland China	Australia	Belgium	Latvia
1954	1980	1981	1983	1985	1986	1990	1993	1995	1998	1999	2001	2002	2007

For the past 20 years *Danisco* has been establishing new sales departments over the world, splitting and acquiring new companies. *Danisco* engaged in the long-term global restructuring from conglomerate to focused strategy in the closely related business areas over a period of more than 20 years. The restructuring involved *selling noncore business units, while acquiring businesses around the world in the core business area* (Meyer 2006). It was a continuous process rather than a one-off restructuring. The focusing was related to rapid internationalization outside of Europe. Internationalization of *Danisco* group involved more than just entry into a range of different markets. Notably, new business models have been developed to take advantage of the global sourcing opportunities and locating production where costs are most favorable. *Danisco* has established themselves as a global player in the selected industries while exiting those industries where it could not achieve market leadership.

Danisco Sugar as the separate business unit of *Danisco* in the Baltic States is one of the largest sugar producers in Europe, boasting market leadership in the Scandinavian countries and the Baltic States and targeting growth in the new markets, such as Poland, Czech Republic, Hungary, Slovakia, Slovenia and other CEECs. Based on the annual output of around 1 million tons of sugar produced at the factories in Denmark, Sweden, Finland, Germany and Lithuania, *Danisco Sugar* offered a wide range of sugar products tailored to the industry and consumer needs, as well as animal feed and sugar beet seed. In 2009 *Danisco Sugar* was acquired by the German company *Nordzucker*, so the name of *Danisco Sugar A/S* was changed to *Nordic Sugar A/S*. *Danisco Sugar* became a wholly owned subsidiary.

Danisco Sugar through its subsidiaries or sales representatives operates in Sweden, Finland, Non EU Nordic (Norway, Faroe Islands and Greenland), Lithuania, Latvia, Denmark, Estonia, etc. Referring to Uppsala theory (Johanson, Vahlne 1977), internationalization stages of *Danisco Sugar* in the Baltic States is presented in figure 1.

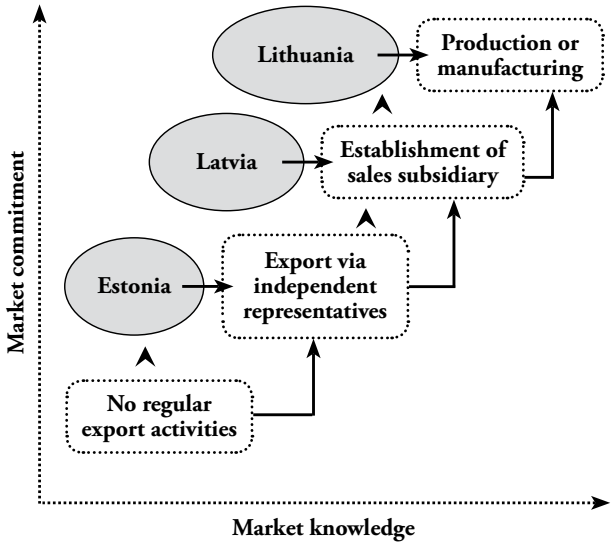

Figure 1. Internationalization stages in the Baltic countries

The strategy of *Danisco Sugar* was aimed to invest in the Baltic States. Hence, the company established a sales office in Estonia handled by *L.L.C. Montemar*, which handled all specialty sugar distribution and arranged logistics solutions in the Baltic region. Notably, *Danisco Sugar* did not aim to acquire or establish new factories in Estonia. Referring to Uppsala theory (Johanson, Vahlne 1977) *Danisco Sugar* internalized in Estonia taking the second step – company established export via the independent representative.

In 2007 Latvia's Competition Council has allowed the merger of *Danisco Sugar* and *Jelgavas cukurfabrika*. As the result *Danisco Sugar* was set to acquire the *Jelgavas cukurfabrika* assets - including its trademark - „*Jelgava cukurs*". The company established new sales office in Riga– *Danisco Sugar SIA*, which was operating as sales subsidiary of *Danisco Sugar*, selling retail and industry sugar products. Warehouse in Jelgava is a convenient geographic place for storage in terms of the Baltic countries and Riga port is expedient to deliver sugar or molasses from Lithuania or the Nordic countries. Before *Danisco Sugar* takeover of Jelgavas Sugar factory, only two competitors were in Latvian sugar market: sugar factories in Liepaja and Jelgava. After the acquisition of Jelgavas Sugar factory *Danisco Sugar* expanded its market share to 30 %. After huge struggle in the market, the share of *Danisco Sugar* in Latvia increased to 49%.

In Lithuania *Danisco Sugar* made the largest acquisitions in the whole Baltic sugar market. In 1998 *Danisco Sugar A/S* in Lithuania acquired sugar producing factories (*Kuršėnų cukrus*, *Panevėžio cukrus*, *Kėdainių cukrus*, and *Pavenčių cukrus*) and they all started working as *Danisco Sugar* subsidiaries. *Marijampolės cukrus* (nowadays *ARVI cukrus*) belongs to Lithuanian investors. Notably, some factors as ineffective production and the EU sugar regime has impacted the decision of shareholders to close *Pavenčių cukrus* in 1999, *Kuršėnų cukrus* in 2004, and *Panevėžio cukrus* factory in 2007.

Currently, Kėdainiai Sugar factory, which is operating since 1970, supplies sugar beets by approximately 613 beet growers. The main product is granulated sugar and feed products from the beet fibers left once the sugar has been extracted. The entire annual sugar production is achieved during the campaign extending up to 80 days - from the end of September to the beginning of January when the facility operates 24 hours a day, seven days a week.

Under the Dan Sukker ® brand, the granulated sugar is sold to the retail market in 1-kilo packages and to the industry in 50-kilo bags and in bulk. There are 211 employees working at the factory; however, during the beet campaign this number is expanded by the temporal labor force of 116 people.

The Baltic countries are supplied with sugar through the Pan-Baltic supply channel (Figure 2).

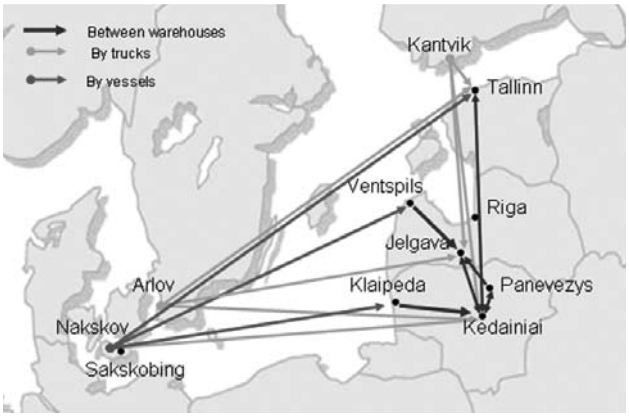

Figure 2. Supply chanel of the Baltic countries, 2009

Notably, different kinds of sugar products are produced in different production sites (Kantvik – Finland, Nakskov or Sakskobing – Denmark, Arlov – Sweden, Kėdainiai – Lithuania) the swapping of products is made via well organized and efficient logistics (mainly ferryboat, trucks and vessels). All *Danisco Sugar* sales procedures in the Baltic countries are controlled and invoiced from Copenhagen. So, this means that the subsidiaries are fully controlled from the headquarters.

The decentralized management is the analogy to the

parent company *Danisco Sugar*.

Danisco Sugar always strived to be closer to the customers and suppliers (because beet growing and production sites must be situated locally), cooperate with them in food industry, select and develop ingredients for new products, adapt them to consumer tastes in different countries. The leadership ambitions of *Danisco Sugar* in the Baltic countries required to develop capabilities to supply food producing multinationals, such as Kraft, Orkla group, Coca-Cola Global, Vaasan&Vaasan, Leipurin, etc. as well as other regional and local players.

Survey results

The survey results of *Danisco Sugar* and its subsidiaries in the Baltic region revealed that all four groups of factors influencing internationalization impacted the decision of the Danish company to enter Baltic market. Figure 3 represents the means obtained during the survey and mean distribution among the factors.

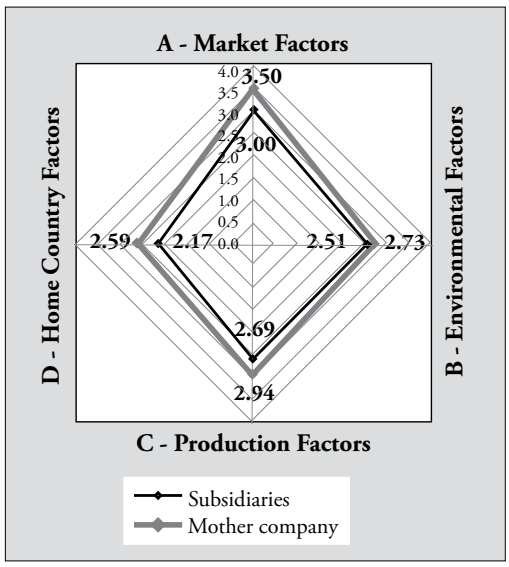

Figure 3. Main factors influencing internationalization

Means are distributed approximately in the same direction. Means, which represent response of respondents from parent company, are larger than means, which represent response of respondents from subsidiary companies. The obtained results allow concluding that internationalization of *Danisco Sugar* in the Baltic countries was impacted by market factors, namely competitive pressure, distance and geographic closeness, product image (responses of respondents from parent and subsidiary companies). Home country factors, namely saturated domestic market and declining sales in it, dependency on raw materials and risk of currency exchange rate are seen as less important. Notably, differences among all four means are not so high (largest difference is 0.5, lowest - 0.22). Hence, the data allow us concluding that all four factors impacted decision of company to internationalize its activities.

Notably, expansion of *Danisco Sugar* in the Baltic countries was impacted by the most important proactive factors namely, *profit advantage* seeking in foreign markets and creating value for different customers with *exclusive information about products support* (very strong attitude is to know-how, continuous learning and expertise in creating new products, recipes, findings about nutritional facts). *Technological advantage* of sugar production plants in Scandinavia, high quality and biotechnologies, biochemistry creation motivates *Danisco Sugar* to enlarge business, through acquisition of new companies or merging with competitors. Hence, the revenues and profits are boosted by exploiting market opportunities. Additionally, *Danisco Sugar* strives to gain tax advantages and aims to diminish investment risk targeting only growing markets.

Reactive factors such as *competitive pressure* in the local market and *declining domestic sales*, overproduction due to optimization and well planned technology in the Danish factories influenced expanding abroad. For instance, in Denmark only one sugar factory operates. Meanwhile in other sites, like Germany, Sweden, France, Poland and etc. the competition is really intense. All the EU countries have to follow the EU sugar regime, which regulates the quotas for sugar production. Hence, the particular sugar quantity, produced in the EU must be sold in the EU. The export to the non-EU countries is very low, due to strict regulations of export permissions. Therefore if company is not able to fight off high competition in the home country, it must export to other countries striving to sell sugar produced according to the obtained quota.

The main reactive and proactive factors, which impacted internationalization of *Danisco Sugar* into the Baltic market, are summarized in Table 3.

Table 3. Proactive and reactive factors that encouraged internationalization

Proactive motivations	Reactive motivations
Opportunity to *increase profit* of *Danisco Sugar* investing in the Baltic countries and being the largest sugar producer in this market. Moving to the Baltic countries allowed obtaining cheaper production sites and new market.	Reaction to *competitors' pressure* (mostly *Sudzucker, Nordzucker*) and big competition in sugar market in the EU and Scandinavia. Competitors could target to buy the Lithuanian and Latvian sugar factories, so being late could mean the loss of the profit and market share.
Technological and high quality production advantages could be transferred to Lithuanian subsidiaries	*Overproduction and excess capacity* of sugar in Scandinavia made the Baltic countries' market attractive of possibility to achieve broader distribution of sugar products in the new markets.
Market knowledge and exclusive information, including tacit knowledge about the Baltic market via international research, previous export activities in Lithuanian, Latvian, Estonian markets	*Declining sales* of *Danisco Sugar* in the Scandinavian countries could be compensated in the Baltic countries as the imported sugar from other EU countries started to flow into the Scandinavian market.
Laws and regulations regarding sugar motivated *Danisco Sugar* to find other markets with sugar quotas and gain profit from sugar production (Latvia case)	*Proximity* to beet growers and large international producers is a key factor for the sugar factories as they tend to be in short distance from the raw material suppliers and customers. Being close means lower cost of transportation.
Economies of scale as a lot of products were produced in Denmark; Sweden and they could be exported to the Baltic market. Exporting activities could increase the output.	
Internationalization decision was urged as of *reducing expenses* for labor, taxes benefits, energy, etc., as the Baltic countries cost of living index, taxes, price of electricity, gas, water prices were lower than in Scandinavia. Low market entry cost comparing with the Scandinavian countries (expenses for marketing, administrative costs, etc.).	

The survey results allow us to compare responses of employees of subsidiary and parent companies (Figure 4).

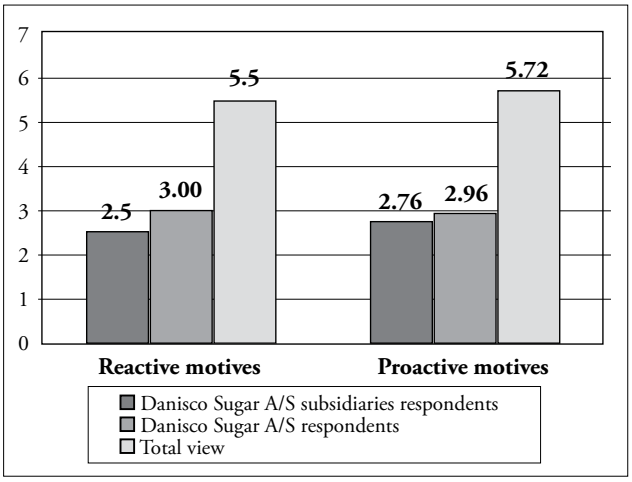

Figure 4. Distribution of respondents' opinions regarding reactive and proactive motives influencing internationalization

The obtained results allow concluding that employees of subsidiary companies distinguish proactive factors as the most important. Meanwhile, employees of parent company indicate that reactive factors are the most important. However, the differences between reactive and proactive motives are not substantial. Hence, both groups of factors are seen as important in internationalizing activities in the Baltic countries.

Conclusions

The internationalization as a phenomenon was analyzed by various scholars and in various fields. The case analysis and survey data allow us concluding that the company has to take significant actions before entering new markets.

The above research indicates that international decision making of multinational company is impacted by both proactive and reactive factors. The research has revealed that multinational company, operat-

ing in Nordic and Eastern Europe, successfully established business in the Baltic countries; the scale of internationalization was larger in Lithuania and Latvia due to acquisition of production site facilities. *Danisco Sugar* expanded geographically into new markets which are closer physically and psychologically. Hence, it is possible to state that internationalization process of *Danisco Sugar* in the Baltic countries followed Uppsala internationalization model.

The findings of research allow elaborating proposals for future research. Notably, the authors have presented research model, which can be tested in other studies, analyzing internationalization motives of multinationals. On the other hand, the research sample can be expanded in order to get more reliable results. A larger sample allows investigating the relationships between factors impacting internationalization and their influence on company's decisions to expand abroad. Moreover, the application of the model in other research studies and other industries allow distinguishing its strengths and weaknesses. The research is valuable for decision makers in multinational companies because it allows distinguishing proactive and reactive factors of internationalization. The limitation of the model refers to the fact that markets are different and various factors, impacting internationalization, may emerge and influence company's decisions.

References

1. Bell, J. McNaughton, R. Young, S. and Crick, D., 2003. Towards an integrative model of small firm internationalisation. *Journal of International Entrepreneurship, 1(4):339-362.*

2. Bilkey, W.J., 1985. Development of export marketing guidelines. *International Marketing Revie*w, 2(1): 31–40.

3. Buckley, P. J. and Ghauri, P. N., 1993. Introduction and overview. In P. J. Buckley and P. N. Ghauri, Ed. *The internationalization of the firm.* London: Academic Press, pp. ix-xxi.

4. Calof, J. L. and Beamish, P. W., 1995. Adapting to foreign markets: explaining internationalization. *International Business Review* 4(2):115–131.

5. Cavusgil, T., 1980. On the internationalisation process of firms. *European Research* 8(6):273–281.

6. Cavusgil, S. T. and Godiwalla, Y., 1982. Decision-making for international marketing: a comparative review. *Management Decision* 20(4): 47-54.

7. Cavusgil, S. T., 1984. Differences among exporting firms based on their degree of internationalization. *Journal of Business Research*. 12(2), 195-208.

8. Cavusgil, S. T., 1984. Organizational characteristics associated with export activity. *Journal of Management Studies* 21(1): 3–22.

9. Chetty, S. and Blankenburg-Holm, D., 2000. Internationalization of small and medium-sized manufacturing firms: a network approach. *International Business Review*, 9(1): 77-93.

10. Coviello, N. E. and McAuley, A., 1999. Internationalisation and the smaller firm: a review of contemporary empirical research. *Management International Review* 39(3):223–256

11. Coviello, N. E. and Martin, K. A. M., 1999. Internationalization of Service SMEs: An Integrated Perspective from the Engineering Consulting Sector. *Journal of International Marketing*, 7(4): 42-66.

12. Czinkota, M. R.; Ronkainen, I. A. 1994. *International Marketing Strategy: Environmental Assessment and Entry Strategies*, Harcourt Brace College Publishers.

13. Czinkota, M. R., Ronkainen, I. A., Ortiz, M. 2004. *The export marketing imperative*. Thomson, Mason, Ohio, U.S.A.

14. De Burca, S., Fletcher, R. and Brown, L., 2004. *International Marketing. A SME Perspective*, 2nd Edition, Australia: Pearson Education.

15. Etemad, H. and Wright, R. W., 1999. Internationalization of SMEs: management responses to a changing environment. *Journal of International Marketing*, 7(4): 4–10.

16. Evangelista, F. U., 1994. Export performance and its determinants: some empirical evidence from Australian manufacturing firms. In: Cavusgil, S. T. and Axmin, C. T., Editors, 1994. *Advances in international marketing* vol. 6**,** JAI Press, Greenwich, CT, pp. 207–229

17. Fletcher, R., 2001. A holistic approach to internationalisation. *International Business Review*, 10(1): 25-49.

18. Johanson, J. and Mattsson, L.G., 1993. Internationalization in industrial systems – a network approach, strategies in global competition. In Buckley, P. J. and Ghauri, P. N. Eds., *The Internationalization of the Firm: A Reader*, Academic Press, London,

pp. 303-22.

19. Johanson, J. and Vahlne, J. E., 1977. The internationalization process of the firm—a model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies*, 8(1):23–32.

20. Johanson, J. and Vahlne, J. E., 1990. The mechanism of internationalization. *International Marketing Review*, 7(4):11-24.

21. Johanson, J. and Wiedersheim-Paul, F., 1975. The Internationalization of the Firm - Four Swedish Cases. *Journal of Management Studies*, 12(3): 305-322.

22. Johnston, W. J. and Czinkota, M. R., 1985. Export attitudes of industrial manufacturers. *Industrial Marketing Management*, 14: 123–132.

23. Katsikeas, C. S. and Piercy, N. F., 1993. Long-term export stimuli and firm characteristics in a Europaen LDC. *Journal of International Marketing*, 1(3): 23-47.

24. Katsikeas, C. S. and Morgan, R. E., 1994. Differences in perception of exporting problems based on firm size and export market experience. *European Journal of Marketing*, 28(5): 17- 39.

25. Kaynak, E. and Kothari, V., 1984. Export behaviour of small and medium-sized manufacturers: some policy guidelines for international marketers. *Management International Review*, 24(2): 61–69.

26. Leonidou, L. C., 1995. Empirical research on export barriers: Review, assessment and synthesis. *Journal of International Marketing*, 3(1): 29-43.

27. Lu, W. J. and Beamish, P. W., 2001. The Internationalization and Performance of SMEs," *Strategic Management Journal*, 22: 565-586.

28. Meyer, K. E., 2006. Globalfocusing: from domestic conglomerate to global specialist. *Journal of Management Studies,* 43(5): 1109-1144.

29. Morgan, R. E., 1997. Export stimuli and export barriers: Evidence from empirical research studies. *European Business Review*, 97(2): 68-79.

30. Okoroafo, D., 1990. An assessment of critical entry factors affecting modes of entry substitution patterns in foreign product markets. *Journal of Global Marketing*, 3(3): 87-104.

31. Petersen, B.; Pedersen T.; Sharma D. 2001. *The Role of Knowledge in Firms' internationalization Process: Wherefrom and Whereto*, Working Paper Series, Department of International Economics and Management, Copenhagen Business School, No 17-2001:12-18.

32. Reid, S. D., 1981. The decision-maker and export entry and expansion. *Journal of International Business* Studies,12(2):101–112.

33. Reid, S. D., 1983. Firm internationalization, transaction costs and strategic choice. *International Marketing Review* Winter, pp. 44–56

34. Ruzzier, M., Hisrich, R. D. and Antoncic, B., 2006. SME internationalization research: past, present and future. *Journal of Small Business and Enterprise Development*, 13(4): 476-497.

35. Yin, R. K., 1994, *Case Study Research, Design and Methods*, Sage Publications: 215.

36. Welch, L. S. and Luostarinen, R. K., 1988. Internationalization: evolution of a concept. *Journal of General Management*, 14(2): 36–64.

37. Wiedersheim-Paul, F., Olson, H. C. and Welch, L. S., 1978. Pre-export activity: the first step in internationalization. *Journal of International Business Studies*, 9(1): 47–58.

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MEASUREMENT FRAMEWORK OF INNOVATION ACTIVITY: THEORETICAL APPROACHES' ANALYSIS

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Abstract. In contemporary economy innovations by the scientists are seen as a driving force of the economic development. Innovation performance is vital to achieve sustainable country's competition and to stay in pace with other developed economies (Grossmann 2009).
The paper aims to reveal theoretical aspects of innovation activity, to systemize and analyze the key elements of measurement framework and relationship between the innovative activity and patents, research and development (R&D). The study is devoted to describing the conceptual elements of innovation, assessing if prevailing understanding about innovation performance approves theoretical approaches and reviewing innovation tendencies in Lithuania. Obtained results lead to get the general view about the innovation activity development.
The research methodology is based on theoretical approaches' comparative analysis, academics' survey examination and generalization.

Keywords: Innovations, R&D, Measurement Framework, Patent, Driving Forces.

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1. Introduction

The systems of innovation approaches (Nelson 1993; Lundvall et al. 2002; Edquist 2005; Korsakienė et al. 2006) focus on how these interactions operate and on the role of cultural, organizational and institutional factors in affecting innovation. The concept of national innovation systems has become very widely used as a perspective both in thinking about innovation and in analyzing science and technology policy. The importance of innovations is discussed by the scientists all over the world. Edquist (1997; 2005) approves that the definition of innovation systems should include "all important economic, social, political, organizational, institutional and other factors that influence the development, diffusion and use of innovations". In contemporary economy innovations are seen as one of the key factors of development of the whole economy and enterprises (Korsakienė et al. 2006). Some scientists illustrate a range of context, within which innovation performance arises (Ginevičius, Tvaronavičienė 2004; Adekola et.al. 2008). Prevailing understanding of innovation performance related with the new products or services, new processes, and new organizational structures as well as with the adoption of a new idea, product, developed internally or acquired from the external environment as a function of a firm's technical, strategic, and administrative skills.

Since the beginning of 1980s, the measurement of innovation activity has grown at a rapid pace. Innovation surveys were conducted in a broad range of countries, including those of the European Union (EU). Bloch (2007) in his paper explains that small and medium-sized enterprises (SME) innovating successfully in the UK tend to have dense external networks involving

other firms, universities and research institutions. The firms that introduce technological innovation are more likely to establish partnerships for all technological, market and organizational reasons compared to the firms that do not. Chang (2003) sees the relationship between the inter-organizational cooperation and innovative performance. Gans and Hayes (2008) accent that measuring innovative performance is essential for effective innovation policy and economic growth. They agree that it is difficult to obtain precise measurement system of innovations due to their complexity. The importance and use of measuring innovation processes is directly related to the links between innovation, genuine improvements in competitiveness, economic growth and levels of well-being of the societies (Lugones 2008). Despite a compelling economic case for innovation as a policy priority, innovative performance is not assessed regularly as macroeconomic indicators like unemployment or inflation. Without a good measure, innovation performance will continue to languish as an item on the economic in generating economic growth and the failure of markets to deliver it at an optimal rate (Gans and Hayes 2008). Compared with monetary policy, which can have an impact on inflation, unemployment or the exchange rate, innovation policy can take many years for the full effects to be realized. This is well outside the necessary time frame for a mechanism that would signal policy makers that policy is off course and needs to change direction (Gans and Hayes 2008).

Adekola et al. (2008) analyze innovation performance and innovation policy of the Lithuanian companies. The prevalence of traditional industries, high energy consumption in industry, and a low productivity rate are the major factors restricting country's competitiveness on the international markets and create preconditions to search for the new development resources.

Various indicators are used to measure innovation activity. Patents have been used as the indicators of the inventive activity in a large number of scientific papers. Patent-based statistics reflect the inventive performance of countries, regions, firms, as well as other aspects of the dynamics of the innovation process. Another widely used measure of innovation is R&D expenditure. R&D data are available for decades back and can be used to form consistent time series.

This study analyzes various aspects of innovations, especially paying attention to the key elements (patents, R&D expenditure as well as relationships between these two categories) of the measurement framework.

2. Conceptual Elements of Innovation Performance: Different Approaches Analysis

Paul (2007) mentions that the first definition of innovation was proposed by Schumpeter (1934), who distinguished five types of innovative activities:

- Introduction of a new product or a qualitative change in an existing product;
- Process innovation new to an industry;
- The opening of a new market;
- Development of new sources of supply for raw materials or other inputs;
- Changes in industrial organization.

However, counting years to up to date, the elements included in innovation activity varied and many authors defined them in different ways.

Paul (2007) and Lugones (2008) defined innovations as comprising implemented technologically new products, processes and significant technological improvements in products and processes. They offer the view of innovation as a part of Knowledge Society.

Innovation appears to be necessary to respond to the increased competition and to be possible thanks to the tools implemented by the Knowledge Society. As it was already stated, the increased innovation leads to the new demand for the higher education graduates to be able to adapt themselves to the innovative environment, to produce innovation and to transfer them.

In formation of the international guidelines of measurement system of innovation activity, different manuals have had a substantial influence on the development, both in terms of survey type and content (Bloch 2007). The Frascatti Manual deals with the measurement of human and financial resources devoted to the research and experimental development (R&D). The second one, the Canberra Manual aims at measuring human resources in science and technology. And the third one, the Oslo Manual, offers guidelines for collecting and interpreting technological innovation data (Paul 2007). Bloch (2007) in his survey described three editions of Oslo Manual and analyzed the evolution of the measurement system of innovation activity. The first edition of the Oslo Manual, published in 1992, was a synthesis of the experiences from a broad group of innovation surveys in the late 1980s, providing a standardized framework for collecting firm-level data on technological product and process (TPP) innovation in manu-

facturing industries (OECD 1992; Smith 1992). It was primarily based on R&D and patent data. This framework was later updated in the second edition in 1997 and included innovation in service sectors (OECD 1997). The third edition of the Oslo Manual involved marketing and organizational innovations, expanded coverage of knowledge flows and the role of linkages in the innovation process (OECD 2005; Bloch 2007).

According to Fagerberg (2003), innovating involves combining several different types of knowledge, capabilities, skills and resources in the search for a competitive advantage, either through reducing production costs, the development of new products or changes to existing ones. Far from being passive, this combination involves making explicit efforts to improve or create technological capacities and skills.

Lugones (2008) distinguishes a common statement usually made in the literature that innovation is between radical and incremental innovations, depending on the breadth and depth of the changes introduced. He argues that innovation activity includes such elements, as follows:

- Research and Development (R&D),
- Acquisition of embodied (equipment, hardware and software) and disembodied (license, patents) technology;
- Contracting consultancy firms and technical assistance;
- Engineering and Industrial Design activities;
- Personnel training;
- Marketing activities.

Various authors, conducting surveys of innovations, accent the concept of learning and construct increasingly comprehensive classifications of different learning processes (Lundvall 1992; Cooke 2001; Lam and Lundvall 2006). The essential thing is to understand that learning processes are never automatic but require specific investment of resources of varying quality and amount depending on the case. Firms learn in different ways, each leading to improvements of knowledge and specific technological capacities of the firms, which in turn generate a range of paths for technological progress. Learning causes inventions to undergo changes during their life cycle, leading to perhaps greater productivity increases than those resulting from the original invention.

There is a conception (now becoming less accepted) of the process of technological change that is based on the marked distinction between innovation and diffusion of technology. This vision underlines that the former activities are concentrated in the developed countries and their outcome is the creation of technologies that are incorporated into "production capacity", i.e., the stock of capital goods and the operating know-how required to manufacture those goods within the bounds of productive efficiency (Paul 2007).

A distinction should be made between technical change and technological learning (or accumulation). The former concept includes any form in which new technologies are incorporated into a firm's productive capacity (through new equipment or plant, incremental changes). Indeed, technological learning refers to any process that boosts the capacity to generate and administer technical change. These intangible resources are increasingly important, reflecting a rise in "knowledge intensity" in industrial production (Lugones 2008).

A wide variety of scientific literature highlights the positive impact of innovation on the principal performance indicators of the enterprise. In fact, those firms that engage in the innovation activities reveal better indicators in terms of sales, export, productivity and employment. Particular emphasis should be placed on the fact that the best performance does not only refer to a stronger positive trend, but also to the more stable development paths (Davila et al. 2006; Drucker 2006; Hesselbein et al. 2006; Hahn 2010; Leiponen et al. 2010).

Table 1. Prevailing concepts of innovation activity

Concepts	The main elements of innovation activity
Neo-classical	Innovations associate with formal R&D activity.
Evolutionism	Innovation associate with learning process.

To sum up the points of views about innovation activity, the following two concepts are prevailing in the scientific literature: neo-classical and evolutionism (Table 1). In contrast to the neo-classical concept, which generally associates innovation with formal R&D activities, evolutionism stresses the importance of learning processes. Not going deeper into the analysis of theoretical approaches, let us support the point of view that innovation related with something new, involving the development of new products and services, technologies, business models

as well as learning process having the purpose to create additional value added. Taking into account the importance of innovation activity, the question arises concerning the measurement tools.

3. Measurement Framework of Innovation Activity

Measurement of innovation activity remains an open issue. Many researches were done regarding this issue, but the unique system of measurement describing the innovation process in the best way has not been proposed. To sum up the surveys and opinions of different scientists, two widely used elements of measurement framework - patents and R&D expenditure - are analyzed in this part trying to assess their advantages and shortcomings as the key elements of measurement system.

3.1. Patent as a Measure of Innovations

Patents have been used as indicators of the location of inventive activity in a large number of papers (Canibano et al. 2000; Parchomovsky et al. 2005; Lanjouw et al. 2006; Ejermo 2009). Patents data provides a rich source of information which is standardized and therefore consistently measured at the micro level both across countries and over time. Patent documents include detailed and complex information about the invention, inventor, applicant, time path of the application, procedure used to file the application, etc. Certain methodological choices have to be made to select the relevant information from patent documents. The relevant criteria to reflect innovative activities are: inventor's country of residence, priority date (the first date of filling in a patent application anywhere in the world to protect an invention), and fractional counts. Patents' data allow a consideration of firms' activities in many countries. This level of details regarding the location of innovative activity is not found in other data. One reason that may be particularly interesting is the number of inventors as a measure of innovative activity. It may be that the highest spillovers from innovative activity result from the interactions between people, to the extent that knowledge is tacit and that innovators are the people who have most tacit knowledge (Abramovsky et al. 2008). The propensity to patent varies both across the industries and time and this needs to be accounted for in any analysis. Many productivity enhancing innovations do not require patenting and certain industrial sectors traditionally rely on secrecy as a way of protecting their intellectual property. Moreover, patenting may be used by firms to determine entry rather than to protect real innovations. The value of patents can be heterogeneous and its distribution very highly skewed. While some patents have little or no industrial application and therefore low economic value, others are of substantial value (Abramovsky et al. 2008).

Barkley et al.(2000) argue that previous measures of the innovative process generally focus on: (1) inputs into the processes such as public and private expenditures for research and development or employment in scientific and technical occupations; (2) an intermediate output measure such as patents; or (3) proxy measures for innovative output and capacity as reflected in the employment in high technology and information technology industries, new product development as reflected in trade and technical publications or venture capital funding for new enterprises. Among these alternatives, patents have become a popular measure for innovative activity at the local level. Alternatively, innovation measures such as new products, private research and development expenditures, and venture capital funding are not available for many non-metropolitan countries because of data collection costs or data disclosure regulations.

Patent counts are not without shortcomings when used to represent innovation (Canibano et al. 2000; Acs et al. 2002; Lanjouwet et al. 2006). First, all inventions are not patented and all patented inventions are not of equal consequence with respect to new products or production processes. Second, the key to new high-technology industries is the presence of "star scientists" and not the scientists' "disembodied discoveries". Patents tend to diffuse over time while the science and engineering stars become more concentrated. Third, patenting activity is concentrated in manufacturing. Innovative activities in trade and service industries are less likely to be patented and the use of patent data may over-represent the relative innovative activity of countries with significant manufacturing sectors. Finally, patents are credited to the home address of the lead scientist on the patent. This location may not be the same country where the research and development occurred or where the new product/process was implemented. The surveys revealed a reasonably high correlation between patent and innovation counts at the metropolitan level, plus patent and innovation counts are associated in

a similar manner to explanatory variables included in regional knowledge production functions. The authors conclude that "the empirical evidence suggests that patents provide a fairly reliable measure of innovative activity".

Patents are legal means for monopolizing technology for a potential 20 years (Gans et al. 2008; Ejermo 2009). In return for this monopoly, society demands that patented technology must be disclosed so that rivals know what is protected. Disclosure also ensures that the knowledge enters the public domain when the patent expires. This availability is assured through computerized online records, which entail a number of advantages for the researchers. Patent requirements are also slowly changing and therefore data are reasonably comparable over the time. The major advantage is that they are good at indicating geographical location compared with other indicators. Addresses are available from the European Patent Office data and are given for the inventors as well as applicants. Economists have considered patent data useful since they seem to provide a short-cut to the collection of economy-wide indicators of inventive activity. Patents can be viewed as the output and input indicators because patents are used as a source of information by subsequent inventors.

To sum up, like any other indicator, patent indicators have many advantages and disadvantages. The advantages are: a) patents have a close link to inventions; b) patents cover a broad range of technologies on which there are sometimes a few other data sources; c) the contents of patent documents are a rich source of information (on the applicant, inventor, technology category, claims, etc.); and d) patent data are readily available from patent offices (Canibano at al. 2000; Gans et al 2008; Ejermo 2009).

However, patents are subject to certain drawbacks: a) the value distribution of patents is skewed as many patents have no industrial application (and hence of little value to the society) whereas a few are of substantial value; b) many inventions are not patented because they are not patentable or inventors may protect the inventions using other methods, such as secrecy, lead time, etc.; c) the propensity to patent differs across the countries and industries; d) differences in patent regulations make it difficult to compare counts across the countries; and e) changes in patent law over the years make it difficult to analyze trends over time (Canibano at al. 2000; Gans et al 2008; Ejermo 2009).

3.2. R&D Linkages to Innovations

R&D is defined by the Frascati Manual as covering three activities: basic research, applied research, and experimental development (Paul 2007). Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of the phenomena and observable facts without any particular application or use in the view. Applied research is also original investigation undertaken in order to acquire new knowledge. It is directed primarily towards a specific aim or objective. Experimental development is systematic work, drawing on existing knowledge gained from research or practical experience that is directed to producing new materials, products, installing new processes, systems or services, or improving substantially those already produced or installed. According to the Manual, the basic criterion for distinguishing R&D from related activities is the presence in R&D of the appreciable element of novelty and the resolution of scientific or technological uncertainty, i.e. when the solution to a problem is not readily apparent to someone familiar with the basic stock of commonly used knowledge and techniques in the area concerned.

R&D data is probably the oldest consistent innovation indicator. The data is available for decades back in time and can be used to form consistent time series. R&D comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications. The small lines of businesses, though, more rarely undertake such activities as systematically as large ones do. Therefore, their innovative efforts are likely to be underestimated by the R&D data. There are also biases depending on the sector in which a firm is active. For instance, in one sector firms may undertake relatively more marketing efforts in order to open up new markets, which will not fall under the heading of R&D. Service businesses also innovate differently and less "formally" may produce biases. The main problem with R&D data is that they do not represent innovation very clearly; there is no guarantee that efforts translate into innovation (OECD 1992; Tang and Le 2007; Ejermo 2009).

R&D data generally come either from micro data collected by national statistics agencies or from firm accounts. National statistics' bodies tend to report R&D expenditure at the aggregate industry level or make firm level data available under restrictive con-

ditions. The data is usually based on activity within the geographic boundaries of a country and do not generally contain information on the activities of firms in other countries. When a country examines its R&D expenditures, its statistical contents and approach may differ from other nations. As a result, a simple comparison of the R&D expenditures among countries may not present comparable data, although it gives a general idea of a country's attitude towards science and technology (Tang and Le 2007; Abromovsky et al. 2008).

Expenditures on research and development and advertising by companies are forms of capital investment in intangible commodities as opposed to capital investment in tangible commodities, such as plant and equipment. The amounts spent on both advertising and R&D are positively related to the profitability of the enterprises. Various studies have recorded the links between R&D and advertising at the level of firms, sub-sectors and sectors of industry for particular countries (Tang and Le 2007; Blankley 2007).

The findings presented by Tang and Le (2007) indicate that the most-developed countries spend between two and six times more on R&D per capita than on advertising. In less R&D intensive economies advertising may equal or exceed R&D expenditure per capita. In the majority of the EU and other countries, for which relevant advertising and R&D data were available, significant correlation was also found between these two variables. The benefits for businesses to continue investing in both advertising and R&D, even under adverse economic conditions, are very obvious. According to the authors, as countries move from the industrial age into an information and knowledge economy, it is increasingly important to develop their intellectual capital and manage their intangible assets. In addition, businesses need to consider the importance of investments in the "soft assets" of advertising expenditure and R&D. The researches approved that the amounts spent on both advertising and R&D are positively related to the profitability of companies.

Some empirical studies find a positive effect of industrial concentration on R&D spending (Griffin et al. 1996; Vossen 1999). In these studies a variety of different measures of innovative output were used, such as productivity growth rates, number of patents, new product announcements in trade journals, sales of products new to the firm and sales of products new to the industry. This indicates that concentration exerts at least a non-positive influence on the number of innovations made in an industry. In more concentrated industries, firms spend more on R&D but this does not result in more innovative output. Moreover, the finding by Vossen (1999) that smaller firms that do engage in R&D, do so at higher levels of intensity and more efficiently than larger firms, indicates that the presence of relatively more large firms in an industry (higher concentration) would reduce the overall effectiveness of R&D in that industry.

3.3. R&D and Patents

Lanjouw and Schankerman (2004) review that research productivity, as typically measured by the ratio of patents to R&D, has declined sharply over the last 40 years in many different industries and countries. By 1990, the number of patents produced per US scientists and engineers (S&E) had fallen to just 55% of its 1970 level with even steeper declines in Europe. At any time there are also large cross-sectional differences in measured research productivity across industries and firms. These facts have attracted the increasing attention from academics and international organizations, such as the OECD, due to the concern about the apparent slowdown in total factor productivity since the late 1960s.

According to Lanjouw and Schankerman (2004), aggregate patent numbers have fluctuated widely and have grown more slowly than investments over much of the twentieth century. This fall in research productivity could simply derive from diminishing returns in the "knowledge production function". As the markets expand, the private returns to R&D increase. The induced rise in the level of R&D investment leads to a fall in research productivity. Thus, the evidence of declining research productivity raises the spectra of technological exhaustion - getting less inventive output for any given level of the R&D investment. A process of technological exhaustion would lower innovative output directly and, by reducing the private returns to R&D, it would also bring down the equilibrium level of private R&D investment (Lanjouw and Schankerman 2004). In their survey the scholars reveal that these two features of technological exhaustion could undermine our ability to sustain growth in total factor productivity. This process could be countered with government policies to provide stronger R&D incentives recharging the pool of invention potential through government-funded R&D and programs to strengthen industry-government research links. Therefore, a key question is whether

we can take the decline in the ratio of patents to R&D as indicating a decline in the reproduction of R&D, i.e. as deterioration in the underlying knowledge production function. Academics propose that in considering this question it is useful to break the patent to R&D ratio into its two component parts: the patent to invention ratio and the invention to R&D ratio. A fall in measured research productivity may be real – a declining invention/R&D ratio – or only apparent – a declining patent/invention ratio. Since we do not normally have information on the number of inventions, there is an identification of a problem in interpreting the changes in the patent to the R&D ratio. What appears to be technological exhaustion may simply be mismeasurement. Inventors may be making less use of a patent system perhaps because the costs of obtaining and enforcing patents have risen relatively to the alternative protection mechanisms. If so, the observed growth in the number of patents over time understates growth in innovation. Furthermore, the average value of an innovation covered by a patent may be increasing over time. Both of these measurement issues imply that counting patents can give a misleading impression of the true output of the research process.

When looking for evidence of technological exhaustion, a common approach taken in the literature is to look for a decline in the R&D elasticity in production function or total factor productivity regressions. Focusing on R&D inputs avoids the potential pitfalls of measuring invention output. However, it involves other serious problems associated with productivity measurement. The R&D elasticity in the production function reflects two distinct factors: the impact of R&D on invention, which could exhibit technological exhaustion, and the effect of invention on productivity. The latter depends on other characteristics of the firm and market, including the level of demand and the ability of the firm to appropriate the rents from invention. Both technological exhaustion and decline in demand or appropriation imply that the rate of return to R&D would fall. Econometric estimates at the firm and industry level do not show any systematic decline in the output elasticity of R&D through the mid-1980s and thus the evidence of exhaustion is at best inconclusive (Lanjouw and Schankerman 2004).

Ejermo (2009) states that patenting does not require formal R&D and it would also be premature to separate the two processes of R&D and patenting in a linear sequence. The contemporaneous relationship found between R&D and patenting can be explained by the fact that a lot of developmental work to adapt to production processes has to take place after formally applying for patents. For these and other reasons, patents have well-known problems, such as innovation indicators. For the companies active in the industries where an appropriation mechanism, such as secrecy, is important, patenting plays a subordinate role due to its disclosure function. There may be alternative ways to reach a technological solution for a company and efforts in between invention and innovation may become patented. As a reaction to the negative conclusions for patents listed, attempts have been made to gauge the quality of patents. Patent documents contain citations that have two major uses for innovation studies. The first concerns the quality and the second the study of the geographical reach of the spillovers (Ejermo (2009).

Patent intensity over industry-financed R&D expenditure is reviewed by Khan and Dernis (2006). There is a strong positive correlation between the number of triadic patent families and industry-financed research and development (R&D) expenditure. The countries with high level of industry-financed R&D expenditures (such as the United States, Japan and Germany) also have large numbers of triadic patent families. In contrast, countries with a low level of industry-financed R&D expenditure (such as Latvia, Estonia, and Iceland) have small numbers of triadic patent families. The triadic patent intensity (triadic patent families divided by industry-financed R&D) of the three OECD regions has followed similar patterns and appears to be cyclical: it decreased during the late 1980s and increased in the mid-1990s. However, there is an important difference in the magnitude and ranking of patent intensity. The high patent intensity ratio for the European countries and the United States in their respective domestic market is mostly due to the "home advantage" factor – domestic applicants tend to file more patents in their home country compared to foreign applicants (Khan and Dernis 2006).

4. Innovation Activity Review in Lithuania

Adekola et al. (2008) analyze innovation activity and policy in Lithuania. The prevalence of traditional industries, high energy consumption in industry, and a low productivity rate are the major factors restricting country's competitiveness in the international markets and create preconditions to search for the new

development resources.

Scholars (Korsakienė et al. 2006; Tvaronavičius and Tvaronavičienė 2008; Adekola et.al.) state that one of the most distinctive features of the new theories of growth has been the increasing importance attributed to human capital and productive knowledge and to the interaction of these two factors. Innovations are one of the key factors of development of the country's economy and enterprises. It is widely agreed that the development and intensification of innovation activities enable multiform modernization of the production and service structures, creation of new and improvement of existent products and used technologies as well as increasing their competitiveness on the international scale, which is one of the main factors of the country's economy development. Innovation is a source of profit and high added value until the innovation is spread around and the competitive advantage provided by it disappears. In the global economy, the competitive advantages lie increasingly in the local variables, such as knowledge, relationships, and motivation. The major challenge Lithuania faces today is upgrading its sustained traditional industries towards the high value-added, knowledge-intensive modern industrial sectors regardless of their position in the low high-tech industrial classification. It should be noted that in recent years Lithuania has made progress in innovation policy-making and implementation. The Lisbon Process and the implementation of the National Reform Program (NRP) are seen as the major contributors to this progress. For instance, structural funds gave Lithuania a real base for implementing and sustaining a wide range of innovation support measures, both in the public and private business domains. Furthermore, knowledge and human resources development capacities are being upgraded for the national economy needs.

According to the World Bank's studies, Knowledge Economy Index (KEI) of Lithuania, representing the overall preparedness of a country towards the knowledge economy, rose from 43rd in 1995 to the 31st position in the 2007 rankings and now amounts 7.49. It should be noted that this index aggregates volumes and status of human resources, innovative policy, information technologies and innovative business. Lithuania has an overall innovation performance, that places it among the group of "catching-up countries" with a performance that is well below the EU average but is increasing over time. Other EU countries within this group and with a similar level of performance are Malta, Latvia, Hungary, Greece, Slovakia, Poland, Portugal, Bulgaria and Romania .Over the past 5 years Lithuania's innovation performance has increased rapidly and based on this trend it would reach the EU average level of performance within 10 years (Tvaronavičienė et al. 2008).

The analysis allows us to make conclusion that Lithuania is less efficient compared with the EU average in transforming innovation inputs into outputs (Tvaronavičienė and Degutis 2007; Adekola et al. 2008). Lithuania performs well according to the innovation drivers which are measured by the share of the graduates per 1000 population, the share of working age population with a tertiary education, the broadband penetration rate, and the share of working age population active. Lithuania performs particularly strongly according to the business R&D expenditures, public funding innovation, high-tech exports, and employment in high-tech manufacturing. By the mentioned indicators Lithuania is above the EU average.

The research of the Lithuanian companies leads us to the generalizations about innovation management practice. The survey was based on questioning 429 randomly chosen companies in Lithuania. The results signal that companies do not identify clearly directions of innovative activity development, innovation measurement system seems to be poorly developed and that does not allow to set targets and monitor deviations (Tvaronavičius el al. 2010).

Conclusions

- Critical overview of scientific literature reveals that the whole set of innovation metrics seems to lack systematic approach to innovation performance measurement. Innovation measurement system seems to be poorly developed. It does not allow managing innovation development efficiently.

- To sum up the points of view of different academics, two concepts are prevailing in the scientific literature: neo-classical and evolutionism. In contrast to the neo-classical conception, which generally associates innovation with formal R&D activities, evolutionism stresses the importance of the learning processes.

- Summary of analyzed scientific literature shows the complexity of innovation process, which combines a wide spectrum of activities (Appendix A). Different studies are addressed to reveal particular dimensions of innovation activity. It approves the opinion, that

there is a lack of systematic approach to the innovation process, its measurement and management.

• Patents have been used as the indicator of inventive activity in a large number of surveys. Patents data provides a rich source of information which is standardized and consistently measured. However, the use of patent data in measuring innovative activity is questionable. On the basis of scientific literature analysis, the authors reveal the main advantages and disadvantages of the patent indicators.

• The advantages of the patent indicators are as follows: a) patents have a close link to inventions; b) patents cover a broad range of technologies; c) the contents of patent documents are a rich source of information; and d) patent data are readily available from the patent offices. However, patents are subject to certain drawbacks: a) the value distribution of patents is skewed as many patents have no industrial application whereas a few are of substantial value; b) many inventions are not patented because they are not patentable or inventors protect the inventions using other methods; c) the propensity to patent differs across countries and industries; d) differences in patent regulations make it difficult to compare counts across countries; and e) changes in patent law over the years make it difficult to analyze trends over time.

• Mostly all scientists agree that R&D data is the oldest consistent innovation indicator. However, R&D data sometimes is difficult to pinpoint to a geographical location. The findings of many authors present the facts that the most-developed countries spend between two and six times more on R&D per capita than on advertising.

• Most empirical studies find a positive effect of industrial concentration on R&D spending. The main problem with R&D data is that it does not represent innovation very clearly. In more concentrated industries firms spend more on R&D but this does not result in the more innovative output. This happens because of the number of rivals, which can lead to reduce the overall effectiveness of R&D in that industry.

• There is a strong positive correlation between the number of triadic patent families and industry-financed research and development (R&D) expenditure. The countries with high level of industry-financed R&D expenditures (such as the United States, Japan and Germany) also have large numbers of triadic patent families. In contrast, the countries with a low level of industry-financed R&D expenditure (such as Latvia, Estonia, and Iceland) have small numbers of triadic patent families.

• The analysis of scientific literature reveals that structural funds gave Lithuania a real base for implementing and sustaining a wide range of innovation support measures, both in the public and private business. The Knowledge Economy Index (KEI) of Lithuania, representing the overall preparedness of a country towards the knowledge economy, had been rising from 43rd position in 1995 to 31st position in 2007.

• Lithuania is less efficient compared with the EU average in transforming innovation inputs into outputs. However, Lithuania performs particularly strongly according to the business R&D expenditures, public funding innovation, high-tech exports, and employment in high-tech manufacturing. By the mentioned indicators Lithuania is above the EU average.

References

Abramovsky, L.; Griffith, R.; Macartney, G.; Miller, H. 2008. The location of innovative activity in Europe. The Institute for Fiscal Studies Working Paper.

Acs, Z.J.; Anselin, L.; Varga, A. 2002. Patents and innovation counts as measures of regional production of new knowledge. Research Policy, Vol 31 (7), 2002. 1069-1085.

Adekola, A; Korsakienė, R.; Tvaronavičienė, M. 2008. Approach to innovative activities by Lithuanian companies in the current conditions of development. Technological and economic development of economy. Baltic Journal on Sustainability. p. 595–611.

Barkley, D. L.; Henry M. S.; Lee, D. 2000. Innovative activity in rural areas: the importance of local and regional characteristics. Community Development Investment Review. Federal Reserve Bank of San Francisco.

Blankley, W. 2007. Correlations between advertising and R&D expenditures: dealing with important intangibles. South African Journal of Science 103. 94-98.

Bloch, C. 2007. Assessing recent developments in innovation measurement: the third edition of the Oslo Manual. Science and Public Policy, 34(1), 2007. 23-34.

Canibano, N.; Garci a-Ayuso, M; Sanchez, P. 2000. Shortcomings in the Measurement of Innovation: Implications for Accounting Standard Setting. Kluwer Academic Publishers: Journal of Management

and Governance 4: 319–342.

Chang, Y. C. 2003. Benefits of co-operation on innovative performance: evidence from integrated circuits and biotechnology firms in the UK and Taiwan. R&D Management, 33 (4).425-437.

Cooke, P 2001. Regional innovation systems, clusters and the knowledge economy. Industrial and Corporate Change, 10, 945–974.

Davila, T.; Epstein, M. J.; Shelton, R. 2006. Making innovation work: how to manage it, measure it and profit from it. New Jersey: Wharton School Publishing.

Drucker, P. 2006. Innovation and entrepreneurship. Harper Collection.

Hahn, S. 2010. Competition, comparison and innovation. Economics Letter 106(2):122-124.

Hesselbein, E.; Goldsmith, M.; Somerville, I. 2006. Leading for Innovation: and organizing for results. San Francisco: Jossey-Bass.

Edquist, C. 1997. Systems of innovation: growth, competitiveness and employment. Cheltenham: Edward Elgar.

Edquist, C. 2005. Systems of innovation — perspectives and challenges. Oxford Handbook of Innovation. Chapter 7. Oxford: Oxford University Press.

Ejermo, O. 2009. Regional innovation measured by patent data- does quality matter? Industry and Innovation, Vol 16, No 2.141–165.

Gans, J.; Hayes, R. 2008. Measuring innovative performance. Melbourne Review, Vol 2, No 1. 2006. 70-77.

Ginevičius, R.; Tvaronavičienė, M.2004. Risk of globalization: case study of Lithuanian economy. Journal of Economics (2). 212-231.

Griffin, A.; Hauser J. R. 1996. Integrating R&D and marketing: a review and analysis of the literature. Journal of Product Innovation Management, 13. 191–215

Grossmann, V. 2009. Entrepreneurial innovation and economic growth. Journal of Macroeconomics 31 (4):602-613.

Khan, M.; Dernis, H. 2006. Global overview of innovative activities from the patent indicators perspective. Statistical Analysis of Science, Technology and Industry. Working paper 2006/3.

Korsakienė, R.; Tvaronavičius, V.; Tvaronavičienė, M. 2006. Incorporating innovations into organization's functioning. Business:Theory and Practice, 7(1).27-32.

Lam, A.; Lundvall, B. 2006. The learning organization and national systems of competence building and innovation. In How Europe's Economies Learn: Coordinating Competing Models, eds. E Lorenz and B-Å Lundvall, pp. 109–139. Oxford: Oxford University Press.

Lanjouw, J. O; Schankerman, M. 2004. Patent quality and research productivity: measuring innovation with multiple indicators. The Economic Journal, 114 (April). 441–465.

Leiponen, A.; Helfat, C. 2010. Innovation objectives, knowledge sources and the benefits of breadth. Strategic Management Journal 31 (2): 224-236.

Lugones, G. 2008. Training module for the recollection and analysis of innovation indicators. Inter-American Development Bank. Working paper 8.

Lundvall, B-Å.1992. National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning. London: Pinter Publishers.

Narula, R and A Zanfei 2005. Globalization of Innovation: the Role of Multinational Enterprises. In The Oxford Handbook of Innovation. Oxford University Press.

Nelson, R 1993. National Innovation Systems. Oxford: Oxford University Press.

OECD, Organization for Economic Cooperation and Development. 1992. Proposed Guidelines for Collecting and Interpreting Technological Innovation Data — The Oslo Manual, 1st edn. Paris: OECD.

OECD (Organization for Economic Cooperation and Development)/ Eurostat 1997. Proposed Guidelines for Collecting and Interpreting Technological Innovation Data — The Oslo Manual, 2nd edn. Paris: OECD.

OECD (Organization for Economic Cooperation and Development)/Eurostat 2005. Guidelines for Collecting and Interpreting Innovation Data — The Oslo Manual, 3rd edn. Paris: OECD.

Parchomovsky, G.; Wagner, R. P. 2005. Patent Portfolios. Formerly American Law Register. Vol.. 154, No. 1.

Paul, J. 2007. The innovative activities of graduates in European companies. Paper presented at the

First European Conference. Knowledge for Growth: Role and Dynamics of Corporate R&D, Seville / Spain,8-9 October.

Smith, K 1992. Technological innovation indicators: experience and prospects. Science and Public Policy. 19, 383–392.

Tang, J; Le, C. D. 2007. Multidimensional innovation and productivity. Econ. Innov. New Techn., Vol 16(7). 501–516.

Tvaronavičienė, M.; Degutis, M. 2007. If approach to innovations differs in locally and foreign owned firms: case of Lithuania. Journal of Business Economics and Management 8(3). 195-203.

Tvaronavičius, V.; Tvaronavičienė, M. 2008. Role of fixed investments in economic growth of country:Lithuania in European context. Journal of Business Economics and Management 9(1). 57-65.

Tvaronavičius, V.; Dudzevičiūtė, G.; Tvaronavičienė, M. Innovation management in Lithuanian enterprises: insight into daily practice. 6th International Scientific Conference May 13-14, 2010, Vilnius. Business and Management.1107-1112.

Vossen, R.W. 1999. Market Power, Industrial Concentration and Innovative Activity. Netherlands : Kluwer Academic Publishers. SOM theme B: Marketing and Networks.

Appendix A

Summary of analyzed scientific literature

Author	Year	Topic	Patents	R&D	Innovative activity	Innovation measurement	Innovation management	Location /geography of innovation	Innovation and entrepreneurship
Abramovsky et al.	2008	The location of innovative activity in Europe			+			+	
Acs et al.	2002	Patents and innovation counts as measures of regional production of new knowledge	+		+	+			
Adekola et al.	2008	Approach to innovative activities by Lithuanian companies in the current conditions of development			+				
Barkley et al.	2000	Innovative activity in rural areas: the importance of local and regional characteristics			+			+	
Blankley	2007	Correlations between advertising and R&D expenditures: dealing with important intangibles		+	+	+			
Bloch	2007	Assessing recent developments in innovation measurement		+	+	+			
Canibano et al.	2000	Shortcomings in the Measurement of Innovation: Implications for Accounting Standard Setting	+		+	+			
Chang	2003	Benefits of co-operation on innovative performance			+				
Cooke	2001	Regional innovation systems, clusters and the knowledge economy			+			+	
Davila et al.	2006	Making innovation work: how to manage it, measure it and profit from it			+	+	+		
Drucker	2006	Innovation and entrepreneurship			+				+
Hahn	2010	Competition, comparison and innovation			+				+
Hesselbein	2006	Leading for Innovation: and organizing for results			+				+
Edquist	1997, 2005	Systems of innovation			+				+
Ejermo	2009	Regional innovation measured by patent data- does quality matter?	+		+	+		+	
Gans et al.	2008	Measuring innovative performance			+	+			
Griffin et al.	1996	Integrating R&D and marketing		+	+				
Grossmann	2009	Entrepreneurial innovation and economic growth							+

Khan et al.	2006	Global overview of innovative activities from the patent indicators perspective	+		+	+			
Korsakienė et al.	2006	Incorporating innovations into organization's functioning			+				+
Lam et al.	2006	The learning organization and national systems of competence building and innovation.			+				+
Lanjouw et al.	2004	Patent quality and research productivity: measuring innovation with multiple indicators	+	+	+				
Leiponen et al.	2010	Innovation objectives, knowledge sources and the benefits of breadth			+				
Lugones	2008	Training module for the recollection and analysis of innovation indicators		+	+	+			
Lundvall	1992	National systems of innovation: towards a theory of innovation and interactive learning			+				
Narula et al.	2005	Globalization of innovation: the role of multinational enterprises			+				+
Nelson	1993	National innovation systems			+				
OECD	1992, 1997, 2005	Oslo manual	+	+	+	+			+
Parchomovsky et al.	2005	Patent Portfolios	+		+				
Paul	2007	The innovative activities of graduates in European companies			+				+
Smith	1992	Technological innovation indicators: experience and prospects			+				
Tang et al.	2007	Multidimensional innovation and productivity			+				+
Tvaronavičienė et al.	2007	If approach to innovations differs in locally and foreign owned firms: case of Lithuania			+				+
Tvaronavičius	2010	Innovation management in Lithuanian enterprises			+	+	+		+
Vossen	1999	Market power, industrial concentration and innovative activity			+			+	

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