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POSSIBILITIES OF DEFENSE SPENDING STABILIZATION

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Abstract. The aim of this paper is to identify, design and classify general instruments applicable to stabilize development in defense spending as one of the decisive prerequisites of a long-term maintenance and development of national defense capabilities. Based on analyses of approaches implemented in the former Czechoslovakia and later in the Czech Republic as well as in other selected European countries, the paper submits a set of measures leading to defense spending stabilization. To gather data regarding practice in individual countries a structured interviews and a questionnaire survey have been carried out, addressing subject matter experts in selected European countries. Result of this research have proven that in a number of countries the issue of defense spending stabilization has never been addressed. Based on experience of those countries that have implemented certain measures of defense spending stabilization, it seems that the optimum approach to defense spending stabilization consists of instruments that are anchored in national legislation and that enable an overall fixation (reservation of certain part of government incomes for the purpose of armed forces maintenance and modernization).

Keywords: defense spending, future spending level, stabilization, modernization, defense capabilities,


JEL Classifications: H56, H68, H76

1. Introduction

During the NATO Summit, held in Wales in September 2014, member states have approved their commitment to stop any further cuts in defense expenditures and to launch process of their gradual increase in order to achieve a more balanced sharing of defense burden within the Alliance.

Those member states that have spent on defense at least 2 % of their national GDP, out of which at least 20 % represented investment expenditures have agreed not to fall below these thresholds. Those member states that have spent less than 2 % of their national GDP on defense have committed themselves to gradually increase their defense spending to achieve the level of GDP 2 % within the period of upcoming 10 years in order to fulfill NATO capability development goals and eliminate gaps in NATO capabilities. And finally, these member states that have allocated less than 20 % of their defense spending to investments have agreed to achieve this level again within the frame of 10 years. The overall defense burden at the level of GDP 2 % with the 20 % of investment expenditures, represent a long-term recommendation of NATO towards its member states. In 2016 the recommendation (or commitment) has been fulfilled just by 5 member states, namely Estonia, France, Greece, Turkey, UK and USA (see the Figure 1).
Fig. 1. Defense Spending of NATO Member Countries as a Share of GDP (%)

Source: Elaborated based on NATO, 2014.

So, the above mentioned commitment has not been fulfilled by app. 80 % of member states of the Alliance. This score is a result of a long-term cuts in defense expenditures mainly in European member states. Based on data for selected member states, the Figure 2 bellow indicates this development.

Fig. 2. Development of the Share of Defense Spending in GDP in Selected European Countries (%)

Source: Elaborated based on SIPRI, 2016.
Similar unfavorable trend has been detected when analyzing data for investment expenditures. On average, NATO member states allocate app. 14% of their defense spending to investments (Mičánek, Holcner, Odehnal, Olejníček, Šulec 2014). Remaining 86% percent aim at operational and personnel expenditures. Figure 3 below illustrates the situation in investment expenditures. The overall misbalance is even strengthened by the fact that in the long term the USA have spent app. 25% of their defense expenditures on investments (SIPRI 2016). In 2016 the highest shares of investments in overall national defense spending have been recorded in Luxembourg, Lithuania; the lowest then Slovenia and Belgium (NATO 2016).

The question is if the NATO member states who are expected to increase their defense spending will really comply with their commitments. On one hand, the period of 10 years might be viewed as a sufficient time frame to gradually increase defense expenditures without creating inadequate fiscal tension in other government spending areas. On the other hand, the period of 10 years might allow to postpone the action of respective national governments, making fulfilling of the commitment unfeasible at later stage. Another question is if the countries in question will be able to maintain (stabilize) the recommended/committed levels of defense spending, i.e. stabilize them. By using the term “stabilize” we mean mainly setting a predictable levels of future spending. So, stabilization does not mean no changes or just a way of fixation of spending levels. Besides others, planning and developing defense capabilities requires the already mentioned predictability.

2. Literature Research and Methodology

The issue of defense spending belongs to the key subjects of research by (Benoit 1973; Smith, Smith 1983, De Haan 1987; Ram 1995). Most often, authors deal with issues of the amounts of expenditures, their impact of economy or determinants influencing their development. The question what is the optimum amount of defense spending evokes controversies but still, the need to set an acceptable level of defense spending seems to be generally accepted. Development of real levels of defense expenditures in European does not correspond with their generally accepted importance (Perlo-Freeman, Fleurant, Wezeman 2016). A series of reasons can be identified, starting with theoretically defined preconditions connected with the public nature of the defense “goods” (Holcner, Olejníček, Horák, Musil 2012) up to empirically tested evidences of the fact that the amount of funds, which governments can allocate to defense depends mainly on the intensity of economic (Odehnal, Neubauer 2015), security
and political determinants (Hartley, Sandler 1990; Gadea et al. 2004; Nikolaidou 2008). During the financial and economic crisis, the often discussed issues related to cuts in defense spending and their impacts, restraining not only defense capabilities but affecting also the economy as a whole or individual industries (NAM 2012). These impacts include limited purchase power of households, decrease in the number of job opportunities or sales issues for arms industry and related subcontractors (Zycher 2012; ACD 2011). Another point of view is the question how the governments try to precede negative changes in their defense budgets and how they try to enhance foreseeability and long-term sustainability of defense burden. Partially, this issue has been analyzed by certain studies (Mar- rone, France, Fattibene 2015; Marrone, France, Fattibene 2016), in detail, it has been captured by a study focused on approach of individual NATO member states to impacts of economic crisis and how it affected their defense expenditures (STO/NATO 2016). However so far, this issue has not been studied and analyzed in a complex.

Due to the lack of empirical data related to defense expenditures stabilization, methods of qualitative research, based on results of questionnaire surveys and semi-structured interviews, represent a valuable asset for further research in this area.

Initially, the questionnaire survey has aimed at NATO countries via permanent national representations to NATO. Due to a relatively low involvement of countries in the survey other European experts engaged in defense resources management have been contacted to participate in the survey. The survey consisted of eight questions divided into two parts. The first part of the survey (four questions) aimed at rather subjective view of given expert on amount of defense expenditures and individual main spending categories, allocated to defense in given country in relation to real needs of defense capabilities maintenance and development. The second part of the questionnaire (four questions again) focused on identification of potential existence and nature of instruments that have been implemented in given country in order to stabilize defense expenditures. The questions aimed at overall defense expenditures as well as their main categories, i.e. personnel, investment and operational expenditures.

The semi-structured interviews have been oriented to answer the same questions contained in the questionnaire, incl. the issue of potential recommendations and related procedural issues. So, the interviews have complemented and verified data gathered throughout the questionnaire survey.

The survey and interview have enabled to sufficiently describe the situation in eight European countries, namely in Austria, Bulgaria, Czech Republic, Denmark, Germany, Poland, Romania and Slovenia. In spite of the relatively low number of these countries, a sample of eight different approaches enables to identify potential solutions and recommendations regarding defense expenditures stabilization. Therefore, based on the inductive end deductive approach and analogy, the synthetic part of this paper summarizes, interprets and classifies the gathered data in a form further applicable with regards of practice of decision-making bodies when managing development of defense sectors.

3. Potentialities of Defense Expenditures Stabilization

By stabilizing expenditures, this paper understands implementation of mechanisms (e.g. legal or administra- tive) that ensure at least medium-term predictability of future amounts of defense spending in relation to given defense capabilities development plan. So, stabilization in this sense does not mean just fixation of certain absolute or relative amount of spending. It is any instrument, implementation of which supports predictability and guarantee of future expenditures. Defense expenditures stabilization is important mainly in relation to the process of planning and implementing development and maintenance of defense capabilities.

Stabilization of defense expenditures is based on possibilities of stabilization of the entire spectrum of public spending. Public spending is determined by public choice. For defense spending competes with other direction of public spending, stable and sustainable public finance represents one of the prerequisites for defense spending stabilization. Defense expenditures stabilization might mean stabilizing the entire defense spending or just one of its components, e.g. investment expenditures, personnel expenditures etc.
To stabilize future public spending a variety of instruments and approaches can be used. From the point of view of future spending amounts, the following approaches can be differentiated:

– Setting absolute spending levels when there is a decision regarding future spending amounts, often infl. expected development of future prices (inflation).

– Setting relative spending levels when there is a decision to link future spending with development of certain indicator, e.g. number of people, economic performance, growth of salaries etc.

– Ensuring future incomes for given spending program when there a decision that certain part of future public incomes will be used only for certain purpose. This can include direct tax assignation or appropriation of certain category of public incomes (Peková 2008).

Mechanisms of future spending amounts guarantee can be classified as:

– Legislative, which are legally binding and enforceable. Changes in given spending commitment requires the same level of public choice, which was applied during its initial setting. This group of legally binding mechanisms includes also commitments resulting from ratified international agreements.

– Political, which are not legally binding and represent a declaration of certain group (e.g. political party, government coalition, opposition etc.) with regards to future spending amounts of given category of public expenditures. This not binding group of stabilization mechanisms includes e.g. declaration at international level within ad hoc groupings of states or permanent alliances.

Particular way of stabilization of certain spending program can represent a combination of the above outlined approaches and mechanisms (see Table 1).

Table 1. Combination of approaches to setting future spending levels and mechanism of future spending amounts guarantee

<table>
<thead>
<tr>
<th>Mechanism of future spending amounts guarantee</th>
<th>Approaches to setting future spending levels</th>
<th>Mechanism of future spending amounts guarantee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legally binding setting of an absolute spending amount.</td>
<td>Legally binding setting of a relative spending amount.</td>
<td>Legally binding assurance of future incomes for given spending program.</td>
</tr>
<tr>
<td>Legally not binding setting of an absolute spending amount.</td>
<td>Legally not binding setting of a relative spending amount.</td>
<td>Legally not binding assurance of future incomes for given spending program.</td>
</tr>
</tbody>
</table>

Source: Own.

4. Defense Expenditures Stabilization in Selected European Countries

This part of the paper submits and overview of approaches implemented with regards of defense spending stabilization in eight European countries

4.1 Defense Expenditures Stabilization in the Czech Republic

Stabilization of defense expenditures in the Czech Republic has been primarily connected with the ambition of the country to become NATO member (1990’s) and subsequent membership in the Alliance (since 1999). Within its accession procedure, the Czech Republic declared its will to gradually increase defense expenditure by GDP 0.1 % to achieve the level of GDP 2.0 % in 2000 (The Czech Government 1998). In 1999, by approving the Concept of Development of the Defense Department the Czech Government has declared even the commitment to spend GDP 2.2 % on Defense until 2004. This commitment was confirmed in 2002 by approving the Concept of Development of the Professional Army of the Czech Republic and Czech Armed Forces Mobilization (The Czech Government 2002).

These commitments were reflected in real spending levels only partially. The commitment to spend on defense at least GDP 2.0 % has been fulfilled just in the years 2000, 2003 a 2005. The level of at least GDP 2.2 % resulting from the Government commitment in 1999 and 2002 has not been reached at all. A transition to the
effort of defense spending stabilization by absolute future spending amounts has come with the Concept of the Professional Army of the Czech Republic Development and Czech Armed Forces Mobilization, Reviewed to a Changed Resources Framework (Czech Republic Ministry of Defense, 2003). This concept has set fixed amounts of future defense expenditures for the years 2004 – 2010. However, these spending commitments were reflected in real spending levels only in the first two years after the Concept approval. Failure to fulfill Government commitments influenced implementation of defense capabilities development plans but also evoked negative reactions from NATO.

In response to changed development in international security environment, changed perception of security threats, especially after the Ukrainian crisis in 2014, the Czech political representation opened a debate on stabilization of future defense expenditures. On the occasion of the 15th anniversary of the Czech membership in NATO, a declaration of the heads of political parties on Czech Republic defense has been signed. Besides others, this declaration includes an intent to conclude an agreement across political parties on future approach to defense sector (Babiš, Sobotka, Bělobrádek, Fiala, 2014). Finally, the agreement has been made only among the heads of actual Government coalition parties. The aim of the agreement is to stabilize defense expenditures in a prospective of future 10 years, specifying the threshold value of GDP 1.4 % in 2020 and no decline until 2024 (Babiš, Sobotka, Bělobrádek 2014). However, in reality, the development of defense burden indicated rather a decrease than the declared increase (GDP 1.08 % in and GDP 1.04 % in 2015 (Czech Republic Ministry of Defense, 2016).

To sum up, during its relative short independent history, the Czech Republic experienced five attempts to stabilize its defense expenditures. The first three attempts meant setting of future relative spending levels (in relation to GDP). In spite of applying the mechanism of Government decrees, effects of these attempts remained invisible. The fourth attempt consisted of a set amounts of absolute future defense expenditures but again, with very little real effect. The last of these attempts has been constructor on a legally not-binding declaratory mechanism of setting relative future spending levels (just for 2015, there was a set fixed spending amount).

4.2 Stabilization of Defense Expenditures in Poland

Poland has stabilized its defense expenditures since 2011, when the Polish Parliament set a minimum threshold for defense spending at the level of GDP 1.95 %. In relation to the NATO Summit in Wales, Poland has increased this threshold to GDP 2.0 % starting from 2016. Defense represents the only public sector in Poland with such a legally binding stabilization mechanism. The approach enables for a high predictability of future defense spending. In addition, since 2009, the national budgetary system applies a quadrennial plan of the Government, setting fiscal priorities in relation to expected macroeconomic development.

In addition, since 2006, Poland has applied a law determining the share of capital expenditures in the overall defense spending at the minimum of 20 %. Since 2014, another law guarantees that at least 2.5 % of the overall defense expenditure has to be allocated to defense related research and development. There are no limits or thresholds set for personnel and operational expenditures.

In 2001, a supplementary source of funding the armed forces modernization has been installed, indicated as the Fund of the Armed Forces Modernization. Nearly 93 % of incomes of this fund consist of earnings of a national agency responsible for military property administration (especially revenues resulting from sales and rentals of unused property), further incomes represent earnings related from the host nation support activities and conventional fines and penalties collected within the Ministry of Defense.

Stabilization measures implemented in Poland enable to comply with the Long-Term Plan of the Armed Forces Modernization, which is annually reflected on defense budget and also subject of annual assessment by the Polish Parliament.

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1 Note: Government decrees as internal acts of the executive power are binding for all government administration bodies, incl. the Ministry of Finance and the Ministry of Defence, responsible for preparation of annual draft budgets of the the Ministry of Defence (i.e. defense expenditures).
4.3 Stabilization of Defense Expenditures in Denmark

Danish defense expenditures are set within political “Agreements on Defense of the Danish Kingdom”, normally covering periods of five years. The current agreement covers the years 2013 through 2017. This stabilization process includes proportions or frameworks of capital, personnel and operational expenditures. The limits of capital expenditures, included in these agreements, are annually corrected by inflation (according to the Annual Financial Act). Similarly, the limits of personnel expenditures are subjects to annual corrections following the wage level growth.

The Agreements on Defense of the Danish Kingdom enable to conduct the process of defense planning in all aspects of defense spending categories. However, political majority can easily enforce revisions of these agreements.

4.4 Stabilization of Defense Expenditures in Germany

In relation to defense expenditures in the Federal Republic of Germany, no stabilization mechanisms have been introduced. In spite of this fact, development of German defense expenditures has been, when compared with other countries analyzed in this paper, relatively stable (although indicated gradual decrease, especially when expressed as a share of national GDP or overall government spending). This applies to main spending components of capital, personnel and operational expenditures as well.

4.5 Stabilization of Defense Expenditures in Slovenia

In the past the Slovenian Parliament has adopted several commitments related to the amount of defense expenditures. The commitment dated 1998 set that until 2004, the Slovenian defense expenditures will reach the level of GDP 2 %. In 2003, a new commitment has been adopted, setting that the level of GDP 2 % is to be reached in the year 2008. Immediately after adopting these commitments, defense expenditures in Slovenia tended to grow, however, never reached the declared level. The most recent commitment from the year 2015, sets that in 2016 the relative share of defense expenditures shall remain unchanged at the level of GDP 0.96 % GDP and that it shall increase by 0.04 % in 2017.

Besides the defense budget, a special law had introduced (and in 2001 extended) the so called Program of Fundamental Development. The aim of this Program was to complement “normal” defense expenditures with additional funds dedicated to acquisitions of armaments and other military equipment in the period of 1994 through 2007. In general, aims of this Program were fulfilled. In 2008 a new Program of Fundamental Development was approved however, due to lack of financial resources it had never been executed.

The example of Slovenia consists of both legally unbinding declaratory measures, generally covering overall defense expenditures, and legally binding predetermination of funds to cover costs of armaments procurement. While the declaratory measure seem to be ineffective, the legally binding predetermination of capital expenditures was effective until 2007. After that, due to impacts of financial crisis and subsequent political decision, this instrument has become ineffective as well.

4.6 Stabilization of Defense Expenditures in Austria

Development of defense expenditures in Austria reflects historical events, mainly during and after the World War II. Austria has never introduced any instrument enabling to stabilize defense expenditures although the national employment program of the Austrian Government can be viewed as a certain form of stabilization in the category of personnel expenditures. Besides others, this program determines numbers of soldiers and civilian employees in the Ministry of Defense. In spite of the absence of any other stabilization measures, the Austrian defense spending has been relatively stable, especially when measured in relation to GDP and overall government expenditures.
4.7 Stabilization of Defense Expenditures in Bulgaria

Bulgaria has introduced no specific instruments aimed at stabilization of future defense spending levels. The process of allocating funds towards defense sector follows the normally used budgetary process. To certain extent, it should consider strategic and conceptual documents approved in the defense sector (2010 Defense White Paper, 2015 Defense Capabilities Development Program and the Ministry of Defense Investment Plan until 2020).

4.8 Stabilization of Defense Expenditures in Romania

Development of Romanian defense expenditures has rather expressed the necessity to respond to actual state of the armed forces than any systematic approach to establishment of a long-term adequate framework of resources allocated to defense. Between 1997 and 2002, the inadequacy of the overall level of defense expenditures was characterized by the share of up to 70% of personnel expenditures and the lowest defense spending per capita in NATO. An official declaration of the Government can be viewed as an attempt to stabilize the situation, aiming at reorganization and restructuring of military garrisons and the plan to increase defense expenditures between the years 2004 and 2007 to the level of GDP 2.38% HDP. Nevertheless, this plan has never been executed. At present, Romania has applied a declaratory approach to defense expenditures stabilization, represented by the so-called National Political Agreements on Increase in Defense Funding. This documents states that starting from 2017, defense expenditures shall reach the level of GDP 2.0%.

5. Discussion of Approaches to Defense Expenditures Stabilization in Selected European Countries

Approaches to planning and stabilizing defense expenditures in the above mentioned European countries differ significantly. However, in some cases, analogical intents as well as effects can be identified. Let us compare and analyze the approaches in the context of actual absolute and relative levels of defense expenditures. Out of the range eight countries included in the analysis, five countries have attempted to stabilize their defense spending, namely Czech Republic, Poland, Slovenia, Romania and Denmark. For the remaining three countries, the survey results contain no indication of these mechanisms (Bulgaria, Germany and Austria). The Table 2 bellow show an overview of the approaches to defense expenditures stabilization in these countries.

<table>
<thead>
<tr>
<th>Country</th>
<th>Overall defense expenditures stabilization instrument(s) implemented.</th>
<th>Capital expenditures stabilization instrument(s) implemented.</th>
<th>Legally binding mechanism implemented.</th>
<th>Political declaratory mechanism implemented.</th>
<th>Fixation of absolute amounts of future spending set.</th>
<th>Fixation of reactive levels of future spending set.</th>
<th>Future revenues predetermined for given purpose (spending).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech R.</td>
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<td>NO</td>
<td>NO</td>
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</tr>
<tr>
<td>Bulgaria</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>

Source: Own.
Poland represents the country with highest activity when stabilizing its future defense spending, implementing a legally binding mechanism of setting future relative level of the overall defense expenditures, complemented with fixation of the share of capital expenditures and expenditures dedicated to defense research and development in particular. In addition, Poland has predetermined a part of the revenues of the Ministry of Defense for the purpose of capital development of the armed forces. When analyzing development of real amounts as well as relative indicators of Polish defense spending, the mix of stabilization instruments implemented in Poland seems to be effective.

Approaches of the Czech Republic, Slovenia and Romania are very similar. All the countries have repeatedly declared a legally unbinding commitment of a minimum relative level of the overall defense expenditures (as a share of GDP). However, these commitments have never been fulfilled. Unlike the Czech Republic, Slovenia had implemented also a predetermination of future revenues in favor of investment development of armed forces, effective before the financial crisis in 2008.

From the point of view of combining legally binding or declarative – legally unbinding mechanisms and the extent and methods of fixation of future spending amounts or levels, the survey has indicated no dependence. Similarly, the survey has indicated no relation between the particular approach selected and the effectiveness of stabilization efforts.

Approaches implemented in Poland and Denmark can be assessed as effective, while Poland has implemented legally binding mechanisms and Denmark has followed unbinding declaratory mechanisms. Poland stabilization approach is based fixing future spending levels in relation to GDP. Denmark sets actual spending amounts for future five years. Besides stabilization of the overall defense expenditures, both of the countries particularly stabilize capital expenditures as well. Denmark similarly stabilizes also other spending components - personnel and operational expenditures, Poland stabilizes also its defense related research and development expenditures.

**Conclusions**

Based on the survey of approaches to defense spending stabilization in eight European countries and analysis of effectiveness of implemented measures and instruments, a set of following recommendations can be deduced:

1. Set the mechanism of defense expenditures stabilization as legally binding, at the level of a law, approved by national parliament. Legal enforceability and more complicated future changes of the mechanism create an environment tending to future higher stability therefore higher effectiveness.

2. Translate international commitments to a legally binding mechanism of defense spending stabilization. If a country adopts a commitment it should be – if meant seriously – reflected in binding measures guaranteeing future fulfillment of the commitment(s) adopted (especially within defense alliances the tendency to fulfillment of common commitments might become a measure of perception of the given country as more or less reliable partner).

3. Combine setting of relative future defense spending levels (e.g. for NATO members reflecting commitments resulting from the NATO Summit in Wales) with setting absolute amounts of future defense spending in the area of capital expenditures, reflecting medium and long-term plans of defense capabilities development.

4. Combine approaches to overall setting future relative spending levels (in relation to GDP) with particular approaches to setting future capital expenditures levels. For NATO members reflecting the commitments after the NATO Summit in Wales.

5. Separate funds allocated to common operation of the armed forces (personnel and operational expenditures) and funds allocated to investment development of the armed forces (capital expenditures allocated to development of set defense capabilities). Separating expenditures for operation and development of the armed forces enables for higher transparency when monitoring and managing the process of defense capabilities development (and maintenance).
6. Stabilization of defense expenditures understand not just as a possibility how to guarantee future spending levels but also – and mainly – as an instrument enhancing transparency of the use of resources allocated to defense, enabling to set such a level of defense expenditures that – in along term – corresponds with approved intent of defense capabilities development.

7. Enable predetermination of the use of certain public revenues in favor of capital development of the armed forces. A good example of these predetermined revenues could be earnings resulting from sales and rentals of property within the ministry of defense etc.

Actual solution and selection of a mix of particular stabilization mechanisms and approaches to setting future spending levels will be always a result of a political decision. However, to achieve prosperity and effectiveness of national defense sector, to express own reliability within defense alliances, it is worth to consider the above indicated lessons learned.

Results of the survey and subsequent analysis indicate that effectiveness of defense spending stabilization is not directly connected with particular sort of stabilization mechanism or selected approach to setting future spending levels. Much more, it reflects the level of responsibility of the political representation and executive sphere in relation to own commitments and in relation to national defense as one of the key function of any state. Nevertheless, implementation or just consideration of the recommendations outlined above can contribute to more stable and therefore predictable environment necessary for effective development of defense capabilities of any country.

References


THE PUBLIC PERCEPTION OF NUCLEAR ENERGY IN LITHUANIA

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Abstract. The relevance of this article is based on the aim to fulfil the lack of understanding of public perception on nuclear energy in Lithuania. The results of the empirical survey (public poll carried out in 2013) are used to explain the public perception of nuclear energy and its contextual aspects (safety, economic benefit, possible new challenges, personal knowledge). To show the distribution of the attitude among the public cluster analysis was performed through which respondents were divided into two groups. The 1st cluster represents that part of the public which is well educated, actively working and actively contributing to the state economy. Meanwhile the 2nd is less educated, less active economically and more dependent on social security programs part of the public. The cluster analysis reveals small, but statistically significant differences in attitude between the clusters.

Keywords: public perception, nuclear energy, cluster analysis, Lithuania


JEL Classifications: Z13

1. Introduction

The perception of nuclear energy is notable topic in academic literature not only in Lithuania (Balzekiene 2006; Balžekienė, Butkevičienė, Rinkevičius, Gaidys 2009; Rinkevičius, Baločkaitė 2009; Pilibaitytė 2011;), East Middle Europe (Novikau 2016; Wagner et al 2016; Strielkowski, Lisin, Tvaronavičienė 2016; Šincāns, Ivančiks 2017), but all over the Europe (Poortinga et al 2005; Sovacool et al 2012; Mulder 2012; Knox-Hayes et al 2013; Demski et al 2014; Goodfellow et al 2014).

Nuclear energy throughout its development in Lithuania could be characterized by dichotomic consequences for energy security and country’s development in general. On the one hand it hugely contributed to economic sustainability and country’s prosperity after the reestablishment of Independence. It was the most important electricity producer and key factor for liberation from former Soviet Russia energy blockade¹. And on the other hand – having such a huge contributor in country’s energy balance it had let to uncontested problems like market concentration and isolation from EU, and after Ignalina’s nuclear power plant (INPP) decommissioning in 2009 (which was one of the key requirements for Lithuania to join EU) we’ve faced extra challenges like, increasing energy prices and unreliable energy supply. In 2010 Lithuania’s dependence on the external energy

supplies has reached critical level (80% of totally consumed energy). Due to the existing power system to the East and the absence of interconnections with the West, Russia has remained the main supplier of electricity (as well as natural gas) and became the key player in Lithuanian energy market at the time (Augutis et al 2013). This was threatening situation from both energy security and political independence point of view.

Having in mind the importance, it doesn’t surprise, that even after the decommissioning of INPP, nuclear energy in Lithuania remained as one of the key factor for energy security at the long-term strategic interest (Nacionalinė energetikos strategija [National energy strategy] 1994; 1999; 2002; 2007; 2012).

The previous research on public attitudes towards nuclear energy in Lithuania showed that during the twenty years of independence Lithuanians were supportive towards development of nuclear energy (Rinkevičius, Gaidys 2008). But in 2012, the public referendum was held, during which society expressed negative will (62.68 % vs. 34.09 %) against construction of new Visaginas nuclear power plant (VNPP). Therefore, the aim of this paper is to reveal the public perception of nuclear energy in Lithuania and explain the distribution of attitudes among the public.

The paper is based on empirical research (public poll) carried out in 2013.

The paper starts with general tendencies of public perception of nuclear energy as well as some associational aspects. Then, with the help of cluster analysis respondents were divided into two groups based on income, education and occupation. Finally, to demonstrate different rationalization of nuclear energy between the clusters the evaluation of additional aspects (regarding self-evaluation of personal awareness, assessment of media performance and trust in the role of various institutions/organizations for Lithuanian energy policy) were discussed. The paper ends with main conclusions.

2. Tendencies of Public Nuclear Energy Perception

To identify the most important aspects of energy security for Lithuanian society, the vast variety of different aspects of energy security were provide for respondents. As we mentioned elsewhere (Leonavičius, Genys, Krikštolaitis 2015) energy security is perceived rather broadly by the public, but in this case we’ll focus only on public perception of nuclear energy and related aspects.

In the rating of the most important aspects of energy security in Lithuania, “The prices of energy resources” was evaluated the highest (4.35), while the lowest – “Development of shale gas extraction” (3.08). “Development of nuclear energy” (3.30) took next to the last position (Leonavičius, Genys, Krikštolaitis 2015: 313). 49.1% supported this kind of energy, 24.1% - did not and 26.8% had no opinion on the issue.

Nuclear energy is complicated issue and let alone the general attitude of the public might be less informative.

2 Representative survey was conducted by public opinion research company “Vilmorus” in May and June 2013. Number of respondents: N = 2002; interviewed 18 years old and older residents of Lithuania. The method of survey: questioning respondents at home using pre-made questionnaires. Method of selection: multi-stage, probabilistic sampling. Selection of respondents was prepared so that each resident of Lithuania should have an equal chance of being questioned. The results reflect the opinion of the entire population of Lithuania and distribution by age, sex, place of residence, education, purchasing power. Error of survey results – 3% (probability – no less than 97%).

3 The aspects of energy security were formed in line with Lithuanian strategic interests and covered different angles of energy security: diversification (of energy suppliers as well as resources), reliability (of supply and infrastructure), independence (from foreign states (mainly Russia) as well as monopolistic practices), ability to take advantage of international political relations (e.g., EU, NATO) to defend Lithuanian interests, lastly – evaluation of strategic projects to be implemented in upcoming future (renewable energy, shale gas, nuclear energy) (Leonavičius, Genys, Krikštolaitis 2015).

4 The five point Likert scale was used for the creation of the rating: respondent disapproval of a particular issue was marked 1, indecisiveness / not knowing – 3 and approval - 5. Increased average of the responses (e.g., when responses average is approaching 5) means a higher importance of the particular aspect from the point of respondents opinion and conversely, lower average – lower importance (e.g., when responses average is approaching 1).
Studies in other countries show that distribution of public attitude divides society to different size groups of those who support, who do not support and those who unaware. Therefore Lithuanian case is no exception, only the proportions of the groups might be different. To better understand public’s attitude to nuclear energy and its associational aspects, respondents were asked to evaluate statements regarding personal knowledge of nuclear advantages and disadvantages, safety evaluation, economic benefit, and its relation to some other issues (Table 1).

<table>
<thead>
<tr>
<th></th>
<th>I know the advantages and disadvantages of nuclear energy</th>
<th>I think, than Visaginas NPP will be safe</th>
<th>I think that Visaginas NPP will be economically beneficial for Lithuania</th>
<th>I think, that VNPP will cause some extra troubles in the country (i.e. oligarchy widespread)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Totally disagree</td>
<td>13.2</td>
<td>12.1</td>
<td>12.0</td>
<td>3.7</td>
</tr>
<tr>
<td>Disagree</td>
<td>40.9</td>
<td>28.1</td>
<td>25.2</td>
<td>14.1</td>
</tr>
<tr>
<td>Agree</td>
<td>26.9</td>
<td>21.1</td>
<td>22.5</td>
<td>34.5</td>
</tr>
<tr>
<td>Totally agree</td>
<td>3.9</td>
<td>2.7</td>
<td>4.3</td>
<td>13.6</td>
</tr>
<tr>
<td>Don’t know/undecided</td>
<td>15.1</td>
<td>36.0</td>
<td>36.0</td>
<td>34.1</td>
</tr>
</tbody>
</table>

The first thing that becomes obvious is the lack of information among the public. 54.1% disagreed or totally disagreed with the statement “I know the advantages and disadvantages of nuclear energy”. Almost third part (30.8%) of respondents agreed or totally agreed with the statement and 15.1% were undecided or did not answer. This show that people lacks clear and understandable information regarding the issue. It seems that large part of the public comes up with a decision regarding nuclear energy without necessary information or having only partial understanding of the issue.

According to public view the safety of VNPP is also troubling: 40.2% of respondents disagreed or totally disagreed with the statement “I think, than Visaginas NPP will be safe”. 23.7% agreed or totally agreed with the statement and even 36% were undecided or did not answer. Having in mind that 49.1% of respondents support nuclear energy and think that it is important aspect of Lithuanian energy security such results reveal sort of contradiction in public perception.

The same part of respondents 36% didn’t have opinion (or did not answer) to the statement “I think that Visaginas NPP will be economically beneficial for Lithuania”. 37.2% disagreed or totally disagreed and almost fourth part of respondents 26.8% agreed or totally agreed. Such almost equal division of attitudes to economic benefit of NPP among the public reflects the struggle of vivid public debate (Genys 2014) and oppositions towards possible VNPP economic benefit (when proponents emphasized the positive impact on country’s economy, while opponents – on the opposite, not only questioned possible benefit of the project, but set a doubt about the uncertainty of nuclear energy in upcoming future and its decreasing economic benefit in general). The big part of those who are undecided show, that some part of the public weren’t persuade by neither side of argumentation and they still lack the information.

Finally, trying to identify the broader context in which VNPP is being evaluate, respondents were asked to identify some of the possible associations that the project might be related to. Almost half of respondents 48.1% agreed or totally agreed with the statement “I think, that VNPP will cause some extra troubles in the country (i.e. oligarchy widespread)”. Only 17.8% disagreed or totally disagreed and almost third part 34.1% didn’t have opinion (or did not answer). And on the contrary the findings of earlier research (carried out in 2008) showed that nuclear energy at that time in public was associated with positive connotations (like economic country’s autonomy and energy independence) (Balžekienė, Butkevičienė, Rinkevičius, Gaidys 2009: 242). Such sig-

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significant changed in public attitude towards nuclear energy might be related with scandalous6 government’s attempts to start the process of the construction of new NPP in 2008-2009.

3. Two groups - different nuclear energy reasoning?

To better understand the distribution of attitudes to nuclear energy between different social groups, it was decided to perform cluster analysis. The clusters were formed accordingly to the concept of socio-economic status deriving from the basis of the American social stratification research tradition (Ganzeboom et al 1992). The concept of socio-economic status is based on three variables, i.e., education, income and occupation. Therefore three empirical questions (What is your educational background? What are your main activities? What is your income?) served as independent variables for the creation of two clusters.

Hierarchical cluster analysis was performed to identify the number of clusters. Between groups linkage method with Chi-square measure as linkage measures was used. 2 different clusters were distinguished. Subsequently a K-means cluster analysis was performed using 2 as the pre-defined number of clusters. The descriptive statistics for each cluster are displayed in table below (Table 2).

Table 2. Final Cluster Centers

```
<table>
<thead>
<tr>
<th>What is your educational background?</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary education</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Secondary education</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Vocational training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Further education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unfinished higher education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is your occupation?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State enterprises employee</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Private business owner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private company employee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student / Pupil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retired</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is your family income (per person after taxes)?7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 86.89 Eur</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>87.18 - 173.77 Eur</td>
<td></td>
<td></td>
</tr>
<tr>
<td>174.06 - 260.66 Eur</td>
<td></td>
<td></td>
</tr>
<tr>
<td>260.95 - 437.54 Eur</td>
<td></td>
<td></td>
</tr>
<tr>
<td>437.83 - 608.49 Eur</td>
<td></td>
<td></td>
</tr>
<tr>
<td>521.61 - 608.20 Eur</td>
<td></td>
<td></td>
</tr>
<tr>
<td>608.49 Eur and more</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

6 In 2008 the new electric company LEO LT (Lithuanian Electricity Organization) was established. Part of the shares (38.3%) acquired private investor and the rest (61.7%) – the government. The establishment of the company and the worth allocation between shareholders led to questions about the transparency from the beginning and eventually caused public dissatisfaction with the project. With the disclosure of the circumstances that company’s establishment took place undermining many procedural steps the public dissatisfaction with the project has increased. Finally, after the term of the office expired and the government of Socialdemocrats (ruling period 2004-2008) were switched by Conservatives (ruling period 2008-2012), shortly the electric company has been disbanded by mutual agreement.

7 The public poll was carried out in 2013 when national currency Litas was still in use, therefore in further analysis in this article income in Litas is used as a category. The analogue amount in Euros is provided in the brackets.
The 1st cluster consists of people with higher education, who are richer and are owning private companies (or are working in it). Meanwhile, the 2nd cluster is dominated by people with lower education (mainly vocational training) and with lower income who are retired, unemployed or students. Through cluster analysis the respondents were divided in two distinct parts when the 1st cluster represent that part of the public which is well educated, actively working and actively contributing to the state economy. Meanwhile the 2nd is less educated, less active economically and more dependent on social security programs part of the public. The size of the 1st cluster is 853 individuals or 42.61% of the surveyed population, 2nd – 916 individuals or 45.75% and 233 – missing (11.64%).

To crystalize the differences and have a broader understanding every each of them we decided to analyze additional correlations regarding living area and age.

### Table 3. Distribution of living are among each cluster (crosstab)

<table>
<thead>
<tr>
<th></th>
<th>Big cities</th>
<th>Centre of region</th>
<th>Small cities</th>
<th>Rural areas and Countryside</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>43.4%</td>
<td>29.9%</td>
<td>2.8%</td>
<td>23.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>2</td>
<td>33.3%</td>
<td>29.5%</td>
<td>2.6%</td>
<td>34.6%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Total</td>
<td>38.2%</td>
<td>29.7%</td>
<td>2.7%</td>
<td>29.5%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

### Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>28.990</td>
<td>3</td>
<td>.000</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>29.158</td>
<td>3</td>
<td>.000</td>
</tr>
<tr>
<td>Linear-by-Linear Assoc.</td>
<td>28.178</td>
<td>1</td>
<td>.000</td>
</tr>
</tbody>
</table>

By comparing two clusters we see that representatives of the 1st cluster more frequently live in bigger cities and more seldom in rural areas, while of the 2nd on the contrary – most of them live in rural areas and in district centers. And also notable part live in cities as well (Table 4).

### Table 4. Age distribution within each cluster (crosstab)

<table>
<thead>
<tr>
<th>Age groups</th>
<th>18 - 25</th>
<th>26 - 35</th>
<th>36 - 45</th>
<th>46 - 55</th>
<th>56 - 65</th>
<th>66 and more</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12.2%</td>
<td>20.5%</td>
<td>24.6%</td>
<td>27.0%</td>
<td>13.4%</td>
<td>2.3%</td>
<td>100.0%</td>
</tr>
<tr>
<td>2</td>
<td>9.2%</td>
<td>5.3%</td>
<td>8.2%</td>
<td>10.6%</td>
<td>20.9%</td>
<td>45.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Total</td>
<td>10.6%</td>
<td>12.7%</td>
<td>16.1%</td>
<td>18.5%</td>
<td>17.2%</td>
<td>24.9%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

### Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>572.603</td>
<td>5</td>
<td>.000</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>664.254</td>
<td>5</td>
<td>.000</td>
</tr>
<tr>
<td>Linear-by-Linear Assoc.</td>
<td>357.905</td>
<td>1</td>
<td>.000</td>
</tr>
</tbody>
</table>

The representatives of the 1st cluster are relatively young and mature, the three largest groups are of 26-35, 36-45 and 46-55 years old. Meanwhile the two largest groups of the 2nd cluster are – elders 56-66 years old and the oldest (66 and more) group.

Having these two different clusters it is interesting to explore what kind of difference it will reveal regarding their attitude towards nuclear energy and VNPP (Table 5).
Table 5. Evaluation of the statements, both clusters (%)

<table>
<thead>
<tr>
<th>Question</th>
<th>Chi-Square</th>
<th>Asymp. Sig. (2-tailed)</th>
<th>1st %</th>
<th>2nd %</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.3. I know the advantages and disadvantages of nuclear energy</td>
<td>25.183</td>
<td>Absolutely / disagree</td>
<td>51.8</td>
<td>56.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Don’t know / not responded</td>
<td>12.6</td>
<td>18.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Absolutely / agree</td>
<td>35.6</td>
<td>25.7</td>
</tr>
<tr>
<td>20.1. I think that Visaginas NPP project will be safe</td>
<td>18.799</td>
<td>Absolutely / disagree</td>
<td>43.1</td>
<td>39.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Don’t know / not responded</td>
<td>30.0</td>
<td>39.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Absolutely / agree</td>
<td>26.9</td>
<td>21.3</td>
</tr>
<tr>
<td>20.2. I think that Visaginas nuclear power plant will be economical beneficial for Lithuania</td>
<td>15.566</td>
<td>Absolutely / disagree</td>
<td>38.6</td>
<td>36.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Don’t know / not responded</td>
<td>30.7</td>
<td>39.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Absolutely / agree</td>
<td>30.7</td>
<td>24.3</td>
</tr>
<tr>
<td>20.3. I think that Visaginas NPP project will cause additional problems in the country (eg., oligarchy widespread)</td>
<td>22.445</td>
<td>Absolutely / disagree</td>
<td>18.8</td>
<td>17.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Don’t know / not responded</td>
<td>28.0</td>
<td>38.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Absolutely / agree</td>
<td>53.2</td>
<td>44.3</td>
</tr>
<tr>
<td>1.7. The development of nuclear energy</td>
<td>26.488</td>
<td>Absolutely / disagree</td>
<td>25.4</td>
<td>22.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Don’t know / not responded</td>
<td>21.5</td>
<td>32.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Absolutely / agree</td>
<td>53.1</td>
<td>45.2</td>
</tr>
</tbody>
</table>

First, the analysis showed that every question was evaluated somehow different between the clusters. A chi-square test for homogeneity to determine whether 1st clusters members opinion differed significantly from 2nd clusters members opinion. From Table 5 we could see that for all 5 questions we are observing statistically significant differences between clusters members’ opinions. Second, as it was possible to predict, the respondents of the 2nd cluster are much more indecisive and frequently don’t have an opinion (differences bolded in the table). Most of the time it exceeds 30% (with exception of the first statement – “I know the advantages and disadvantages of nuclear energy”, 18.2%). Third, the respondents of the 1st cluster are more positive towards every statement (including “I think that Visaginas NPP project will cause additional problems in the country (eg., oligarchy widespread”). However, this doesn’t mean that the respondents of the 2nd cluster eventually are more sceptical regarding every statement. Even though the 1st cluster has more positive attitude at the same time it is more sceptical. It seems that the 1st cluster, whether the answers are positive or critical, it is more decisive than the 2nd.

To sum up main differences between at least two groups of respondents, we could say, that representatives of the 1st cluster (who are better educated, richer, frequently working in private sector, frequently living in big cities and are in the age range from 26 to 55) are more positive as well as more critical about every statement. They tend to agree with the advantages (safety, economic benefit) as well as disadvantages (VNPP contribution to oligarchy widespread). Finally, this cluster has less doubts regarding the development on nuclear energy and tends to support it.

On the other hand, the representatives of the 2nd cluster (who are somehow less educated, have lower income, mainly retired, unemployed or studying, frequently living in rural areas and are older (56 and more)), first of all, have less information and frequently are unaware about nuclear energy issues. The respondents of this cluster are less critical to every statement (with the exception of “I know the advantages and disadvantages of nuclear energy”). Finally, this cluster has more doubts regarding the development on nuclear energy.

As it was mentioned in the beginning the paper doesn’t seek to explain the cause of nuclear energy perception of the public or different its reasoning between the clusters, but aims to reveal existing differences. The final table (below) provides contextual information representing broader scope to self-evaluation of personal awareness on energy issue, assessment of media performance, and trust in the role of various institutions/organizations for Lithuanian energy policy (Table 6).
Table 6. Evaluation of contextual statements, both clusters (%)

<table>
<thead>
<tr>
<th>Statement/Question</th>
<th>Chi-Square</th>
<th>Asymp. Sig. (2-tailed)</th>
<th>Response</th>
<th>1st %</th>
<th>2nd %</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1. I am very well informed about energy problems.</td>
<td>21.409</td>
<td>.000</td>
<td>Absolutely / disagree</td>
<td>68.7</td>
<td>68.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Don’t know/ not responded</td>
<td>9.7</td>
<td>16.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absolutely / agree</td>
<td>21.6</td>
<td>15.8</td>
</tr>
<tr>
<td>9.2. I think that media reflects the energy issues in detail.</td>
<td>22.137</td>
<td>.000</td>
<td>Absolutely / disagree</td>
<td>57.8</td>
<td>56.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Don’t know/ not responded</td>
<td>12.1</td>
<td>19.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absolutely / agree</td>
<td>30.1</td>
<td>23.8</td>
</tr>
<tr>
<td>6.2. Do You Trust the Influence of these Institutions and Organizations on Lithuanian Energy Policy? Lithuanian Government.</td>
<td>8.864</td>
<td>.012</td>
<td>Absolutely / disagree</td>
<td>36.2</td>
<td>29.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Don’t know/ not responded</td>
<td>18.2</td>
<td>19.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absolutely / agree</td>
<td>45.6</td>
<td>50.7</td>
</tr>
<tr>
<td>6.4. Do You Trust the Influence of these Institutions and Organizations on Lithuanian Energy Policy? Municipalities.</td>
<td>9.523</td>
<td>.009</td>
<td>Absolutely / disagree</td>
<td>43.6</td>
<td>38.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Don’t know/ not responded</td>
<td>25.2</td>
<td>23.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absolutely / agree</td>
<td>31.2</td>
<td>38.1</td>
</tr>
<tr>
<td>6.5. Do You Trust the Influence of these Institutions and Organizations on Lithuanian Energy Policy? Scientists.</td>
<td>0.161</td>
<td>.922</td>
<td>Absolutely / disagree</td>
<td>8.2</td>
<td>8.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Don’t know/ not responded</td>
<td>16.4</td>
<td>17.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absolutely / agree</td>
<td>75.4</td>
<td>74.6</td>
</tr>
<tr>
<td>6.6. Do You Trust the Influence of these Institutions and Organizations on Lithuanian Energy Policy? Lithuanian Energy Ministry.</td>
<td>3.460</td>
<td>.117</td>
<td>Absolutely / disagree</td>
<td>31.4</td>
<td>27.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Don’t know/ not responded</td>
<td>24.3</td>
<td>26.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absolutely / agree</td>
<td>44.3</td>
<td>46.6</td>
</tr>
<tr>
<td>6.7. Do You Trust the Influence of these Institutions and Organizations on Lithuanian Energy Policy? NGOs.</td>
<td>11.117</td>
<td>.004</td>
<td>Absolutely / disagree</td>
<td>30.2</td>
<td>23.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Don’t know/ not responded</td>
<td>33.3</td>
<td>39.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absolutely / agree</td>
<td>36.5</td>
<td>36.7</td>
</tr>
<tr>
<td>6.9. Do You Trust the Influence of these Institutions and Organizations on Lithuanian Energy Policy? Private Energy Companies.</td>
<td>12.082</td>
<td>.002</td>
<td>Absolutely / disagree</td>
<td>50.3</td>
<td>46.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Don’t know/ not responded</td>
<td>31.1</td>
<td>38.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absolutely / agree</td>
<td>18.6</td>
<td>15.1</td>
</tr>
<tr>
<td>6.17. Do You Trust the Influence of these Institutions and Organizations on Lithuanian Energy Policy? International/global energy organizations (i.e., IAEA, WEC).</td>
<td>7.387</td>
<td>.025</td>
<td>Absolutely / disagree</td>
<td>18.8</td>
<td>17.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Don’t know/ not responded</td>
<td>43.4</td>
<td>49.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absolutely / agree</td>
<td>37.9</td>
<td>33.1</td>
</tr>
</tbody>
</table>

Only in two cases (Do You Trust the Influence of these Institutions and Organizations on Lithuanian Energy Policy? “Scientists” and “Lithuanian Energy Ministry”), there are no statistically significant differences between the answers. Both clusters express strong support towards scientists’ role in energy policy (75.4% 1st and 74.6% 2nd absolutely agreed and agreed). This aspect left the less amount of those who don’t have an opinion or those who disagree among all statements/questions.

Another similarity between clusters it’s both quite critical attitude towards the role of “Lithuanian Energy ministry”. Even though the 2nd is more supportive and little less critical (27.4% absolutely disagreed and disagreed and 46.6% absolutely agreed and agreed) than the 1st (31.4% absolutely disagreed and disagreed and 44.3% absolutely agreed and agreed), the answers do not indicate statistical significance in those differences.

The 1st cluster seems to be more confident regarding personal awareness about energy problems (21.6% 1st vs. 15.8% 2nd absolutely agreed and agreed). But it trust (45.6% 1st vs. 50.7% 2nd absolutely agreed and agreed) less in “Lithuanian government influence on energy policy” as well as is more critical to “municipalities role in energy policy” (43.6% 1st vs. 38.4% 2nd absolutely disagreed and disagreed).

Both clusters are lacking information regarding “NGO” (33.3% and 39.4%), “Private companies” (31.1% and 38.6%), and “International organizations” (43.3% and 49.8%) role in Lithuanian energy policy. The 1st cluster is little more critical as usual than the 2nd. It is worth mentioning that “Private companies” are strongly lacking support from both clusters (50.3% 1st and 46.3% 2nd).
Conclusions

The analysis of public perception of nuclear energy revealed diverse attitude among the public. For example, 49.1% supported this kind of energy, 24.1% - did not and 26.8% had no opinion on the issue. For deeper analysis of public perception additional questions (regarding respondents’ knowledge of nuclear advantages and disadvantages, safety evaluation, economic benefit, and its relation to some other issues) were provided. The lack of information among the public is obvious: 54.1% disagreed or totally disagreed with the statement “I know the advantages and disadvantages of nuclear energy”, 36% didn’t have an opinion on “I think, than Visaginas NPP will be safe” and “I think that Visaginas NPP will be economically beneficial for Lithuania” and 34.1% on “I think, that VNPP will cause some extra troubles in the country (i.e. oligarchy widespread)”. This somehow echoes the findings of public perception across various countries, that large sections of public have no firm views for or against nuclear energy in many countries.

40.2% of respondents disagreed or totally disagreed with the statement “I think, than Visaginas NPP will be safe”. Only 26.8% agreed or totally agreed with the statement “I think that Visaginas NPP will be economically beneficial for Lithuania”. While almost half of respondents 48.1% agreed or totally agreed with the statement “I think, that VNPP will cause some extra troubles in the country (i.e. oligarchy widespread)” (on the contrary, only 17.8% disagreed or totally disagreed).

To show the distribution of public attitude among the public cluster analysis were performed through which respondents were divided into two groups. The 1st cluster represents that part of the public which is well educated, actively working and actively contributing to the state economy. Meanwhile the 2nd is less educated, less active economically and more dependent on social security programs part of the public. The cluster analysis reveals small, but statistically significant differences in attitude between the clusters. The respondents of the 2nd cluster are much more indecisive: most of the time they don’t know answers exceeds 30% (with exception of the first statement – “I know the advantages and disadvantages of nuclear energy”, 18.2%). The respondents of the 1st cluster are more positive towards every statement (including “I think that Visaginas NPP project will cause additional problems in the country (eg., oligarchy widespread”).

The 1st cluster is be more confident regarding personal awareness about energy problems (21.6% 1st vs. 15.8% 2nd absolutely agreed and agreed), but it trust less (45.6% 1st vs. 50.7% 2nd absolutely agreed and agreed) in “Lithuanian government influence on energy policy” as well as is more critical to “municipalities role in energy policy” (43.6% 1st vs. 38.4% 2nd absolutely disagreed and disagreed). Both clusters are lacking information regarding “NGO” (33.3% and 39.4%), “Private companies” (31.1% and 38.6%), and “International organizations” (43.3% and 49.8%) role in Lithuanian energy policy.

Literature


DECISION MAKING OF THE ENSURING PUBLIC SECURITY AT THE LEVEL OF THE STATE TERRITORIAL BORDERS

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Abstract. The article presents the current issues and latest trends of the legal and administrative aspects of ensuring public security in the field of state border protection. Firstly, the research reveals aspects of the public security threats in the sphere of national border security. Secondly, discusses the administrative legal regimes of the state border and frontier. Further discussion pertains to the functions and strategic goals of the State Border Guard Service, and the activity-related problems are elaborated. Finally, attention is devoted to one of the significant priorities, aiming at ensuring public security in this field – the EU external border control and protection. The authors applied general scientific methods of studying objective reality, peculiar to legal sciences: systematic document analysis, meta-analysis, structural-functional analysis, teleological, comparative, critical approach, generalisation and prediction. As a result in this research is emphasised the importance of decentralisation in ensuring public security at the level of the state territorial borders; the main guidelines of modernisation in this field are presented.

Keywords: public security, state territorial border, EU external border, protection, optimization, modernization.

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JEL Classifications: K1, K14, F52

1. Introduction


One specific kind of threats might be determined by location of country. The geopolitical position of Lithuania determines the state border be assigned strong guarding. The various issues pertaining to public security, organization and coordination of the state border protection were explored by S. Greičius (2005), D. Seniutienė (2005, 2011, 2013), G. Ivoška (2011) and A. Kuksaitė (2005, 2007), who underlined also the priority problem of safeguarding the European Union internal borders.

Within the first half of 2015, 96 cases of violation of the state border of the Republic of Lithuania were fixed, 151 border violators were detained, of which 16 were returned by the neighboring states. Comparing the data
of the recent years, it may be stated that the number of state border violations at the EU external border went on decreasing.

*For example*, the fixed violations at the border with the Republic of Belarus were by 21.3 percent lower than in 2014, and at the border with the Russian Federation the number of violations has been also declining (–21 percent). Nevertheless, the decreased number of the fixed state border violations by 28.9 percent and the practically unchanged number of detained state border violators disclose “the intensification of illegal state border violations in terms of quantity – groups of more numerous illegal migrants are detained.” It should also be noted that the decline in the number of violations was mostly conditioned due to the strengthening of border guarding with the efforts of both the State Border Guard Service at the Ministry of the Interior (further the SBGS) and other institutions, especially when setting up surveillance systems (Thematic Overview 2015).

As stated in the Public Security Development Program for 2015–2025 (The Seimas of the Republic of Lithuania 2015), one of the main risk factors of public security at the state border remains illegal migration. After Lithuania has become a full-fledged member of the states within the Schengen area, the number of aliens, detained in the state territory as illegally staying or attempting to cross it, increased. Many illegal migrants still treat Lithuania as a transit country on their way to Western Europe or the Scandinavian countries. Large numbers of illegal migrants come to Lithuania from the Republic of Belarus; therefore, a significant step should be taken to make a return (readmission) agreement in the name of Lithuania or the EU with the Republic of Belarus.

Citizens from the Member States may travel in the Schengen area unrestricted without visas and cross-border check procedures irrespective of their travel purpose (Nedzinskas 2007). This may become an important challenge for national and regional security, since the mobility and transnational character of organized criminal groups are augmenting. A still more serious problem is becoming the immigrants from third countries. As a result of the conflict in Syria, Europe has confronted with the unprecedented crisis of refugees (Kahdo, Amireh 2015). Even though the South European states had to meet biggest challenges in the face of this crisis, this demographic crisis, no doubt, will have an impact on other European regions, including the Baltic States. Growing multiculturalism makes one to search for qualitatively new security solutions, which may be defined as a phenomenon of ethnocultural fragmentation of the society, directed against culture as a manifestation of the identity of a nation and based on a liberal conception of cultural diversity (Amilevičius, Andrejevas 2012).

One of the consequences of multiculturalism is the effect of “sandwich civilization”, describing a postnational state which is “the confederation of completely autonomous communities. All taken together, they form one element, whereas inside that element they do not merge together, do not penetrate into one another. (...) The state just tackles general and technical issues” (Amilevičius, Andrejevas 2012). Undoubtedly, the qualitative protection of the state border will not have an effect on these processes, but can greatly reduce their negative aftermaths, for instance, when controlling the illegal migration flows and strengthening the EU external border protection.

Two thirds of the State border transgressions are linked with smuggling (Thematic Overview 2015). The illegally imported goods diminish the profits of persons, legally operating and paying taxes; no taxes are paid for such goods; therefore, part of income is lost for the state budget and the principles of fair competition are distorted. The income raised from the illegal international trade is also used for financing of other criminal acts. As claimed in the Public Security Development Program, at present barely in nine Lithuania’s border control points, X-ray control systems are used for checking trucks and transported cargo and containers. Their use should be expanded to raise the effectiveness of customs clearance procedures The Seimas of the Republic of Lithuania 2015). The main reasons for smuggling are non-equivalence of prices, incompatibility of the labor market, inefficient control of customs transit procedures, insufficient financial activity control of trade enterprises and other economic entities, imperfect development and education of public spirit (Baltrūnienė, Šarauskas 2011). Despite of the complexity of a smuggling problem, the identification and implementation of the adequate state border protection measures have a big effect on problem solving.
Discussing the problems of ensuring public security in the field of the state border protection, it is expedient to focus on the main trends in the administrative legal regimes of the state border and frontier, the peculiarities of the activities of the key institution responsible for the state border protection – the State Border Guard Service at the Ministry of the Interior – as well as the implementation of the main state border guard priority – EU external border protection.

2. Improvement of the state border and frontier administration system

In the Law on the Basics of National Security, a reliable control and guarding of the state border meeting the requirements set by the European Union with a particular attention devoted to the control and guarding of the EU external border is indicated as one of the priorities of a public security policy. The state border and frontier legal regimes shall be laid down and the organization of the state border guarding shall be regulated by law.

The administrative legal regime of the state border guarding consists of constitutional and legal norms, identifying the legal grounds of the administrative legal regime thereof. The state border guarding is also based on international legal norms, general principles of international law, and internal legal norms of the state, regulating the activities of the state border guarding subjects. The administrative legal regime of the state border guarding is comprised of the totality of legal measures, ensuring the implementation of legal norms in the field of the state border protection, and of the legal mechanism of material supply which is intended for the functioning of the administrative legal regime of the state border guarding.

The state border guarding legal regime ensures that persons would adhere to the state border and frontier legal regimes and to the operation regulations of the border control points. The state border guarding administrative legal regime may be subdivided into the legal regimes of the state border, frontier, and border control points.

The Constitution of the Republic of Lithuania (1992) does not contain any article, intended for the state border guarding, except for general norms regulating territorial integrity and indivisibility of the state. The core legal acts regulating the provisions of the state border protection is the Law on the State Border and Protection thereof (2000). This law is targeted to establish the legal regimes of the state border and frontier, and to regulate the activity of border control points and organization of the guarding of the state border. Part 2 of Article 1 of the Law enforces the provision that the state border of the Republic of Lithuania shall be inviolable. This provision fills a certain gap in the Constitution, being a grundnorm in the state border protection system. Article 2 of the Law defines the state border as the line and the vertical surface extending along this line, delineating the limits of the territory of the Republic of Lithuania on land, in the entrails of the earth, in air space, inland waters and the territorial sea, and the depths thereof.

Protection of the state border is described as the measures stipulated by legal acts being designed to avoid unlawful changes in the state border demarcation; to ensure that natural and legal persons would adhere to the state border legal regime, to the frontier legal regime, and to the rules of operating border control points; to enforce other vitally important interests of the persons, the society, the state at the border control points, and in places where the border legal regime is in force. The state border legal regime is defined as the procedure established by legal acts for determining, marking, crossing, and administrating the state border.

The legal regime of the frontier means enforcement of the guarding of the state border in the frontier zone and in the territorial sea by means of laws and other legal acts, establishing the rules for the stay of persons, as well as the procedure of implementing their other rights and behavior rules. The Law also regulates the main legal regimes of the frontier and of the operation of border control points, emphasizing that the State Border Guard Service shall perform the control of the frontier regime (Article 17), and the control of the legal regime of the activities of border control points shall be implemented by the State Border Guard Service, customs office and other inspecting institutions within their powers.

Making analysis of the provisions of the Law on the State Border and the Protection Thereof, attention should
be drawn to the fact that they are comparatively not exhaustive, here only the main concepts are characterized and the competences of institutions responsible for the state border protection are described. It is to be emphasized that the law under discussion has already been adopted in 2000, when the Republic of Lithuania was neither a member of the NATO nor the EU.

Evidently, during the law adoption the topicalities and problems related to the state border protection have been completely different. Certainly, the law was amended more than once, revised and adjusted to the international and EU legal acts, *inter alia* the Schengen Convention. However, frequent amendments and corrections of the law predetermined its fragmentary character and have not solved its non-compliance with the geopolitical tendencies of the period. In fact, quite a number of urgent provisions pertaining to the state border protection are regulated in the Law on the State Border Guard Service (2000), describing therein more broadly the powers of this institution. Nevertheless, the choice of such legal regulation is again subject to discussion – both legal acts are comparatively small in scope, therefore, a logical conclusion comes forth naturally that they are to be joined into one – the Law on the State Border and the Protection Thereof – which would contain all the principal provisions regulating the state border and frontier administrative legal regimes, necessarily envisaging additionally the contemporary tendencies, complying with the priority trends in the state border protection (especially the EU external border protection) and objectives.

It is also notable that another statutory implementing legal act of a substantially big scope and topical for administrative legal regimes of the state border protection is the Border Control Regulations approved by order of the Commander of the State Border Guard Service (2012). The purpose of the Border Control Regulations is to regulate planning, organizing, and executing the state border surveillance and cross-border checks by the State Border Guard Service and its structural units being involved in organizing and implementing the Service functions in the assigned frontier section, part of the territorial sea, marine, airport or some other established territory. Item 6 of the Regulations defines the border control planning as “the purposeful activity for organizing the border surveillance and cross-border checks, pursuing other goals and tasks set for border control or ensuring other functions of the Service.”

It is also laid out that border control planning and organizing within the frontier station operation territory consist of the drafting of the unit commander’s order on border control, evaluation of the situation at the frontier station operation territory, monthly shift scheduling, drafting of border guard shift working plan and completing of shift official worksheets. Further, all these stages are regulated in detail in the Border Control Regulations as well as the types of border guards, separate organizational aspects of their service (e.g., laying an ambush, competences of a video and/or signal system operator, etc.). In making an analysis of this legal act, a focus on the technical aspects of the activities of the border control officers is striking the eye most of all, although the principles of their activities, rights and duties have not been regulated more comprehensively.

It is noteworthy that these aspects are not regulated by either the Law on the State Border Guard Service or the Law on the State Border and Protection Thereof (the latter only succinctly mentions the core principles of the State Border Guard Service activities). Therefore, if a proposal to reform the legal regulation of this area is implemented by regulating all cornerstone provisions in a single modernized Law on the State Border and Protection Thereof and by drafting the project thereof, the above-mentioned aspects must be included in the provisions of the future law.

In summary it should be said that administrative legal regimes of the state border guard, frontier and border control points are topical for the state border protection. The necessity to modernize the present legal regulation is witnessed by the fact that currently the state border protection provisions are regulated by the two key laws: Law on the State Border and Protection thereof and Law on the State Border Guard Service, which should be logically and expediently incorporated into one.

It should be also taken into account that the above laws have already been adopted in 2000, when the Republic of Lithuania was neither a member of the NATO nor the EU; the laws have been amended more than once,
corrected and adjusted to international and EU legislation, inter alia the Schengen Convention, this predeter-
mining their fragmentary character and not tackling their non-compliance with the geopolitical tendencies of
the period.

Therefore, it would be expedient to adopt the qualitatively new Law on the State Border and Protection Thereof,
containing therein all the principal provisions regulating the state border and frontier administrative legal re-
gimes, additionally necessarily foreseeing the state border guard priority trends in compliance with contempo-
rary tendencies (especially the EU external border protection) and objectives.

3. Trends in the activity improvement of the state border guard service

The Law on the Basics of National Security states that the purpose of the State Border Guard Service is to
implement the protection of the state border on land, in the sea, in the Curonian Lagoon and in frontier inland
waters and the state cross-border control, to prevent and regulate the frontier incidents. The status, structure,
functions, organizational basis, funding, the rights and duties of the officers of the State Border Guard Service
(SBGS) are identified by the Law on the State Border Guard Service (2000). Pursuant to Article 2, SBGS is
charged with the implementation of the policy of state border guarding and cross-border control, and in wartime
to defend the state as an integral part of the armed forces. Meanwhile, the Ministry of the Interior guides the
implementation of the policy of state border guarding and controls it. It is also regulated that SBGS activities
are based on the principles of lawfulness, respect to human rights and freedoms, adjustment of the officer’s
personal freedom and statutory discipline, constant readiness, publicity and confidentiality adjustment, though
the content of these principles has not been elaborated. In the same article it is regulated that SBGS shall con-
duct criminal intelligence, control of the state migration processes, and shall be entitled to initiate and control
pre-trial investigations.

Article 5 regulates that SBGS functions are:
- to guard the state border;
- to exert control over persons and vehicles crossing the state border;
- to enforce the legal regime of the frontier and, within the scope of its competence, the regime of border
  control points;
- to take part in implementing control over the state migration processes;
- to take part in ensuring public order in the frontier zone;
- to defend the state in time of war as an integral part of the armed forces;
- to take part in the activities of international organizations;
- to maintain constant readiness in renewing the frontier check at the internal border.

It is also indicated that this list of functions is not final; moreover, the SBGS implements the functions referred
to in this article while operating publicly and, if necessary, conducts criminal intelligence operations. Further
the law details the powers of the Service by the functions regulated in the article. It is not clear, however, why
only some functions are distinguished in this case.

Probably, it is also partly understandable that there is no necessity to elaborate how the SBGS gets involved in
the military defence in time of war, even though it is completely not clear why other functions are not given in
detail, for example, how the SBGS takes part in implementing control over migration processes. The legislator
in Article 5 has enforced a list of functions which is not final.

This presupposes a premise that the core and most important SBGS functions have been distinguished. Never-
theless, the further elaboration of such functions at random is not clear and hardly justified. Also, three articles
are incorporated into the law not very consistently: Article 7 1 regulating therein the right of SBGS to receive
information, Article 7 2 regulating SBGS data management, and Article 7 3 regulating the right of persons to
obtain information. However, the inclusion of such provisions among SBGS functions makes such regulation
inconsistent.
It is also noteworthy that no consistent regulation of the rights and duties of the officers exists, even though the powers of officers in various fields are especially widely regulated and their responsibility is outlined, whereas the main rights of a SBGS officer have not been enforced. Upon making notices as regards some provisions and their non-systematic character, a general criticism of this legal act is also to be rendered.

*Firstly,* it should be said that as previously mentioned a conclusion may be drawn that the Law on the State Border Guard Service should be an integral part of the Law on the State Border and Protection Thereof. *Secondly,* the former does not foresee the SBGS priority objectives and tasks. In fact, these issues are discussed in the SBGS Regulations (Republic of Lithuania Government Resolution No. 194, 2001), wherein the norms of the Law on the State Border Guard Service are actually repeated, whereas the SBGS Regulations are just the statutory implementing legal act with the lower force of law. In addition, both the Law on the State Border Security Service and the SBGS Regulations have been adopted prior to Lithuania’s accession to the EU. After Lithuania joined the EU and Schengen area, the provisions of these legal acts have been changed more than once, though it was neither systematic nor consistent; therefore, the SBGS strategic goals have not been emphasized.

It should be underlined that neither the Law on the State Border Guard Service nor the Law on the State Border and Protection Thereof as well as the Regulations have enforced the priority goal of the EU external border protection; not any account is taken of contemporary geopolitical tendencies.

This presupposes the necessity to alter the legal regulation of the SBGS activity by regulating the SBGS activity in the Law on the State Border and Protection Thereof rather than in a separate Law on the State Border Guard Service; foreseeing the SBGS strategic goals and tasks (*inter alia* the priority of the EU external border protection) in the Law, to adjust the norms of the Law and the SBGS Regulations seeking to achieve that the Regulations would not mechanically reiterate the norms of the Law, but would regulate those issues on the SBGS activities that are not expedient to be regulated at a level of the law. Mention should be also made of certain practical problems relevant to the SBGS activities.

Primarily, it should be noted that the problem of human resources and the adequate qualification of the staff is of importance to many institutions.

*On the one hand,* upon Lithuania’s joining the Schengen area, the control of the border with Poland and Latvia has declined.

*On the other hand,* Lithuania has become the border state in the Schengen area and that is why the external border control should be strengthened. *For example,* according to J. Baltrūnienė and G. Šarauskas (2011), “After Lithuania has become the EU member, smuggling as a social phenomenon has not disappeared and its scale from the start of the border liberalization (...) has increased considerably.” Therefore, as V. Andrejevas (2012) claims, “Lithuania’s membership in the European Union requires that the external wall protection and cross-border checks be conducted by the staff with special training.” However, the profession of a border guard for most of future students does not seem perspective; moreover, part of the trained professionals get employed in other structures. Therefore, currently, higher attention is attempted to be focused on the employment of graduates in the SGBS and for quality enhancement of studies. Competence of the already working SBGS officers is also striven to be raised (Andrejevas 2012).

In summary, one concludes that the necessity exists to change the legal regulation of the SBGS activities by regulating the SBGS activities in the Law on the State Border and Protection Thereof rather than in a separate Law on the State Border Guard Service, envisaging the SBGS strategic targets and tasks (*inter alia* the priority of the EU external border protection) in the Law; to adjust the norms of the Law and the SBGS Regulations, seeking to achieve that the Regulations would not mechanically reiterate the norms of the Law but would regulate those issues of the SBGS activities that are not expedient to be regulated at the legal level.
4. Tendencies in the improvement of the European Union external border protection

Free movement of persons and goods in the EU space, safe and swift movement of persons and goods through the EU external borders is one of the cornerstones of the EU socio-economic model to be related “with the constant need to improve the regulatory environment and institutional basis” (Effective Protection of EU...2012). According to S. Greičius and D. Seniutienė (2005), “refusal of cross-border checks at the internal borders inevitably means both the national and public security deficit, since the Member States are losing an important national tool enabling to control the persons crossing the country through the internal borders and to identify them.” As underlined by A. Kuksaitė (2007), “security got changed in the core when borders from external turned into internal.” Therefore, a certain compensatory system is foreseen for this security deficit: certain control requirements, aims, principles, mechanisms, forms of closer cooperation of institutions responsible for the internal security have been incorporated (Greičius, Seniutienė 2005).

However, the question arises as to whether these mechanisms are implementable in Lithuania, where, as seen, the priority of the EU external border security has not been foreseen even in the basic laws regulating the state border security.

According to D. Seniutienė (2011), two categories of the borders are distinguished at the EU level: internal and external. To ensure the Schengen area security, utmost attention should be devoted to strengthening the external border security.

The objective to create the area of freedom, security and justice at the EU level has already been set in the Treaty of Amsterdam. Here the reforms on the issues of asylum, visas, immigration and external border control have been envisaged. D. Seniutienė claims that “under the protocol of the Treaty the Schengen acquis has been incorporated into the EU legislation (acquis communautaire) and has become its integral part” (Seniutienė 2011).

The Treaty of Rome has enforced unrestricted mobility and freedom of movement as one of the fundamental privileges of the EU citizens. The EU has gradually developed the large space not split by the borders of the states and giving the opportunity for the EU citizens to move without any restrictions and without cross-border control. However, the free movement of citizens from different states, differing by both cultural and social criteria, may engender the greater insecurity, especially in respect of the immigrant-receiving country (Seniutienė 2013).

An integrated border security model has been developed and used in the countries belonging to the Schengen area. This model covers certain areas (dimensions) of activities that are called four filters. These dimensions include the activities in third countries, the countries of origin and transit countries, bipartite and international cooperation, measures at the external borders and further work inside the territory (Greičius, Seniutienė 2005).

It should be noted that such integrated border security model has not been enforced in any national legal acts. The EU integrated external border protection is based on the EU internal security strategy of the Council of Europe, adopted in February of 2010. Attention in the “Internal Security Strategy for the European Union “Towards a European Security Model” Project” is focused on the EU internal security and external border protection cohesion. This concept was further elaborated in the Treaty on the Functioning of the European Union. The concept of the integrated border protection is to be perceived as “the way towards convergence of national systems in order to ensure cross-border control mechanisms for movement of persons and goods to develop the area of freedom, security and justice” (Seniutienė 2011).

Consolidation of the external borders of the Schengen area encompasses both physical and legal measures. Implementation of new technologies and surveillance facilities may be referred to as physical measures. Legal measures mean the system of responsibility for illegal border crossing, the more stringent visa issue regime.
The Schengen information system, where data on wanted or missing persons, objects, etc. are being stored, has been implemented (Seniutienė 2010). A. Kuksaitė (2005) distinguishes five essential constituent parts in the common policy relating to the integrated external border management: the common legal basis, the common activity coordination and cooperation mechanism, the common integrated risk analysis, commonly used equipment and staff training to operate it at the EU level; burden sharing among the Member States in order to join the European border security forces. The issues on the development of integrated external borders have neither been regulated in national legal acts so far, nor been accorded more considerable attention in the scholarly works. The first more distinct impetus in this field is to be related to the Public Security Development Program for 2015–2025.

One of the priority tasks under the Public Security Development Program for 2015–2025 is to ensure the effective EU external border control and to prevent illegal migration and illegal international trade (The Seimas of the Republic of Lithuania 2015). All aspects of this goal are integral and closely related; therefore, it is possible to state that the foreseen target may be implemented only by complex measures. The program also sets the key tasks to implement this goal.

*The first such task* is the EU external border management enhancement. This task may be implemented by getting integrated into the EU external border management system; by implementing modern border surveillance systems at the state border with the Russian Federation and the Republic of Belarus and surveillance of the sea border and by ensuring their proper functioning; by improving and modernizing the procedures of the state cross-border checks and strengthening international cooperation.

*The second task* covers illegal migration prevention and control strengthening. To implement this task it is necessary to enhance the interaction of institutions, responsible for migration process control, especially in the field of information exchange, and for collaboration with other EU Member States and third countries and increase their powers and capacities to react promptly, adequately and by requisite measures; to consolidate the preliminary illegal migration control by effectively using a visa issuance system; to reduce opportunities for abusing the legal ways of migration; to ensure the effective implementation of policy to return aliens to their country of origin or foreign states where they are entitled to go, to encourage the voluntary return, and thus to save the state funds; to more broadly disseminate information on the opportunities of legal migration of aliens, procedure of entrance into Lithuania, staying here, passing it in transit and departure. Likewise, it must be necessary to develop the effective fight against illegal trade by strengthening both national and regional coordination and interaction of competent institutions, expanding the application of prevention measures being intended for control of the turnover of illegally imported goods, etc (The Seimas of the Republic of Lithuania 2015).

As stated in the Public Security Development Program for 2015–2025, since the end of 2013 the European Border Surveillance System (EUROSUR) has started operating in the EU and is intended for the EU Member States and the European Agency for the Management of Operational Cooperation at the External Borders of the Member States of the European Union (FRONTEX) to exchange information and to mutually cooperate seeking to identify the illegal migration and transnational crime cases and to prevent them.

By the Resolution of the Government (Republic of Lithuania Government Resolution No. 444 2014) the State Border Guard Service has been appointed as the National Coordination Centre, intended to coordinate the activities, to cooperate with all the institutions, responsible for surveillance of the external borders of the EU Member States, as well as with other national coordination centers and FRONTEX, and to exchange information with these institutions within EUROSUR.

Strengthening the EU external border control, it is necessary to employ the opportunities of this system (The Seimas of the Republic of Lithuania 2015). Nevertheless, the stationary EU external border surveillance system has been implemented only in some sections of the EU external land border with the Russian Federation and the Republic of Belarus, at the approaches to some border control points and for surveillance of the territo-
rial sea. At the end of 2014, 32 percent of the border was controlled by the stationary surveillance systems in Lithuania the EU external borders – 345 km. In the Public Security Development Program for 2015–2025, it is emphasized that state border violations reduced greatly in the state border sections where the border surveillance system is being implemented. For example, upon implementation of such systems at the border with the Russian Federation, the number of the state border violations in this border section has reduced even by 78 percent in 2010–2013.

Therefore, the program focuses on the aim to constantly strengthen the available forces, to implement the modern border surveillance systems at the EU external border, to improve their use with account of the changes in the external and internal risk factors and threats, and to ensure the efficient functionality of the implemented border surveillance systems. In the state border sections where the stationary border surveillance systems have been installed the constant patrolling should be replaced by the operational reaction to the illegal state border crossings and efficient prevention of those crossings (The Seimas of the Republic of Lithuania 2015).

Currently, an opportunity exists at the border control points to conduct checks of electronic travel documents with electronic protection measures issued only in some states, as the system of exchange of certificates confirming the authenticity of electronic documents has not been developed. The ‘smart borders’ initiative envisages the broad use of biometric identifiers and electronic documents for checks at the border control points, with the assistance of the special border checking programs and creation of the common entry and departure system at the EU external border. It is necessary to improve and modernize the check procedures at the border control points and to supply SBGS officers with the most sophisticated equipment for people detection, travel document check, and vehicle inspection.

It is necessary to further strengthen cooperation with the frontier protection (coastal) services of the Baltic Sea region states, ensuring the external border surveillance in the sea, to actively participate in FRONTEX activities, other international forums and projects of the EU and Baltic Sea region states (The Seimas of the Republic of Lithuania 2015).

In summary, it should be said that refusal of cross-border checks at the internal borders after signing the Schengen Convention predetermines the deficit of public security within the state; therefore, the proper functioning of compensatory mechanisms should be ensured. The reasonable doubt arises whether these mechanisms are effectively implemented in Lithuania where, as seen, the EU external border protection priority is not foreseen even in the main laws regulating the state border protection.

The first more distinct impetus in the national lawmaking is related to the Public Security Development Program for 2015–2025 where ensuring of the efficient EU external border control and prevention of illegal migration and illegal international trade are among priority objectives. Of importance is also that SBGS is appointed as the National Coordination Centre for coordination of activities and cooperation with all institutions, responsible for the external border surveillance of the EU Member States, as well as other national coordination centers and FRONTEX, information exchange with these institutions within EUROSUR. To strengthen the EU external border control, the potentials of this system should be used effectively.

It is necessary to improve and modernize the check procedures at the border control points and to supply SBGS officers with the most sophisticated equipment for people detection, travel document check and vehicle inspection. It is necessary to further strengthen the cooperation with frontier protection (coastal) services of the Baltic Sea region states, ensuring the external border surveillance in the sea, to actively participate in FRONTEX activities, other international forums and projects of the EU and Baltic Sea region states.
Conclusions

The necessity for modernization of the present legal regulation in the field of state border protection is witnessed by the fact that currently the state border protection provisions are regulated by the two key laws: Law on the State Border and Protection Thereof and the Law on the State Border Guard Service, which should be logically and expediently incorporated into one. The above laws have already been adopted in 2000, when the Republic of Lithuania was neither a member of the NATO nor the EU; the laws have been amended more than once, corrected and adjusted to international and EU legal acts, inter alia the Schengen Convention, this predetermining their fragmentary character and not tackling their non-compliance with the geopolitical tendencies of the period.

The reasonable doubt also arises whether these mechanisms are effectively implemented in Lithuania where, as seen, the EU external border protection priority is not foreseen even in the main laws regulating the state border protection.

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INTERCOMPANY NETWORKS OF THE CROSS-BORDER REGION (LATVIA-LITHUANIA-BELARUS)

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Abstract. Global crises of the end of the XX – beginning of the XXI century have additionally contributed to the search for new market opportunities and made it obvious that on the modern market efforts of one particular company are not enough to do business efficiently. Thus, companies choose a survival strategy in times of growing uncertainty and together with small-scale and medium-scale companies form unified structures which allow competing successfully with large companies. These structures also reveal and enhance their advantages which lie in flexibility and adaptability to the market demands. The article examines basic models of the intercompany networks which meet the requirements of transition to sustainable economic growth in the cross-border region (Latvia-Lithuania-Belarus).

Key words: intercompany networks, network competitiveness, sustainable growth.


JEL Classifications: O1, R12, L26, Y1

1. Introduction

The globalization process has exerted a significant impact on the development of network cooperation (Simionescu et al. 2017; Balcerzak, Pietrzak 2017; Prause, Atari 2017; Hilkevics, Hilkevics 2017; Fuschi, Tvaronavičienė 2016; Monni et al. 2017; Tvaronavičienė, Černevičiūtė 2015). Intercompany cooperation has become an integral part of the economy of modern companies: the number of links among the units of a company and independent businesses has increased. Moreover, a growing number of companies have been successfully taking advantages of their mutual cooperation. Mutual collaboration in the economy has formed the basis for the development of high-technology products and increase in network competitiveness of companies based on developing a strategic policy among the business partners (Menshikov et al. 2017). At the moment to succeed a multiple number of conditions must be met which include economic, organisational and technological opportunities of different market players (Caimcross 2002; Dicken 2003; Hakansson, Waluszewski 2007; Goeke et al. 2010; Hamel 2012; Belas, Sopková 2016; Lavrinenko, et al. 2017). Intercompany networks are viewed as a beneficial strategy for small-scale and medium-scale businesses which helps them to grow and develop without a surge of intercompany expenses associated with the business expansion (Besser, Miller 2011; Veilleux et al. 2012).

A network is a means of intercompany cooperation which is juridically independent but dependent in the economic sense. It can be implemented vertically and/or horizontally (Ziber 2000); it is a means of enterprise...
integration, i.e. their unification through the system of vertical and horizontal cooperation agreements and contracts, coordination of their activity and through engaging new partners (Rüegg-Stürm, Achtenhagen 2000). It is a structure which contains two or more companies which share common objectives or work to meet shared challenges by cooperating over a long period of time (Haggins 2000); it is a loose flexible coalition managed at a single centre which forges and manages alliances, coordinates financial resources and technologies, defines the areas of competencies and strategies as well as addresses the relevant management issues which connect the network together using information resources (Webser 1995).

The main factor contributing to network formation is their feature of facilitating access of economic agents to resources and capacities which they need but lack (Gorlacheva, Omelchenko 2010). In terms of resource approach companies form strategic networks to create value. This objective, in turn, can be divided into three main tasks: obtaining, using and developing resources and capacities. Using resources and capacities implies company’s following these objectives: using its strengths and key resources and overcoming weaknesses using resources and capacities of the partners. When making a decision concerning the transition to forms of organization based on networks several factors must be taken into account: increased need for organizational flexibility, need for reducing market uncertainty, search for complementary resources and capacities which other network participants possess as well as developing of a high-technology basis.

2. Methodology

One of the first works which examined sustainable network interaction is “Principles of Economics” of A. Marshall (Marshall 1890). A. Marshall pointed out that sustainable network interactions among collaborating economic agents located in close proximity to each other receive positive externalities (accelerated information sharing on important issues, access to specialized suppliers of goods and services as well as access to skilled labour). In the future the ideas of A. Marshall were widely accepted and developed as they formed the basis for the modern understanding of enterprise clusters as a network form of modern markets.

However, most of the researchers believe that the theory of network forms of business organization is fragmented and it has not been completely formed by now. They stick to the idea that there is neither integrated approach to defining networks in business nor a generally acknowledged methodology of its studying. (Colombo et al. 2011; Bergenholtz, Waldstrom 2011; Katkalo 2006; Katenev 2007; Sheresheva 2010). Thus, conceptual framework of the research subject needs its developing and defining a consensus on some key concepts.

At the current stage intercompany cooperation is characterised by the following features: cooperation is an effective form of interaction while creating innovative products; cooperation with foreign partners increases (Prasad 2004); companies use cooperation agreement to successfully develop technological base of innovative enterprises (Hamel, Prahalad 1996), As T.Choi and Y.Hong put it, (Choi, Hong 2002), business process management in networks means developing a tool of intercompany coordination directed to policy coherence as well as to adjustment, streamlining and synchronization of all the actions done by interdependent network participants.

R. Miles and C. Snow (Miles, Snow 1986) conceptualized networks as a strategic organization solution by the beginning of the 90s. They suggested that intercompany networks should be considered a new stage in organizational structures evolution: linear – functional – divisional – matrix – network. The main feature of a network was the idea that the place where it occurs is global turbulent markets; the researchers saw the modus operandi in aggregating of temporary structures by a broker company. These structures presuppose information exchange among the participants as a foundation of trust and coordination. According to Miles and Snow, a common difference of networks is also using collective assets of some economic agents located at different stages of value chain creation. It differs from a “traditional” situation when all assets necessary for product creation are within one organization or exclusive contract. In resource management market mechanisms predominate, but network participants demonstrate proactive behaviour in order to improve a product or service, i.e. they not only observe their contractual obligations but also are ready to extra investments in shared outcome.
Complexity and diversity of network forms are confirmed by the fact that the researchers analyse different types of intercompany networks: internal, stable, and dynamic (Miles, Snow 1989). Internal networks imply partial ordering of goods and services from other suppliers. Internal networks best suit the situations when companies experience difficulties with finding new suppliers and flexibility of their own independent branches is required. Network of cooperation between divisions even in times of strict coordination makes it possible to adopt organizational innovations. One of the advantages of a stable network is supply and distribution reliability as well as close cooperation in the production schedule and quality control. A drawback of this network type is strong interdependence of the companies and the loss of flexibility. The future of the network is determined basically by the development level of the core company. Internal and stable networks are most prevalent in mature sectors where significant capital investments are required.

Dynamic network strives to adapt to business environment through distribution of self-administered entities on different markets. Such network type is used in a fast-changing competitive environment. The network head office unites necessary assets in some cases wholly owned by other companies; it has only key competencies for the business in, for instance, producing, designing or marketing. The advantage of dynamic networks is specialization and flexibility, which is convenient within projects at least cost and in minimum time. Dynamic networks exist both in low-technology industries with a short cycle of product development and in high-technology industries such as electronics and biotechnology.

Other researchers (Möller, Rajala 2003) used marketing logic of creating value and pointed out three types of business networks. Stable business networks with a well-established system of value creation, well-known competencies of the participants and clearly defined business processes. They are divided into two categories: vertical demand and supply networks built along the value chain and horizontal market networks which are created to offer the final consumers the product of a collaborative effort. Incremental business networks also have quite a stable system of value creation; the network participants, however, can change and improve it. They are also divided into two categories: temporary networks with a single goal which consists from a focal company and its suppliers, customers, consultants and specialized technologies suppliers; solution networks for the end-user which comprise producers with complementary resources and competencies and which act as projects.

At present intercompany network has transformed into an effective tool of coordinating actions of all its participants. This tool directly influences the establishment of a sustainable competitive advantage.

In this regard, the following models of the network cooperation have been determined to reach the research objectives:

- intercompany cooperation model based on supply chain;
- cooperation model based on competencies and capacities;
- cooperation model based on the market offering with developing a new product;
- competitive cooperation model.

The main data for analysis in the regions under research was obtained from the survey of 620 small and medium-sized business entrepreneurs in the cross-border regions in Latvia (Latgale region), Lithuania (Vilnius county, Alytus county, Utena county, Panevezys county, Kaunas county), Belarus (Vitebsk oblast, Grodno oblast, Minsk oblast, Mogilev oblast) in the period April-June, 2014. The survey was carried out in the main communication languages in the regions: Latvian and Russian in Latgale, Lithuanian in Lithuania and Russian in Belarus. The sample design by the type of selection – combined, by the method – non-repeated sampling, by the way of selection – stratified by the main directions of the research. The survey was carried out by means of a questionnaire available both in paper version and online to be completed on the Internet (Daugavpils University 2015). In the process of work on the base in the SPSS programme, the survey data were subjected to weighting on the main directions of stratification, as a result the deviations of the parameters of the sample from the parameters of the general population comprised less than 3%. One of the limitations of empirical research is different methodological approaches to identifying the size of business in the EU and Belarus. Therefore, for
the weighting the sampling of Latvian and Lithuanian companies, the EU criteria were applied (Department of Trade and Industry 2015), but in Belarus regions – the criteria defined by the law of the Republic of Belarus, as the weighting is based on the statistical data, but the further analysis of the obtained survey data is based on the EU methodology. The results of the frequency-response analysis as well as other methods of mathematical statistics were applied to the data analysis (Lavrinenko et al. 2015)

3. Results

Not a single company in the world can increase its capabilities, resources, innovations and geographical spread fast and at no extra cost; thus, the only way to do this is based on the intercompany cooperation development. Cooperative relationship is one of cooperation models among the companies. Answering the question “what percentage of costs is associated with paying external services?” the authorities of the enterprises estimated it from 21% to 39%. Thus, the percentage of costs associated with paying services of external organisations indicates the necessity of intercompany cooperation: the higher the costs percentage, the more necessary intercompany cooperation is.

The greatest need for intercompany cooperation of enterprises have shown the enterprises of Panevezys region (39% of costs are associated with paying services of external organisations), Utena region (35% of costs are associated with paying services of external organisations), Latgale (33%), Vilnius region (32%), Kaunas region (30%), and Minsk and Alytus regions (29%). Not that great need for intercompany cooperation exists in Mogilev region (25% of costs are associated with paying services of external organisations), Grodno region (22%), and Minsk and Vitebsk regions (21%).

![Percentage of Costs Associated with Paying External Services](image)

Source: calculations of the enterprise survey authors in 2014 within the project Creating a Unified Support System to Entrepreneurship and Establishing Business Relations for a Sustainable Transboundary Cooperation of Latvia, Lithuania and Belarus (B2B) funded by transboundary cooperation programme of Latvia-Lithuania-Belarus The European Neighbourhood and Partnership Instrument (ENPI) of 2007-2013.

The enterprises of Latgale, Vilnius and Kaunas regions are most acutely aware of the need for intercompany cooperation development (69,5%, 69,2% and 61,1% of the respondents respectively have replied that need exists and that there is very strong need). They are followed by the enterprises of Utena region (55, 6%), Mogilev region (45,3%), Alytus region (44,3%), Minsk (42,2%), and Vitebsk region (41%). Whereas intercompany cooperation development of the enterprises in Grodno (28,5%) and Minsk regions (23,8%) is considered less necessary.

42
Table 1. Assessment of the Need for Intercompany Cooperation Development

<table>
<thead>
<tr>
<th>Region</th>
<th>No need at all</th>
<th>No need</th>
<th>Moderate need</th>
<th>Need exists</th>
<th>Very strong need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latgale</td>
<td>1,1%</td>
<td>4%</td>
<td>25,4%</td>
<td>33,9%</td>
<td>35,6%</td>
</tr>
<tr>
<td>Vilnius</td>
<td>2,1%</td>
<td>6,8%</td>
<td>21,8%</td>
<td>42,9%</td>
<td>26,3%</td>
</tr>
<tr>
<td>Alytus</td>
<td>3,9%</td>
<td>19,5%</td>
<td>32,3%</td>
<td>38,2%</td>
<td>6,1%</td>
</tr>
<tr>
<td>Utena</td>
<td>2,9%</td>
<td>18,1%</td>
<td>23,4%</td>
<td>44,3%</td>
<td>11,3%</td>
</tr>
<tr>
<td>Panevezys</td>
<td>10,7%</td>
<td>38,4%</td>
<td>35%</td>
<td>0%</td>
<td>15,8%</td>
</tr>
<tr>
<td>Kaunas</td>
<td>5,1%</td>
<td>10,7%</td>
<td>23,1%</td>
<td>48%</td>
<td>13,1%</td>
</tr>
<tr>
<td>Vitebsk</td>
<td>7,1%</td>
<td>14,1%</td>
<td>37,9%</td>
<td>21,8%</td>
<td>19,2%</td>
</tr>
<tr>
<td>Grodno</td>
<td>2,6%</td>
<td>13,1%</td>
<td>55,7%</td>
<td>10,7%</td>
<td>17,8%</td>
</tr>
<tr>
<td>Minsk</td>
<td>16,1%</td>
<td>16%</td>
<td>44,1%</td>
<td>19%</td>
<td>4,8%</td>
</tr>
<tr>
<td>Minsk (city)</td>
<td>27,2%</td>
<td>3%</td>
<td>27,6%</td>
<td>23,3%</td>
<td>18,9%</td>
</tr>
<tr>
<td>Mogilev</td>
<td>5,7%</td>
<td>12,9%</td>
<td>36,2%</td>
<td>24,1%</td>
<td>21,2%</td>
</tr>
</tbody>
</table>

Source: calculations of the enterprise survey authors in 2014 within the project *Creating a Unified Support System to Entrepreneurship and Establishing Business Relations for a Sustainable Transboundary Cooperation of Latvia, Lithuania and Belarus* (B2B) funded by transboundary cooperation programme of Latvia-Lithuania-Belarus.

The last to acknowledge the need for intercompany cooperation is Panevezys region – only 15.8% of the company authorities have answered the question about cooperation that need exists and that there is very strong need, which somehow comes into conflict with the amount of the previously established indicator, which shows the intercompany cooperation necessity (39% of costs are associated with paying external services).

Pic. 2. Assessment of the Need for Intercompany Cooperation Development

Source: calculations of the enterprise survey authors in 2014 within the project *Creating a Unified Support System to Entrepreneurship and Establishing Business Relations for a Sustainable Transboundary Cooperation of Latvia, Lithuania and Belarus* (B2B) funded by transboundary cooperation programme of Latvia-Lithuania-Belarus.
4. Assessment of Cross-Border Company Resources and of their Usage Effectiveness

According to the survey a lack of resources and their usage effectiveness have been determined at small-scale and medium-scale enterprises. Latgale region enterprises mostly face difficulties with financial resources (40% of the enterprises lack them or do not have them at all), 5.7% of the entrepreneurs, however, admit that financial resources are inefficiently used; 34.6% of the enterprises lack human resources while they are inefficiently used in 2.6% of the enterprises; 19.1% of the enterprises lack information resources while they are inefficiently used in 12.1% of the enterprises; 18% of the enterprises lack time resources while they are inefficiently used in 11.1% of the enterprises; 15.4% of the enterprises lack technological resources while they are inefficiently used in 10% of the enterprises; 14.4% of the enterprises lack energy resources while they are inefficiently used in 4% of the enterprises.

The enterprises of Vitebsk region lack financial resources (36.3% of the enterprises lack them or do not have them at all), but 14.5% of them use the resources ineffectively; 34.1% of the enterprises lack information resources while they are inefficiently used in 28.7% of the enterprises; 31.7% of the enterprises lack technological resources while they are inefficiently used in 26.3% of the enterprises; 24.7% of the enterprises lack time resources while they are inefficiently used in 18.3% of the enterprises; 23% of the enterprises lack human resources while they are inefficiently used in 20.6% of the enterprises; 6.6% of the enterprises lack energy resources while they are inefficiently used in 20.8% of the enterprises.

The enterprises of Grodno region face greatest difficulties with financial resources (21.9% of the enterprises lack them or do not have them at all), however, 11.6% of them use the resources ineffectively; 14.6% of the enterprises lack human resources while they are inefficiently used in 10.7% of the enterprises; 14% of the enterprises lack time resources in 9.7% of which the resources are used ineffectively; 12.5% of the enterprises lack information resources while they are inefficiently used in 4.4% of the enterprises; 6.6% of the enterprises lack technological resources while they are inefficiently used in 8.8% of the enterprises; 2.3% of the enterprises lack energy resources while they are inefficiently used in 3.4% of the enterprises.

The enterprises of Minsk region lack financial resources (19.9% of the enterprises lack them or do not have them at all), but 24% of the enterprises use them inefficiently; 24.3% of the enterprises lack technological resources while they are inefficiently used in 12% of the enterprises; 13% of the enterprises lack energy resources while they are inefficiently used in 12% of the enterprises; 8.2% of the enterprises lack information resources while they are inefficiently used in 16.1% of the enterprises; 4.1% of the enterprises lack time resources while they are inefficiently used in 13% of the enterprises; the region is ensured with human resources despite the fact that 16.1% of the entrepreneurs use them inefficiently.

The metropolitan region – Minsk – face greatest difficulties with financial resources (35.1% of the enterprises lack them or do not have them at all), 16.7% of the entrepreneurs, however, use them inefficiently; 31.2% of the enterprises lack human resources while they are inefficiently used in 25.7% of the enterprises; 24.9% of the enterprises lack technological resources while they are inefficiently used in 19.5% of the enterprises; 14.9% of the enterprises lack information resources while they are inefficiently used in 20.5% of the enterprises; 13% of the enterprises lack time resources while they are inefficiently used in 23.8% of the enterprises; 3.9% of the enterprises lack energy resources while they are inefficiently used in 19.7% of the enterprises.

The enterprises of Mogilev region face greatest difficulties with financial resources (30.9% of the enterprises lack them or do not have them at all); 5.4% of the entrepreneurs, however, admit that they are inefficiently used; 22.5% of the enterprises lack technological resources while they are inefficiently used in 11.2% of the enterprises; 21.6% of the enterprises lack time resources while they are inefficiently used in 8.1% of the enterprises; 16.1% of the enterprises lack information resources while they are inefficiently used in 9.8% of the enterprises; 8.1% of the enterprises lack human resources while they are inefficiently used in 4.7% of the enterprises; 5.6% of the enterprises lack energy resources while they are inefficiently used in 5.2% of the enterprises.
Thus, the enterprises of both Latgale and Belarus regions face considerable difficulties both with the resource potential and their usage effectiveness.

In Lithuania regions there is the most favourable situation with the resource usage effectiveness as well as with the resource potential. The greatest difficulties with all the regions are connected with financial potential. The enterprises of Vilnius region face the difficulties with financial resources. (11.3% of the enterprises lack them or do not have them at all while they are inefficiently used in 1.2% of the enterprises), 9.2% of the enterprises lack time resources while they are inefficiently used in 1.2% of the enterprises; 1.2% of the enterprises lack technological resources despite the fact that they are used effectively. Other resources are used effectively as well.

In Alytus region difficulties with financial resources have been determined (29.3% of the enterprises lack them or do not have them at all whereas all the enterprises use the resources efficiently); 11.7% of the enterprises lack technological resources 2.6% of which use them ineffectively; 2.7% of the enterprises lack human resources; 2.6% of the enterprises lack time resources. Usage effectiveness of human, energy, financial, information and time resources is quite high.

In Utena region in 12.3% of the enterprises difficulties with financial resources have been determined; 5.3% lack human resources, 3.9% of the enterprises lack time resources, 2.9% of the enterprises lack energy and technological resources. Information resources are inefficiently used in 2.9% of the enterprises. Human, energy, finance, technological and time resources are used quite effectively.

In Panevezys region the greatest difficulties are with financial resources: 32.2% of the enterprises lack them or do not have them at all; 9.1% of the enterprises lack time resources; 6.5% of the enterprises lack technological resources; 3.7% of the enterprises lack information resources; 1.9% and human resources. However, the effectiveness of the resource usage is quite high (excluding information resources which in 5.8% of the enterprises are used ineffectively).

In Kaunas region there is no problem with either resources or their usage effectiveness. Some minor difficulties have been encountered with financial resources: 7.2 % of the enterprises lack them or do not have them at all, 6.7% of the enterprises lack time resources, 5.1% of the enterprises lack energy and information resources, 4.2% of the enterprises lack technological resources. The usage effectiveness of all the resources is very high.

Intercompany cooperation is quite a risky business which involves considerable resources of the enterprises. That is why it is necessary to establish cooperation with regard just to the enterprise strategic priorities. Consequently, being engaged in intercompany cooperation relationships, it is vital to analyse four aspects of enterprise activity: business processes, organization capabilities, designing and implementing value offering, and supply chain management. To develop each of the four aspects of the activity mentioned above it is necessary to implement the appropriate cooperation model based: on the supply chain, on the company capacity, on the market offering, and on the competitive cooperation.

5. Assessment of Companies on the Basis of Cooperation with Strategic Providers and Clients (on the Basis of Supply Chain)

Cooperation on the basis of supply chain is based on business processes. It does not entail broadening of a company activity scope as when implementing this cooperation model either a certain part of work is given to the partner or, when the cooperation is directed to broadening of the intercompany offering up or down the industry chain of adding value, performing of specific actions can be distributed among the organisations. In this regard, the cooperation may focus either on reducing costs or enhancing its quality. Therefore, cooperation model on the basis of supply chain exists to provide available products or services of enterprises in a more efficient way than when using personal resources only. The risks of this cooperation model are minor; they are associated not so much with deterioration in the existing situation, but more with absence of the anticipated progress. The factor which contributes to successful cooperation is similarity of corporate cultures of the cooperating companies: commitment to similar values, similar approaches to management, common incentive schemes and etc.
Table 2. Cooperation with Strategic Providers and Clients (on the Basis of Supply Chain)

<table>
<thead>
<tr>
<th>Region</th>
<th>Not developed</th>
<th>Rather not developed than developed</th>
<th>Moderately developed</th>
<th>Rather developed than not developed</th>
<th>Highly developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latgale</td>
<td>6%</td>
<td>9,2%</td>
<td>44,1%</td>
<td>18,3%</td>
<td>22,4%</td>
</tr>
<tr>
<td>Vilnius</td>
<td>2,1%</td>
<td>1,3%</td>
<td>15,4%</td>
<td>37,8%</td>
<td>43,4%</td>
</tr>
<tr>
<td>Alytus</td>
<td>0%</td>
<td>16,3%</td>
<td>19,2%</td>
<td>47,7%</td>
<td>16,8%</td>
</tr>
<tr>
<td>Utena</td>
<td>2,9%</td>
<td>6,4%</td>
<td>18,6%</td>
<td>48,2%</td>
<td>23,8%</td>
</tr>
<tr>
<td>Panevezys</td>
<td>0%</td>
<td>3,5%</td>
<td>46,8%</td>
<td>24,3%</td>
<td>25,3%</td>
</tr>
<tr>
<td>Kaunas</td>
<td>5,1%</td>
<td>2,9%</td>
<td>8,2%</td>
<td>45,2%</td>
<td>38,6%</td>
</tr>
<tr>
<td>Vitebsk</td>
<td>18%</td>
<td>24%</td>
<td>20,2%</td>
<td>35,1%</td>
<td>2,8%</td>
</tr>
<tr>
<td>Grodno</td>
<td>22,2%</td>
<td>11,4%</td>
<td>23,6%</td>
<td>39,4%</td>
<td>3,4%</td>
</tr>
<tr>
<td>Minsk</td>
<td>3,8%</td>
<td>7,6%</td>
<td>39,6%</td>
<td>40,1%</td>
<td>8,9%</td>
</tr>
<tr>
<td>Minsk (city)</td>
<td>17,5%</td>
<td>7,3%</td>
<td>33,3%</td>
<td>26,3%</td>
<td>15,5%</td>
</tr>
<tr>
<td>Mogilev</td>
<td>4%</td>
<td>14,7%</td>
<td>11,8%</td>
<td>32,6%</td>
<td>36,9%</td>
</tr>
</tbody>
</table>

Source: calculations of the enterprise survey authors in 2014 within the project *Creating a Unified Support System to Entrepreneurship and Establishing Business Relations for a Sustainable Transboundary Cooperation of Latvia, Lithuania and Belarus* (B2B) funded by transboundary cooperation programme of Latvia-Lithuania-Belarus *The European Neighbourhood and Partnership Instrument (ENPI) of 2007-2013.*

Kaunas and Vilnius regions are in the lead in terms of development of cooperation on the basis of supply chain (83,8% and 81,2% of the enterprises revealed a *developed* and *highly developed* cooperation level respectively). High development of this enterprise cooperation model has been shown by the regions of Utena, Mogilev and Alytus (72%, 69,5% and 64,5% respectively). These are followed by the enterprises of Panevezys and Minsk regions (49,6% and 49%). Moderate development of this enterprise cooperation model can be observed in Grodno region, Minsk and Latgale region (42,8%, 41,8% and 40,7% respectively). The least developed cooperation on the basis of supply chain is in Vitebsk region (37,9%).
6. Assessment of Cooperation to Acquire Knowledge and Experience of other Partners (Cooperation on the Basis of Competencies and Capacities)

Cooperation on the basis of competencies and capacities is based on companies’ acquiring the knowledge and experience of one another in order to get a new product within the present activity scope. In this regard, this cooperation type does not broaden the activity scope of a company. It is directed to improvement and if the partners do not get the anticipated advantage, it does not have devastating consequences. That is why although the risks in this model are higher than in the one mentioned above, they are not high either.

Table 3. Cooperation to Acquire Knowledge and Experience of other Partners (Cooperation on the Basis of Competencies and Capacities)

<table>
<thead>
<tr>
<th>Region</th>
<th>Not developed</th>
<th>Rather not developed than developed</th>
<th>Moderately developed</th>
<th>Rather developed than not developed</th>
<th>Highly developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latgale</td>
<td>18,3%</td>
<td>33,5%</td>
<td>22,4%</td>
<td>18,3%</td>
<td></td>
</tr>
<tr>
<td>Vilnius</td>
<td>2,1%</td>
<td>27,1%</td>
<td>35%</td>
<td>29%</td>
<td></td>
</tr>
<tr>
<td>Alytus</td>
<td>0%</td>
<td>42,9%</td>
<td>23,8%</td>
<td>10,6%</td>
<td></td>
</tr>
<tr>
<td>Utena</td>
<td>6,0%</td>
<td>38,4%</td>
<td>35%</td>
<td>9,8%</td>
<td></td>
</tr>
<tr>
<td>Panevezys</td>
<td>9,6%</td>
<td>20,8%</td>
<td>32,9%</td>
<td>4,2%</td>
<td></td>
</tr>
<tr>
<td>Kaunas</td>
<td>9,4%</td>
<td>17,8%</td>
<td>47%</td>
<td>15,1%</td>
<td></td>
</tr>
</tbody>
</table>
Vilnius and Kaunas regions are leading in terms of cooperation development on the basis of capacities (64% and 62.1% of the enterprises revealed a developed and highly developed cooperation level respectively). Moderate development of this enterprise cooperation model can be seen in the regions of Utena, Latgale, Mogilev, Panevezys and Alytus (44.8%, 40.7%, 37.6%, 37.1%, and 34.4% respectively). The least developed cooperation development on the basis of capacities is in Minsk region, Minsk, Vitebsk and Grodno regions (21.3%, 18.5%, 15.5% and 14.8% respectively).

![Cooperation to Acquire Knowledge and Experience of other Partners](image)

**Pic. 4. Cooperation to Acquire Knowledge and Experience of other Partners**
*(Cooperation on the Basis of Competencies and Capacities)*

Source: calculations of the enterprise survey authors in 2014 within the project *Creating a Unified Support System to Entrepreneurship and Establishing Business Relations for a Sustainable Transboundary Cooperation of Latvia, Lithuania and Belarus* (B2B) funded by transboundary cooperation programme of Latvia-Lithuania-Belarus.

*The European Neighbourhood and Partnership Instrument (ENPI) of 2007-2013.*
7. Assessment of a Model of Combining Company Capacities with Promoting a New Product or Service (Cooperation on the Basis of Market Offering)

The core of cooperation on the basis of market offering is creation of a new product or service offering. If, however, the ideas are being developed to implement a new offering, cooperation on the basis of capacities is appropriate. Cooperation on the basis of market offering results in creation of a product or service which broadens the activity scope of the participating companies. The clients, in turn, get a new, more advanced offering. The risks of this model are quite high as something new is being created which broadens the activity scope of the participating companies, which is associated with considerable uncertainty, and, as a result, with high risk level. In this way, particular attention should be paid to the processes of contracting and management as well as to defining intellectual property rights.

Table 4. Combining Company Capacities with Promoting a New Product or Service (Cooperation on the Basis of Market Offering)

<table>
<thead>
<tr>
<th>Region</th>
<th>Not developed</th>
<th>Rather not developed</th>
<th>Moderately developed</th>
<th>Rather developed than not developed</th>
<th>Highly developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latgale</td>
<td>16,2%</td>
<td>9,3%</td>
<td>36,9%</td>
<td>32,1%</td>
<td>5,5%</td>
</tr>
<tr>
<td>Vilnius</td>
<td>2,1%</td>
<td>9,7%</td>
<td>25,1%</td>
<td>42,2%</td>
<td>20,7%</td>
</tr>
<tr>
<td>Alytus</td>
<td>0%</td>
<td>27,6%</td>
<td>31,4%</td>
<td>35%</td>
<td>6%</td>
</tr>
<tr>
<td>Utena</td>
<td>2,9%</td>
<td>13,6%</td>
<td>42%</td>
<td>31,1%</td>
<td>10,4%</td>
</tr>
<tr>
<td>Panevezys</td>
<td>14,8%</td>
<td>30,8%</td>
<td>25,5%</td>
<td>17%</td>
<td>11,9%</td>
</tr>
<tr>
<td>Kaunas</td>
<td>10,4%</td>
<td>11,6%</td>
<td>39,7%</td>
<td>27,1%</td>
<td>11,2%</td>
</tr>
<tr>
<td>Vitebsk</td>
<td>50,9%</td>
<td>17,4%</td>
<td>20,9%</td>
<td>10,8%</td>
<td>0%</td>
</tr>
<tr>
<td>Grodno</td>
<td>36%</td>
<td>26,6%</td>
<td>10,5%</td>
<td>25,8%</td>
<td>1,1%</td>
</tr>
<tr>
<td>Minsk</td>
<td>27%</td>
<td>27,8%</td>
<td>7,9%</td>
<td>36,3%</td>
<td>1%</td>
</tr>
<tr>
<td>Minsk (city)</td>
<td>52,2%</td>
<td>11,2%</td>
<td>23,7%</td>
<td>11,2%</td>
<td>1,7%</td>
</tr>
<tr>
<td>Mogilev</td>
<td>16,3%</td>
<td>11,6%</td>
<td>20,6%</td>
<td>21,7%</td>
<td>29,9%</td>
</tr>
</tbody>
</table>


Vilnius and Mogilev regions are at the top in terms of cooperation development on the basis of market offering (62,9% and 51,6% of the enterprises revealed a developed and highly developed cooperation level respectively). Moderate development of this enterprise cooperation model can be observed in the regions of Utena, Alytus, Kaunas, Latgale, Minsk, Panevezys and Grodno (41,5%, 41%, 38,3%, 37,6%, 37,3%, 28,9% and 26,9% respectively). The least developed cooperation development on the basis of market offering is in Minsk and in Vitebsk region (12,9% and 10,8% respectively).
8. Assessment of a Competitive Cooperation Model (Teamwork to Lessen Competition)

Competitive cooperation is based on search for the ways to enter the market not changing the scale of the company production (excluding the situation when new offer prices are established). The goal of competitive cooperation is redistribution of the market power by gradually adding value. Intercompany competitive cooperation forms the basis for subsequent mergers or acquisitions of companies. The focus must be directed to devising contract proposals taking into account state or regional antimonopoly legislation. The risks of this model are high and they must be actively managed, which presupposes monitoring the activity of regulatory authorities, competitors, clients and partners.

Table 5. Teamwork to Lessen Competition (Competitive Cooperation)

<table>
<thead>
<tr>
<th>Region</th>
<th>Not developed</th>
<th>Rather not developed than developed</th>
<th>Moderately developed</th>
<th>Rather developed than not developed</th>
<th>Highly developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latgale</td>
<td>8,6%</td>
<td>19,1%</td>
<td>45,8%</td>
<td>22%</td>
<td>4,4%</td>
</tr>
<tr>
<td>Vilnius</td>
<td>6,3%</td>
<td>14,2%</td>
<td>31,0%</td>
<td>33,7%</td>
<td>14,8%</td>
</tr>
<tr>
<td>Alytus</td>
<td>8,5%</td>
<td>47%</td>
<td>24,4%</td>
<td>14,3%</td>
<td>5,8%</td>
</tr>
<tr>
<td>Utena</td>
<td>8,5%</td>
<td>39,5%</td>
<td>15,9%</td>
<td>32,3%</td>
<td>3,8%</td>
</tr>
<tr>
<td>Panevezys</td>
<td>17%</td>
<td>24,2%</td>
<td>41,6%</td>
<td>13,7%</td>
<td>3,5%</td>
</tr>
<tr>
<td>Kaunas</td>
<td>9,6%</td>
<td>23%</td>
<td>39,3%</td>
<td>22,9%</td>
<td>5,2%</td>
</tr>
<tr>
<td>Vitebsk</td>
<td>71%</td>
<td>12,7%</td>
<td>10,1%</td>
<td>1,3%</td>
<td>4,9%</td>
</tr>
</tbody>
</table>
Despite the high risk, the leader of the intercompany competitive cooperation is Vilnius region (48.5% of enterprises have shown a developed and highly developed level of this cooperation type) whereas competitive cooperation of the regions of Utena, Kaunas, Latgale, Grodno, Mogilev, and Alytus is less developed (36.1%, 28.1%, 26.4%, 23%, 22.3%, and 20.1% respectively). At the bottom of the competitive cooperation development are Panevezys region, Minsk, Vitebsk region, and Minsk region (17.2%, 17%, 6.2%, and 1% respectively).

The partners of cooperative enterprises in Vilnius region have been determined: 1.8% of the enterprises cooperate with enterprises from Switzerland, Sweden and Denmark. In Panevezys region 1.8% of the enterprises cooperate with the enterprises from Latvia and Russia. In Grodno region 5.1% of the enterprises cooperate with enterprises from China, Russia and Poland. In Kaunas region 5.2% of the enterprises cooperate with enterprises from Poland and Germany. In Utena region 6.4% of the enterprises cooperate with enterprises from Poland and Germany. In Latgale region 8.1% of the enterprises cooperate with enterprises from England, Poland, Norway, Sweden and Finland. In Minsk 17.6% of the enterprises cooperate with enterprises from Austria, Russia, Lithuania, Germany, Poland and Turkey. In Mogilev region 18.7% of the enterprises cooperate with enterprises from the USA, Russia, the Baltic States and Germany. Thus, it can be concluded that the number of the cooperative enterprises characterised by full integration level testifies its insufficiency in some regions.
In general, in assessing the border area of Latvia, Lithuania and Belarus it can be singled out that the cooperation model on the basis of supply chain predominates (the average is 3.47; the median is 4); the cooperation model on the basis of competencies or capacities is less developed (the average is 2.81; the median is 3); the cooperation model on the basis of the market offering and development of a new product is not developed enough either (the average is 2.68; the median is 3). The least developed model is the one of competitive cooperation (the average is 2.47; the median is 3).

Conclusions

The necessity for intercompany network cooperation has been determined: 21% - 39% of the companies reveal costs associated with paying external services. The greatest need in intercompany network cooperation has been determined in enterprises of Minsk and of the regions of Panevezys, Utena, Latgale, Vilnius, Kaunas and Alytus. Not that urgent need in intercompany network cooperation has been determined in the regions of Mogilev, Grodno, Minsk and Vitebsk.

The enterprises of Latgale and Belarus regions face significant challenges in both resource potential and in effectiveness of its use. In Lithuania regions there is a favourable situation with effective use of resources as well as with the resource potential as such. Therefore, the determined predominance of the cooperation model on the basis of supply chain in the cross-border region (Latvia-Lithuania-Belarus) can be explained by compensating the lack of one’s own resources as well as by this model posing the lowest risk. It is possible that an additional factor which contributes to sticking to this model is close location of the cooperating companies.

Kaunas and Vilnius regions are in the lead in terms of development of cooperation on the basis of supply chain (83.8% and 81.2% of the enterprises revealed a developed and highly developed cooperation level respectively). High development of this enterprise cooperation model has been shown by the regions of Utena, Mogilev and Alytus (72%, 69.5% and 64.5% respectively). These are followed by the enterprises of Panevezys in Minsk regions (49.6% and 49%). Moderate development of this enterprise cooperation model can be observed in Grodno region, Minsk and Latgale region (42.8%, 41.8% and 40.7% respectively). The least developed cooperation on the basis of supply chain is in Vitebsk region (37.9%).

Vilnius and Kaunas regions are leading in terms of cooperation development on the basis of capacities (64% and 62.1% of the enterprises have revealed a developed and highly developed cooperation level respectively). Moderate development of this enterprise cooperation model can be seen in the regions of Utena, Mogilev, Panevezys and Alytus (44.8%, 40.7%, 37.6%, 37.1%, 34.4% respectively). The least developed cooperation development on the basis of capacities is in Minsk region, Minsk, Vitebsk and Grodno region (21.3%, 18.5%, 15.5% and 14.8% respectively).

Vilnius and Mogilev regions are at the top in terms of cooperation development on the basis of market offering (62.9% and 51.6% of the enterprises revealed a developed and highly developed cooperation level respectively). Moderate development of this enterprise cooperation model can be observed in the regions of Utena, Alytus, Kaunas, Latgale, Minsk, Panevezys and Grodno (41.5%, 41%, 38.3%, 37.6%, 37.3%, 28.9% and 26.9% respectively). The least developed cooperation development on the basis of market offering is in Minsk and in Vitebsk region (12.9% and 10.8% respectively).

Despite the high risk, the leader of the intercompany competitive cooperation is Vilnius region (48.5% of enterprises have shown a developed and highly developed level of this cooperation type) whereas competitive cooperation of the regions of Utena, Kaunas, Latgale, Grodno, Mogilev, and Alytus is less developed (36.1%, 28.1%, 26.4%, 23%, 22.3%, and 20.1% respectively). At the bottom of the competitive cooperation development are Panevezys region, Minsk, Vitebsk region, and Minsk region (17.2%, 17%, 6.2%, and 1% respectively).

Thus, intercompany cooperation has become one of the most important features of modern times as because of it control and information are distributed. Proliferation of intercompany networks dictates changes in the
means of coordinating human activity and frames the mechanisms of structuring in the society. However, for cooperation to be successful, apart from the process of establishing relations and subsequent management, it is necessary to establish a clear procedure of business partner selection. The business partner must share common values and aims; integrated planning must take place both at the beginning of the cooperation and in the course of it as well as a standardized assessment of the cooperation process and progress in the collaborative work must be made.

References


PSYCHOLOGICAL ASPECTS OF OPERATIONAL AND INVESTIGATIVE ACTIVITIES AS A FACTOR OF STRENGTHENING OF THE NATIONAL SECURITY

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Abstract. The authors deal with the history of formation of operational and investigative psychology as a field of knowledge influencing the national security. The article discloses in details some psychological essentials of the application of this knowledge in everyday activities of employees of special forces units, police, prosecutor’s office, courts, punishment execution system and other law enforcement institutions. The authors also notes as important that during operational activities, in the process of determination of the truth, officers have not only to help in the reproduction of the facts, but also to try to achieve the truthfulness of the evidence. Because of applying, psychological techniques of operational investigative psychology create conditions for acquisition of correct and complete information about facts, particular events being of interest to law enforcement institutions ensuring necessary impact on persons who intentionally want to hide the truth and often forward false information. Therefore, the acquisition of psychological knowledge in the operational and investigative activities is a necessity for law enforcement institutions.

Keywords: national security, crimes, operational activity, psychological methods, truthful evidence.


JEL Classifications: K42, O10, P00

1. Introduction

Priorities of the state are guaranteeing of national security, public order and state prosperity; prevention of civil disorders and crimes, protection of health and morality, as well as guarding of rights and freedoms. For implementation of this priority, each country has developed appropriate state authorities/ governmental institutions, which puts into effect above mentioned priorities, resp., executive institution and local governments have been established, that, in its turn, must ensure execution of certain instructions.

State authorities, which functions by law are ensuring of national security and lawfullness, protection of rights and legal interests of persons and the state, elimination of infringement of rights, application of state measures of constraint or public measures of influence to offenders of rights, are called law enforcement institutions (Zahars, Stīvenieks 2016). Each of these institutions operates within its competence sphere, and, cooperating between each other, forms a system of institutions which task is the protection of rights.
The competence of the system of law enforcement institutions comprises prevention, detection and investigation of unlawful offences. A significant part of crimes are committed covert; criminals, especially organized criminal groups, act secretly, actively and purposefully against efforts of the state to detect and investigate their crimes (Tumalavičius et.al. 2016). Therefore, to clarify the truth, prevent and detect crime, it is necessary to execute operational activities.

Specific character of truth clarification in operational activities include the need to restore the facts, actions that may be determined only by the mediation of witnesses or participants of events/ incidents. In order of giving opportunity to witnesses to restore the objective reality as completely as possible, they always need a certain help. This assistance is doubtless nothing more than a certain psychological impact (Ratinov 1967). Most crimes are a twist of various very complex, mutually opposite interests of persons, by assistance of which the truth about the events and facts should be clarified in the process of operational activities. In the everyday life, the conflict of such interests leads to the situation that some individuals knowingly hide certain facts or intentionally deform them.

2. Objectives and tasks of operational and investigative psychology

Each official of the subjects of operational activities (hereinafter referred to operational officer) bases inevitably during the work process on the data of psychology, sometimes without noticing it. This is empirical, everyday psychology, based on individual experience, knowledge of life and people.

However, along with empirical knowledge, an operational officer needs also scientific knowledge (Kavalieris, Makans 2008). However, this empiric knowledge, acquired finally by an experienced operational officer during long-time seeking and through disappointments, mistakes and discoveries, may be approved or, on the contrary, disproved in a very short time period and with sufficient accuracy thanks to objective psychological research.

Meantime, a detailed research of psychological basic principles in the Criminal Law, Forensics, Penitentiary Science and Theory of Operational Activities have lead to the development of such recommendations which allow to avoid many failures, make easier the work of operational officers, and, to some extent, compensate differences in their experience and skills (Sinilov 2016; Konovalova 1978). Therefore, knowledge of psychology is needed for both beginners and skilled operational officers.

The necessity to use results of psychological research in the field of operational activities is determined by the following specific features:

1. Operational activities have the character of constant and hidden conflicting interaction with criminal environment, with persons who plan, prepare crimes or who have already committed crimes. As a consequence, operational activities: are executed secretly related to a certain risk due to a lack of complete information about criminal events and persons involved in them, and, accordingly, depends on matter of chance to a certain extent; objectively contains possibility of failure of the carried out operational activities, and beginning of unwelcome consequences due to the counteractions of criminals; it is extremal because of constant diversity of organizational forms and tactical methods, regular shortage of time, availability of factors of professional risk and physical danger.

2. Operational activities are characterized by:
   - constant analysis and forecasting of results of own activities and activities of criminal elements;
   - constant operational readiness for actions in extreme situations.

3. Operational activities are:
   - built on a regulatory and legal basis;
   - related to involvement of diverse forces, means and methods;
   - always conformed to the operational conditions and specific tactical situations;
   - characterized by high dynamism due to a constant change of functioning environment.
Of course, above mentioned specific features of operational activities are not full-scale ones, however, they are among the most significant. Even an incomplete list of these features shows with certainty that this activity, like any other, has significant psychological components, and the human psyche is its constant, necessary and highly dynamic element. In this regard, within the framework of Legal psychology and Theory of operational activities, the operational investigative psychology acquires its motivation. Regularities and mechanisms of psyche of individuals should be considered as subjects of operational investigative psychology. Individuals acts here as subjects of operational activities and as criminal elements opposing to them, namely, as persons engaged in illegal activities and their environment, as well as psychology of criminal groups and criminal communities, an also psychology of their conflictual interaction among themselves under appropriate objective conditions.

The aim of operational and investigative psychology is to add to the theory of operational activities the knowledge of logical and psychological regularities occurring in connection with the receipt of primary information about crimes in preparation or about committed crimes. These regularities find their expression in construction of versions and forecasts, and are related to the analysis of problematic situations in the circumstances of informational uncertainty and operational risk. They, resp., regularities are associated with the use of intuitive (unconscious) methods of operational thinking. At the present stage, the importance of social and psychological aspects of operational activities increases on its organizational and administrative level. It is about the use of data from psychological research when estimating and selecting personnel for operational units (professional selection).

Taking into consideration above mentioned, the main tasks of operational investigative psychology are formed:

- research of actual state of public relations of subjects of operational activities with citizens and criminal environment for objective assessment of dependency in the fight against crime and for development of science-based legal and psychological recommendations for improvement of them;
- promotion of professional and psychological development of individuality of subjects of operational activities in accordance with law enforcement functions carrying out by them;
- development of psychologically well-grounded recommendations for establishment of reliable relationship with people involved in the process of operational activities for prevention and detection of covert serious and very serious crimes, for solving of problematic and conflict situations arising from them, etc.

As we may see, the operational and investigative psychology similarly with the theory of operational activities according to their aims and tasks, is an applicable, practically oriented branch of the scientific knowledge.

3. Methods of psychological influence/impact when receiving and transmitting information during communication.

The practice of information receipt shows that psychological factors play a crucial role in this process. In most cases, the success depends on the ability of an operational officer to establish psychological contact with the interlocutor and influence his/ her psyche in the process of communication. Such influence is realized for different purposes (Ivančiks, Makans 1994). One of them is to provide certain information that the interlocutor would not like to share with anyone.

There are two main ways to obtain the necessary information:

1. To encourage the object to involuntary expression of facts that are of interest to operational officers.

For obtaining necessary information, the author identifies a number of the following methods:

Demonstration of specified articles/ things, which “animate” corresponding image in the memory of an object and encourage him/ her to involuntary expressions. For example, in order to find out whether a person of interest is familiar with religious articles, an officer demonstrates unobtrusively any icons, crosses, bindings, which may objectively help to the relevant expressions, as well as to conversation in general. Moreover, for example,
to find out some aspects of the life of the person of interest, you may use appropriate advertising materials, for example, to start a conversation about automobile theme – a newspaper, a magazine. The personal belongings of the object (telephone, toiletries, etc.), articles belonging to his/her relatives; other articles accessible to perception may also be used. The presence of such specific articles/things gives a double psychological result. On the one hand, an album, for example, reproduces in the memory of the object images of the past stored there, and on the other hand – encourages to concrete expressions. It should be noted that the main rule of application of this method is the following: the encourage to involuntary expression when demonstrating objects reaches its specific aim only if an object does not realize that this article serves as a motive for expression.

Use of adjacent/related topic of conversation. Such a topic enlivens a series of images in the memory of a person, inevitably capturing also images from the sphere of forbidden, respectively, only to him/her known information into one's mental outlook. Switching to a related topic may be realized through a variety of various neutral questions. The main conditions for the successful application of this method are as follows:

1) topic of conversation used as a related one must be known to the object and must have a certain personal significance and value for him/her, the topic should not be too close to the main question to be found out, because otherwise, the topic acquires the character of a possibly camouflaged direct question;  
2) a related topic should logically follow from the concrete situation. Therefore, the essence of use of adjacent/related subjects of conversation for obtaining of information, being of interest to an operational officer, is: to revive impressions stored in the memory of the person of interest, to camouflage the actual meaning of the related topic and, as a result, to induce him/her to transmit unintentionally the relevant information.

Approaching to feelings of self-esteem. This technique involves praise, flattery, an emphatic expression of respect, great interest and attention related to the object. The technique is especially effective in dealing with selfish and ambitious people. Approaching to feeling of self-esteem makes possible to establish close relations with such people and promotes expression of sincerity from them. Conditions for successful application of this method:

1) before praise, one should always make a compliment; 2) when handling praise, one should take appropriate facial expression and pose; 3) to emphasize the “veneration” to/“good qualities” of the object better when comparing him/her with opponents. At the same time, one should know that everything is good in moderation, and this should not be forgotten.

Display of indifference. This technique is used when the interlocutor has a great desire to discuss the information that he/she has at his/her disposal, to mention in the conversation piece of news known only to and of great importance for him/her. Expression of indifference to the information important from the point of view of the object and neglecting of it, hurts the self-esteem of the object, and thereby stimulates the presentation of additional data emphasizing the significance of this information. The conditions, which are necessary for successful application of this method, are as follows:

1) one have to feel in time that an object is “overflowed” with information. This is certainly noticeable in his/her behaviour: the object shoots frequent glances at the operational officer; she/he cannot sit quietly in one place; the object begins to gesticulate intensely and shows that he/she possesses information;  
2) it is not allowed at this time to expose to the object your topic of conversation; 3) expression of indifference on the side of an officer may induce the object to speak only under conditions of trust.

Use of emotional stress. The condition of psychic strain is understood under emotional stress in this case. In this condition, a person’s control over his/her behaviour and expressions is weakened. There are several stages in the development of this condition. The main stage is a period of intensive emotional experiences, poorly controlled actions and speech reactions. As a result, the emotional stress comes at an end with a gradual transition to peacefulness. You can put the object into a state of emotional stress by asking an unexpected question; by making an inaccurate or false statement by reporting seemingly “important” information; or by showing your competence in anything.
Furnishing of false evidence. It is known long before that a person has trust in ideas that arise in his own head much more than in those, which are presented to him/ her by other people. Therefore, professionally experienced operational officers try to avoid direct pressure on the object as much as possible, and prefer indirect influence on the way of thinking of the object. To do this, officers, as it were, inadvertently toss to the object certain information, the conclusions from which the object must do oneself. The art of obtaining information is based exactly on the fact that due to the competent submission of certain facts, the object of our interest has to draw precisely those unambiguous conclusions and deliver it to a listener, as an operational officer had intended.

Creating an image of “simpleton”. The essence of this method is that an officer, intentionally belittling his own mental abilities, tries to create the feeling of intellectual superiority in an object. As a result, the object loses alertness, as it does not expect any intrigue from this “simpleton” with which he/she communicates. In fact, a simpleton proves to be the object.

The second way to obtain necessary information is:

2. To encourage the object to involuntary physical and expressive activities, containing corresponding information.

The methods, using which this technique of obtaining information is realized, are the following:

Demonstration of concrete articles/ things related to criminal activities of an object.

This method is successfully used in operational and investigative practice. As an example, we may give some facts about the expressive reactions of the detainee C. to articles/things related to his criminal activities. In the process of inspecting the place where he left his car, bank pouch with money, he had stolen and had hidden being in hiding from the police tracking, was confiscated. In order to verify the psychological impact of confiscated bank bags on S., the officer, as it were, accidentally opened the safe door at the beginning of one of the examination, in which bank pouches were placed. Seeing the bank bags, he behaved nervously during the entire interrogation, and in the prison cell concretely stated: “Everything is lost. They have found money ...”. Continuing to apply the planned tactical techniques, the employee left on the table a bank pouch similar to the one stolen by the detainee. The detainee watched the pouch for a long time, and during signing the minutes, he touched the pouch convulsively. In this case, the object reacted to stimulating influence resp., thing with expressive or physical actions. He, of course, was quite aware of the significance of such articles/ things, but his expressive movements (in facial expressions, posture, fingering) were completely unconscious. However, exactly these involuntary reactions contain the information being of interest for investigation officers, that is, information about involvement of a person in committed crime. Provisions of practical use of this method are as follows:

1) specific articles/ things to be demonstrated must be truly or eventually related to the criminal activity of this subject;

2) the subject must perceive these things in a corresponding situations;

3) actions and behaviours of a person who demonstrates the article/ thing must express his/ her neutral relation to these thing, and must be adequately motivated.

Creation of short-term psychologically sharp life situations. Such situations may be either naturally developed or artificially created. Therefore, this technique was applied enough successfully during search a place of a drug dealer. While the search was executed in the rooms, the drug dealer showed no signs of worry, indifferently staring out the window. After a while, one of the officers went into the kitchen and suddenly gave a cry: “Here is!” The drug dealer suddenly gave a jump, ran into the kitchen and looked at a locker above the refrigerator. In the created unexpected and psychologically sharp situation, wanting to make sure that the hiding-place is found, the drug dealer involuntarily gave his view to the place where the hiding-place with a large amount of drugs really was. During the other search a place, another similar situation occurred. When searching a room,
at the beginning of the search of a corner cupboard by a policeman, the owner, who behaved quite at ease and even superficially, suddenly fell silent and became gloomy. This alerted the police officers and forced them to move the wardrobe: as a result of which the stolen goods were discovered in the room of the owner, masterly hidden behind a false wall.

The conditions for successful application of this method are:

1) situations to be created must have personal significance for the subject;

2) it is important to choose such a moment for creation of a situation that the subject have to react mandatory to it;

3) actions of the person who uses the situation should follow logically from this situation and should receive appropriate expressive confirmation;

4) mental/ psychological conditions and expressive motions of the object must be thoroughly fixed in response to the created situation.

These motions are subconscious, so the degree of reliability of condition of the subject and his intention reflected in these motions is sufficiently high.

Thus, psychological methods and techniques of obtaining of interested information, outlined in these methods, are based on the general regularities, of unconscious mental phenomena that appear outwardly as unintentional voice reproduction of information, as well as expressive and physical actions of the subject.

One of the aims of the operational activity – influence/impact on persons who have committed a crime, impact on unstable individuals who probably may commit a crime – is achieved by various methods, including also the methods of psychological influence. Specific feature of establishing the truth during execution of operational activities is the necessity to restore the facts or actions which identification in many cases is possible only through evidence of persons who were witnesses or participants. In order to enable reproduction of objectively existing facts as much as possible by witnesses, it is always necessary to provide some assistance to them. This aid, no doubts, may not be anything else that a certain psychological impact. In most cases, events of a crime are a very intricate interweaving of diverse, sometimes even conflicting interests of those persons through whom in the course of operational activities we have to establish the truth about the events and facts. In reality, these contradictions of interests make sometimes situation that some people do not report information deliberately, known to them or purposely distort them. Therefore, during operational activities, in the process of establishing the truth, we have not only to help in reproduction of facts, but also to ensure the reliability of evidence. In this situation, psychological methods of influence create the conditions for obtaining from all persons, which are listed in available materials of the case, correct and complete information about facts, concrete events being of interest for law enforcement institutions which provide necessary impact on persons who intentionally want to hide the truth from the inquiry and investigation, and often deliver false information.

It should be noted that there are a number of principles, without preliminary taking into account of which, the purposes of impact in the course of operational activities may not be achieved:

1. The impact should be carried out taking into account specific characteristics of individuality. Among these specific characteristics of individuality, first of all, the type of temperament and mental condition of individuality at concrete time should be taken into consideration.

2. The process of carrying out the impact requires knowledge of the general regularities of familiarization of information by an individual, of specific of its perception in the communication process, of factors influencing activation of the process of information acquiring onto the thinking process, of the influence of emotional processes onto the mental activities, onto the performed impact.

3. The impact process, its elements, counter-action of a person, on which the impact should be planned and predicted in advance.
4. The positive perception of the impact must be stimulated obligatory. This is achieved in various ways: an indication on achieved results, verbal encouragement, etc.

5. The impact must be strictly limited to procedural competences in all cases, in no case the rights of the impacted person should be violated.

6. When executing impact, it is necessary to take into account external conditions in which the impact is carried out. External conditions should help to achieve impact aims. In all cases, one needs to know, to foresee conditions that may ensure effective application of psychological methods of impact/ influence.

7. When executing impact, it is necessary to provide mental activity of a person to which the impact is directed. The impact will be effective only in the case, if it is actively ensured and perceived. At the initial stage of the impact process, some interest in the conversation should be awakened.

8. The impact during implementation of operational activities should be carefully prepared. So, before executing the impact, the initial data should be taken into account, namely, the data that include information about a person, its behaviour, condition immediately before the impact; determination of final and intermediate aims of the impact; sequence in achieving intermediate aims; facts and circumstances that are possible to use; sequence of such use; information about impact from the side of other persons.

The main methods of psychological impact are as follows – method of delivery of information, method of persuasion, method of compulsion, method of implantation/ suggestion, method of setting and varying of mental/ thinking tasks.

**Method of delivery of information.** Under this method the purposeful transfer of facts, events, knowledge is to be understood. Under the circumstances of operational activities, the method of delivery of information helps to make certain changes and directions in mental processes of a person to whom the impact is applied. The essence of the method lies in the quality that the information gathered previously and transmitted in accordance with a certain order, conditions and technique, includes a person to whom the impact is applied in intellectual, emotional, volitional processes, then is processed by him/ her and leads to the achievement of the anticipated aim of the impact. This method is used for a variety of aims: to assist in memorizing of the forgotten, to change the direction of thinking processes of a person, which gives false evidence; to change settings, views, world outlook; to initiate certain emotional condition.

Information may be perceived by different organs of sense (eyesight, hearing) separately or simultaneously. Information designed for visual perception, in its turn, may be presented to the subject differently. In some cases, it is possible a direct addressing of the attention on a certain object (“look at the icon”), in other cases - to create conditions that provide a visual perception of an object without such addressing, as it were accidentally. Such information may affect the thinking processes and guide them no less strongly. Information may be transferred in the speech in any grammatical form: interrogative, affirmative and negative. The form of delivery of information differently stimulates the processes of mental activity, and may be used in different ways for such impact. During application of various forms of delivery of information, the condition of a person at the time of communication should be taken into consideration. It is also necessary to monitor constantly the impact of information. To do this, it is important to make sure that a person has understood what was said to him/ her, to observe carefully his/her reaction and verbal expression. All of these factors should be considered when planning the impact using this method.

The method of delivery of information may be applied for restoring of information forgotten in the memory. In order to obtain more objective results, it is advisable that the additionally transmitted information would more fully restore that information, which to a person seems that he/ she remember it, and does not directly prompts the replay to a question asked.

The method of delivery of information is widely used also for the change of person’s attitude to his/ her behaviour and to the facts delivered by him/ her. The impact by using information is capable to change the volitional decisions of a person, helps him/ her to revise previously chosen course of behaviour. In this regard, this
method must be widely used in operational activities, esp., in situations when enquired or suspected person reports false facts or hides them.

Method of delivery of information is used in cases when it is necessary to change sharply the emotional state of a certain person. The delivery of additional information may be used to remove the brake action (excitation) by sharp excitation of new strong emotions or by gradually switching of the attention of interested person from the facts, on which his/her thinking activity was concentrated, to other facts.

**Method of persuasion.** The persuasion – this is the main method of impact/ influence. The following is understandable under this method: on the one hand, the diverse influence on the individual with the aim to form certain qualities and to get rid of others ones, and on the other hand - the urge for certain activities. This method is widely used in operational activities. The main components of the persuasion are: providing of information (narration), explanation, proving/argumentation and disproof, as well as the talk.

An important role in urging of a person to activity plays information, which is necessary, because a person before to do something must be convinced that it is necessary and possible to do. Informing appears as a story/narration, i.e. lively and pictorial explanation of information with the aim to inform the object about facts and findings which are necessary to induce his/her for working. Being free in its form from any canons, the narration/story allows an officer to use in full all of his/her skills to convince and persuade the interlocutor. Telling something to the explored person, the inductive way may be chosen, that is to inspect step by step facts, phenomena, occurrences and then to make generalizations; or - the deductive way may be chosen, that is, first of all to draw general conclusions and then to bring the facts for supporting the conclusion.

The process of persuasion should always help a person to make the right decision, to identify faults and to acknowledge own guilt. The persuasion is in all cases the process comprising always the following basic elements:

1) explanation of certain arguments;
2) delivery of information confirming correctness of stated arguments;
3) hearing of doubts and objections of the person to be persuaded;
4) explanation of new arguments taking into account objections;
5) repeating of certain arguments and elements of delivered information with the aim to make more perfect impact onto mental processes of the person to be persuaded.

When implementing the persuasion, the following should be taken into account: all the positive features and qualities of the person to be persuaded; appropriate accentuation of the attention on them, using also the opposition to their characteristics and settings of other objects. It is very important to identify the points of hesitation, doubt of the person to be persuaded. In this regard, in the process of applying of the method of persuasion, the careful examination of personality; observation of his/her reactions, changes in behaviour, facial expressions, gestures, and so on, should be continued.

A prerequisite condition of use of persuasion methods is establishing of psychological contact, which usually is characterized by positive attitude to the person who makes persuasion, as well as by desire to perceive his her arguments.

*Method of compulsion/ coercion.* It is known that it is not always possible to achieve success by influencing a person with persuasion. Sometimes, it is necessary to use also compulsion/ pressure. However, it should be noted that “naked” compulsion, insulated from the persuasion, is destructive in many cases. It is important that the object of influence, to some extent, would be conscious of inevitability of coercive measures taken to him. This is possible to achieve, as a rule, in the case when the compulsion is preceded by persuasion.
By its nature, compulsion is divided into physical one (is not examined) and psychological one. Psychological compulsion acts as an encouragement of interested person to a particular activity, unlike to his/ her wishes. In the process of psychological compulsion, the object executes an order in the condition of a strong internal protest. Only external circumstances force him to obey. Therefore, an essential condition for the use of the method of compulsion is an external precondition. If such precondition is absent, the compulsion becomes senseless. In the circumstances of operational activities, the feeling of fear acts as a precondition for compulsion, which in its primitive form is associated with the unconditioned defensive reflex and most elementary is manifested in the mechanisms of self-preservation. It is known, that the fear is caused and becomes stronger, when a person is aware of and sometimes suffer sharply from his/ her vulnerability and weakness. The officer has to know this regularity and has to understand clearly that the fear has little effect on a strong person. For an unstable person, the fear is a very strong stimulating factor. This means that the compulsion is related not only to external factors, but also, of course, to internal, psychological ones. As a rule, the fear arises mainly because of the verbal impact.

It should be noted that when assessing the possibility of using compulsion to a certain person, you have mentally to take his/ her point of view and draw conclusions whether the feeling of fear arises in this person, for example, after the presentation of compromising materials to him/ her. If a person, after understanding of situation, will evaluate it for him/ herself as dangerous, he/ she will be encircled by fear to some extent. The use of compulsion is justified in this case. However, if the object did not see danger in this situation, and fear does not arise, the use of compulsion will be senseless.

The basic techniques of psychological compulsion during activities of operational officers are prohibition, categorical demand, warning and menace/ threat.

*Prohibition* acts in two ways:

a) the prohibition of impulsive actions;

b) the prohibition of unpermitted behaviour.

*Categorical demand* includes a strong command/ order and may be effective only if an officer has a great authority/ influence on the object. In other cases, this technique may be useless and sometimes even destructive.

*Warning*, The sense of warning is that an officer provokes in the object anxiety/ alarm, and, respectively, on it base – the desire to prevent negative consequences for the object. The tone is very important part of the warning, in addition to the content. It should be impressive, with elements of threat. All this makes an obvious pressure on the object and causes in his/ her mind mostly negative feelings; and predominance of anxiety and fear regarding the consequences of their behaviour arises. This is what motivates the object to comply with the requirements of an officer.

*Menace/ threat* crowns the hierarchy of psychological compulsion, bringing the object to the strongest emotional experience, creates feeling of fear. In order to apply the anxiety, it is necessary that it should cause feeling of fear to the object. Some people are very resistant to feeling of fear. Therefore, it is quite difficult to apply compulsion to them. In order to influence such persons psychologically, the method of suggestion is applied.

*Method of implantation/ suggestion* – one of the means of mutual influence of people in the process of their communication. The specific of implantation is expressed in the fact that it affects the behaviour of the influenced object invisible for him/ her. Uncontrollably penetrated into psyche, implanted idea is realized in the form of actions. However, the person evaluates his/ her actions as self-evident.

Operational activities, saturated by various elements of communication, are a wide sphere for implantation. Hence it is clear that the mastery at least of a part of implantation methods is very important for an operational officer. The implantation, as a method of influence onto a person, is a psychological impact perceived by an object without proper control of consciousness. The suggesting influence is based on the specific quality of
the human psyche - suggestibility, i.e. the ability to perceive the implantation/ suggestion. In order to use the methods of implantation, we must be able to identify suggestible people. The degree of suggestibility depends mainly on the nature of the social role of an individual, an abrupt change of which, as a rule, creates favourable conditions for increase of suggestibility. And on the contrary, increase of the importance of the executed social role leads to the increase of independence of an object, based on a critical attitude to own actions. However, a number of circumstances should be taken into consideration. In particular, the older is the person, the harder he/ she is influenced. The reduction of suggestibility occurs gradually, in the course of education, social interaction and practical activities of individuals. Educated people are less suggestible than uneducated. Suggestibility depends also upon the level of cultural development of the nation. It should be noted that women are generally more suggestible than men. However, if a woman takes a long time prestigious position in society or if she acts as a leader, her level of suggestibility may be lower than that of a man.

To ensure the implantation/ suggestion, it is necessary to “place” the person, which will be implanted, into a specific background condition in which he/she would be “deaf” to everything except the information of a person performing implantation. The most simple, but at the same time also the most reliable method of adoption of the person, to be implanted, into a background condition, is relaxation of this person; and about effectiveness of relaxation may be judged according to a number of indications: body lean back on the backboard of a chair, blushful face, bright eyes, freely straddled legs, straightened out hands, etc.. Figure bent down over the table, bent legs, wandering eyes, wrinkles on the forehead and vertical folds on bridge of the nose point to the stress condition of the object.

Method of setting and varying of mental/ thinking tasks. The impact/influence is carried out not only by delivery of certain positive information. The informational impact may occur in the form of the question – mental/ thinking task. Its main essence is setting of tasks with the aim of development, direction of thinking processes of persons to whom the impact is executed. The impact is executed:

1) by techniques of setting task (question);
2) by orientation of thought processes as a result of formulation of a task (question);
3) by assistance in solving of thinking problem.

By assistance of setting mental tasks, the process of analysing of own actions and behaviour is stimulated. This is an indispensable condition for acceptance of certain decisions of will, for changes of attitude to own behaviour and actions. This may not be achieved only by delivery of information or solely by persuasion. It is necessary that active processing of all facts, all delivered arguments, would be made by a person, who is influenced. The method of setting mental/ thinking tasks fulfils exactly this role.

This method is widely used in operational activities also when uncovering false evidence. The fact is that a person who knowingly gives false evidence has two mental models of the event, about which the evidence is given. One model represents an event in the form as it was in reality, and the other model - delivered version of the event. The presence of these two models leads to complication of mental filtrations after setting a mental task – a question. The person who gives false evidence seeks to combine these two models in details as much as possible- only in such a case the false version will be believable. In condition of such complicated mental work, using efficient formulation of questions, varying them, by unexpected formulation of questions, by hiding the main question with series of small, insignificant questions – the situation appears, when a person, who is influenced by this method, does not manage to control the relevance of the question to the model of the true events and reports facts related exactly to this and not to the fictional event.
Conclusions

The knowledge of psychology is highly important in clarifying the truth. In order to find out the truth, to draw the appropriate conclusions, one has to know and follow the laws of psychology. In addition, the knowledge of psychology makes possible to control own cognitive, volitional, emotional processes, to check and direct these processes of other persons, to take right decisions.

The main task of activities of employees of operational units of law enforcement institutions is working with people. This work includes a number of interrelated aspects: research and evaluation of people, establishment and development of psychological contacts with them, making impact on them, etc.

The knowledge of psychological characteristics of offenders and of reasons of committed crimes is of great importance for improvement of operational and investigative activities and for investigation of crimes, as well as for improvement of their effectiveness.

The purpose of operational and investigative psychology is to add to the theory of operational activity the knowledge of logical and psychological regularities occurring in connection with receipt of primary information about prepared or committed crimes. This knowledge finds its expression in construction of versions and forecasts and is related also to the analysis of problematic situations in the conditions of informational uncertainty and operational risk.

Acquisition of psychological knowledge in the operational and investigative activities is the must for law enforcement institutions. However unfortunately, there is no specialized course - psychology of operational activities in Latvia at present time. This significantly reduces the efficiency of operational and investigative activities. The authors see the necessity of introducing the course of psychology of operational activities in specialized educational institutions.

References


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TOWARDS SECURITY THROUGH ECONOMIC POLICY: A BALDWIN’S APPROACH

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Abstract. The safety and security research is presented as a problem of multiple levels. This article is focused on security on a national level within the wider international community. More specifically, it evaluates economic policy exercised by several members of the international community as the response to the Russian annexation of Crimea in 2014. “Economic statecraft” as a technical term presented by David A. Baldwin in the book with the same name represents economic policy exercised by International actor or multiple actors to influence the behavior of another actor in the desired direction. The main advantage of such tool is it’s non-violent nature as the opposite of direct military involvement often resulting in death and various atrocities. Baldwin as a realist or perhaps neo-realist on the field of the theory of international relations provides us with tools for assessment of the viability of economic sanctions. Evaluation tools can be used in retrospect when the wider economic data is available. Economic statecraft is the comprehensive name for economic policy instruments such as economic sanctions, economic warfare and foreign aid. When these are used in the particular case, their usage can be consequently evaluated taking into consideration four main criteria. The aim of this paper is to analyze, evaluate and discuss economic sanctions imposed against Russia as a consequence of Crimean annexation. A secondary aim of this article is to synthesize acquired knowledge and assess the success of sanctions in this particular case. Final part of this article reviews the outcomes of such economic policy using the Baldwin’s “failure makers.”

Keywords: foreign economic policy, economic sanctions, international relations, Crimea


JEL Classification: H 12, H56, K14, K32

1. Introduction

Russian annexation of Crimea in 2014 was an unacceptable violation of international law to many, and several members of the international community decided to undertake retaliatory measures other than war. Since the Putin’s Russia behaved in the past decade as a classical unitary actor on the “political chessboard” in the spirit of political realism (Brzezinski, 2016), the author thought that it would be exciting and enriching to use the corresponding approach to evaluate economic sanctions as the prevalent measure used against Russia. The primary purpose of this article is therefore to assess the economic policy tools described in book published by David A. Baldwin (Baldwin, 1985), who wrote it in the last years of the Cold War and apply its findings to the ongoing international situation regarding Russian annexation of Crimea and Russian “indirect military involvement” in Eastern Ukraine. More specifically, to evaluate economic policy exercised by several members of the international community as the response to the Russian annexation of Crimea in 2014. “Economic statecraft” as a technical term represents economic policy crafted by the International actor to influence the behavior of another actor in the desired direction. The main advantage of such tool lies in avoiding direct military involve-
ment that often results in death and other atrocities. Baldwin’s neo-realist approach on the field of the theory of international relations together with his economic knowledge provides us with excellent evaluation tools that can be used in retrospect when the wider economic data is available. Economic statecraft is a comprehensive name for economic policy instruments such as economic warfare, foreign aid, and economic sanctions (Kabát, Filip, Filipová, 2017). Main questions which we shall ask when evaluating the outcomes of economic policy measures – Do costs outweigh the benefits? Would another alternative have been more useful? Was the “minimum acceptable” degree of success attained? Were some goals ultimately achieved? The aim of this paper is to analyze, evaluate and discuss economic sanctions imposed against Russia as a consequence of Crimean annexation and to review the outcomes of such economic policy using the Baldwin’s “failure makers.”

The first half of this article attempts to describe and explain Baldwin’s concept of foreign economic policy he calls “statecraft,” while the second half analyzes the international situation after the annexation of Crimea using Baldwin’s perspective and tools for the analysis. The conclusion then discusses our findings and results of the study.

2. Economic statecraft

Economic Statecraft (1985) represents a mixture of knowledge from the fields of international relations, foreign policy, economy and political science carefully structured, and well integrated. This Study of economics as an instrument of politics is a significant contribution to an understanding of the use of various economic tools in the international relations (Filip, Ujváry, 2016, Fabuš, 2014). The book was written as the response to the increased number of available alternatives or instruments in the nuclear age. Economic statecraft is being defined from multiple perspectives. The author provides an analytical framework within which reliable knowledge about economic statecraft can be developed to replace the conventional wisdom (Baldwin, 1985:368). This framework is at the same time tested at numerous known cases of sanctions and provides a compelling explanation of success or failure. These examples are here to support his claims and hypotheses which drive him to the conclusion, that in virtually every case examined, there was a reason to suspect that thorough and rigorous application of the framework he developed would lead to conclusions significantly different from those of the conventional wisdom. Among other things, Baldwin captures dynamics of sanction policies in modern international relations. Extracts the theory of statecraft and most clearly defines the role of economics. Finally, he regards the elucidation of alternatives to military statecraft especially important in the nuclear age.

Baldwin defines statecraft as “an art of conducting state affairs” (Baldwin, 1985). Deriving from his definition, economic statecraft then is an art of conducting state economic affairs.

Specification of this term is developed further:
- Emphasizes means rather than ends
- Does not restrict the range of goals that may be sought by economic means,
- Treats policy instruments as property concepts, thus facilitating the maintenance of a clear distinction between undertakings and outcomes,
- Definition of economic statecraft includes a definition of “economic” and provides criteria for distinguishing economic techniques of statecraft from non-economic methods.

Since the definition of the term is quite clear, it is also important to understand what lies behind this term. Baldwin distinguishes three basic components of economic statecraft:
- Type of policy instruments used in the influence attempt (economic tools)
- Domain of the influence attempt (by other international actors)
- Scope of the influence attempt (some dimensions of the targets behavior including beliefs, attitudes, opinions, expectations, emotions etc.)

According to Baldwin, the chief contribution to the international community can be done by “improving understanding of statecraft is one of the most valuable contributions scholars can make to the functioning of democratic political processes” (Baldwin, 1985). Since the nation-states emerged, military and diplomatic tech-
niques were commonly used. That wasn’t the case with economic methods. Such discrepancy or deficiencies in the use of various techniques led Baldwin to the conclusion that exploration of this dimension of international politics might improve the state of world affairs.

When trying to understand Baldwin’s argumentation, it is crucial to bear in mind that he thinks as the realist or perhaps neo-realist and a practical economist as well. The latter is among other statements easy to identify in the following: “The costs of military statecraft have substantially increased. Assuming that political leaders will continue to want to influence other states or non-state actors, they are likely to find nonmilitary measures such as economic techniques of economic statecraft, increasingly attractive. If this is correct, enhanced understanding of the capabilities and limitations of such policy instruments would seem desirable” (Baldwin, 1985).

No matter how high the country’s political influence is or how accurately economic tools were used in the past, a higher number of available choices could be decisive for a statesman when contemplating alternatives. Even though, the only real world superpower is still the United States “…no country in the world has a greater need for alternatives to military statecraft than the United States” (Baldwin, 1985) is a statement that remains valid even thirty years after its first publication. The United States is not the only international actor whose policymakers, students or just ordinary people might find this knowledge useful. Many citizens perceive happening behind the borders as something “out there,” and their responsibility for those matters is often underestimated. In fact, citizens are the only ones who have the power to elect their representatives. For this reason, such knowledge increases their ability to assess accomplishments of policies applied abroad.

The statesman’s primary responsibility is to evaluate costs and benefits correctly before any action is to be taken. Any knowledge and options available and relevant to his objective might be the one that will have the biggest influence on the outcome. Sometimes it is not so important which choice or a set of options is the best, but which choices have to be avoided. It might also help the politicians to develop an adequate reasoning when presenting their ideas to the public. For instance, “…economic pressure is to be welcomed as a peaceful alternative to war rather than condemned as a means of pressure similar to war” (Baldwin, 1985:354).

3. Tools and techniques

When discussing the most important tools of the economic statecraft that is quite broadly defined, Baldwin summarizes economic tools into three separate categories:

- Economic sanctions
- Economic warfare
- Foreign aid

Needless to add that some argumentation in his book is written in a very defensive way what implies individual awareness of possible derogation of his concept - “Economic statecraft is not a bizarre, abnormal, non-routine, extraordinary, unusual occurrence, but rather a regular, routine, everyday, ordinary, commonplace activity” (Baldwin, 1985).

So what are then the techniques of economic statecraft? These are ways for foreign policy makers to make influential attempts in other states or non-state actors in the international arena. On the world stage as well as in front of the democratic public, in general, wars are the least favorite “solutions” to the problems. For this reason, war is to be discouraged by encouraging alternative means of settling disputes and that prohibition on a functional equivalent to war is likely to increase the probability of war (Baldwin, 1985). On the contrary, in assessing the utility of economic statecraft critics often accentuate the negative and downplay the positive aspects of such measures.

In connection with military dimension, as the realist, Baldwin understands that trade bind states together. In fact, trade functions as a protection against each other (Baldwin, 1985). Even though the efficient use of techniques of economic statecraft was often infirmed by many scholars, coercive effects of economic statecraft can
be as intense as those produced by armed force, without leaving dead bodies on the battlefield. Nevertheless, military tools of foreign policy go hand in hand with the domestic economy because military power is built upon economic foundations.

**Economic sanctions.** As mentioned above, the most common tools of economic statecraft are economic sanctions, foreign aid, and economic warfare. Every tool has a different effect, and this also depends on the particular situation and circumstances. Most commonly used are perhaps the economic sanctions in all forms. Economic sanctions were especially helpful when a slow, undramatic, cumulative effect is necessary (Baldwin, 1985).

On the other hand, Baldwin’s argumentation about the impact of the embargo on the Soviet Union seems a bit odd. Soviets had a centrally planned economy where a military sector had a top priority, and the plans were designed for several years ahead. Planners with party advisors would rather let 10 million people starve than decrease an expected output of military production. In my opinion, influence difference of economic sanctions on capitalist economy and CPE is too vast to compare. Also, embargoes in general cause harm mainly to “non-politicians” and “non-soldiers” – to the people directly irresponsible for the political status quo. It is applicable in the 21st century as well. Later in the book, Baldwin claims that embargo did strengthen Soviet control of the bloc. As he writes, he realizes even more that “rudderless states” are difficult to influence (Baldwin, 1985). We will discuss the impact differences between the Soviet Union and Russia later on.

In all analyzed cases where sanctions had been applied, these only strengthened the regime and prolonged suffering of ordinary people.

**Economic warfare.** The purpose of economic warfare is to capture crucial economic resources of the opponent to prevent the enemy forces to operate properly. This tool is used mainly in the total war between states but also during the preparation for the war. Typical policies applied and subsumed under economic warfare are a blockade, preclusive purchasing, capturing enemies’ assets and blacklisting of people or entities under opponents control.

**Foreign aid.** Foreign aid is a controversial tool of economic statecraft. Baldwin provides us with two definitions of aid, first one is defined as a transfer of resources from the United States Government to other countries for any purpose other than payment of an obligation. The second one is used, when nothing material is expected in return with a notion that the loan is not aid, but the grant is. In connection to economic statecraft, Baldwin specifies that foreign aid is very much like an ordinary commercial exchange transaction in that one party uses financial resources to get another party to change its behavior (Baldwin, 1985:292). Nuances of the diction of the text or speeches that accompany aid-giving cause differences in an actual outcome. Aid as a tool of economic statecraft is often used to clarify commitments:
- “you have our support” with the aid means an enhancement of the commitment;
- “we disapprove” is enhanced when aid suspension follows.

Furthermore, any attempt to determine the utility of foreign aid as an instrument of statecraft must be based on a clear distinction between the feasibility of the goals on the one hand and the utility of the aid on the other. Quite appropriate is Baldwin’s parable of aid to salt. More salt doesn’t necessarily mean better (Baldwin, 1985).

**Costs, benefits, and morals.** The leitmotif of Baldwin’s publication is the idea of lower costs of economic tools used in foreign policy compared to relatively high costs of military tools. A first instance can be found here: “Costs always matter to the rational decision maker, and cost estimates must be made no matter how difficult that may be. “All or nothing” is a decision rule for fanatics, not for rational and prudent statesmen” (Baldwin, 1985).

One of the biggest advantages of using economic instead of military statecraft derives from avoiding the costs associated with military statecraft. The preference for using the economic statecraft to a large extent depends on the accuracy of cost estimates of military statecraft. Despite this fact, there can’t be the equation between one billion dollars of military costs and one billion dollars’ worth of military force. We also can’t claim that 2bn in
economic losses is more than 1bn of military equipment lost, because a use of military tools causes death, and there is no economist or politician in the world that has the moral right to calculate the cost of a human life. Still, in our era, we tend to put a price tag nearly on everything, even human life (Sandel, 2013).

When evaluating connection of economic sanctions to costs and benefits, we can ask if the trade sanctions have the appropriate means through which to show concern? Baldwin answers with the following: “It depends on goals and targets of the influence attempt, the probable costs and benefits, and the costs and benefits associated with alternative policy options.” (Baldwin, 1985). His advocacy of sanctions on cost benefits follows with an argument that, if there is no change in the behavior after economic sanctions were applied, it, at least, increased target country’s costs of noncompliance with the international order.

4. Evaluating success of economic statecraft

When determining success or failure of economic statecraft, it is important to define what is considered as a failure. The failure assessment criteria are perhaps the most important outcome of the book.
- The costs outweigh the benefits
- Another alternative would have been more useful
- The “minimum acceptable” degree of success was not attained
- Some goals were not completely achieved

To conclude the first part of this paper, economic statecraft works well only when it is firmly supported by other political tools by the majority of the international community. Otherwise, the effect of them is highly questionable no matter what approach or assessing framework is used to evaluate the outcomes. Even though the cold war is over; this book did not lose anything from its actuality.

In the second part of this work, we can use Baldwin’s “failure markers” and evaluate economic sanctions imposed on Russia by the part of the international community as a response to the events in Ukraine in 2014.

Sanctions against Russia – The pretext. The initial stage of the Ukrainian revolution in the winter of 2013-2014 already indicated that the lawfully elected President Yanukovych would not stay in his office much longer. People in the streets of Kiev and many other mostly west-Ukrainian cities declared their will to change pro-Russian affinity and declared their desire to become a part of the “West.” Ukraine as a traditional sphere of Russian influence consists of a large Russian-speaking population. As much as 24% of the population uses The Russian language as their primary language while 17.3% of Ukrainian citizens claim their Russian ethnicity (CIA World Factbook, 2017). Once President Yanukovych escaped to Moscow and a new temporary government was established, Putin’s Russia began to act to maintain its influence in the region. Officially, Russia was only “protecting rights of Russians abroad” (The Washington Post, 2014). Russia began to send unmarked troops and military equipment in the late February 2014 which blockaded most strategic Ukrainian infrastructure in the Crimean area. This intervention is commonly known as “a stealth invasion”(The Economist, 2014). The invasion was followed by the abrupt “referendum” where 95.5% of voters agreed with reunification with Russia. Although Russia initially insisted that Russian forces were not involved in the invasion, President Putin admitted, that Russian troops had been active in Crimea saying “Of course, the Russian servicemen did back the Crimean self-defence forces” (Putin, 2014).

Reaction of the international community. The majority of United Nations General Assembly passed on March 27, 2014, the non-binding resolution declaring Crimea’s referendum invalid. Thus, the internal community did not recognize Crimea as a part of Russian Federation. Needless to add, that the draft resolution against Crimea referendum in the UN Security Council was vetoed only by the Russia earlier that month. The secession of Crimea from Ukraine was then a clear violation of international law.

The United States was alleged several times by the Russia’s representatives that they incite anti-Russian Maidan demonstrations in Ukraine. And that they intentionally want to reduce the traditional sphere of Russia’s
influence. However, United States declared that such a flagrant infringement of international law in the case of Crimea calls for the immediate reaction. For this reason, President Obama announced a list of economic sanctions that were already several times augmented (Ashford, 2016).

The European Union summoned an extraordinary meeting of the Council of the European Union on 3 March 2014. EU leaders condemned the clear violation of Ukrainian sovereignty and territorial integrity by acts of aggression by the Russian armed forces as well as the authorization given by the Federation Council of Russia on March 1 for the use of the military forces on the territory of Ukraine. The EU called on Russia to immediately withdraw its troops to the areas of their permanent stationing, by the Agreement on the Status and Conditions of the Black Sea Fleet stationing on the territory of Ukraine of 1997. In the absence of de-escalatory steps by the Russian Federation, on 17 March 2014, the EU imposed the first travel bans and asset freezes against Russian and Ukrainian officials following Russia’s illegal annexation of Crimea. The EU strongly condemned Russia’s unprovoked violation of Ukrainian sovereignty and territorial integrity (EU Newsroom, 2014).

Australia’s Prime Minister Abbot declared that Australia stands with countries around the world in urging Russia to de-escalate tensions, pull back its military, and engage in genuine dialog with Ukraine (Nelson, 2015). On June 19, Australia unveiled financial sanctions and travel bans against 50 people, and 11 entities thought to be responsible for or complicit in the Russian threat to the sovereignty and territorial integrity of Ukraine. Since there was no de-escalation in the conflict in Ukraine, Australia broadened its sanctions several times by the end of 2014 (Taylor, 2014).

Canadian sanctions related to Russia were enacted under the Special Economic Measures Act to respond to the gravity of Russia’s violation of the sovereignty and territorial integrity of the Ukraine. On March 17, 2014, the Special Economic Measures Regulations came into force (Government of Canada, 2014).

**Set of sanctions.** Canada’s sanctions targeted on Russia are limited to assets freeze on designated persons and financial prohibitions. The Regulations of Canadian government include a list of names of persons for which the Governor in Council considers there are reasonable grounds to believe that they are connected with the Government of Russia, or that they are individuals or entities engaged in activities that directly or indirectly facilitate, support, provide funding for, or contribute to the deployment of Russian armed forces to Crimea. In addition, Canadians are prohibited from dealing with any property held by or on behalf of a designated person, or facilitate or provide financial or other related services in respect of such a dealing, make any goods available to a designated person, provide any economic or related services to or for the benefit of a designated person. The Regulations also impose restrictions on some areas, like the financial and energy sectors. With some exceptions, they prohibit any person in Canada or Canadians abroad to deal with a loan, bond or debenture of longer than 90 days maturity in relation to certain designated persons, or to provide or otherwise deal with capital funding through the transaction of shares in exchange for an ownership interest in relation to certain designated persons. Causing, assisting or promoting prohibited activities is likewise prohibited.

The Australian Government (The Government of Australia 2014) listed 113 Russian individuals, and Ukrainian collaborators – thought to be largely members of President Vladimir Putin’s inner circle and close supporters. The sanctions against Russia include travel bans, export bans on certain products and asset freezes. Another company will be penalized as well, taking the total to 32. Other sanctions include restrictions on access to Russian banks to Australian capital markets, a ban on the export of goods and services for Russian oil exploration and production and a ban on arms exports to Russia. Australia’s defense exports to Russia are typically subtle, but the weapons ban is being included because the sanctions are mirroring those taken out by the European Union and the United States. The unanimity stops exporters using back doors through other countries where sanctions don’t apply.

Sanctions introduced by the EU target the finance, energy and defense sectors. The Union has restricted three Russian energy companies from raising long-term debt on European capital markets – Rosneft, Transneft, and Gazprom Neft. The EU has also halted services Russia needs to extract oil and gas in the Arctic, deep sea, and shale extraction projects (Dreyer, 2015). The export of any technology considered military ‘dual-use’ has been
banned from nine Russian companies, including the manufacturer of Kalashnikov rifles. Five major Russian state-owned banks – Sberbank, VTB, Gazprombank, Vnesheconombank (VEB) and Rosselkhozbank - have been banned from receiving any long-term (over 30-day) loans from EU companies. Brussels has also added 24 individuals to the list, blocking travel to the EU and freezing assets. Russian MPs and businessmen, as well as politicians in Crimea and Donbass, are on the blacklist (TV-Novosti 2014).

The President of the United States Barrack Obama authorized sanctions against Russia that include restrictions on the travel of certain individuals and officials and showed our continued efforts to impose a cost on Russia and those responsible for the situation in Crimea. Designated some Russian and Ukrainian entities, including 14 defense companies and individuals in Putin’s inner circle, as well as imposed targeted sanctions limiting individual financing to six of Russia’s largest banks and four energy companies. U.S. has also suspended credit finance that encourages exports to Russia and financing for economic development projects in Russia. The provision, exportation, or re-export of goods, services (not including financial services), or technology in support of exploration or production for deepwater, Arctic offshore, or shale projects that have the potential to produce oil in the Russian Federation, or in maritime area claimed by the Russian Federation and extending from its territory, and that involve five major Russian energy companies were also suspended. The United States is prepared to take additional steps to impose further political and economic costs. A secure Ukraine, integrated with Europe and enjoying good relations with all its neighbors, is in the interests of the United States, Europe, and Russia (US. Department of State, 2014).

The initial stage of the Ukrainian revolution in the winter of 2013-2014 already indicated that the lawfully elected President Yanukovych would not stay in his office much longer. People in the streets of Kiev and many other mostly west-Ukrainian cities declared their will to change pro-Russian affinity and declared their desire to become a part of the “West.” Ukraine as a traditional sphere of Russian influence consists of the largely Russian-speaking population. As much as 24% of the population uses The Russian language as their primary language while 17.3% of Ukrainian citizens claim their Russian ethnicity (CIA World Factbook, 2017). Once President Yanukovych escaped to Moscow and a new temporary government was established, Putin’s Russia began to act to maintain its influence in the region. Officially, Russia was only “protecting rights of Russians abroad” (The Washington Post, 2014). Russia began to send unmarked troops and military equipment in the late February 2014 which blockaded most strategic Ukrainian infrastructure in the Crimean area. This intervention is commonly known as “a stealth invasion” (The Economist, 2014). The invasion was followed by the abrupt “referendum” where 95.5% of voters agreed with reunification with Russia. Although Russia initially insisted that Russian forces were not involved in the invasion, President Putin admitted, that Russian troops had been active in Crimea saying “Of course, the Russian servicemen did back the Crimean self-defense forces” (Putin, 2014).

Reaction of Russia. In response to the sanctions imposed on Russia, Russia retaliatory imposed a “full embargo” on food imports from the EU, the US and some other Western countries. President Vladimir Putin said (BBC, 2014) that the food ban would take immediate effect and last for a year. In addition to the food imports ban, Russia has banned Ukrainian airlines from transit across its territory. The Russian government considered banning transit flights for EU and US airlines in retaliation for sanctions over Ukraine. Barring airlines from Siberian airspace would significantly increase costs and flying time for many jets bound for Asian destinations. To understand why Russia has chosen “food import ban” as a retaliatory measure it is necessary to look at the structure and proportions of Russian exports and imports (Filipová, 2016; Gasperová, Filipová, 2016).

A year before the sanctions were imposed, EU’s food exports to Russia were worth 11.8bn € while the US food exports to Russia were worth 972m €. Russia was the EU’s second-biggest market for food exports (10% of total), after the US (13%). Russia had to choose the group of products that are easily replaceable and have relatively little-added value (Shirov, 2015, Fabuš,2015). Also, such group shouldn’t harm EU too much, but still it is considerably “resonant” within the exporting countries. Considering the volume of imported volumes of automotive industry products, chemicals, and other products with high added value, it would indeed hit the Russian economy as a boomerang. For the comparison, see the following Table 1, how insignificantly influenced EU sanctions the volumes of trade with Russia.
Table 1. Top Russia’s trading partners in 2016

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Percentage</th>
<th>Value (in USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Netherlands</td>
<td>10.2%</td>
<td>29.3bn USD</td>
</tr>
<tr>
<td>2.</td>
<td>China</td>
<td>9.8%</td>
<td>28bn USD</td>
</tr>
<tr>
<td>3.</td>
<td>Germany</td>
<td>7.4%</td>
<td>21.3bn USD</td>
</tr>
<tr>
<td>4.</td>
<td>Belarus</td>
<td>4.9%</td>
<td>14.1bn USD</td>
</tr>
<tr>
<td>5.</td>
<td>Turkey</td>
<td>4.8%</td>
<td>13.7bn USD</td>
</tr>
<tr>
<td>6.</td>
<td>Italy</td>
<td>4.2%</td>
<td>11.9bn USD</td>
</tr>
<tr>
<td>7.</td>
<td>South Korea</td>
<td>3.5%</td>
<td>10bn USD</td>
</tr>
<tr>
<td>8.</td>
<td>Kazakhstan</td>
<td>3.3%</td>
<td>9.4bn USD</td>
</tr>
<tr>
<td>9.</td>
<td>United States</td>
<td>3.3%</td>
<td>9.4bn USD</td>
</tr>
<tr>
<td>10.</td>
<td>Japan</td>
<td>3.3%</td>
<td>9.4bn USD</td>
</tr>
<tr>
<td>11.</td>
<td>Poland</td>
<td>3.2%</td>
<td>9.1bn USD</td>
</tr>
<tr>
<td>12.</td>
<td>UK</td>
<td>2.5%</td>
<td>7bn USD</td>
</tr>
<tr>
<td>13.</td>
<td>Finland</td>
<td>2.3%</td>
<td>6.5bn USD</td>
</tr>
<tr>
<td>14.</td>
<td>Ukraine</td>
<td>2.2%</td>
<td>6.3bn USD</td>
</tr>
<tr>
<td>15.</td>
<td>Belgium</td>
<td>2%</td>
<td>5.7bn USD</td>
</tr>
</tbody>
</table>

Source: http://www.worldstopexports.com/russias-top-import-partners/

Moreover, after Medvedev’s directions toward the Russia’s agriculture ministry and producer organizations to find ways to boost farm outputs to prevent price rises for consumers it might help local producers to develop their business as a result of which Russia’s self-sufficiency will be accompanied by the higher employment rate. In the meantime, the Russian authorities are already searching for alternative suppliers in South America, Turkey, and China.

Effects of sanctions on the Russian Economy

Although it might be quite early to assess an overall effect of direct sanctions imposed on Russia, we can try to review the Russian GDP in 2014, 2015 (Kudrin, 2015). Russia’s Real GDP grew only by 0.6% in 2014, which could be easily seen as the success of the economic sanctions implemented by the West. Nonetheless, taking into account the unexpected situation on the world oil market in 2015 it is questionable to account 3.7% GDP decline to direct economic sanctions. But again, 0.3% growth in 2016 is showing that Russian economy is not doing too well.

Russia is heavily dependable on the earnings it receives from the oil exports. In 2013, the natural gas and oil sales accounted for 68% of total export revenues (EIA, 2014). Having in mind Russia’s high imports of goods with higher added value and weakening Ruble, shrinking oil prices only intensified the objectively severe conditions in which Russian economy appeared to happen (Baffes, 2015).

We can only speculate, why the Russia on the OPEC summit refused to decrease oil production, and whether or not would the U.S. allies as Saudi Arabia or Kuwait cut their crude output as well (Olson, 2014). Did the sanctions weaken the Putin or the Russia as a whole? Embargo as the most powerful tool of economic statecraft did strengthen Soviet control of the bloc during the cold war. According to international newspapers including those in Russia, nationalism in the largest Country in the World is on the rise (Laruelle, 2015). That strengthens the position of Russia’s beloved leader Vladimir Putin. Introduced sanctions by the West increased his popularity what gives him even more space to maneuver in the international arena. As Baldwin writes, “rudderless states are difficult to influence” (Baldwin 1985:247).

What economic and mostly financial sanctions undeniably caused was, that they gave a clear message to investors and financial speculators that the Russia is to be avoided. Also, foreign portfolio capital was leaving Russia at 2014 and 2015 at a brisk pace.
Conclusion

To evaluate economic sanctions against Russia, we can use Baldwin’s failure markers again. If the primary aim of sanctions was to force Russia to withdraw from Crimea or to stop Russia sending troops to Ukraine, this did not happen, and it’s quite unlikely that it will occur in the foreseeable future. So far, the costs outweigh the benefits. Unfortunately, regarding Russia’s retaliatory measures, European producers pay for it with no compensation from the officials. And that quite clearly damages European economy.

Would another alternative to such sanctions had been more useful? Imposing the more strict embargo on Russia in this globalized world and, more importantly, taking into account EU’s dependency on Russia’s oil and gas, would have economically disastrous consequences for far too many European economies. It is hard to believe that Russia would withdraw from Crimea. With such energized 19th-century nationalism that is still taking place in Russia, it would only make Russian public blinder to Putin’s “chess moves” on the international “chess board” of politics. Sanctions might weaken the enemy in material terms, but it might and usually do strengthen the opponent morally.

However, we can talk about “acceptable minimum.” Russia feels the pressure from the outside and perhaps understands that while it is a powerful player on the scene of world politics, it’s underdeveloped, and unbalanced structure of the economy heavily reliant on the export of non-renewables makes it very economically vulnerable to external pressures and turbulences on a global market.

Since the use of economic statecraft as a substitute to the military statecraft, it has its limits, and the effects come very slowly as we mentioned before. Their outcome is only to be increased in their intensity. All introduced sanctions we referred to in the first part of this work are weak. Soft and mild and they do no harm to the decision-makers in Russia. We can understand that countries that disagree with the politics of Russia and the annexation of Crimea “have to act” in order not to lose their credibility and respect. Even if the results are null.

One of the fulfilled goals or desired impacts caused by imposing economic sanctions is “considerably reduced space for maneuvering of Putin’s Russia” in the case of financial and economic problems. As a matter of fact, Russia was facing serious fiscal and economic problems in 2015. Interventions of the central bank in an attempt to prevent Ruble’s further devaluation probably won’t be sufficient in 2017 if something “goes wrong again.” Only rising oil prices can help Ruble to grow. Interest rates have already tripled reaching 17%, and state bond yields reached 12.97% p.a. in 2016. A gluton for money by the plethora of Russian companies who want to finance their losses, not only because of sanctions but also because of them, drastically increased demand for money. Companies are unable to pay their debts, and corporate bonds are also endangered. If the prices of crude won’t significantly grow by the end of this year, Russia might face even harder economic reality. There soon might be no one to buy Russia’s debt. Would that present a sufficient punishment for Putin’s annexation of Crimea? Probably not.

On the contrary, what direct sanctions were unable to accomplish, economic warfare can. Excessive oil drilling by the United States and its allies such as Saudi Arabia keep oil prices on level unacceptable by many oil exporters like Russia. How far and how long will such low levels be sustained remains the question of the day. And how long can Russia economically survive on oil export prices around 40 USD would be an intriguing research question for further research.

As we discussed, economic sanctions as a tool of economic statecraft have the capacity to serve the imposer with several significant advantages. Nonetheless, as Baldwin puts it (Baldwin 1985:63): “Economic sanctions may have diplomatic, political, psychological, military or other effects even when their economic effect is nil.” In other words, anything is better than war.
References


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Abstract. Financial security of companies is of the strategic importance. An effective credit risk management greatly impacts on a company security because its failure can threaten the existence of the company. These aspects are closely related to the sustainability of the SME sector, which is determined by many negative processes in the current post-crisis period. The aim of this article is to research the dependence between the entrepreneur’s ability to manage the credit risk in their company effectively and their knowledge of the corporate capital. Within the set goal, we looked at the differences in the attitudes of entrepreneurs depending on a company size, gender and education of entrepreneurs. To analyze acquired data, we used descriptive statistics, regression analyses and Z-score in our research. The originality of the article is that the whole process and result trajectory is focused on highlighting the financial security and sustainability of the searched sector. The results of our research brought an interesting finding. On the one hand, entrepreneurs declared a high capability of the effective credit risk management in their companies and, on the other hand, demonstrated a low level of knowledge in managing the corporate capital. This trend creates a potential possibility of a growth of corporate financial risks. The research results confirmed that the theoretical knowledge of the corporate capital has a significant impact on the formation of effective attitudes of the entrepreneur to manage the credit risk. Larger companies, men and entrepreneurs with higher education have much better level of knowledge of the corporate capital management. The research results enable to form a platform for a deeper insight into the financial security processes in companies and in the sustainability of the SME sector, especially in the current post-crisis period.

Keywords: corporate financial safety, small and medium sized companies, credit risk, management of credit risk


JEL Classifications: D81, G21, G31

1. Introduction

Small and medium sized enterprises represent the primary moving mechanism for creation of a new job and increase of the gross domestic product (Czarniewski, 2016; Tvaronavičienė, 2016), their growth and development are the priorities amongst the goals of national economies for developed countries of the world as well as for countries in transition (Kozarevic et. al., 2015, Virglerová et al., 2016, Krejčí et. al., 2015; Munteanu, Tamošiūnienė, 2015; Travkina, Tvaronavičienė, 2015). The issue of business risks of small and medium enterprises (SMEs) represents a current area of theoretical research and practical applications (Ključnikov, Popesko,
A financial security of companies is a strategic management area, as every company has the prospect of staying in the market and increasing its value (Pavelková and Knápková, 2005, Kislingerová et al., 2010; Stasytytė and Aleksienė, 2015).

An efficient corporate credit risk management is a significant area of an overall management because many businesses are directly dependent on external financing in the form of bank loans. In the case of efficient corporate credit risk management, they use the financial leverage to accelerate their business activities. On the other hand, the excessive debt ratio necessarily implies a limitation of the debtor’s rights, which may lead to the discovery of the bankruptcy. In such a case, the debtor is wholly forbidden from controlling its assets. This is also in the case when the default is solved by a bankruptcy. In the case of a rescue, the debtor’s dispositional rights are subject to the supervision of the creditors (Smrčka et al., 2016).

Thus, unsuccessful credit risk management can lead to the termination of a company. In this context, Pavelka and Krchnak (2015) pay attention to the fact that SMEs have more difficult access to foreign financial resources for their development and increased competitiveness.

The global economic crisis meant a serious external shock for the SME segment, and in many cases also jeopardized the existence of these businesses. Enterprises in the SME segment experienced a significant drop in demand, orders, and worsening of sales over the period, which subsequently resulted in lower sales, worse profitability and decrease of liquidity. Low return on investment provoked problems with repayment of loans and liabilities to suppliers and employees, which led to the creation of the secondary insolvency and threatened the operation of other businesses. Banks and credit institutions tightened credit standards, increasing the difficulty of credit obtaining and the costs of repayment. For SMEs, the access to external funding worsen significantly and so their liquidity. These processes associated with the crisis and the post-crisis periods put increased demands on the financial management in companies and on the application of various financial scenarios. This aspect is strongly related to the level of knowledge of the credit risk and corporate capital management. Requirements for this knowledge have changed significantly in recent years. It is not enough to have only basic knowledge and experience in the field of the financial management, entrepreneurs are getting in their management regime into much more complex decision-making problems that determine their existence.

In a reflection of the facts presented, we see the current issues of SME in two lines - at the micro level - represented by the financial security of SMEs (Akhmadeev, Manakhov, 2015), and at the macro level - represented by the sustainability of the SME sector (Astrauskaitė, Paškevičius, 2016; Giriūnienė, G.; Giriūnas, L. 2015).

There is a causal conditional relationship between the financial security of SMEs and their sustainability in this sector that has not been the subject of any research studies yet. This is due to the problematic capture of their qualitative and quantitative links, which are complicated by dynamic changes in the external environment of the SMEs. This also raises the need for methodological processes, as well as the available data base. This consistent fact instilled us, in the initial stages, the need for a deeper research of selected aspects of the effective risk management of SME entrepreneurship in relation to the financial security of companies and the creation of a macroeconomic trajectory of the impacts of these aspects on the global sustainability of the SME sector.

The originality of this article lies in the research of the dependence of the credit risk management on the knowledge of the basic rules of the corporate capital management. Our article is based on the empirical knowledge which we gained in the segment of small and medium sized enterprises using the questionnaire research.
level - the sustainability of the SME sector. In the next part, we focus on the research processes, where we describe in detail the methodology of the research and the main research lines. The results of the analyses are the subject of the third part, in which the research findings of both quantitative and qualitative characters are aggregated. In the context of the highlighting of the significance of the financial security processes of SMEs and the sustainability of the sector, in the discussion part we point out also to the risks of the company insolvency, its global situation and the attitudes of Czech and Slovak entrepreneurs towards this fact. The discussion line ends with the institutional usability of the results of our research and inspirational ideas for the further research.

2. Theoretical background

According to Leopoulos et. al. (2006) managing of financial and credit risk should be a fundamental part of everyday activities of SMEs. Authors presented explicit quantitative tools for its successful management (Kulišauskas, Galinienė, 2015; Tamulevičienė, 2016).

Similarly, Stan-Maduka (2013) stressed the necessary role of financial risk management and assessment in the business processes and profitability of SMEs. In this context Kozubíková et al. (2017) state that financial risk is considered to be one of the most important types of risk because high financial risk-taking may in turn significantly affect the liquidity of the company.

The strong relations between credit risk, macroeconomic conditions and capital structure was analysed by Hackbarth et. al. (2006) introducing the model for measuring the impact of various capital structure on credit risk.

The leverage effect in terms of capital structure and its influence on corporate credit risk management is highlighted also by Purananandam (2008). Grossl et. al. (2001) provided an investigation of German companies’ financial structure in context of financial risk of SMEs, while finding out that positive trend of owing leads to significant higher financial risk of the company. In the same way Kim et. al. (2011) studied the leverage impact on corporate cash holdings in Korean SMEs in context of financial risk.

Furthermore, Dangl and Zechner (2004) proved that dynamic capital structure lower optimal initial leverage ratios while increasing credit spreads and expected default probabilities. The research of these authors has shown that the extent of the effect of capital structure dynamics depends mainly on firm characteristics, such as asset volatility, the growth rate, the effective corporate tax rate, debt call features and transactions costs. Equally Behr and Guttler (2007) state that the value of loans of SMEs have direct impact on their credit risk.

On the other side some authors state that effective credit risk management involves not only management of financial indicators and considering economic conditions, but also it is important to evaluate SME characteristics, such as firm-specific characteristics (Moon and Sohn, 2010; Felicio et al., 2015).

According to Gupta et. al. (2015) successful credit risk management depends strongly on the size of the company. They argue that within the broad category of small and medium size enterprises exists a huge diversity, as SME differ widely in their capital structure, firm size, access to external finance, management style, numbers of employees etc., which is important to consider while managing credit risk.

Similarly, Marshall et. al. (1996) have dealt with the importance of knowledge management in context of financial risk. Their results further suggest that there is a need for a more structured approach to transferring knowledge to decision makers before it is needed, enabling the access of information as it is needed and transferring the knowledge about the firm’s changing risk management requirements.

The value of non-financial information in SME companies credit risk management is highlighted also by Altman et. al. (2010) and Kritzman and Li (2010). In the same way Chen (2016) studied the influence of geography characteristics of companies on the credit risk. The study provided in Taiwan showed that the firm loca-
tion affects credit risk through the channels of incomplete information and financial leverage. Moreover, the study found out that a firm’s market-debt financing distance is positively associated with its credit risk while the firm’s banking-debt financing distance has insignificant effect.

Kozubikova and Bartos (2015) provided the examination of the relationship between personality characteristics and approach to the perception and management of credit risks. They proved that there are significant differences in approaching credit risk between artist-entrepreneurs and businessmen-laborers. The results further showed a high degree of confidence of individual groups of entrepreneurs when evaluating their ability to manage financial risks in the company. Same groups of entrepreneurs were studied also by Kozubikova et. al. (2015). They proved the high degree of confidence of individual groups of entrepreneurs when evaluating their ability to manage financial risks in the company and the high intensity of entrepreneurial optimism regardless of the personal characteristics of entrepreneurs. The results by Kozubíková et al. (2017) show that there are differences between men and women entrepreneurs in factors which are important for the perception of financial risk.

The authors pay much attention to other attributes of the corporate credit risk management. Size of the company can play an important role in the context of external funds obtaining (Pervan, Kuvek, 2013). Credit tightening that followed the crisis has affected some SMEs more than others (Bain & Company, Inc. and the IIF (2013). The access to finance is one major challenge for SMEs, which affects them disproportionately more than large firms (International Finance Corporation, 2013), especially in the conditions of the financial distress, when SMEs are often denied for credit (Kundin & Erecgovac, 2011). The reason can be the asymmetry of information in the credit process (Ramlee & Berma, 2013).

Many authors research the relation of the gender to the financial risk. Diaz-Garcia and Jimenez-Moreno (2010), Ayub et al. (2013) and Lim and Envick (2011) identically found that women are more risk averse than men. On the other hand, Garwe and Fatoki (2012) confirmed that gender does not have any significant impact on SME finance, however, females were more discouraged from bank finance than males. Gamage (2013) also negated the influence of the gender and the experience of the entrepreneur.

The importance of education for the entrepreneurship of SMEs is searched by other authors. According to Irwin and Scott (2010), higher education of the entrepreneurs has a positive impact on the ability to undergo financial difficulties and provide better access to the external funding. Higher educated people are more interested to have their own business (Velez, 2009; Lafuente, Vaillant, 2013). Educated individuals can look for more opportunities in the market (Naude et al., 2008), which is positively related to higher growth (Rauch, Rijsdijk, 2013, Van der Sluis and Van Praag, 2008).

3. Aim, methodology and data

The aim of this article is to search the dependence between the entrepreneur’s ability to manage the corporate credit risk effectively and their knowledge of the corporate capital.

Within the set goal, we searched the differences in the attitudes of entrepreneurs, depending on the size of business, gender, and entrepreneurship education.

In connection with the defined goal, in 2017 we realized an empirical research in the Czech business environment of SMEs using a questionnaire. Entrepreneurs and business managers expressed their approval with the defined claims on the 5-degree Likert scale: I totally agree, I agree, I have no attitude, I disagree, I totally disagree. The questionnaire consisted of 6 questions related to the socio-demographic characteristics of enterprises (region, business sector, number of years of entrepreneurship, size of an enterprise, gender and education of an entrepreneur) and 36 claims related to the credit risk.

The procedure of obtaining empirical data was as follows. By a random numbering method, using the Randbetween mathematical function, we selected 1,000 SMEs from the official Czech database of the companies Al-
bertina. We addressed these businesses by mail and telephone at least once, and if we had a negative response, we contacted the company again. The sample presented 352 enterprises (35% success rate) with the received feedback. Data were collected in all regions of the Czech Republic.

The structure of socio-demographic characteristics of entrepreneurs was as follows: males 265 (75.4%), women 87 (24.6%), university education 171 (48.6%), secondary education with graduation 139 (39.5%), secondary education without graduation 42 (11.9%). The structure of enterprises was as follows: enterprises up to 10 employees 233 (66.2%), enterprises up to 50 employees 67 (19.0%), enterprises up to 250 employees 52 (14.8%). Business doing business more than 10 years in the market 227 (64.5%), from 5 to 10 years 64 (18.2%) and up to 5 years 61 (17.3%).

The effective credit risk management was defined by the claim (indicator):

Ky: I can manage credit risk in my business effectively.

We defined the entrepreneur’s knowledge of the corporate capital by the following statements (indicators):

K1: Debt (a bank loan) is cheaper than the entrepreneur’s equity and therefore I use a bank loan.
K2: Debt (a bank loan) is less risky than the entrepreneur’s equity and therefore I borrow money from the bank.
K3: Businesses need a certain amount of credit, but I think the entrepreneur should have more equity than loans.
K4: Debt should be used primarily to finance the current capital of the company.

The mentioned dependency can be formally written as:

\[ I_{Ky} = f(K1, K2, K3, K4) \]  \hspace{1cm} (1)

\[ I_{Ky} \geq I_{Kn} \]  \hspace{1cm} (2)

\[ I_{Kn} = \frac{I_{K1} + I_{K2} + I_{K3} + I_{K4}}{4} \]  \hspace{1cm} (3)

\( I_{Ky} \) expresses the overall value of the ability to manage the credit risk in the company effectively, \( I_{K1} + I_{K2} + I_{K3} + I_{K4} \) express the value of partial indices. We assumed that the declared ability to manage the credit risks effectively would be greater or equal to the average value of knowledge in the field of the corporate capital.

The formulation of the individual indicators was determined in such a way that the higher value of the knowledge indicators determined the higher value of the effective credit risk management. The \( I_{Ky} \) belongs to the interval \((0; 4)\). The lowest value means that the sum of the knowledge index values is zero. The highest value means that the sum of the knowledge index values is excellent. When formulating the statements, we used the findings of many authors (e.g. Pavelková and Knápková, 2005, Kislingerová et al., 2010).

In the article, we identified these scientific hypotheses using the expert estimation method:

H1: The value of \( I_{Ky} \) for the entire SME segment will be higher than the average theoretical value of \( I_{Ky} \) (0.500). The values of partial \( I_{Ky} \) calculated for individual groups of entrepreneurs will be higher than the average theoretical \( I_{Ky} \) value (0.500).

H2: The value of \( I_{Kn} \) for the entire SME segment will be higher than the average theoretical value of \( I_{Kn} \) (0.500). The values of partial \( I_{Kn} \) calculated for individual groups of entrepreneurs will be higher than the average theoretical \( I_{Kn} \) value (0.500).

H3: The multiple linear regression model explains more than 30% of the total variability between the dependent variable \( Ky \) and the independent variables (K1, K2, K3, K4).

H4: There are no statistically significant differences in the selected indicators by company size, gender and education.

The values given in Equations 1 and 3 were calculated for the defined groups of entrepreneurs.

We used descriptive statistics and Z-score to validate hypotheses H1-H3. Statistically significant differences
between the positive responses of the designated social groups were compared using the Pearson statistics at the significance level of 5%. If the calculated p-value was lower than 5%, we reject the null hypothesis, and the alternative hypothesis was confirmed. The calculations were made using the free software available at http://www.socscistatistics.com/tests/ztest/Default2.aspx.

In order to quantify the relationship between the dependent variable and the independent variables, a regression analysis was used. Independent variables must meet the linearity assumption (verification by the graphical analysis using the “point graph”), the assumption of homoscedasticity (verification by Bartlett’s test), the assumption of normal data distribution (graphical verification by comparing the histogram to the normal distribution curve and by testing the descriptive characteristics using the z-value). If the z-value of the descriptive characteristic (skewness, kurtosis) of the indicator is less than 2 (Hair, 2010) then the assumption of the normality is met. The relationship between the variables was searched using a correlation matrix. T-test was used to verify the significance of regression model parameters. The general form of the regression model with multiple linear function, which expresses the additive relationship between the dependent and independent variables, can be expressed as:

\[ Ky = \beta_0 + \beta_1 \cdot K_1 + \beta_2 \cdot K_2 + \beta_3 \cdot K_3 + \beta_4 \cdot K_4 + \varepsilon_t, \]  

(4)

Where the \( Ky \) – a dependent variable, \( \beta_0 \) – a constant, \( \beta_1, ..., \beta_4 \) - parameters of independent variables, \( K_1, K_2, K_3, K_4 \) - independent variables, \( \varepsilon_t \) – an error term.

The statistical significance of the regression model was verified by the F-test. The presence of a multi-collinearity was identified by the variance inflation factor (VIF test). If the regression model function has three or more independent variables, then a negative phenomenon, multi-collinearity, is to be verified (Noriss and Lecavalier, 2009). We used the determination coefficient (R2) to express the reliability of the regression model. In the tests required for the regression analysis, we used the probability of a test error of 0.05. The calculations were made using the SPSS Statistics software.

4. Results and discussion

The results of the research are presented in the following tables. Table 1 lists the results that show the entrepreneurs’ view on their ability to manage the credit risk in the company effectively.

<table>
<thead>
<tr>
<th>I can manage the credit risk in my company effectively</th>
<th>Total SMES</th>
<th>Micro</th>
<th>OE</th>
<th>M</th>
<th>W</th>
<th>UD</th>
<th>OD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. totally agree</td>
<td>32</td>
<td>20</td>
<td>12</td>
<td>25</td>
<td>7</td>
<td>16</td>
<td>16</td>
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<tr>
<td>2. agree</td>
<td>206</td>
<td>137</td>
<td>69</td>
<td>150</td>
<td>56</td>
<td>106</td>
<td>100</td>
</tr>
<tr>
<td>Sum 1+2</td>
<td>238</td>
<td>157</td>
<td>81</td>
<td>175</td>
<td>63</td>
<td>122</td>
<td>116</td>
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<tr>
<td>Total number</td>
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<td>119</td>
<td>265</td>
<td>87</td>
<td>171</td>
<td>181</td>
</tr>
<tr>
<td>Index</td>
<td>0.676</td>
<td>0.674</td>
<td>0.681</td>
<td>0.660</td>
<td>0.724</td>
<td>0.713</td>
<td>0.641</td>
</tr>
</tbody>
</table>

Notice: Micro-micro enterprises, OE – other enterprises, M-men, W-women, UD- university education, OD – other education

The research results, which represent the knowledge of entrepreneurs of the corporate capital management, are presented in Tables 2-5.
### Table 2. Knowledge 1

<table>
<thead>
<tr>
<th></th>
<th>Total SMEs</th>
<th>Micro</th>
<th>OE</th>
<th>M</th>
<th>W</th>
<th>UD</th>
<th>OD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt is cheaper than the entrepreneur’s equity and therefore I use a bank loan.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. totally agree</td>
<td>17</td>
<td>11</td>
<td>6</td>
<td>14</td>
<td>3</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>2 agree</td>
<td>91</td>
<td>40</td>
<td>51</td>
<td>70</td>
<td>21</td>
<td>57</td>
<td>34</td>
</tr>
<tr>
<td>Sum 1+2</td>
<td>108</td>
<td>51</td>
<td>57</td>
<td>84</td>
<td>24</td>
<td>69</td>
<td>39</td>
</tr>
<tr>
<td>Total number</td>
<td>352</td>
<td>233</td>
<td>119</td>
<td>265</td>
<td>87</td>
<td>171</td>
<td>181</td>
</tr>
<tr>
<td>Index</td>
<td>0.307</td>
<td>0.219</td>
<td>0.479</td>
<td>0.317</td>
<td>0.276</td>
<td>0.404</td>
<td>0.215</td>
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</table>

### Table 3. Knowledge 2

<table>
<thead>
<tr>
<th></th>
<th>Total SMEs</th>
<th>Micro</th>
<th>OE</th>
<th>M</th>
<th>W</th>
<th>UD</th>
<th>OD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt (a bank loan) is less risky than the entrepreneur’s equity and therefore I borrow money from the bank.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. totally agree</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>2 agree</td>
<td>56</td>
<td>31</td>
<td>25</td>
<td>43</td>
<td>13</td>
<td>30</td>
<td>26</td>
</tr>
<tr>
<td>Sum 1+2</td>
<td>62</td>
<td>34</td>
<td>28</td>
<td>47</td>
<td>15</td>
<td>34</td>
<td>28</td>
</tr>
<tr>
<td>Total number</td>
<td>352</td>
<td>233</td>
<td>119</td>
<td>265</td>
<td>87</td>
<td>171</td>
<td>181</td>
</tr>
<tr>
<td>Index</td>
<td>0.176</td>
<td>0.146</td>
<td>0.235</td>
<td>0.177</td>
<td>0.172</td>
<td>0.199</td>
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</table>

### Table 4. Knowledge 3

<table>
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<tr>
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<th>Total SMEs</th>
<th>Micro</th>
<th>OE</th>
<th>M</th>
<th>W</th>
<th>UD</th>
<th>OD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Businesses need a certain amount of credit, but I think the entrepreneur should have more equity than loans.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. totally agree</td>
<td>69</td>
<td>48</td>
<td>21</td>
<td>55</td>
<td>14</td>
<td>30</td>
<td>39</td>
</tr>
<tr>
<td>2 agree</td>
<td>185</td>
<td>125</td>
<td>60</td>
<td>128</td>
<td>57</td>
<td>81</td>
<td>104</td>
</tr>
<tr>
<td>Sum 1+2</td>
<td>254</td>
<td>173</td>
<td>81</td>
<td>183</td>
<td>71</td>
<td>111</td>
<td>143</td>
</tr>
<tr>
<td>Total number</td>
<td>352</td>
<td>233</td>
<td>119</td>
<td>265</td>
<td>87</td>
<td>171</td>
<td>181</td>
</tr>
<tr>
<td>Index</td>
<td>0.722</td>
<td>0.742</td>
<td>0.680</td>
<td>0.691</td>
<td>0.816</td>
<td>0.649</td>
<td>0.790</td>
</tr>
</tbody>
</table>

### Table 5. Knowledge 4

<table>
<thead>
<tr>
<th></th>
<th>Total SMEs</th>
<th>Micro</th>
<th>OE</th>
<th>M</th>
<th>W</th>
<th>UD</th>
<th>OD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt should be used primarily to finance the current capital of the company.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. totally agree</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. agree</td>
<td>105</td>
<td>68</td>
<td>37</td>
<td>82</td>
<td>23</td>
<td>52</td>
<td>53</td>
</tr>
<tr>
<td>Sum 1+2</td>
<td>112</td>
<td>72</td>
<td>40</td>
<td>88</td>
<td>24</td>
<td>55</td>
<td>57</td>
</tr>
<tr>
<td>Total number</td>
<td>352</td>
<td>233</td>
<td>119</td>
<td>265</td>
<td>87</td>
<td>171</td>
<td>181</td>
</tr>
<tr>
<td>Index</td>
<td>0.318</td>
<td>0.309</td>
<td>0.336</td>
<td>0.332</td>
<td>0.276</td>
<td>0.322</td>
<td>0.315</td>
</tr>
</tbody>
</table>

Based on the results of the empirical research, we calculated the indicators $I_{ky}$, $I_{ka}$ and compared the value $I_{ky}$ with the $I_{ka}$ value:

- $I_{ky} = 0.676$
- $I_{ka} = \left( I_{k1} + I_{k2} + I_{k3} + I_{k4} \right) / 4 = 0.381$
- $I_{ky} > I_{ka}$

- $I_{ky}/Micro = 0.674$
- $I_{ka}/Micro = 0.354$
- $I_{ky}/Micro > I_{ka}/Micro$

- $I_{ky}/OE = 0.681$
- $I_{ka}/OE = 0.433$
- $I_{ky}/OE > I_{ka}/OE$

- $I_{ky}/M = 0.660$
- $I_{ka}/M = 0.379$
- $I_{ky}/M > I_{ka}/M$

- $I_{ky}/W = 0.724$
- $I_{ka}/W = 0.385$
- $I_{ky}/W > I_{ka}/W$

- $I_{ky}/UD = 0.713$
- $I_{ka}/UD = 0.394$
- $I_{ky}/UD > I_{ka}/UD$

- $I_{ky}/OD = 0.641$
- $I_{ka}/OD = 0.369$
- $I_{ky}/OD > I_{ka}/OD$
The research results showed that the declared value of the ability to manage the credit risk (I_{Ky}) effectively was higher than the average theoretical value of 0.500 in all defined groups of entrepreneurs. The highest value of this indicator was found in the group of female entrepreneurs (0.724) and the lowest value in the groups of entrepreneurs with a lower level of education (0.641). These results confirmed a relatively high self-confidence of entrepreneurs in managing the credit risk.

The average value of I_{K_n} for the entire SME segment was lower than the average theoretical value of I_{K_n} (0.500). The values of partial I_{K_n} calculated for individual groups of entrepreneurs were lower than the average theoretical value of I_{K_n} (0.500). The highest value of the indicator was found in the group of larger companies (0.433) and the lowest in the group of micro-enterprises (0.354). These results confirmed the low level of the entrepreneurial knowledge in the field of the corporate capital management.

*The H1 hypothesis was confirmed.*
*The H2 hypothesis was not confirmed.*

The research results that quantify the relationship between the dependent variable and the independent variables are shown in the following tables.

**Table 6. Skewness, kurtosis, z-value and Bartlett’s test of independent variables**

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Descriptive statistics</th>
<th>Tests to verify the assumption of the normal distribution and the homoscedasticity distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Skewness (S)</td>
<td>Kurtosis (K)</td>
</tr>
<tr>
<td>K1</td>
<td>1.354</td>
<td>1.254</td>
</tr>
<tr>
<td>K2</td>
<td>1.002</td>
<td>0.358</td>
</tr>
<tr>
<td>K3</td>
<td>2.654</td>
<td>0.735</td>
</tr>
<tr>
<td>K4</td>
<td>2.168</td>
<td>1.231</td>
</tr>
</tbody>
</table>

The results in Table 6 show that the independent variables (K1, K2) meet the assumption of the normal distribution of the respondents’ responses (K1: z-value (S) = 1.681, z- value (K) = 0.624, K2: 1.119, z-value (K) = -0.458). At the same time, K1 and K2 indicators meet the assumption of homoscedasticity, because Bartlett’s p-value is higher than the significance level. The graphical analysis of the data, using the point graph, shows only slight variations in the pairing assessment of the respondents for the indicators K1 and K2. And vice versa, K3 and K4 do not meet the assumption of normality, linearity or homoscedasticity. The results of the correlation matrix indicate strong or very strong dependencies between respondents’ responses to the Ky indicator (effective credit risk management) and its determinants (knowledge of the entrepreneur in the field of the corporate capital). The results of paired t-tests of the dependent variable Ky and the independent variables (K3: t-test = 1.153; K4: t-test = 0.846) confirmed the statistical insignificance of the regression model parameters. But the independent variables K1 and K2 are suitable for describing the dependence using a suitable regression model.
To describe the dependence between the dependent variable (Ky) and the independent variables (K1, K2) we used a regression model with multiple linear function. The selected regression model best explains the overall variability of the effective credit risk management ($R^2 = 0.4825$). The selected linear regression model is statistically significant because the significant level of F-test is less than the significance level of the regression model.

Based on the results of the regression modelling characteristics (see Table 7), we formulated the relationship between the effective credit risk management and its determinants. The mathematical function of the regression model has the form:

$$Ky = 0.5581 \times K1 + 0.3159 \times K2,$$

where Ky - effective credit risk management, K1 - I use debt, i.e. bank loan because it is cheaper than equity; K2 - debt, i.e. bank loan is less risky than equity.

*The H3 hypothesis was confirmed.*

The multiple linear regression model explains more than 30% of the total variability between the dependent variable Ky and the independent variables (K1, K2, K3, K4). The shape of the regression model explains up to 48.25% of the overall variation of the entrepreneurs’ responses to Ky. A significant influence on the formation of effective attitudes of the entrepreneur to the management of the credit risk have K1 and K2. In our research, we found out that K3 and K4 do not have a statistically significant impact on the formation of effective attitudes of entrepreneurs to the credit risk management.

In Table 8 we compare the attitudes of entrepreneurs, according to business, gender, and education.

<table>
<thead>
<tr>
<th>Z-score: p-value</th>
<th>Ky</th>
<th>K1</th>
<th>K2</th>
<th>K3</th>
<th>K4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro/OE</td>
<td>0.8966</td>
<td>0</td>
<td>0.0375</td>
<td>0.2225</td>
<td>0.6031</td>
</tr>
<tr>
<td>M/W</td>
<td>0.2713</td>
<td>0.4715</td>
<td>0.9124</td>
<td>0.0232</td>
<td>0.3271</td>
</tr>
<tr>
<td>UD/OD</td>
<td>0.1471</td>
<td>0.0001</td>
<td>0.2757</td>
<td>0.0032</td>
<td>0.8887</td>
</tr>
</tbody>
</table>

Values of the test criterion (p-value = 0.8966/ 0.2713/ 0.1471) confirmed that there are no statistically significant differences in the attitudes of entrepreneurs within the defined groups to assess their own ability to manage the credit risk.
When evaluating K1 indicator, we found that there are statistically significant differences in respondents’ responses. Larger businesses and entrepreneurs with higher education showed better level of knowledge (p-value = 0 / 0.0001).

Considering K2 indicator, we found that there are statistically significant differences in respondents’ answers. Larger businesses presented higher level of knowledge in the field of the capital risk (p-value = 0.0375).

Taking K3 indicator into account, we found that there are statistically significant differences in respondents’ answers. Women entrepreneurs and entrepreneurs with lower level of education declared a higher tendency to prudent management of the corporate capital (p-value = 0.0232 / 0.0032).

When we assess the K4 indicator, we found that there are no statistically significant differences in respondents’ answers considering the defined groups of respondents.

$H4$ was partially confirmed.

The results of our research showed a relatively low correlation between the declared ability to manage the credit risk effectively and the average level of knowledge of the corporate capital because up to 68% of entrepreneurs declared that they are able to manage the credit risk effectively, but only 38% of them demonstrated their knowledge of indicators K1 to K4, which significantly determine the correct attitude towards the credit risk management.

Entrepreneurs demonstrated a relatively low level of knowledge of the corporate capital because only 31% of them agreed with the claim that debt is cheaper than equity. The lowest level of knowledge was demonstrated by entrepreneurs in assessing the risk of debt, where we found that only 18% of them understood correctly the mutual risk ratio of both types of capital.

In our research, entrepreneurs demonstrated a relatively responsible approach to the corporate equity management, as up to 72% of them agreed with the claim that the entrepreneur should have a higher volume of equity than loans.

Only 32% of entrepreneurs agreed that debt should be primarily used to finance the current capital of the company.

The results of our research, to some extent, confirmed the conclusions of Moon and Sohn (2010) about the impact of the firm-specific characteristics on the effective credit risk management and about the corporate size impact on the credit risk management (Gupta et al., 2015, Pervan, Kuvek, 2013) and about the impact of the personality characteristics and gender of the credit risk management (Kozubikova and Bartos, 2015; Kozubiková et al., 2015; Kozubíková et al., 2017). Our research also confirmed the conclusions of Irwin and Scott (2010) about the importance of education in the entrepreneurship.

In the results of our research, we can see a number of dissemination lines as well as clear microeconomic and macroeconomic significance.

The SME sector in the Czech business environment is comparable, in quantitative terms, to the situation in other EU countries, but considering a qualitative side, the situation is much more complicated, related to the more problematic adaptability of SMEs to changes in external conditions. The development of SMEs is complicated by complex, often changing legislations, taken without any analyses of impact on the business environment, high administrative burdens of business, bureaucratic interventions, public sector inefficiency, increase of input prices, lack of resources for start-up entrepreneurs, malfunctioning capital market, fragmented financial and other support of SMEs, inadequate interconnection of the education and training systems with the needs of the labor market and with the requirements of SMEs.
These factors are important in the process of maintaining the sustainability of the SME sector, as their importance in the post-crisis period increase. High demands on knowledge are also made on entrepreneurs and business executives who find themselves in more complex decision-making situations associated with the financial management. Current education processes embedded in separate systems are inadequate or do not reflect the current needs of practice in the field of the financial management knowledge as well as changes in the external environment of companies, etc. This creates a potential for risks in several dimensions of the financial management of SMEs. We also see the importance of this issue taking the current global insolvency development of companies into account, which implicitly determines the sustainability of the SME sector. From an aggregate point of view, looking at the insolvency development of companies, the global insolvency rate was declining to 2017, but in the last few months there was a very low decline. Experts estimate a gradual increase in insolvency for 2017. The world insolvency index, Euler Hermes, declined by only 2% between November and December, with an expected increase of 1% in the global insolvency. The increasing rate of insolvency is particularly peculiar to the US, Russia and China. For companies, it means a strong deflationary pressure and a slump in the global demand. Looking at the insolvency assumption for 2017 (Business Insolvency Worldwide - Economic Outlook 1230-1231, November-December 2016), the planned decrease in the Czech Republic is 7% which is less than in Portugal (8%) and more than in Slovakia (5%). A significant decline in insolvency is expected this year in Denmark (19% annual rate) and in Hungary (25% annual rate). From the home environment, interesting research findings were provided by Ředinová and Paseková (2013) who searched the attitudes of SME owners to insolvency in the Czech and Slovak Republics (more than 130 respondents in each country).

The results of their study show that up to half of respondents have some experience with insolvency of their own business or their business partner. The attitudes of managers and owners of SMEs to insolvency and experience with it were almost the same in both countries. In both countries, less than a fifth of respondents thought about changing the seat of the company due to tax profitability. More than 60% of respondents in the Czech and Slovak Republics consider insolvency processes to be the business-termination related events, less than 10% of respondents would be passively waiting for the reaction of creditor in the event of insolvency. In both countries, there was a tendency to address the problem of their insolvency actively, highlighting the need for a wide range of knowledge in the field of the financial management of companies and the related financial security of companies. Here we can see a significant disproportion in the transfer of these findings to educational structures and policies. Despite the availability of the wide range of research studies dealing with financial literacy and its importance for the economy of the country, we can see the research flows only in the direction of initiating and realizing of the research and disseminating of their outcomes to the target subjects. An active feedback, a reflection on identified needs in the education, a transfer of knowledge into national strategic plans, regional concepts and programs are implemented in a minimal range. This leads to the deepening of disproportions and discrepancies among the research sphere, entrepreneurial practice and the sphere of policies.

Conclusion

The aim of this article was to search the dependence between the entrepreneur’s ability to manage the corporate credit risk effectively and their knowledge of the corporate capital. The process and result trajectory of the research was focused on highlighting the financial security as well as the sustainability of the SME sector which are causally related. The importance of the research on the financial security and sustainability of the SME sector is increasing in the current post-crisis period.

The results of our research brought an interesting finding. Despite the fact, that entrepreneurs declared a relatively high ability of the effective credit risk management in their companies, they demonstrated a relatively low level of knowledge in managing the corporate capital.

Entrepreneurs in the SME segment have limited knowledge in the process of the credit risk management, which creates a potential growth of the corporate financial risk.

A significant impact on the formation of effective attitudes of the entrepreneur to manage the credit risk have
indicators K1 and K2. In our research, we found that indicators K3 and K4 do not have statistically significant effect on the formation of effective attitudes of entrepreneurs to the credit risk management.

Our results confirmed that larger companies (compared to microenterprises), men (compared to women) and entrepreneurs with higher education (compared to lower-level education) have better level of knowledge of the corporate capital management.

Our research, similarly to comparable researches, has some limitations (e.g. sample size, definition of indicators), but it is beneficial as it creates a platform for further and deeper future research of processes of the financial security and sustainability of the companies in the SME sector.

The findings of our research have open a space for a deeper insight into the dimensions of the financial security of companies in the SME sector that absent in the scientific studies, particularly for its methodological difficulty and data limitation. Financial security of companies, in the context of the findings, is planned to be further analyzed considering several financial processes in companies and to model the financial scenarios on a quantitative and qualitative basis for a deeper study of the financial security of the companies and their sustainability.

Our ambition is also an active dissemination of these outputs to monitoring and evaluating reports, development concepts, national policies, and thus to encourage relevant institutions to find the possibilities of more effective support of SME entrepreneurs at different stages of their life cycle as well as to various unpredictable and predictable changes in national and international environments. This will greatly enhance the relevance of research studies for science and practice and open a space for further research of this issue.

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References


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MECHANISTIC, OR BIOTIC ORGANIZATIONS: RESEARCH OF ORGANIZATIONAL PRINCIPLES TOWARDS SUSTAINABILITY OF SOCIAL SYSTEMS

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Abstract. This article deals with the question of how we perceive organizations – as machines for making money, or as living systems with specific needs and objectives. In accordance with these views, a model of a biotic organization has been created with the research aim to measure the level of representation of biotic organizations in the business environment. The model of a biotic organization consists of four principles: amorphous structure, leadership, shared vision and service to its own environment. In practice, the existence of the individual elements of the biotic organization were evaluated by quantitative and qualitative research. Answers were sought and found to the four partial questions put forward, namely: What is the purpose of the existence of the organization? What type of structure is applied in organizations? Is there a shared vision within organizations? Which of these principles, management or leadership, is applied more in practice? The results of the research show that only five percent of organizations in the business environment are biotic organizations. This confirms the research hypothesis that this organizational form is not prevalent in the current economic environment. The low level application of biotic principles reveals that most companies are still organized on the basis of the principles of mechanistic organizations. This is reflected in formal hierarchies, a pyramidal structure and traditional management that create an environment of command and control.

Keywords: adhocracy, leadership, living system, mechanistic system, service to society, shared vision


JEL Classifications: M20, O30

1. Introduction

The current perception and conception of organizations as the social products of an industrial society (Čirjevskis 2015; Kaźmierczyk, Aptacy 2016; Tvaronavičienė 2016) has evolved from two simultaneously applied theories. These theories are the theory of mechanistic systems (an organization is a closed system) and the theory of living systems (an organization is an open system). These two basic approaches have led to the creation of completely different organizational models. The first of these models is known as the “mechanistic organization”. This model defines an organization as a machine for making money. The second model is known as the “biotic organization”. This model defines an organization as a living organism whereby specific tasks arise from the needs of the external environment. Both the aforementioned models are unique not only for their attitude to the nature of the organization. The properties of these models also indicates that each of them applies a different form of management. While the model of the mechanistic organization applies elements of traditional management (i.e. to be controlled), the model of the biotic organization applies elements of self-management (i.e. to lead myself) and emergency management.
This non-traditional theoretical definition which stems from the efforts of new science built on the assumptions of vitalism and organicism opens up completely new possibilities for research in the field of management. The intention is therefore to explore the extent of the principles of biotic organizations in practice and to determine the representation of biotic organizations in the organizational population.

2. Theoretical background

The model of the mechanistic organization was described in the scientific paper “The Principles of Mechanical Organizations” (Slinták 2013). This concept consists of four elements of classical management, namely the division of labour, bureaucracy, command and control, and profit. A mechanical organization may be defined as a machine for making money. The elements of a mechanical organization were described in the theoretical works of the founders of classical management. The division of labour was already described in 1776 in the book “The wealth of nations” by Adam Smith (Hammer and Champy 1993). Bureaucracy was defined in 1922 by Max Weber. Weber understood bureaucracy as an ideal organizational form of a mechanical organization (Weber 1947). The principle of command and control was described in Taylor’s scientific management (Taylor 2011) and Fayol’s theory of management (Fayol 1916). These theories were based on the assumptions that organizations are closed systems (in this context we speak about closed system strategy) with deterministic behaviour. The aim of these authors was to search for certainty in their behaviour. Clarity and certainty therefore became the prerequisites for the creation of the ideal conditions for internal arrangements.

Historical analysis reveals that from the 1950s onwards authors started to deviate from efforts to define organizations as mechanical systems and began to examine them in the context of living systems (Gouldner 1959, Bragdon 2009, Burns and Staulker 2000, Luhmann 1986). The attention of authors focused especially on the relationship between organizations and their surroundings. This process started in 1956 with Boulding’s theory which defined organizations as open systems for the first time. The new approach called open system strategy created space for the expectation of uncertainty. The authors often summarized their findings through so called organizational forms. These new forms expressed important changes in the conception and perception of organizations and ultimately led to the creation of new organizational models.

In contrast, other authors have failed to describe or explain the concept of a biotic organization. The impetus for the creation of this model was how people perceive companies – as a community of people, or as a machine for making money (Dee Geus, 1997). The theoretical sources that preceded this concept are summarized in the following table (Table 1).

<table>
<thead>
<tr>
<th>Authors</th>
<th>Fundamental ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boulding (1956)</td>
<td>Organizations are open systems, characterized by a high level of complexity, reactivity and looseness of coupling among system components.</td>
</tr>
<tr>
<td>Gouldner (1959)</td>
<td>Organizations can apply two underlying models – a rational and natural system. The rational system defines organizations as instruments which can be consciously shaped and molded to accomplish a given end. A natural system defines organizations as an organic system, as collectivities that evolve via spontaneous, indeterminate processes.</td>
</tr>
<tr>
<td>Burns and Stalker (1961, 2000)</td>
<td>There are two important organizational approaches – mechanical and organic. Organizations located in a dynamic environment must be organic systems.</td>
</tr>
<tr>
<td>Thompson and Hawks (1962)</td>
<td>An ad hoc organization usually emerges to overcome the effects of large-scale disasters in communities. This organization may be labelled as being a synthetic organization.</td>
</tr>
<tr>
<td>Lawrence, Lorsch and Garrison (1967)</td>
<td>Companies in more complex environments are more likely to be highly differentiated in structure and devote more resources to coordination. Companies in less complex environments are less differentiated and more easily integrated.</td>
</tr>
<tr>
<td>Thompson (1967, 2001)</td>
<td>Thompson suggested a “levels” model in which he proposes that: (1) all organizations are, by their nature, open to the environment; (2) all organizations must adopt to their environments by crafting appropriate structures; (3) organizations are differentiated systems.</td>
</tr>
</tbody>
</table>
The authors proposed that the typology of an organization is based on genotypic and second factors. According to genotypic factors there are four types of organizations: (1) Productive organizations; (2) Maintenance organizations; (3) Adaptive organizations; (4) Managerial-political organizations.

Mintzberg (1979) proposed that how an organization actually functions? The results of Mintzberg’s synthesis were five basic configurations: Simple Structure; Machine Bureaucracy; Professional Bureaucracy; Divisionalized Form; and Adhocracy.

The return to the thesis of the organization as a living system was caused by the significant economic and social changes that occurred in the 1990s. At that time, it was already apparent that company size cannot be an independent variable function of performance. This is because at times when demand exceeds supply, enterprises cannot have the character of predictable machines in an environment that is close to biological complexity. In their work, many authors began to explore terms reflecting the area of biology, such as the immune system (Hammer, 2002); homeostasis (Senge, 1990); dynamic complexity (Forrester, 1987); cyclical systems and the circular economy (Senge, 1990, 2007); system archetypes (Senge 1990), the DNA of a company (Bateson, 1972; Hock, 2000); the soul of an enterprise (Handy, 1997); network structure (Kelly, 2007); synergy and holism (Covey, 2010, 2013); Harung 2004; Senge, 2007, 2009); and collective intelligence (Hamel & Breen 2008; Hamel 2013). This change in terminology implies a gradual passing from the philosophy of natural sciences to the philosophy of biological sciences (Sandow & Allen, 2005). New organizational models began to appear on the back of these changes. These models understood organizations as being living systems rather than mechanistic systems. An example is the view of John Kotter (2000) summarized in Table 2.

Table 2. Two types of organizations

<table>
<thead>
<tr>
<th>Structure</th>
<th>Traditional organization of the 20th century</th>
<th>Modern organization of the 21st century</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Bureaucracy</td>
<td>- Pyramid structure</td>
<td>- Non-bureaucratic structure</td>
</tr>
<tr>
<td>- The task of management is to control.</td>
<td>- The rules and procedures create a complex network of artificial dependencies</td>
<td>- The rules and procedures are created in minimal cases.</td>
</tr>
<tr>
<td>Systems</td>
<td>- Information system is insufficient for performance measurement.</td>
<td>- Information system is a complex system for performance measurement.</td>
</tr>
<tr>
<td>- Unwillingness to share information on financial results.</td>
<td>- Qualifications determine work assignment.</td>
<td>- Transparency – sharing information on financial results.</td>
</tr>
<tr>
<td>- Open culture</td>
<td>- Centralization</td>
<td>- Talent, skills and abilities determine work assignment.</td>
</tr>
<tr>
<td>- Rigid decision-making process</td>
<td>- Clientelism</td>
<td></td>
</tr>
<tr>
<td>- Avoiding risk</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Kotter (2000)

In addition to Kotter, there are other authors who summarize their findings into new organizational forms or models. Table 3 recapitulates the models that influenced the creation of the concept of biotic organizations.
Table 3. Organizational models

<table>
<thead>
<tr>
<th>Authors</th>
<th>Organizational model (and/or significant idea)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handy (1989)</td>
<td>The organizations of the future are the “three Is” – Information, Intelligence and Ideas. In those organizations, the demands related to people's management are big – “The wise organization is already conscious that its shrewd personnel cannot be easily defined as employees or managers, but as individuals, specialists, liberal professionals, executives or leaders, and those people and the organization itself also need to have an obsession for the search of the learner if they want to follow the rhythm of change.”.</td>
</tr>
<tr>
<td>Senge (1990)</td>
<td>The learning organization is formed by five disciplines: personal mastery; system thinking; mental models; team learning; and shared vision.</td>
</tr>
<tr>
<td>Kotter and Heskett (1992)</td>
<td>Corporate culture can have a significant impact on long-term economic performance. Value based organizations have a strong culture which emphasizes all three interests (customers, shareholders, employees). A strong culture also means a high level of conformity values and business methods.</td>
</tr>
<tr>
<td>Collins and Porras (1994)</td>
<td>Visionary companies were defined as those organizations which have achieved lasting success for several decades. It was found that the long-term success of these companies related to synergy of stability (core ideology) and change (envisioned future). The authors shattered many myths, particularly about the goal of maximizing profits. Visionary companies are not just organizations, they are institutions in the richest sense of that word, for, as Collins and Porras put it, “they have woven themselves into the very fabric of society.”</td>
</tr>
<tr>
<td>Kelly (1995)</td>
<td>Organizations must be formed by biological means. A natural metaphor for organizational complexity is something like a network. Network organizations reflect the shift from monolithic, vertical, homogenized institutions to extremely decentralized, fragmented, heterogeneous and flat organizations. The new type of organization is characterized by greater uncertainty and ambiguities in relation to who is a part of the organization and who is not.</td>
</tr>
<tr>
<td>Hock (2000, 2005)</td>
<td>The chaordic organization is a new organizational form. The word “chaordic” refers to a system of organization that blends the characteristics of chaos and order. Generally speaking, chaord means any self-organizing, adaptive, nonlinear complex system, whether physical, biological, or social, in which its behaviour exhibits the characteristics of both order and chaos or loosely translated to business terminology, cooperation and competition.</td>
</tr>
<tr>
<td>Drucker (2003)</td>
<td>There are three dimension of enterprise: companies like economic organizations (American model); companies like organizations of human beings (Japanese model); and companies like social organizations (German model).</td>
</tr>
<tr>
<td>Harung (2004)</td>
<td>There are four stages of organizational development which lead to breakthrough improvements in organizational performance: (1) Task based management; (2) Process based management; (3) Value based management; and (4) Development based management.</td>
</tr>
<tr>
<td>Covey (2010)</td>
<td>Whole person paradigm consists of four dimensions which are the body, heart, mind and spirit. This paradigm is the basis for the better understanding of humans as well as organizations. The organizational model based on principles of the whole person paradigm contain these elements: (1) Vision; (2) Discipline; (3) Passion; and (4) Conscience.</td>
</tr>
<tr>
<td>Prahalad and Ramswamy (2013)</td>
<td>A nodal company coordinates the activities of many suppliers, users, and consumers to make up a network of experience. Basically, this organizational form creates and develops a platform (ecosystem) which leads to the formation of co-creational experience. In such networks the company no longer takes first place, instead the experience of the individual consumer comes first.</td>
</tr>
</tbody>
</table>

3. Research aim, data and methods

This article aims to create a model of a biotic organization and to measure the extent to which the principles of a biotic organization are applied in practice in Czech companies. The result of these efforts will be the characterization of biotic organizations in the economic environment of the Czech Republic, based on verification of the following research question: “Do biotic organizations represent more than 10% of those in the organizational population?” The model of a biotic organization will be based on an analysis of the theoretical bases of other authors. The procedure for creating a model of a biotic organization is described in Section 3.

Quantitative research

The respondents were randomly selected through the Inform database. Data were collected by means of an interactive questionnaire. The questionnaires were distributed in one of two ways, either by email or through a personal visit. The respondents all came from Czech companies and worked at middle or top management level. For the purpose of this survey it wasn’t necessary to determine the minimum company size. Companies which participated in the research were divided into four categories according to European Union (EU) legislation.
Sample statistics

Respondents submitted 56 surveys through the web-based system (response rate = 6.6 %). Data resulting from this quantitative research was processed in the form of descriptive statistics and then categorized into absolute and relative frequencies. Some data tables were converted into graphic form. Some data were analysed using the Pearson test. Hypotheses were tested on a level of significance of α = 0.05. A p-value lower than the confidence level resulted in the rejection of the null hypothesis. The null hypothesis claims there is no association between the variables. The calculations were performed in Excel.

The very low response rate and relatively small statistical sample could have a negative impact on the research results. It is for this reason the authors had to determine the minimal number of respondents (sufficient representative sample). It is possible to calculate this according to the formula known as the sample size calculation that can be found in Cochran (1977):

\[
n = \frac{Z^2 p(1-p)}{d^2}
\]

Where:
- \( t_{\alpha} \) is the coefficient of reliability for the selected reliability \( \alpha \) (for desired confidence level 90 %, z-score is 1.645),
- \( p \) is the estimate of the relative frequency of surveyed criteria in the basic sample (0.5 used for sample size needed),
- \( d \) is the required permissible error.

If we require 90% reliability with a permissible error of 11%, then the minimum number of surveyed respondents is the following:

\[
n = \frac{1.645^2 \times 0.25}{0.11^2} = 55.90960744
\]

According to the calculation above the minimum number of surveyed respondents for a representative sample is 56. Of the total 850 companies contacted, exactly 56 surveys were returned. Although we can only speculate why the response rate was so low, we believe that the response rate could have been influenced by the methods by which the questionnaire was distributed. The majority of the companies surveyed were contacted through email correspondence.

The basic parameters of the quantitative research – the details of the statistical sample including selected characteristics of the surveyed companies – are summarized in Table 4.

**Table 4. Basic parameters of the quantitative research**

<table>
<thead>
<tr>
<th>Frequency of organizations by size:</th>
<th>Freq. (absolute)</th>
<th>Freq. (relative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of respondents</td>
<td>56</td>
<td>6.6 %</td>
</tr>
<tr>
<td>1. Large enterprises</td>
<td>11</td>
<td>20 %</td>
</tr>
<tr>
<td>2. Medium-sized enterprises</td>
<td>24</td>
<td>43 %</td>
</tr>
<tr>
<td>3. Small enterprises</td>
<td>12</td>
<td>21 %</td>
</tr>
<tr>
<td>4. Microenterprises</td>
<td>9</td>
<td>16 %</td>
</tr>
<tr>
<td><strong>Frequency of organizations by output:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Primary sector (raw materials)</td>
<td>4</td>
<td>7 %</td>
</tr>
<tr>
<td>2. Secondary sector (manufacturing)</td>
<td>28</td>
<td>50 %</td>
</tr>
<tr>
<td>3. Tertiary sector (services)</td>
<td>24</td>
<td>43 %</td>
</tr>
</tbody>
</table>
Frequency of age range of organizations:

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10 years</td>
<td>5</td>
<td>9%</td>
</tr>
<tr>
<td>11-20 years</td>
<td>32</td>
<td>57%</td>
</tr>
<tr>
<td>21-30 years</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>31-40 years</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>41 and more</td>
<td>16</td>
<td>29%</td>
</tr>
</tbody>
</table>

The field of research was aimed at answering the following four questions:
1. What is the purpose of the existence of business organizations?
2. What type of structure is applied in business organizations?
3. Is there a shared vision in business organizations?
4. Which of these principles, management or leadership, is applied more in practice?

Our quantitative research was limited by very strong standardization. Most questions were of the closed type. Respondents could choose from two variants (research question 2, 3 and 4) or three variants (question 1). They could choose only one option. Some terms contained in the questionnaire were explained in person or by using the enclosed terminology. For the question regarding the shared vision, responses were corrected by control question so as to reduce the subjective tendencies of the respondents (biased answers). Subjectivity was also eliminated by the fact that the respondents could not know what the correct answer was because they were unaware of the fact that the objective of the research was focused on identifying biotic principles.

Case studies

The very strong standardization of the quantitative research was partially reduced by information obtained through case methodology. Utilizing this methodology meant we could take into account practices in selected companies. A list of the observed companies, their unique practices and the research subject is presented in Table 5.

<table>
<thead>
<tr>
<th>Observed companies</th>
<th>Unique practices</th>
<th>Field of research</th>
</tr>
</thead>
<tbody>
<tr>
<td>W.L. Gore</td>
<td>Lattice structure</td>
<td>Network structure</td>
</tr>
<tr>
<td>Harley Davidson</td>
<td>Circle structure</td>
<td>Network structure</td>
</tr>
<tr>
<td>Semco</td>
<td>Antistructure</td>
<td>Network structure</td>
</tr>
<tr>
<td>Visa</td>
<td>Radical decentralization</td>
<td>Network structure</td>
</tr>
<tr>
<td>Morning Star</td>
<td>Agreement of colleagues</td>
<td>Self-management</td>
</tr>
<tr>
<td>W.L. Gore</td>
<td>Reciprocal obligation</td>
<td>Self-management</td>
</tr>
<tr>
<td>Semco</td>
<td>Participation</td>
<td>Self-management</td>
</tr>
<tr>
<td>ABB</td>
<td>A rule of 50.</td>
<td>Shared vision</td>
</tr>
<tr>
<td>W.L. Gore</td>
<td>Principle of 200</td>
<td>Shared vision</td>
</tr>
<tr>
<td>Semco</td>
<td>Production cells</td>
<td>Shared vision</td>
</tr>
<tr>
<td>Google</td>
<td>Self-managed teams</td>
<td>Shared vision</td>
</tr>
<tr>
<td>FAVI</td>
<td>Know-Why</td>
<td>Culture and principles</td>
</tr>
<tr>
<td>W.L. Gore</td>
<td>Culture of trust</td>
<td>Culture and principles</td>
</tr>
<tr>
<td>SOL</td>
<td>Culture of freedom</td>
<td>Culture and principles</td>
</tr>
<tr>
<td>Semco</td>
<td>Democratic workplace</td>
<td>Culture and principles</td>
</tr>
<tr>
<td>IDEO</td>
<td>Attitude of wisdom</td>
<td>Culture and principles</td>
</tr>
</tbody>
</table>

4. Principles of biotic organization

The models of a biotic organization have been affected by theories (see Table 1) which define such organizations as open, dynamic systems. The differentiation between these systems depends on the complexity of the environment. In this concept, organizations are living systems which were born in conditions of uncertainty, of their own free will and subject to interdependencies. A biotic organization can be defined as a social organism which takes different forms depending on the task that it fulfils in its environment. There are many organiza-
tional models which became the prototypes for biotic organizations (see Table 3). The synthesis of these models led to the creation of images of four organizational dimensions that reflect the organizational needs of a biotic organization: the need to live (adaptability), to love (stability), to learn (dynamics) and to serve (usefulness). The final shape of the model of a biotic organization arose mainly from Senge’s concept of a learning organization (Senge 1990) and Covey’s perception of organizations as holistic systems consisting of four organizational dimensions (Covey 2010).

The model of a biotic organization arises from the technology of postmodern management, which takes into account changing environmental conditions, reflects new assumptions, and recognizes the principles of living systems rather than the principles of mechanistic systems. These principles include an amorphous structure (i.e. adhocracy), leadership, shared vision and service (to its own environment). Each of these principles is based on natural law, because all living systems are of a cyclical and self-regulating character. In natural communities there is often the phenomenon of collective intelligence (by analogy with human systems, it can be understood as a certain form of shared purpose observed, for example, in birds or fish); they are self-organized, which means that they are not controlled by others, but rather self-organized through their own unconscious instincts. Finally, each animal fulfills its specific task according to the environment in which it occurs. These principles are in some sense a response to the specific characteristics of the external environment, illustrated in the Figure 1.

In practice, these principles may take different forms. Shared vision is the result of system thinking, on the basis of which the dynamic complexity of the world of interdependencies can at least be partially understood. It sets out a common path and evokes a feeling of partnership and shared purpose. The common goal defines the limits of individual behaviour. In a sense, it replaces the original philosophy of management based on the fragmentation of the organization, in which people are working on the basis of functional classification in order to achieve only partial goals (not companywide goals). The amorphous structure creates the internal form of an organization, depending on the task which the organization is engaged in. It is thus a specific kind of adhocracy, which is the counterpart of bureaucracy (Mintzberg, 1979). This approach to the internal configuration of the organization is based on the assumption of the instability and unpredictability of the external environment. It creates a high degree of freedom inside the organization. In practice, this form of organization spread particularly in the creative industries. Structuring for a particular purpose, for example, is typical for Hollywood movie studios, as well as for companies that deal with advanced technologies, including Apple and Google. These companies face enormous pressure from competitors and powerful dynamics in the development of new technologies. In this case, it is obvious that the new technology of postmodern management can be directly enforced by the specific circumstances of the environment.
Biotic organizations are harmonized and, above all, have a culture of trust (and freedom), which gives people considerable power and freedom to focus on what they want to do (Carney & Getz, 2013). This type of culture has been identified in the companies W.L. Gore, Semco, SOL, FAVI, IDEO. The amorphous structure, however, can’t exist without institutionalized moral authority. As Carney with Getz discovered when they researched freedom in work, real leaders become guardians of culture in a more free working environment. Companies applying this specific culture include FAVI, IDEO, SEMCO, SeaSmokeCellars, and, previously, Radica Games. The authority of a biotic organization is thus institutionalized by leadership, i.e. a new management function that puts an emphasis on enhancing powers in order to release human potential through specific types of motivation in the form of self-management. However, the core of a biotic organization resides in the ability to reveal a deeper purpose, which grows out of the whole person paradigm. This paradigm can be simply defined in the sense of the attitude reflecting “our world”, not “my world”. Therefore, biotic organizations must seek the purpose of their existence in the external environment. High performance is achieved only if organizations become excited about something more than simply making a profit (Google wants to change the world, Apple wants to create revolutionary products, Walt Disney wants to bring happiness to people, Whole Foods Market wants people to improve their health and well-being etc.). Simply put, biotic organizations have a purpose that provides their workers with a deeper motivation.

The nature of these organizations requires us to look at them as organs of society with clearly identifiable characteristics, these being an amorphous structure, leadership, a shared vision, and service to one’s own environment. On the basis of these attributes, we can explore the extent to which current organizations approach an organizational form based on biotic principles, and how far such biotic organizations are representative of the business environment.

5. Results and discussion

The quantitative research aimed at mapping the occurrence of biotic principles sought to answer the following: 1. What is the purpose of the existence of business organizations? 2. What type of structure is applied in business organizations? 3. Is there a shared vision in business organizations? 4. Which of these principles, management or leadership, is applied more in practice.

As we can see in the following table (Table 6), the logic of research was closely related to the categorization, which emerged from the model of the biotic organisation.

<table>
<thead>
<tr>
<th>Characteristics of the external environment</th>
<th>Principles of biotic organization</th>
<th>Research questions</th>
<th>Categorization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wisdom</td>
<td>Service to society</td>
<td>What is the purpose of existence?</td>
<td>Service to society/making money</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>Adhocracy</td>
<td>What type of structure is preferred in practice?</td>
<td>Adhocracy/hierarchy</td>
</tr>
<tr>
<td>Interdependencies</td>
<td>Shared vision</td>
<td>Is there shared vision in organization?</td>
<td>Shared vision/individual goals</td>
</tr>
<tr>
<td>Free will</td>
<td>Leadership</td>
<td>Which of these principles is applied more in practice?</td>
<td>Leadership/management</td>
</tr>
</tbody>
</table>

5.1 What is the purpose of existence of business organizations?

Classical economic theory defines the company as a machine for making money. According to this theory, each enterprise should follow a simple rule: to use resources (including human) in order to maximize earnings. In view of this goal, the enterprise is the creator of resources, the purpose of which is to transform inputs into outputs. Of course, outputs must exceed inputs. In financial terms, this means that a positive economic result is achieved, one which usually reflects accounting profit rather than economic profit.
An alternative theory, which is based on the profit motivation, involves the idea of the market value of the company. However, because the market value of a company grows when the company makes a profit and falls when the company makes a loss, it can be argued that the goal of increasing market value springs from the same base as the profit motive. These are, therefore, two theories describing the same idea. In both cases, performance is measured by short-term, and usually only financial, indicators. In the background of these concepts is the assumption that every enterprise is a machine that consists solely of the economic dimension.

Research conclusions by Collins and Porras (1994) summarized in the book entitled Built to Last, as well as the famous study of the longevity of organizations conducted by Royal Dutch / Shell in 1983 (Handy, 1997; Senge, 1990), however, show that the ability to exist for a long time in a business environment deviates from the mere satisfaction of economic needs. The function of each organization, as an organ of society, must be to satisfy the specific needs of the external environment. The purpose of the existence of a biotic organization is to serve society (its own environment). This definition of the corporate sense corresponds with research findings according to which the vitality of organizations is very closely related to the ability of organizations to satisfy the needs which emerge from the external environment. In contrast to traditional economic theory, the criteria of success in the case of biotic organizations lie only in the external environment. The purpose of biotic organizations, therefore, will always be limited by the external environment. The conditions, characteristics and requirements of this environment can redefine the business tasks and change the default mission of these organizations. The primary function of these organizations is, therefore, to reveal this task, which requires not only external orientation toward the customer, but also internal orientation in the form of the creation of a work environment that reflects the needs and interests of other stakeholders, which are associates and owners. This demonstrates the interdependence of biotic principles, when a deeper sense cannot be created without leadership, an open structure, and shared vision.

The three goals are clearly rooted in the practice of contemporary organizations. They show their attitude to their customers, employees, shareholders, and society as a whole. Surprisingly, the survey revealed considerable orientation towards the external environment (41%) and a lower than expected proportion of companies oriented towards the profit motive (29%). The following table presents the results of the research (Table 7).

<table>
<thead>
<tr>
<th>What is the purpose of existence of your organization?</th>
<th>Relative in (%)</th>
<th>p-value (1-α = 0.95)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earning</td>
<td>28.57</td>
<td>0.963689357</td>
</tr>
<tr>
<td>Market value</td>
<td>30.36</td>
<td>0.751807493</td>
</tr>
<tr>
<td>Service to society</td>
<td>41.07</td>
<td>0.921056892</td>
</tr>
</tbody>
</table>

Source: Authors research.

Organizations whose purpose of existence is defined as service to society are still in the minority (41% of the total). Among other things, this means that the majority of organizations (more than 50%) are too focused on the internal environment and ignore the external one. On the basis of research findings, we can conclude that most companies are, in terms of their actual purpose, still defined as instruments for making money (59% of the total).
It was also found out whether there is a positive relationship between company size and the purpose of existence (H10: There is not a significant positive relationship between company size and the purpose of existence of business organizations). The results of this research have shown that there were not statistically significant differences between company size and individual purposes of existence, which was confirmed by the values of the test criteria (see Fig. 2).

5.2 What type of structure is applied in business organizations?

Three basic types of structures have been developed in the economic environment over the last three hundred years. These structures are the haphazard structure, the hierarchical structure, and the amorphous (i.e. network) structure. Each of these structures arose in a specific environment. The haphazard structure was the result of the agrarian society that predominated from the 17th to the 19th centuries. It began to transform into industrial society from the 19th century. At that time, people created the first modern business organizations organized on the basis of a hierarchical structure. At present, however, an entirely new kind of structure is emerging, one that symbolizes the age of information. These structures are amorphous, or network structures. In W. L. Gore, this new type of organization is referred to as a lattice structure (Hamel & Breen 2008; Hamel 2013; Harung 2004). In Semco, people were organized according to circular structure (in the nineties) and later, this company stopped to use organizational structure and hit the road to uncertainty (Semler 2011). In this context, we can speak about antistructure (see Hammer 2002). In Harley-Davidson, circular structures were also established (Senge 1990). No matter what this new type of structure is called, they share one particular feature; that is, they are not built on the principles of formal hierarchy, but rather on a network of relations, which is defined by reciprocal obligations towards colleagues and co-workers.

Research work therefore focused on two basic organizational approaches, namely pyramid schemes and network configuration settings, in order to determine to what extent network structures are applied in practice in current enterprises. Simultaneously, the authors attempted to find out whether there is a significant positive relationship between company size and the type of structure (H21). The Results are given in the table below (Table 8).

<table>
<thead>
<tr>
<th>Table 8. Typology of structures in practice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What kind of structure is applied in your organization?</strong></td>
</tr>
<tr>
<td>Amorphous structure</td>
</tr>
<tr>
<td>Hierarchical structure</td>
</tr>
</tbody>
</table>

*Source: Authors research.*
The research indicated that only one in seven organizations is organized by means of a network without a stiff formal hierarchy, despite a radically changing ecosystem, which causes the increasing institutional collapse of bureaucratic organizations built on formal hierarchies. Our research findings from previous table also show that there is not a significant positive relationship between company size and the type of structure (see Fig. 3).

![Fig. 3. The type of structure within the context of company size.](image)

In the current environment, it appears that bureaucracy is not able to respond quickly enough to the frequent changes in the environment. The proof of this assertion can be seen in the recent past. It was the collapse of the Soviet Union and other centrally controlled economies, as well as the bankruptcy of the automobile giant General Motors (GM), that provided a great deal of knowledge about the limits of hierarchical structures. Both of these examples are of identical origin. They were social systems built on the technology of traditional management, which does not take into account the conditions of discontinuity, uncertainty, and variability.

Nowadays, many organizations strive to take advantage of the effects of synergy. However, these effects are related to the way individual elements within the system are organized. Experience in the building of sports teams suggests that the effects of synergy are achieved by the so-called concept of aligning (see Senge and Carstedt (2001), Covey 2010, 2013). The essence of aligning is ensuring that team members strive to achieve the same goal. Having a common goal affects behaviour in such a way that the energy of individuals is multiplied rather than fragmented. Aligning also demonstrates that a network structure cannot work effectively without the existence of a shared vision, which is an integral part of it.

In practice, the outlines of a network structure can be seen in Visa Interactive, W. L. Gore, Semco, and Morning Star, and also partly in Google and Apple. These companies have created a new trend: management without a formal hierarchy. Obviously, this does not mean that there isn’t some form of hierarchy, but the hierarchy has, rather, a more natural than formal character, because people working in these companies become leaders due to their competence and knowledge, and not on the basis of contacts and mutual sympathy. In most cases, leaders are elected by members of teams or working groups, as well as recalled by them. The teams can also determine who will work in them. In these organizations, there are no superiors or subordinates, only associates and colleagues. People acquire the freedom (to do what they want), which is balanced by reciprocal obligation in W. L. Gore or the agreement of colleagues in Morning Star (Hamel 2011).

Based on the research of organizational practices, the abovementioned companies have acquired two basic characteristics of amorphous structures: firstly, structures without a formal hierarchy require a common focus (i.e. the creation of a shared vision as a common goal); secondly, they require the identification of operating principles that reinforce core purpose and values, namely freedom, openness, transparency, and responsibility. These conditions, which are related to the principle of shared vision and leadership, were examined in the areas of alignment and cohesion.
5.3 Is there shared vision in business organizations?

According to our research, most organizations (71% of respondents) have a vision about the future direction of their business. However, this vision does not always lead to an aligned system. The level of inner harmony affects the organization’s ability to share its purpose and to evoke a feeling of partnership and solidarity. Alignment of the enterprise requires, apart from a deeper sense and amorphous structures, also the ability to share its vision. If we look at mechanistic organizations, we find that these organizations cannot really communicate. They can only transmit information from top to bottom. They create visions, but the visions are not compatible with the personal visions of individuals. These organizations do not achieve internal harmony, as individuals tend to move in different directions (Kiefer and Stroh 1983).

The research was therefore aimed at mapping not only an organization’s ability to create a vision, but also their ability to share that vision, the ability to communicate and to seek a common path or to define a common direction. The results of our research are presented in following table. It was found that more than 60% of organizations which create a vision (71% of organizations from the sample) are not able to communicate their vision. In most cases, the vision takes the form of either a financial target or a list of positive values or corporate policies. It is a tool of top management rather than an organizing principle that would support the creation of an environment of creativity and collaboration.

Table 9. Shared vision in practice.

<table>
<thead>
<tr>
<th>Is your vision shared throughout the organization?</th>
<th>Relative in (%)</th>
<th>p-value (1-α = 0.95)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>39.29</td>
<td>0.483477669</td>
</tr>
<tr>
<td>No</td>
<td>60.71</td>
<td>0.661992811</td>
</tr>
</tbody>
</table>

Source: Authors research.

In our research, we also tested whether there is a positive relationship between company size and shared vision (H3: There is not a significant positive relationship between company size and shared vision; H3,: There is a significant positive relationship between company size and shared vision). According to the values of the test criteria, we can state that there are not statistically significant differences between company size and the ability to communicate (share) vision (see Fig. 4).

Fig. 4. Shared vision within the context of company size.

The research data supported one of the basic assumptions, according to which the application of the principles of mechanics (we may understand them as traditional management practices) limit the true potential of organizations. Great results cannot be achieved without the alignment of individual parts with the whole. This special
conformity can be called metaphorically the conformity of souls, which releases the so-called “E factors” (energy, enthusiasm, effort, excitement, excellence) (Handy 1997). The E factors are released by those organizations that combine their own values and goals with the values and goals of individuals. These are companies that are able to apply the principle of biotic organization known as shared vision. It is coincidentally the same principle that has been detected in enterprises encouraging freedom at work (Carney & Getz 2013). In practice, the atmosphere of mutual sharing and understanding is present in smaller organizational units (see Figure 5), where the “rule of ten” is preserved. This rule is related to the principle of confidence, which is obviously limited by the number of people which an individual can trust, based on personal experience. Simply put, I can’t trust someone I do not know. Previous research focused on the performance of people in working groups has revealed that the best results are achieved in relatively small working groups, so-called specific attractors (i.e. 8-12 people) (Kelly 2007), in which people know each other and therefore can build relationships based on mutual confidence without the use of compensators in the form of impersonal control mechanisms, which involve additional social and financial costs.

Fig. 5. Conformity of values and objectives in practice.

If we build on the practical knowledge of some companies, we can identify, for example, a “rule of 50” applied in the Asea Brown Boveri company, which employs 250 000 people, divided into more than 5000 units. These departments are further divided into basic units comprising an average of forty-five people. W. L. Gore is organized on the principle of 200, according to which each production unit should comprise no more than 200 people. (It must be noted that each unit is formed by many small creative teams constructed on the basis of personal responsibility, which means that each co-worker can determine what to do, where to do it, and with whom. For this purpose, a specific structure known as the lattice structure was created) (Hamel & Breen 2008). Simultaneously, individual organizational units are organized into industry-related clusters, so that the company as a whole does not lose synergies resulting from intensive, interdisciplinary, and cross-functional communication. The organizing principle limiting the size of organizational units was also reported in the Brazilian company Semco, which decided in the late nineties to organize production at its factories according to production cells including a maximum of 24 workers and 1 coordinator (Semler, 2011). Google, which attracts considerable attention with respect to its rapid development and economic success, excels in the formation of ultra-thin structures consisting of self-managed teams of just 3-4 members (Hamel 2013).

These practices indicate the efforts of these organizations to avoid the hidden costs of traditional management based on the principles of mechanics (the cost of mistrust resulting from the implementation and maintenance of control mechanisms) and at the same time so unwittingly they took into account principles of the biotic organization that encourage openness, transparency, collaboration, and especially confidence. The shared purpose observed in organizations with ten or fewer employees demonstrates the importance of a personal approach to
people and takes into account the importance of the freedom that people need in order to be able to identify with the company itself and especially to be able to develop and grow.

It turns out that in the light of practical experience, organizational size affects the alignment of the whole system. Large organizations have considerable difficulties in reconciling individual parts and, thus, behave as a single unit. The absence of shared purpose in larger organizations results in insufficiently developed system thinking on the part of managers and the inability to create a process of shared vision. There may also be an unwillingness to lead arising from an excess of traditional management. This assumption will be verified in the next chapter.

5.4 Which of these principles, management or leadership, is applied more in practice?

The theory of management has developed two basic principles to ensure the internal consistency of organizations. These principles were identified by Peter Drucker (1998) when considering the nature of organizations. According to Drucker, the organization of type commands and controls is similar to an organism that holds together in its shell. A new form of organization which is appearing today is based on a supporting framework of information. Information is the new integration system of enterprises (it is a necessary precondition for internal cohesion, because responsibility and, thus, self-management cannot exist without shared information) and expression (the ability to acquire information determines the future of the company, because information can be seen as a tool for wealth creation). Traditional management therefore assumes that people must be controlled. The emerging postmodern form of management, by contrast, argues that people must be led. In the economy, information is a new source of wealth; it also means power. Each of these principles, however, shares information within organizations in quite different ways. While traditional management shares only some information, successful leadership is based on the creation of a transparent, open environment in which information becomes the essence of independent and responsible behaviour. Simply put, if companies do not share information, they cannot expect people to manage themselves.

The functioning of complex living systems is characterized by the fact that perception and action always take place on the local scale. The existence of centralized control is therefore possible only due to a complex network of local controls. This regularity corresponds to the principle of subsidiarity, according to which decision-making and responsibility within the system should be transmitted to the lowest possible level. In an unstable environment of many variables, the principle of leadership (i.e. to create a vision, to share and communicate the vision, to inspire) appears as an important principle for the strengthening of subsidiarity. The principle of leadership is becoming an alternative to the principle of traditional management, which accumulates too much power in one function (or site), which, in turn, may cause hierarchical breakdown in conditions of uncertainty.

Management (i.e. planning, organization, command and control) is appropriate only when it is applied to non-living parts of the organization (property and financial capital). Leadership is the key to creating the structure of the engagement which offers the required degree of freedom (and responsibility) in workplaces characterized by synergies in things and relations. The importance of leadership, which increases with increasing complexity and interdependence, is underlined by John Kotter (2000) who sees leadership as a fundamental principle affecting the ability of organizations to adapt to a world of constant change. This research therefore focused on the occurrence of these principles in practice in order to determine whether and to what extent leadership, as one of the principles of the biotic organization, is rooted in the practice of contemporary enterprises (namely in the context of fundamental changes which the external environment has undergone in the last forty years).

The results in Table 10 indicate that leadership is still insufficiently exploited due to the character of the environment in which enterprises exist today. (The characteristic features of the current environment are uncertainty, nonlinearity, and free will.)
Table 10. The occurrence of management and leadership in practice

<table>
<thead>
<tr>
<th>Which of these principles is applied more in your organization?</th>
<th>Relative in (%)</th>
<th>p-value (1-α = 0.95)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management (control and planning)</td>
<td>71.42</td>
<td>0.765505984</td>
</tr>
<tr>
<td>Leadership (sharing vision and inspiration)</td>
<td>28.57</td>
<td>0.412114051</td>
</tr>
</tbody>
</table>

Source: Authors research.

Management, as one of the most important principles of mechanical organizations, is an integral part of the management systems of more than two thirds of the organizations included in this study. The ability to create a shared vision and transform working conditions to encourage inner motivation was observed in less than a third of organizations. It was also discovered that there is not a significant positive relationship between company size and principles of management and leadership, which means that hypothesis H4 (there is statistically significant differences between company size and principles of management and leadership) is rejected (see Figure 6).

The environment of engagement and freedom occurs especially in small organizational units (no more than ten employees). The backbones of most large organizations are constituted by an authoritarian form of management based on predictability and controllability, which are the basic assumptions of traditional management.

5.5 Population of biotic organizations

On the basis of our own earlier research, it was found that the predominant organizational form is a hybrid organization combining mechanistic and biotic elements. The predominance of mechanistic principles in the operational infrastructure of business organizations supports the research assumption that the principles of biotic organization in the practices of current companies are underdeveloped.

The research thus focused on exploring the four areas of the organization which deliberately follow the four dimensions of whole person paradigm as a prototype for creating of biotic organization in order to verify the initial assumption about the occurrence of biotic organizations in the business environment. The previous chapters introduced the results of quantitative and qualitative research, according to which the level of structuring in organizational entities and their abilities to empower, share purposes, evoke a sense of partnership, and define their own purpose of existence were evaluated.

The results of the survey, which were processed by using the Venn diagram, are shown in the following figure (Figure 7).
Fig. 7. Occurrence of biotic organizations in the business environment.

Data from this research provided answers to research questions regarding the representation of the principles of biotic organization in practice. Network-organized institutions, whose coherence entails the principle of leadership as a tool for sharing visions and empowering individuals and the principle of a widely shared vision as a discipline creating an environment of shared purpose and partnerships with a purpose that goes beyond just making money, represent only a minority of organizations in the economic environment (approximately 5% of the total organizational population).

Analysis of the data also showed that the principles of biotic organization are not dependent on organizational size. In this context, it was tested whether there is a positive relationship between company size and the occurrence of biotic organization (H5): There is not a significant positive relationship between company size and the occurrence of biotic organization). The results of this research have shown that there were not statistically significant differences between company size and the occurrence of biotic organization, because value of the test criteria was upper than the level of significant of $\alpha = 0.05$ ($p = 0.671049034$).

**Conclusion**

The aim of the article was to construct a model of biotic organization and to map the occurrence of biotic organizations in the economic environment. The research conclusion emerged from an effort to answer the question of whether biotic organizations are represented in practice in more than 10 percent of cases. Based on the analysis of theoretical assumptions, we identified the principles of biotic organization. These principles, which are amorphous structure, leadership, shared vision, and service, created the final form of the four-dimensional organizational model. The occurrence of these principles in practice was verified by survey. The processed data revealed a relatively low frequency of these principles in the practice of contemporary organizations.

The hypothesis that, in practice, biotic organizations represent less than ten percent of cases was confirmed. According to the created model, approximately 5% of organizations may be considered as biotic organizations. Organizations have particular problems with the creation of a network (amorphous) structure and the more frequent application of soft management practices that create space for self-management.

Future research work should therefore be focused on an analysis of the main management techniques taught mainly at economic universities, with an emphasis on promoting support courses relating to change management, the creation of a shared vision, inspiration, and the creation of an internal environment that will build on the principles of...
freedom and confidence. Of special note is the prevalence of traditional methods of organization and structural forms in current organizations, where, as it turns out, there is almost no alternative to the current pyramidal structure. This is probably a result of the fact that very few companies build management systems without formal hierarchies, ones which are based more on leadership than on management and control, and thus there are too few positive exceptions in the economic environment that could inspire other companies with respect to specific management practices. In this area, it is the practice of some companies more than pure theory that offers much interesting material, whether it is the lattice structure in W. L. Gore, the anti-structure in Semco, the inverted pyramid in the Indian software company HCLT, or the specific structure formed on the basis of agreements between colleagues in Morning Star.

These companies should be subjected to deeper research in order to discover the common characteristics of these new organizational forms and to create a real alternative to the dominant management system built on the principles of mechanics, which prevails not only in the theoretical background, but also in the practice of today’s companies.

References


THE IMPACT OF CHOSEN ECONOMIC INDICATORS ON TOURISM SUSTAINABILITY:
CASE STUDY OF THE CZECH REPUBLIC AND NORWAY

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Abstract. In recent years, tourism businesses have had to face rapid changes brought about by modernisation, internationalisation, social changes, and the higher demands of tourists. These features have an impact on the current level of tourism services and determine the overall economic environment on the supply and demand side. To keep up with global and national competition and these new emerging processes, it is important for managers to discover and monitor how key global figures can have an impact on the future development of tourism units in the hopes to achieve further sustainability growth. Managers should adapt to the changing environment by using new methods and strategies that make tourism units sustainable for future generations. One of the main indicators measuring economic sustainability is gross domestic product, as it captures the market value of the measured services or goods in general. For this reason, it is worthwhile to determine what the interconnections with regard to gross domestic product and tourism variable are. Through this relationship, it is possible to evaluate the health of a certain economy of tourism that can serve as a viewpoint for the management of tourism businesses in a certain state. This research looks at the relationship between the chosen indicators from the tourism sectors of the Czech Republic and Norway. Its purpose is to identify the relationship between the chosen general economic indicators measuring tourism economic prosperity, such as overall gross domestic product for international travel expenditures within a 7-year period. The main aim of the research is to determine the relationship between the chosen indicators through comparison and trend analysis. The data will be examined in order to determine the relationship between the chosen variables, as well as the strength of the dependence of both variables. Based on these findings, further research may use gross domestic product as one of the crucial indicators for the measurement of economic sustainability with respect to its added value for tourism businesses and management.

Keywords: sustainability, economy, expenditures, gross domestic product, Czech Republic, Norway, tourism


JEL Classifications: F63, Q01, Q56, Z32

1. Introduction

Even from the beginnings of tourism, it is known that merchants travelled for business purposes with the aim of searching for financial security. Trade and business have been interconnected ever since. Business as a primary motive for travel has caused its spread, and nowadays trade is also an activity that promotes tourism in general. This viewpoint is based on the work of Gallega et al. (2011), who note that tourism is directly interconnected with trade. Especially in the business environment and business travels, there is much truth about the interconnection between trade causing tourism and tourism causing trade. The first option, again based on Gallega et al. (2011), resides in trade promoting tourism. It is clear that businessmen cause tourism to develop for various reasons. Firstly, business travellers not only consume goods and national products, but moreover consume services
such as accommodation, needs to exchange currencies, or must travel in order to arrive at planned meetings. Secondly, business travellers may require the same products that they are accustomed to in their home country or vice versa. This is the export vs. import benefit, which is connected with the second option that states that tourism promotes sales. Tourists visiting a country will be consumers of national products, souvenirs, etc. and through the sale of these items, will contribute to the economic growth of the country (Gallega et al., 2011).

In recent times, tourism has played a significant role not only with regard to trade, but mostly in the overall global economy compared to other industries. Its potential causes managers of all of the related economic activities of tourism to do their best to ensure the potential of its functioning. This makes tourism a very important source of revenue for the economy. In the Czech Republic, the direct contribution of Travel and Tourism to GDP represented 2.6% of GDP in 2014 and in Norway 2.9% of total GDP in the same year, and it is forecasted to grow (WTTC, 2015a, 2015b). The primary objective of managers in the various tourism sectors is definitely to make and subsequently maximise profit and to generate business. If this is not fulfilled, any other aims become, at that point, not relevant for these managers. For this reason, tourism businesses should be aware of the need to establish a sustainable measurement system consisting of appropriate economic sustainable indicators in order to achieve this profit maximisation. By taking this step, progress can be seen, monitored, and assessed accordingly. Therefore, they should look for indicators that have an impact on the tourism sector, on their business, and require faster decision-making in the long term. Given the growing trend in the GDP of tourism and also the general GDP of all sectors, it is necessary to deal precisely with the potential of this variable for further decision-making.

2. Literature review

Tourism’s need for economic sustainability measurement

From a theoretical perspective, measuring sustainability allows managers to think more strategically about their businesses because it represents “one way to introduce long-term economic prospects into our assessment of socioeconomic well-being” (Fleurbaey and Blanchet, 2013). The connection of two relatively vague terms such as sustainability and measurement could raise the question whether its interpretation and findings can be taken into real practice throughout the whole tourism industry. The importance of sustainability in tourism and its measurement is highlighted by many authors throughout the literature. Due to the fact that the term sustainability has a vague character and its objectivity has decreased due to its normative character (Moldan, 2003), its measurement is thus necessary for the possibility of its practical application. This is confirmed, for example, by Daly (1996), Bossel (1999), Vojnovic and Knezevic (2013), Rio & Nunes (2012), and Oyola et al. (2012). In addition to these sources, governmental bodies such as the European Union (2013) and World Tourism Organisation (2004) have issued a document describing sustainability indicators and their measurement in all three pillars – namely economic, environmental, and social.

The measurement of sustainability is not an easy task even for tourism providers and managers. To quantify and measure performance in each sustainability pillar, it requires having an indicator system and knowing what each dimension is characterised and influenced by. Sustainability dimensions are described as follows:

– Economic sustainability: measures financial health and the impact of the business on stakeholders and society.
– Social sustainability: social criteria such as employment, education, health and safety, or trainings should be done in such way to benefit the business and its participants.
– Environmental: ensure that environmental issues such as energy efficiency, water, emissions, waste management, and biodiversity are consumed in a way that benefits business and protects the environment at the same time. (Brockett and Rezaee, 2012):

Many tourism units, and specifically hotel businesses, mostly focus on environmental sustainability preservation. Moreover, this “green” period serves as a good soil for its growth because it has become very popular to behave in accordance with “green” rules. Gardetti and Torres (2016) support this by saying that sustainability is nowadays “frequently reduced by associating it with environment”. On the one hand, environmental sustainability can bring economic savings in terms of water, electricity, etc., but on the other hand economic sustain-
ability should be put above social and environmental sustainability in order to make hotels and other tourism sectors such as transport, food and beverage, or tourism agencies viable. For this reason, economic performance is and should be taken as the most important of all three pillars (Gardetti and Torres, 2016).

The obvious reasons for incorporating economic sustainability into the decision-making process for managers in tourism facilities resides in its overall economic impact on the national economies. In practice, this resides in the decreased “use of resources with potentially less adverse social and environmental impacts from their use” (Dwyer, L. and Spurr, L., n.d., p.1).

Gross domestic product (GDP) as a main indicator of economic measurement in tourism sustainability

Generally, the economic sustainability indicators that are relevant for managers and monitor their financial health include “return on assets, return on equity, market value, growth, quality and quantity of earnings, research and development and market share” (Gardetti and Torres, 2016). These indicators measure concrete activity in a certain tourism facility regardless of the negative effects occurring on the economic stage in which these businesses operate. At this point, businesses are a part of the economic cycle and therefore must realise that they do not function from isolation from their economic surroundings, and must concentrate on general economic prosperity above all. Generally speaking, if tourism can lead to growth of gross domestic product, increased employment, or the exchange of currency, all of these indicators can obviously cause a boomerang effect in the form of contraction or a boom for tourism facilities – and their profits. For this reason, concentrating on indicators such as economic value added or return on equity measured within a concrete tourism facility is not enough, and businesses should be advised to concentrate on long-term economic indicators, ups and downs in the economic cycle, and periodically review the economic situation.

Focusing primarily on gross domestic product, it was one of the first measurement indicators assessing the economic health and sustainability of tourism (Daly, 1996; Lawn, 2006); however, some authors believe that it does not reflect all three pillars and therefore it should not be taken as a complex measurement method (Fleurbaey, M. and Blanchet, 2013; Bossel, 1999; Nováček, 2010; Jurigová, 2016).

Opponents to this view include Ki-Moon or Helen Clark, who believe that while looking at sustainability and non-economic factors such as happiness or equity, GDP should not be the one and only indicator but there should be a new set of indicators or new sustainable development index that will complement GDP (United Nations Development Programme, 2012). With this in mind, sustainable development should include not only GDP as a representative of the economic dimension, but it should “integrate financial/economic analysis with environmental and socio-cultural analysis” and these three dimensions should work as an integrated framework for long-term decision-making (Hall, Gössling, Scott, 2015, p. 78).

Influence of GDP on tourism development

In general terms, GDP as a macroeconomic indicator is one of the most used indicators for describing a state’s well-being. One of the first studies that described GDP as an indicator of economic growth was undertaken by Ghali (1976). As he claimed, the development of tourism is a key factor in the strategic planning of further national economic growth.

Balcilar, M., R. van Eyden, and R. Inglesi-Lotz (2014) found that in South Africa, the relationship between tourism and GDP with the usage of the Granger causality methodology is positive. More concretely, tourism receipts were taken as a positive prediction for GDP in the period between 1960 and 2011, except in the years of 1985 and 1990. On the contrary, a different approach and research in South Africa regarding economic growth and tourism using the same Granger analysis is seen in the work of O. Akinboade or L. Braimoh (2009), who see “unidirectional causality” between tourism earnings and GDP. Similarly, J. Ridderstaat, R. Croes, and P. Nijkamp (2014) believe that the relationship is reciprocal, which means that tourist arrivals also suffer in the business cycle during times of recession or downturn and that this further influences tourism results, respectively.
A similar study provided by Li and Chuan (2012) on the relationship between economic growth, tourism receipts, and education based on Granger causality revealed a bidirectional relationship. Based on this, it is suggested that economic growth can be concretely supported in Malaysia by promoting tourism receipts and education. The analysis of Lee and Chang (2008) showed that “unidirectional causality relationships exist from tourism growth to economic development in OECD countries, but bidirectional causality relationships are found between the two variables in non OECD countries”. With this in mind, the authors advise a concentration on the relationship of tourism and economic growth from a long-term perspective.

All of the previously mentioned studies should also bear in mind the differences occurring during the various phases of business cycle during the monitored period. The impacts of phases in the economic cycle such as booms, downturns, or recessions on the demand for tourism were also studied by several authors (Crouch, 1996; Gouveia and Rodrigues, 2005; Song and Li, 2008).

However, the question remains whether tourism influences GDP in such a way that the economy could profit from this relationship, or whether the economic cycle in its different phases influences tourism and its economic outputs. The reciprocity and a clear interconnection in this relationship is confirmed by Rifai, the UNWTO Secretary General who believes that “tourism has been instrumental in supporting the economic recovery of many countries” with sustainability being a core of the whole process (UNWTO, 2015). In the end it is necessary to remind that the positive effects of tourism include tourism revenues, value creation and multiplier effect, its contribution to foreign exchange earnings and other non-economic (environmental, social and cultural) effects. The negative effects of tourism are seen in its uncoordinated development, price increases, crime, etc (Jurigová, Lenčesová, 2015).

3. Methodology

The aim of this research is to compare and discover the changes in international expenditures in the tourism sector and to determine its percentage of overall GDP in two tourism economies – in the Czech Republic and Norway. In other terms, it should reveal whether it is essential for managers and stakeholders to include GDP in their strategic planning and whether it is essential to look over macroeconomic data while managing tourism facilities. The research is conducted in two states, the Czech Republic and Norway. Secondary data for the research were collected from OECD statistics in a 7-year period from 2008 to 2014.

The statistical research of Cárdenas-García, Sánchez-Rivero, and Pulido-Fernández (2015) confirmed that Norway had the highest value of the synthetic index of economic development in 1991 from all 72 ranked countries, which points to a positive relationship between tourism growth and economic development. According to this research, Norway achieved first place followed by Sweden and France, with the Czech Republic ranked in the 39th position. Therefore, Norway was taken as a comparison basis as the data of Norway were compared with the Czech Republic.

Two variables were compared, namely gross domestic product and international travel expenditures. Gross domestic product (GDP) is characterised by the methodology of OECD as “the expenditure on final goods and services minus imports: final consumption expenditures, gross capital formation, and exports less imports: (OECD, 2016a, p.14; OECD, 2016). GDP in market prices is used in this research.

Another variable, international travel expenditures, “covers goods and services for own use or to give away acquired from other economies by residents during visits to these other economies” (OECD, 2016, p.14). In other words, these are the expenditures of international outbound visitors that are spent in other countries. Total travel expenditures could not be taken into consideration because these were not measured throughout the entire 7-year period in Norway, and thus the trends would be difficult to capture.

Secondary statistical data are in both countries stated in their own currency as exchange rate differences were not counted. While counting with GDP (see Figure 3), the USD currency was adapted to the Czech and Norwegian currencies in order to capture these relationships.
These data were chosen because they traditionally highlight the economic situation regarding tourism and overall prosperity in the state and can serve as a starting point for examining the state’s overall prosperity.

4. Results and findings

The economic importance of travel in both countries was conducted by a comparison of international travel expenditures and by looking at the trends for each country. It has confirmed that the importance of tourism in both countries has been growing. Firstly, the trends in international travel expenditures in the Czech Republic and in Norway were compared. The comparison revealed the following results; see Figure 1.

![](image1.png)

**Fig. 1.** Trends in international travel expenditures in Norway and in the Czech Republic

*Source: (own processing based on OECD Stat., 2008-2014 and OECD, 2016a)*

It is evident that the growth of international travel expenditures in Norway is quicker than in the Czech Republic, even though both of the countries exhibit a growing tendency. Although both countries demonstrate a positive trend, there is one point to note during the years of recession. The Czech Republic’s recovery from recession period in question was slower and developed gradually, whereas in Norway the trend was quicker, which corresponds to previously-mentioned comments. Moreover, Norway was ranked as the state with the highest standard of living for its citizens based on the Human Development Index measured by United Nations (United Nations Development Programme, 2014). With this in mind, Norwegian tourists are used to high living standards, they travel more, require a higher standard of tourism services, and their overall approach differs based on their mentality. In addition to the previously mentioned behaviour of Norwegian tourists, the growth and expansion of international expenditures is therefore quicker compared to the Czech Republic.

The previously mentioned recession during the economic crisis of 2008 and 2009 had an impact on changes in international arrivals when compared to other years. The following Figure 2 shows these changes compared to 2008.
The figure shows a gradual increase in international tourism expenditures in both countries; however, the trend behaves slightly differently for the Czech Republic. The recovery from the recession is most visible in 2013 and 2014 in the Czech Republic. Before then, expenditures remained stable and increased only slightly. This is not the case for Norway. The Norwegian recovery had already begun in 2009 and its notable increase is also seen in Figure 2. As proof, in Norway international travel expenditures have increased by 51% from 2008, whereas in the Czech Republic this increase only amounted to 29%. It can be expected that expenditures will grow with the capturing of similar economic conditions. Although for Czech tourists, their behaviour and attitudes are similar to those tourists from the Visegrad Four countries, there is still a room for taking inspiration from other developed tourism destinations.

When focusing on international travel expenditures and its deeper analysis, it can be seen that Norwegian and Czech tourism managers should pay more attention to monitoring economic cycles and the overall situation while examining the causalities. In order to see whether a deeper connection between national economy and international travel expenditures exists, Figure 3 describes the percentage of international travel expenditures from the overall GDP of Norway and the Czech Republic.
In Norway, there is then a rapid increase when comparing 2008 to 2014. This responds to the previously mentioned faster increase in expenditures. Based on this figure, it can be assumed that tourism in this case did not affect GDP because it follows a similar trend. The decrease is caused by industries other than tourism. On the contrary, the Czech Republic’s percentage share of travel expenditures on GDP is stable in critical years, but it grows only slowly. This observation confirms the fact that favourable economic conditions at the end of 2013 and 2014 in the Czech Republic influenced tourist behaviour, encouraging them to spend more money for travelling abroad. This may be adapted for Norwegian tourists accordingly. Nowadays, a huge area has opened up to services involving various activities from earlier times as well as new opportunities for services that arise every day, which also can be applies to the field of tourism in both countries. (Tučková, Tuček, 2013)

Conclusions

This research was aimed at comparing two states with different approaches to tourism, Norway and the Czech Republic, in order to find out the similarities, differences, and connections with regard to overall gross domestic product and international travel expenditures. The research determined the following conclusions. Norway, as the country with the highest standard of living standard, has higher tourism expenditures for international journeys since tourists look for higher-quality services based on their mentality. Therefore, the curve of trend portrayed a sustained, more rapid upward trend than did the curve for the Czech Republic. The 2008 crisis hit both countries, causing decreases in expenditures as tourists were forced to limit their financial means and to prioritize their other basic needs before travel expenditures. Interestingly, the recovery from the crisis did not progress in a similar fashion. International travel expenditures began to increase more fully in 2013 and 2014 for the Czech Republic, while in Norway the recovery was already quicker in 2009. Therefore, this means that tourism managers and authorities should focus not only on classic economic data such as economic value added, return on equity, or other indicators, but that they should follow and predict the overall economic situation in the state and in the world, too. This is confirmed by the Figure 3, which described the percentage of international travel expenditures from overall GDP in each country. If GDP has is experience a tendency for growth, tourist expenditures for international journeys will adapt accordingly. The findings from the above-mentioned analysis are relevant for tourism managers and facilities because they can use the positive similarities between GDP and international travel expenditures for future sustainability measurements. One limit of this research resides in lacking same-source data in both countries for further comparison of additional tourism indicators in both states. Therefore, another limit can be seen in the non-objectivity of the research details, as it deals with only two variables. This leads us directly to the question or whether GDP would have an influence on other tourism indicators and whether these would also succumb to business cycles. Further research can support these findings by using other indicators and other methods such as correlation analysis to discover the causality.

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ASSESSMENT OF INCLUSIVE EDUCATIONAL SPACE IN HIGHER EDUCATION INSTITUTION

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Abstract. This article is devoted to development, adaptation and approbation of the methodology for analysis and assessment of an inclusive educational space in a higher education institution which implements education for students with limited health abilities. The validity of data presented in the research is provided by the representativeness of sample and the use of such methods of data processing and analysis as factor analysis, cluster analysis, and classification tree analysis. The five factor structure of the researched phenomenon presented in the research allows analysing the inclusive educational space at a higher education institution from different points of view. The formation of homogeneous clusters in the space of identified clusters will make it possible developing targeted programs for working with teachers and other participants of the educational process in the higher education institution, which will help to create a high-quality inclusive educational environment in the higher education institution and increase the effectiveness of inclusive education.

Keywords: sustainable development, inclusive education, inclusive educational space, factor analysis, cluster analysis

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JEL Classifications: I23, Q35

1. Introduction

Sustainability and security assessment currently arises as comprehensive and integrated approach. Sustainable development is a fundamental and overarching objective of the European Union countries. It aims to improve the quality of life of citizens through sustainable communities that manage and use resources, by linking economic development and security, protection of the environment and social justice (Miriam, Radoslav 2017; Dobrovolskienė et al. 2017; Rajnoha & Lesnikova, 2016; Baronienė, Žirgutis 2016; Dirzytė et al. 2017; Stjepanović et al. 2017; Boonyachut 2016; Oganisjana et al. 2017; Akhter, 2017).

In a number of publications, the problems of integrating people with disabilities into modern society are presented in terms of social justice (Polat, 2011; Theoharis, 2007; Dudzevičiūtė, 2012; Korsakienė, Breivyttė & Wamboy, 2011; Tsaurkubule, 2016).

The development of inclusive education is an effective mechanism for the development of an inclusive society – a society for all and for everyone. This is the key importance of inclusive education for the sustainable development of society. At the 70th session of the United Nations General Assembly, where new goals for sustain-
able development were adopted, UNESCO reaffirmed the importance of inclusive and qualitative education for all in achieving sustainable development (Gupta & Vegelin, 2016; Arts, 2017; Wals, 2014). Inclusive education in the context of sustainable development has found reflection in the studies of several authors (Dombrovskis, Guseva & Capulis, 2015; Fuller, Bradley & Healey, 2004; Kovalev, Zakharov & Staroverova, 2012; Malhotra, 2002; Wolbring & Burke, 2013; Lozano, Lukman, Lozano, Huisingh & Lambrechts, 2013).

The modern system of treating people with limited health abilities aims to ensure not just social protection, but the full integration of these people into all spheres of society. A necessary part of this process is providing access to qualified, highly paid and prestigious work, which in turn is impossible without obtaining a high-quality professional education. The close connection between the education of a disabled person and the degree of his or her participation in the life of society is recognized in the world practice (Riddell, Tinklin, & Wilson, 2005).

Foreign practice of inclusion in education has rich experience and legislative consolidation (Sturm, 2006; Ainscow & Sandill, 2010; Hitch, Macfarlane, & Nihill, 2015; Adams & Brown, 2006; Miles & Singal, 2010; Kyriazopoulou & Weber, 2009; Pilner & Johnson, 2004.). The Russian experience is only just beginning to evolve and develop. In December 2006, the UN General Assembly adopted the Convention on the Rights of Persons with Disabilities. This Convention was developed with the active participation of disabled people. The Convention came into force on 3 May 2008. Currently, 137 countries have signed the Convention, 45 of which have ratified it. In the Russian Federation, its ratification was carried out in 2012. The Convention recognizes that a person is disabled not only because of his limitations, but also because of the barriers that exist in society. Ratification of the Convention marks the intention of a particular country to create a material environment for the fulfilling life of a disabled person – a full-fledged member of society, to develop a system of inclusive education. In the Russian Federation, the development of inclusive education is lagging behind European states and America, but it is possible to analyze the experience of other countries, identify positive features of inclusion and adapt them to the conditions of the Russian education system.

Inclusive education is a certain innovation for the education system in Russia, therefore, it requires competent management at all stages of its modelling and implementation. The effectiveness of inclusive education presuppuses the creation of a set of conditions, among which there is a creation of an inclusive educational space. The educational space (educational environment) is a system of influences and conditions for the formation of a personality; a set of opportunities for its development, contained in the social and spatial-objective environment (Yasvin, 2001). The category “educational environment” connects the understanding of education as a sphere of social life, and environment as a factor of education (Baeva, 2002).

An inclusive educational environment is a type of educational environment that provides all subjects of the educational process with opportunities for effective self-development. It presupposes the solution of the problem of education for students with LHA (limited health abilities) by adapting the educational space to the needs of each student, including the reform of the educational process, methodological flexibility and variability, a favourable psychological climate, re-planning of the classrooms so that they meet the needs of all children without exception and ensure, as far as possible, full participation of students in the educational process. The security of inclusive space is based on the availability of the necessary normative and legal documents in the university, the methodological base, the specialists of psychological and pedagogical support, and on the interaction of specialists with one another.

On the basis of the understanding and acceptance of the philosophy of inclusive education, the following basic conditions are necessary to effectively address the challenges of building an inclusive educational environment as a system that implements equal access to education and the development of various categories of students. These include the following conditions:

- understanding and acceptance of the philosophy of inclusion;
- special training of teaching staff included in the inclusive process;
- architectural transformation of an educational institution leading to a barrier-free environment;
- availability of appropriate methodological guides, recommendations and developments.
The effectiveness of the inclusive educational space of a higher education institution is ensured not only by the structure and level, but also by its perception and assessment by all participants of the educational process (Cotton, Warren, Maiboroda & Bailey, 2007; Moriña, Lopez & Molina, 2015). For the purpose of self-analysis of the inclusive educational environment created in the higher education institution, which implements inclusive practice, a methodology was developed that allows the educational institution to carry out a self-assessment of the educational space in terms of the effectiveness of implementation of inclusive education and to develop development and improvement plans based on the analysis of the obtained results.

2. Design and the sample of the research

The empirical basis of the research was based on the data obtained in the framework of a sociological research aimed at assessing the inclusive educational space of the Tyumen region. The survey was organized and conducted by the team of the Institute of Pedagogy and Psychology of the Tyumen State University, in cooperation with the educational sociological laboratory at the Department of General and Economic Sociology of the Financial and Economic Institute and OOO “Siberian Innovations” from March 14 to April 19, 2017. The survey involved 2,035 respondents from 10 higher education institutions.

Test instruments used for the research were developed and adapted by the authors of the research. The development of the questionnaire included the selection and grouping of indicators reflecting the respondents’ assessment of themselves and their educational institution regarding the implementation of inclusive education. The structure of the questionnaire and the formulation of indicators were based on a competence approach to education, as the foundation for the changes in the educational system. The implementation of inclusive practice is associated with the allocation and meaningful description of the teacher’s competence as a set of personal and professional qualities that are actualized in the innovative environment of an inclusive environment that enable him or her to successfully solve the tasks associated with organizing the education of all students without exception, taking into account the specificity of their educational needs.

When selecting the indicators, normative legal documents, the results of earlier studies, interviews with students with limited health abilities (LHA), expert assessments were used. A three-factor structure of the questionnaire was assumed a priori. The identified factors reflected the respondents’ readiness to form an inclusive educational environment in the higher education institution, their level of knowledge about integrated and inclusive education, and the extent to which the respondents’ skills for working in an inclusive educational environment were formed. Some questions of the questionnaire made it possible to judge the level of barrier-free environment created in the higher education institution where the respondent works. For the purpose of analyzing the factor structure of the researched phenomenon, factor analysis was performed. A posteriori a five-factor structure of the phenomenon was developed. Cluster analysis in the space of the identified factors made it possible to group the respondents into five clusters characterized by a similar relation to the researched phenomenon.

The validity of the results obtained is ensured by: sample representativeness; application of methods adequate to the purpose and objectives of the research; reliability of empirical information obtained using modern methods of data collection, measurement, processing and interpretation.

3. Research results

With the purpose of analyzing the factor structure of the researched phenomenon, a factor analysis in the space of indicators was performed, reflecting the respondent’s assessment of himself and his educational institution regarding the inclusive education of students with LHA. Kaiser-Meyer- Olkin Measure of Sampling Adequacy (KMO) is 0.925, which indicates the expediency of using factor analysis to analyze the structure of the phenomenon on the basis of the proposed questionnaire (Table 1).
Table 1. Indicators, factors and factor loads reflecting the respondent’s assessment of himself and his educational institution regarding the implementation of inclusive education

<table>
<thead>
<tr>
<th>Context of the indicator</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to use methods and techniques of corrective action</td>
<td>.757</td>
</tr>
<tr>
<td>Ability to use special approaches to learning</td>
<td>.731</td>
</tr>
<tr>
<td>Ability to carry out psychological and pedagogical support</td>
<td>.726</td>
</tr>
<tr>
<td>Ability to assess the mastering of educational material by students with LHA</td>
<td>.711</td>
</tr>
<tr>
<td>Ability to develop and implement individual programs</td>
<td>.681</td>
</tr>
<tr>
<td>Knowledge of international documents reflecting the rights of persons with LHA</td>
<td>.833</td>
</tr>
<tr>
<td>Awareness of foreign experience in inclusive education</td>
<td>.804</td>
</tr>
<tr>
<td>Knowledge of Russian laws in the field of inclusive education</td>
<td>.784</td>
</tr>
<tr>
<td>Awareness of the Russian experience in inclusive education</td>
<td>.767</td>
</tr>
<tr>
<td>Availability of systematic knowledge about inclusive education</td>
<td>.471</td>
</tr>
<tr>
<td>Ability to create a favourable psychological climate in the audience</td>
<td>.848</td>
</tr>
<tr>
<td>Ability to help in overcoming difficulties in the learning process</td>
<td>.812</td>
</tr>
<tr>
<td>Ability to observe protective-pedagogical and sparing regimes</td>
<td>.765</td>
</tr>
<tr>
<td>Ability to evaluate educational results</td>
<td>.434</td>
</tr>
<tr>
<td>The need to improve skills of working in an inclusive environment</td>
<td>.816</td>
</tr>
<tr>
<td>The need to achieve results in teaching students with LHA</td>
<td>.777</td>
</tr>
<tr>
<td>Awareness of the social relevance of working with students with LHA</td>
<td>.661</td>
</tr>
<tr>
<td>Readiness to assist students with LHA</td>
<td>.550</td>
</tr>
<tr>
<td>Readiness to show empathy towards students with LHA</td>
<td>.503</td>
</tr>
<tr>
<td>Material and technical conditions for teaching students with LHA</td>
<td>.847</td>
</tr>
<tr>
<td>Level of adaptation for the movement of students with LHA</td>
<td>.788</td>
</tr>
<tr>
<td>Qualified specialists for working in an inclusive environment</td>
<td>.706</td>
</tr>
<tr>
<td>Tolerant environment for teaching students with LHA</td>
<td>.632</td>
</tr>
</tbody>
</table>

*Source: composed and calculated by the authors*

Factor analysis made it possible to reveal the five-factor structure of the phenomenon:

- the factor “ability to use methodology” (F1) reflects the ability to use special approaches, methods, techniques for teaching students with LHA, develop and implement special educational programs, carry out psychological and pedagogical support;
- the factor “knowledge of theory” (F2) allows to assess the level of systematic knowledge about inclusive education, knowledge of Russian and international laws in the field of inclusive education, awareness of Russian and foreign experiences in inclusive education;
- the factor “practical skills” (F3) reflects the ability to work with students with LHA, help them to overcome difficulties in the learning process, create a favourable psychological climate, evaluate educational resources;
- the factor “readiness for implementation” (F4) assesses the respondent’s readiness to form an inclusive educational environment in educational organizations, the need to improve working skills in an inclusive environment, awareness of the social importance of working with students with LHA;
- the factor “environmental conditions” (F5) allows to assess an open inclusive educational environment created in an educational institution represented by the respondent, including the material and technical conditions for teaching students with LHA, the level of adaptation for the movement of students with LHA, the availability of qualified specialists, tolerance.
Further, the identified factors will be called inclusion factors.

The total percentage of variance attributable by the identified factors is 67.7%. The factor F1 accounts for 16.3% of the total variance, F2 – 15.8%, F3 – 13.7%, F4 – 11%, F5 – 10.9%.

The quantitative values of the factors are calculated as the average arithmetic values of the corresponding indicators. Statistical analysis of factors allows drawing the following conclusions:

- the respondents most highly assess the factor of their readiness to implement inclusive education, the lowest assessment has the factor of the knowledge necessary for this;
- the widest range of opinions is observed when assessing the factor that reflects the ability of respondents to work with the necessary methods, the respondents are most unanimous in assessing the readiness for implementation of inclusive education;
- the factor of readiness for implementation of inclusive education varies in the range from 1 to 5, relative to the average value of 3.89, but for 50% of respondents, assessment is more than 4.2;
- the factor of knowledge varies from 1 to 5, relative to the average value of 2.41, but for the half of the respondents its assessment does not exceed 2.2, and 25% of respondents assess this factor to be below 1.4;
- the factor of environment in average is assessed by respondents at 2.95, and half of the respondents assess it to be at least 3.

Table 2. Correlation coefficients among the factors

<table>
<thead>
<tr>
<th>Factors</th>
<th>Ability to use methodology</th>
<th>Knowledge of theory</th>
<th>Practical skills</th>
<th>Readiness for implementation</th>
<th>Environmental conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to use methodology</td>
<td>1</td>
<td>.677**</td>
<td>.646**</td>
<td>.364**</td>
<td>.159**</td>
</tr>
<tr>
<td>Knowledge of theory</td>
<td>.677**</td>
<td>1</td>
<td>.447**</td>
<td>.318**</td>
<td>.197**</td>
</tr>
<tr>
<td>Practical skills</td>
<td>.646**</td>
<td>.447**</td>
<td>1</td>
<td>.400**</td>
<td>.130**</td>
</tr>
<tr>
<td>Readiness for implementation</td>
<td>.364**</td>
<td>.318**</td>
<td>.400**</td>
<td>1</td>
<td>.194**</td>
</tr>
</tbody>
</table>

Source: composed and calculated by the authors

Among all the identified factors, direct significant correlations are observed, which indicates their interconnection. The closest connection is observed between the factor of knowledge and the factor that reflects the ability to implement the methodology. The factor characterizing the environmental conditions is most weakly connected to other factors (Table 2).
Two-stage cluster analysis in the space of the identified factors characterizing the perception of inclusive education allowed grouping the respondents into five homogeneous clusters (Figure 1).

The first of the identified clusters contains the largest number of respondents (473), which is 21.7% of the research sample. Respondents of this cluster assess the most highly (above the rest and higher than the average on aggregate) their level of knowledge in the field of inclusive education, the ability to use the methodology and the level of inclusive environment created in the educational institutions where they work. The level of practical skills and readiness for implementation of inclusive education is also higher than the average.

Respondents of the second cluster, which contains 377 people (17.2% of the sample), demonstrate a high readiness to implement inclusive education with virtually no necessary knowledge and skills.

Respondents of the third cluster (350 people, which is 16%) appeared to be the least prepared to implement inclusive education. All factors are assessed by them lower than the average on aggregate and the absolute value is not higher than 2.6.

Respondents of the fourth cluster (548 people, which is 25.1%) are characterized by a rather low level of necessary knowledge, a high level of skills associated with the implementation of methods, and a high level of readiness to implement inclusive education, with the lowest level of the inclusive environment created in the educational institution.

For respondents in the fifth cluster (434 people, which is 19.9%) the greatest advantage is the ability to work with students with LHA, which is not characteristic for respondents from other clusters, but at the same time the level of skills associated with the implementation of methodology is lower than average on aggregate.

According to the constructed classification tree, the factor F1, which reflects the ability of respondents to implement the methods of work connected with inclusive education, has the greatest discriminant ability.

On the basis of the constructed classification tree, the following prognostic rules for classifying a respondent as belonging to a particular cluster can be formulated:

- When F1 > 2.8 and F2 <= 2.8, the respondent with a probability of 78.3% enters Cluster 4.
- When F1 > 2.8, F2 > 2.8, F5 <= 3.5, with a probability of 68.4%, the respondent enters Cluster 2.
- When F1 > 2.8, F2 > 2.8, F5 > 3.5, F3 < 4.3, the respondent enters Cluster 1 with a probability of 91.1%.
- When F1 <= 2.8, F3 > 3.75, the respondent with a probability of 78.7% enters Cluster 5.
- F1 <= 2.8, F3 <= 3.75, F5 <= 3.2, the respondent with probability 73.4% enters Cluster 2.
Fig. 2. Classification tree in the space of inclusion factors

The analysis of the tree constructed in the space of inclusion factors (Figure 2) will allow predicting the distribution of respondents according to clusters of inclusion based on the results of processing the questionnaire, without conducting a cluster analysis procedure.

Source: Own research
Conclusions

The inclusive educational space of a higher education institution is a multifactor phenomenon, and its perception by the participants of the educational process is multidimensional.

Despite the fact that most teachers of higher education institutions demonstrate readiness to implement inclusive education in their higher education institution, their perception and assessment of the existing inclusive space may differ.

With the purpose of effective implementation of inclusive education in the higher education institution, targeted work with teachers is needed depending on at what level of perception and understanding of inclusion they are, and to which of the identified clusters they belong.

The developed methodology will allow higher education institutions, which implement inclusive education, to carry out a self-assessment of the educational space in terms of the effectiveness of inclusive education and develop development and improvement plans based on the analysis of the obtained results.

References


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ENERGY SECURITY AND ECONOMIC DEVELOPMENT:
RENEWABLES AND THE INTEGRATION OF ENERGY SYSTEMS

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Abstract. Our paper is dealing with the issues of energy security and economic development. Our focus is on the changes and challenges that are posed in front of the many countries with regard to the threat of the shortages of energy sources and the depletion of the existing carbon sources. Economic, social and demographic changes in the world call for the novel solutions that would include innovative ways how to secure the smooth and undisrupted flow of energy for maintaining the daily lives of the citizens. We are particularly interested in showing how the integration of energy systems or the coordination between neighboring energy systems might contribute to the sustainable development and operation of the energy sector. The paper uses an example of hydro energy storage in order to show the shortcomings of the battery energy storage and the ways how it can be solved. Our results and findings show that renewable energy sources might become a viable solution to the problems specified above. Well-balanced and well-placed usage of renewables might cushion the shortcomings of the traditional energy systems and prevent major shocks to the energy security through the world and in the European Union countries.

Keywords: energy, energy security, economic growth, renewable energy sources, European Union


JEL Classifications: L90, Q20, Q30, Q43

1. Introduction

Energy is an essential resource for all forms of a business field that covers the providers of energy, transport businesses, energy associated industries and service suppliers of energy. According to International Energy Agency (IEA, 2007), energy security is the continuous availability of the sources of energy which are reason-
ably priced. Energy security means self-assurance and belief in its constant ability to obtain economical and reliable energy (Bielecki, 2002). It is regarded to be important for both day-to-day operations and long-term investments (Chamberlin, 2015; Kalyugina et al., 2015; Koudelková et al., 2015; Ehrenberger et al., 2015). Again, energy security comprises multiple scopes – long-term energy security primarily relates to appropriate investments for supplying energy in alignment with economic growth and needs for sustainable economic development (Strielkowski et al., 2017). On the other hand, short-term energy security emphasizes on the capability of the energy system to respond on time to unexpected variations in the balance between the supply and demand of energy. Thus, the absence of energy security is associated with the negative social and economic effects of either physical obtainability of energy or uncompetitive or excessively volatile prices. This process is equally vital and important for rural and urban areas (Chmielewska and Horváthová, 2016; Zielińska, 2016; Jankelová et al., 2017; Jankurová et al., 2017) and is widely reported in mass media and discussed by the general public (Čábelková et al., 2015).

The modern era has experienced the rising focus as well as awareness towards the energy security issue which, in a way, becomes a new religion (Strielkowski and Čábelková, 2015; Strielkowski, 2017). In a report by Nematollahi et al. (2016), there is a lot of fear and apprehension such as the depletion of fossil and oil fuel, reliance on foreign energy sources, firmness of countries which supply energy, the energy demands of developing and third world nations, and increasing demands from developed countries, environmental problems and economic efficiencies (Ignatavičius et al. 2015; Tvaronavičienė et al. 2015; Tvaronavičienė, Černevičiūtė 2015; Tvaronavičienė 2016; Dobrovolskienė et al. 2017; Tvaronavičienė 2017).

Internationally, there has been an outburst of many energy crises that have resulted in more focus on energy security. Access to fairly economical energy has turned out to be vital to the operation of contemporary economies. Nevertheless, the unbalanced delivery of energy supplies amongst nations has caused substantial vulnerabilities (Lisin and Strielkowski, 2014; Lisin et al., 2017).

This paper is organized as follows: Section 2 outlines and discusses threats to energy security that stem from dependence on traditional carbon energy sources. Section 3 describes long-term of energy security, while Section 4 contradicts with outlining the concepts of long-term energy security. Section 5 elaborates on the energy storage issues and makes implication for the integration of energy systems. Finally, the Conclusions section summarizes our reasoning and findings and provides the pathways for further research to follow.

2. Threats to energy security

The contemporary world depends on a large supply of energy for fueling everything ranging from communication to transportation, to health delivery and security systems. Energy is an important player in the national security of all countries as a fuel for powering the trade and industry engine. Certain sectors depend on energy more greatly compared to others. Today, there are many threats to energy security including the rivalry over sources of energy, energy supplies manipulation, attacks on the infrastructure for supply, political instability of different energy producing nations, accidents, dependence on foreign nations for oil, terrorism, and natural disasters.

Chart 1 that follows reports how the gross inland consumption of energy in the EU-28 countries has shifted over the last 25 years. It is clear that the share of the total petroleum products and solid fuels has diminished considerably with the total rise of the share of gas.
Foreign supplies of energy are susceptible to abnormal interruptions from internal conflict, interests of exporters, and non-state players who target the distribution and transport of the resources of oil. The economic and political instability as a result of warfare or other aspects like strike action may correspondingly prevent the appropriate operation of the energy industry in an oil producing country. For instance, the oil nationalization in Venezuela has prompted protests and strikes, whereby the rates of oil production in the country are yet to recuperate (Yetiv and Lu, 2007). Exporters could have an economic or political incentive for limiting their overseas sales or causing interferences in the supply chain. Terror attacks which target oil fields, refineries, tankers, pipelines and oil facilities are so prevalent that they have become risks to the energy industry. Infrastructure for the production of the resources is very vulnerable to interruption. Fresh threats to energy security have arisen due to increased global completion of resources of energy triggered by the raising speed of industrialization in nations like China and India, coupled with the amplifying impacts of climate change (Yetiv and Lu, 2007). Augmented rivalry over energy resources can as well result in the establishment of security agreements for enabling an equitable supply of gas and oil between main powers. Yet, such could occur at the expense of economies which are less developed.

### 3. Long-term energy security

Long-term actions to promote energy security focus on the reduction of reliance on any single source of energy that is imported, increment of the suppliers’ number, exploitation of natural renewable energy or fossil fuel, and the reduction of overall demand through measures for energy conservation. Besides, it may involve signing international agreements to cement global energy trading relationships, like the Energy Charter Treaty (ECT) in Europe (Haghighi, 2007). Each concern which comes from security threats on long-term security measures of oil resources will help in reducing the future cost of importation and exportation of fuel into and out of nations without worrying about the damage which comes to the transit goods.

The effect of the oil crisis of 1973 and the advent of the OPEC cartel was a specific milestone which triggered some nations to intensify their energy security. Virtually entirely reliant on imported oil, Japan, progressively introduced the usage of nuclear power, natural gas, high-speed mass systems of transit, and effected measures of energy conservation. The UK started the exploitation of North Sea oil as well as gas reserves and grew into a
net energy exporter during the 2000s (Haghighi, 2007). In other nations, energy security has traditionally been a lesser priority. For example, the US has continued increasing its reliance on imported oil, though after the prices of oil increased from 2003, the creation of biofuels has been proposed as a way of dealing with this (Barton et al., 2004). Furthermore, the increment of security is among the reasons behind a block in the establishment of natural gas in Sweden. Higher investments in natural renewable energy technologies along with energy conservation are rather envisaged. India is performing a major search for national oil to reduce its dependence on OPEC, whereas Iceland is well progressive its strategies to become energy independent as of 2050 by using 100 percent renewable energy (Lior, 2012).

4. Short-term energy security

According to Cordesman (2006) and Zlyvko et al. (2014), crude oil (petroleum) has turned into the most used energy resource by nations globally, including China, Russia, and the US. Due to the location of oil wells across the globe, energy security has turned out to be a major issue to guarantee the safety of the petroleum which is being generated. Oil fields in the Middle East have become a key target for sabotage since most of the world countries depend on them for oil (Yetiv and Lu, 2007). Most of the nation-states keep strategic petroleum reserves to act as a cushion against the political and economic consequences of an energy crisis. In comparison to petroleum, dependency on imported natural gas leads to substantial short-term vulnerabilities.

As reported De Vries et al. (2007), most of the European nations saw an abrupt decrease in supply after the halting of the Russian gas supplies throughout the 2006 Russia-Ukraine gas dispute. Natural gas has become a sustainable energy source globally. However, natural gas providers are being faced with one of the biggest challenges today – the ability to store and transport it. Because of its low density, it is hard to create adequate pipelines in North America for transporting enough natural gas to equate demand. Nuclear gas has also become one of the main energy sources, and it presently generates 13 percent of the total electricity worldwide.

The use of renewable technologies normally upturns the diversity of sources of electricity and, through local production, leads to the system’s flexibility and its fight against fundamental shocks. For the nations where increasing reliance on imported gas is an important energy security problem, renewable technologies may offer alternative electric power sources along with shifting electricity demand by direct production of heat (De Vries et al., 2007). Renewable biofuels for transportation represent a major source of diversification from crude oil products. Lior (2012) asserts that, due to the fact that the resources which have been very important for survival across the globe to this day begin decreasing in numbers, nations will start recognizing the necessity for a renewable source of energy will be as critical as ever. As a result of the generation of new energy types such as wind power, biofuel, hydroelectric, geothermal and solar energy, there is adequate energy for powering the world.

Water storage currently dominates the world’s conventional electrical energy storage (EES), rapid ongoing decrease in the cost of batteries raises hopes that chemical will offer a new and attractive storage option. Newbery and Strbac (2016) summarize estimates for 2020 battery energy storage (BES) costs which range from €253-€345/kWh for the battery pack as opposed to the today’s costs of about €1117. Energy stored in batteries from renewable energy source such as wind turbines during off peak periods could be discharged during peak periods as opposed to running non-renewable sources such as natural gas turbines which are more expensive. The value obtained from storing cheap or free energy obtained from renewable sources during off-peak or low-demand periods which could be sold during peak hours (which are mostly in the afternoon) can be calculated by simply taking the market price difference between the time periods.

5. Battery storage and energy issues

Nowadays, battery energy storage accounts for just 1% of world’s EES with Pumped Hydroelectric Energy Storage (PHES) making up the remaining 99% (Newbery, 2016). Pumped Storage Plants (PSP) first introduced in the 1960s represent the overwhelmingly established bulk EES technology with an operation output capacity reaching about 164 GW in 2016 (Barbour et al., 2016). This capacity has been growing for past 8 years at an
average of 2.7% per annum (EIA, 2016). Since 2008, the rate of development of PHES has increased to harness the growing energy demand in the 1990s and 2000s and anticipation of increased wind generation. The most recent PHES projects in Europe have been commissioned in Austria and Spain (2013-2014). Comparing to other regions of the world, Europe has the most PHES capacity with about 80% of it developed in 1960-1990. Most of the facilities can be found in the mountainous regions of Austria, France, Germany, Italy, Spain, and Switzerland. The development of PHES was coordinated with significant increases in nuclear capacity, although some countries that do not have nuclear power (e.g. Austria) also installed considerable PHES capacities (Barbour et al., 2016).

The world hydro capacity in 2012 was 979 GW, generating 3,288 TWh/year (or 16% of world total electricity output) (EIA, 2016). Germany had 6.8 GW output capacity and stored 50 GWh, or 7.4 hours on average, while Britain with 2.86 GW output stored 26.7 GWh, or 9.3 hrs. For the 45 GW of PSPs for which capacity is available, total storage is 1.7 TWh (although the top four by capacity have 75% of this total and a very low output, corresponding more to storage hydro). The remaining PSPs have 10.9 hours, duration so if this is representative of the remaining PSPs, the total global storage capacity is 2.9 TWh (compared to roughly 23.4 GW storage hydro and 70 TWh in dams in Norway alone). Assuming the capacity factor is related to storage capacity as in Norway, the capacity would be 3.7 months. At 3 months, storage capacity would be 2,144 TWh, or 2,700 times the global PSP capacity (Newbery, 2016). The example of Norway represents an important lesson in the possibility of the integration of energy systems. Provided the efficient transfer of energy is ensured (e.g. via the cables in the North Sea), the viable integration of energy systems of the United Kingdom and Norway can be achieved which would ensure the smooth supply of renewable hydro energy from Norway to the United Kingdom.

Overall, it might seem if the indirect use of hydro power (as well as the electric transport envisaged in the future) were accessible at reasonable cost, they would be cheaper than conventional EES. Moreover, there is still no battery revolution for a future smarter energy system in sight despite the plethora of research focused on improving performance and reducing costs of battery storage across electrochemical, and mechanical and thermal devices. However, everything is not that simple as it seems. It is true that opposed to batteries that draw from the chemical energy, have short lifetimes and prove inviable under the current electricity prices (Staffell and Rustomji, 2016), the hydro power EES use the free storage medium (water) and can operate for more than 100 years. But their potential of gravitational energy is remarkable weak compared to chemical energy and their high capital costs and their distance from demand centres sometimes make them less favourable options then BES.

Conclusions

Energy security is a troubling issue for many nations nowadays. Depleting carbon energy resources, growing demand for energy and volatile energy prices make this issue to be of the life and death importance in both energy-abundant countries and countries short on energy resources. The whole world is in the search of solution how to deal with the constantly increasing need for the constant supply of cheap and efficient energy.

In our analysis, we argue that renewable energy sources and noteworthy prospects for energy efficiency are present over extensive geographic regions, contrary to other sources of energy, which are concentrated in a few countries globally. Rapid utilization of renewable energy sources along with energy efficiency, and industrial expansion of energy sources could lead to significant economic benefits as well as energy security. Since no nation is self-reliant based on energy requirements, they may ensure access to dependable, cheap and ecologically sound energy through partnerships and collaboration. The major concern is the depleting energy sources. Accordingly, it is important to create a new energy system that could provide sufficient, cost-effective and non-polluting energy.

When it comes to the pathways for the further research that found themselves outside the scope of this paper, it would be interesting to conduct a more in-depth analysis of the world’s regions and to make a comparison of their potential when it comes to energy sources and their exhaustion. Also, it would be interesting to assess the potential for renewable energy sources (e.g. hydro, wind, solar) in various regions of the world and to make as-
sumption about which regions might specialize in which renewables and how the potential trade might be conducted. This seems to be a particularly interesting discussion since the concept of the comparative advantage and the principles of the international trade can be embedded into the analysis of energy. Moreover, it would also be interesting to focus more on the perspective of the integration of energy systems worldwide.

References


Abstract. The aim of the paper is to analyise the opinion of enterprise representatives upon the risk of errors occurrence in selected areas of accounting. Research presented in this paper explains the view of enterprise accountants upon the risk of errors occurrence, both unintentional and intentional, aimed towards the creation of so called „creative accounting”. The research itself, done on a sample of 232 Czech enterprises, was based on questionnaire investigation which focused on perception of problematic areas influencing the quality of accounting information. The obtained set of data was evaluated using descriptive method and mathematical/inference statistics. Special testing was done at hypotheses on concordance of two mean values and at the Friedman test. Evaluation of problematic rates of individual areas of accounting revealed that practically each observed area of accounting is connected with specific difficulties. The major causes of problems are tax impacts, namely in the area of the cost, time differentiation and of revenues and also difficulty in pricing, especially in the area of inventories and fixed and financial assets. High respondents’ concordance on rating individual accounting areas as to the risk of an error occurrence was detected. It stemmed from the research that the risk of formation of unintentional errors is subjectively rated as the highest in the areas of conjectural and adjusting items and the lowest at asset and depreciation classification. Rating the space for intentional distortion of accounting statements indicates a very reserved attitude of the respondents. The results have proved that in the respondents’ opinion practically all areas of accounting give space for occurrence of errors. The results of the research provided a somewhat different perspective on the issue of accounting errors in comparison with results published by other authors who used objective assessment of error rate as a departure point.

Keywords: financial sustainability, accounting, financial statements, creative accounting, information quality, errors


JEL Classifications: M41

1. Introduction

Financial sustainability of any company is influenced by accounting performance. As in all other areas of human activity, keeping accounting records is accompanied by the emergence of errors. The aim of our research is to provide information on the risk of the emergence of accounting errors from the perspective of business accountants.

Accounting provides data on the company’s performance, finance flows, and this information is used to evaluate the company’s performance, to make management decisions and future plans (Večerskiene et al., 2008). The fundamental objective of accountancy is to provide a fair and true view of the entity and its financial position. One should take into account the fact that accountancy occupies an important place in the informal enterprise
system and is a strong source of information, as pointed by Dumitru (2012).

Accountancy should be used not only as a source of information that allows us to calculate the amount of tax liability and assemble the required statements. Accountancy, along with other instruments of financial management, should be a source of complete data for both internal and external users. Financial performance is seen as a stake in the company’s internal and external relations, its partners being affected by the level and quality thereof (Grosanu et al., 2011). Porter & Norton (2015) add that external users such as investors and creditors often do not have access to detailed business records. The quality of accounting information affects the decision-making of investors and the interest creditors (Li et al., 2017). Beatty, Liao & Weber (2010) examined how different sources of financing affect the importance of accounting quality on firms’ investment cash flow sensitivity. It is therefore evident that accountancy can fulfill its informative function only if the accounting data is processed at a high level of quality.

It is obvious that the quality of accounting information is determined by applied accounting principles, methods and by the degree of legislative regulation. The accuracy of the application of accounting methods and of bookkeeping itself is verified by an audit. Šindelář & Müllerová (2016) analyzed the market concentration of audit services in the Czech Republic and indicated their high concentration in the Czech Republic.

It is important to realise that accounting data processing can be connected with some difficulties and mistakes in their subsequent transfer to financial statements. When processing accounting information, we can see purposeful or unintentional manipulation, which reduces the quality of accounting information. The main areas that could influence the quality of accounting information are data falsification, accounting methodology and information systems (Vlčková & Friebel, 2015). One of the reasons for falsifying data is the reduction in tax liability for entities (Stangova & Vighova, 2016).

The final accounts may either contain errors that have an impact on the explanatory power of the financial statements, or errors that do not affect their explanatory power.

Errors that do have an impact on the explanatory power:
- Balance sheet and income statement also contain zero-value items
- Poor distribution of equity values
- Definition of items in the annex to the final accounts (Kolářová, 2013).

Generally, an accounting entity is able to influence these factors and it is therefore important to pay attention to them.

The paper focuses on the identification of areas where accounting errors particularly arise and on determination of accounting areas where the largest space for application of creative accounting can be found.

2. Creative Accounting and Risk of Errors

Accounting ensures certain types of quantitative information for decision making and management of an enterprise. Accounting information ranges among the crucial sources of information on an enterprise for the majority of interest groups (Otrusinová & Šteker, 2013). In order to provide relevant information, the accountant should follow the rules and principles on which accounting data processing is based (Puican et al., 2011). In Oprean & Podoaba’s point of view, the best quality accounting information urgently requires the best organization of its system (Oprean & Podoaba, 2016).

3. Quality of accounting information

Accounting information should be collected in such a way so as to be able to respond both to the enterprise requirements, as regards the decision fundamentals, and also to informal needs of its partners. In this way the
quality of the information offered by the financial positions, becomes a purpose in itself and it should bring an added value to the financial report frame sustaining the financial system and economic increase in this way. The benefit of the accounting information, offered through financial reports, is proven in the conditions in which the users make use of it in order to understand the economic reality of the enterprise, and in order to make suitable decisions. Thus the accounting information benefit cannot be defined in another way, but only through its quality (Dumitru, 2012).

The need for ensuring the quality of financial information was felt in the United States of America after the economic, financial and stock market crisis of 1929-1933. The Financial Accounting Standards Board (FASB) recognizes a wide range of quality characteristics: usefulness for decision making, relevance, reliability, timeliness, predictive value, retrospective value, verifiability, neutrality, representational faithfulness, prudence (conservatism), continuity, materiality, balance between benefits and costs, completeness, no elements leading to misinterpretation, intelligibility, and comparability. According to the IASB’s Framework for the Preparation and Presentation of Financial Statements, the analysis of the qualitative characteristics of accounting information is carried out around four vectors, namely understandability, relevance, reliability and comparability (Rusu, 2012).

The quality of information is characterized by Puican, Avram & Dutescu (2011) as:
- Speed – sets the time necessary for information to reach from the issuer to the receiver;
- Frequency – represents the number of information of the same type in a time unit determining information rate;
- Accessibility – depends on the communication means, on the personnel training degree, of storage means, etc.;
- Actuality – represents the information capacity to present recent events;
- Intelligibility – indicates the property of some information to be understood by the users;
- Reliability – represents the capacity of the information to provide a real and certain image of an event/object;
- Pertinence – indicates the quality of information to give answers in a given situation;
- Age – it is expressed by the time between collecting the information until the enforcement of decisions taken on their grounds.

According to Krištofík, Lament & Musa (2016) the scope and quality of information and reporting disclosures play an important part in building socio-economic relations of an enterprise and its environment and are addressed by systemic theories, referred to as open system theories.

High-quality accounting information enables measurement of an enterprise’s performance, financial position, assesses costs and revenues, income and expenses, and profit. This information is necessary for the management and decision making of the enterprise (Baba, 2009). The number of cases where accounting plays an important role is gradually increasing, as is the number of published opinions on this topic. Performance information is argued to assist managers of enterprises in making more informed decisions on control of the production process (Romolini, Gori & Fissi, 2015).

The research of Cascino, Pugliese, Mussolino & Sansone (2010) focuses on ownership structure and its effects on financial reporting quality. They show that the quality of accounting information of family businesses is on average higher than at non-family businesses.

Qualitative characteristics of accounting information are significant in connection with setting of accounting rules by enterprises. The role of qualitative characteristics of financial information in management’s decisions was investigated by Nobes & Standler (2014).

Porter and Norton (2015) investigate what qualitative characteristics make accounting information useful. In their opinion, the information should be understandable, relevant, faithful, representative, comparable and consistent. Similarly, Puican, Avram & Dutescu (2011) claim that relevance, credibility and comparability are the
main accounting quality characteristics.

If the accounting information is to be relevant it has to be prompt. Information that is unavailable when required or is available much later loses its value (Puican, Avram & Dutescu, 2011).

Baba (2009) argues that the needs of accounting information users have to be met permanently. It is evident in many enterprises that a high-quality information system and particularly a sophisticated system of management accounting contribute to their successful management significantly. These enterprises know that only those who are able to manage their businesses effectively will survive in competitive environment. The importance of quality of accounting information system is confirmed also by other experts, e.g. Susanto (2015) or Alamin et al. (2015). Alamin et al. (2015) examined the factors (perceived technology fit, effort expectancy, etc.) that influence accounting information system.

4. Aspects affecting the quality of accounting information

Accounting errors are further transferred into financial statements. Chaney, Faccio & Parsley (2011) assert that some enterprises require only a mechanical application of accounting rules while others rely on the judgment of the enterprise’s management and accountants. These decisions include errors – both intentional and unintentional. However, with regard to the quality of information, the source of these errors is irrelevant, as both reduce the quality of accounting information.

The aim of the study by Holtz & Sarlo Neto (2014) was to investigate the effects of the board’s structural and compositional characteristics on the quality of accounting information of enterprises listed on the Brazilian Securities, Commodities, and Futures Exchange. This study shows that stronger governance structures have a positive effect on the quality of reported accounting information.

The evidence that regulatory interventions seeking to improve accounting information quality can reduce the mispricing of securities in the capital market was provided by Chan, Lee & Lin (2009).

Baba (2009) notes that unskilled employees, errors in application of accounting principles, manipulation of results, inflation, contravention of the law, etc. are potential sources of poor-quality information. Further, Laptes (2009) adds that poor information quality can occur on all levels. The quality of accounting data influences the enterprise throughout its lifecycle. Much depends on the acquisition thereof, insofar as a company can achieve the greatest improvement in quality by using appropriate sources.

Primary data sources are records as such that describe certain economic transactions. For this reason, attention has to be paid to the requirements of the records.

Accounting errors unfavourably affect the quality of financial reporting. Burks (2015) states that stakeholders react negatively in cases deficiencies are disclosed in financial reporting of non-profit organisations. This often results in a decrease in donations which are significant for these organisations. He analysed accounting errors disclosed by public charities between 2006 and 2010 and ascertained that public charities disclose errors at a substantially higher rate than U.S. publicly traded firms.

Türkmen (2016) claims that general mistakes are made especially in accounting areas such as financial accounts, e.g. cash and bank accounts, cheques, bank loans and trade payables and receivables.

Deaconu, Crisan & Buiga (2016) show frequent use of replacement cost, gross or net, to the detriment of book value in their study.

Vlckova & Friebel (2015) divide facts that have a negative effect on the quality of accounting data into three groups. The first group covers misrepresentation of data, errors and fraud and includes creative accounting,
accounting frauds carried out by the management or employees and accounting errors arising from lack of knowledge. The second group represents accounting methodology, which is connected with mistakes in the method of calculating depreciation, asset valuation etc. The last group concerns the influence of the information system, where an error can be caused by lack of information and accounting legislation changes in the information system. The research results showed that the most important aspects that influenced the quality of accounting data were creative accounting, valuation, internal control, accounting fraud carried out by the company management, lack of information and poor internal communication.

Likewise, it is important to emphasize that there are some factors which influence the accountants’ activities.. Oprean & Podoaba (2016) divided them into two categories: quantifiable factors and unquantifiable factors. Quantifiable factors are the number and structure of the employed personnel, needs for information resources, computers, informatics programs, financial and unquantifiable factors are professional knowledge and skills of accountants, competence and integrity of accountants, the quality of management, the trust granted to accountants.

5. Creative accounting

References to creative accounting were made for the first time in 1494 in the famous treatise by Luca Paciolo “Suma de Arithmetic, Geometric, Proportion et Proportionality.” It refers to creative accounting techniques used in Venice in terms of a highly developed foreign trade. In those times, relations among traders were written in ink, based on accounting principles, in the main and secondary registers. When inconsistencies appeared among them, the ink bottle was often poured over them, not by chance but so as to render the records illegible (Cernusca et al., 2016).

The term creative accounting exists in connection with handling of accounting information. In essence, there is a wide definition applied in the USA and narrower definitions practised in the UK. Whereas the UK definition views creative accounting as using flexibility within the regulatory system excluding frauds, the US definition views creating accounting as a fraud (Jones, 2011). Creative accounting is a useful instrument for managers to promote the enterprise image and select information so that the data offered will maintain the interest (Marilena & Corina, 2012).

From Popa’s point of view (2012), creative accounting is one of manipulative practices strongly enhanced in the field of accounting as time has passed. Although accounting information is determined by the degree of legislative regulation, creative accounting creates a fake image of the enterprise.

Baba (2009) views creative accounting as a technique that allows one to present the outcome and the balance sheet in a new and favourable image. Jones (2011, p. 32) defined it as “using the flexibility in accounting within the regulatory framework to manage the measurement and presentation of the accounts so that they give primacy to the interest of the preparers not the users”. Even if it is not illegal, it simply utilises accounting flexibility to misrepresent the overall situation in an enterprise.

Accounting misrepresentation of the data has been confirmed by other authors such as Türkmen (2016). Türkmen (2016) states that enterprises may intentionally manipulate accounting data in order to present financial statements that are more than standardly credible in the interest of acquiring more and cheaper credit facilities.

Identification of manipulative behaviour on the part of preparers of financial statements was searched by Gowthorpe & Amat (2005). They specified two principal categories of manipulate behaviour: macro-manipulation presented as lobbying of regulators to produce rules that are advantageous to the interests of the preparers, and micro-manipulation described as engagement in the entity level manipulation in order to present a biased view of economic reality. In this context the quality of the business environment for SMEs is an important precondition for the successful development of this business segment (Ključnikov, Belás, Kozubiková & Paseková, 2016).
Creative accounting in financial reporting was investigated by Tassadaq & Malik (2015). They focused on factors like the role of auditors, the role of government regulations or international standards, impact of manipulative behaviours and also impact of ethical responsibility. Likewise, Milesi-Ferretti (2003) examined if fiscal rules encourage the use of creative accounting. They developed a model in which governments circumvent these rules by reverting to creative accounting. Hagen & Wolff (2006) tested the model by Milesi-Ferretti. They confirmed the prediction that the use of creative accounting varies over the business cycle. Moreover, Maltritz & Wüste (2015), inspired by findings of Hagen & Wolf (2006), examined how creative accounting influences the fiscal budget and interacts with fiscal rules in particular. They found a significant influence upon fiscal rules and stock-flow adjustments.

Likewise, Reischmann (2016), examined whether electoral motives influence creative accounting as measured by stock-flow adjustments. The results show that stock-flow adjustments increase before election and that governments strategically use stock-flow adjustments before regular elections. In a similar way, Melo, Pereira & Souza (2014) investigate the impact of political competition on the governors’ decision to make use of creative accounting. They demonstrated a positive influence of the turnover on states levels of creative accounting.

6. Objective and Methods

The research is based on a questionnaire investigation (Tab. 1) in which 232 respondents participated. The selection of respondents depended solely on selections by students who had visited enterprises which they had selected by themselves. Then each student completed, together with a business representative, an online questionnaire form prepared in the Google document environment. The questions in the questionnaire aimed at ascertaining fundamental characteristics, such as the business field of activity and further, how the enterprise rates the risk of errors in individual financial statement areas and the possibilities of applying “creative accounting” therein.

<table>
<thead>
<tr>
<th>Research</th>
<th>Quality of accounting information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data collection and processing</td>
<td>2016, enterprises of the Czech Republic</td>
</tr>
<tr>
<td>Form of data collection</td>
<td>Questionnaire survey, interviews with respondents</td>
</tr>
<tr>
<td>Number of relevant questionnaires</td>
<td>Questionnaire survey, interviews with respondents 232</td>
</tr>
</tbody>
</table>

Source: Author’s own

The obtained set of data was evaluated using the descriptive method and mathematical/inference statistics. Special testing was done at hypotheses on concordance of two mean values and at the Friedman test.

7. Results

The introductory questions of the questionnaire focused on ascertaining the field of activity of the enterprise (Fig. 1).
Fig. 1. Relative representation of enterprises according to the size and field of activity

Source: Author's own

Micro enterprises formed the largest proportion in the monitored sample; their number exceeded 40%. The proportion of small and medium-sized enterprises was approximately the same – around 25%. The proportion of large enterprises amounted only to 10%. This structure of the sample of monitored enterprises corresponds approximately to the representation of enterprises according to the size in our country. Furthermore, it is clear from the overview that by far the largest number of enterprises provides services. This is followed by production, with an approximate 28% proportion of enterprises. Only about a fifth of the enterprises focuses on trade. The dominant proportion of enterprises providing services is evident especially among micro enterprises.

The questionnaire assessed how enterprises evaluate the risk of errors in individual parts of financial statements. Marks within the following scale were used for assessment: 1 = least risky, 2 = slightly risky, 3 = neutral, 4 = somewhat risky, 5 = most risky.

Table 2. Risk of emergence of errors

<table>
<thead>
<tr>
<th>Assets classification</th>
<th>Unvalued</th>
<th>Mark</th>
<th>St. dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depreciation</td>
<td>1</td>
<td>2.6</td>
<td>0.95</td>
</tr>
<tr>
<td>Accruals and deferred charges</td>
<td>3</td>
<td>2.9</td>
<td>1.11</td>
</tr>
<tr>
<td>Measurement</td>
<td>5</td>
<td>2.9</td>
<td>1.06</td>
</tr>
<tr>
<td>Matching principle and accruals</td>
<td>2</td>
<td>3.0</td>
<td>1.06</td>
</tr>
<tr>
<td>Provisions</td>
<td>15</td>
<td>3.0</td>
<td>1.08</td>
</tr>
<tr>
<td>Impairment of assets</td>
<td>6</td>
<td>3.1</td>
<td>1.07</td>
</tr>
<tr>
<td>Estimated items</td>
<td>3</td>
<td>3.2</td>
<td>1.10</td>
</tr>
</tbody>
</table>

Source: Author's own

Table 2 also contains a decisive deviation which provides information as to the concordance among respondents in the assessment of individual areas.

The following chart (Fig. 2) illustrates rating of the risk level of emergence of errors in individual accounting areas.
Fig. 2. Risk of emergence of errors in individual accounting areas

Source: Author’s own

There is a very low variation in the average rating of risk of emergence of errors in individual accounting areas. Despite this, however, there is a clear perception of lower risk in the areas of asset and depreciation classification. In contrast to this, the areas of conjectural and adjusting items areas are rated the riskiest.

The concordance level of respondents on rating of individual accounting areas is practically identical; the decisive deviation corresponds roughly to one degree of the rating scale. Differences in the ratings of accounting areas are below the decisive deviation value.

The difference in ratings of risks of depreciation and time differentiation is statistically significant. The test of the rating concordance hypothesis in these two areas, as against the unilateral alternative hypothesis of their divergence, gives a test criterion p-value of 0.022, which leads to rejection of a zero hypothesis at the 2.5 % significance level.

The hypothesis on median concordance was tested with the aid of the Friedman test (Kovářík, 2012). A p-value of 0.012 was calculated. The zero hypothesis can thus be rejected only at a high significance level.

The survey further focused on the question of how enterprises rate the possibility of application of “creative accounting” in individual areas of financial statements (Tab. 3). Marks with the following scale were used in assessment: 1 = smallest space, 2 = small space, 3 = neutral, 4 = considerable space, 5 = widest space.
Table 3. Possibility of applying creative accounting in individual areas

<table>
<thead>
<tr>
<th>Area</th>
<th>Unvalued</th>
<th>Grade</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial statement</td>
<td>10</td>
<td>2.3</td>
<td>1.05</td>
</tr>
<tr>
<td>Salaries</td>
<td>9</td>
<td>2.5</td>
<td>1.17</td>
</tr>
<tr>
<td>Significant events which occurred between the end of the reporting</td>
<td>12</td>
<td>2.5</td>
<td>1.03</td>
</tr>
<tr>
<td>period and the date when the financial statements are authorised for</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>issue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventories and fixed assets valuation</td>
<td>10</td>
<td>2.5</td>
<td>0.97</td>
</tr>
<tr>
<td>Donations and gratuitous transfers</td>
<td>10</td>
<td>2.5</td>
<td>1.12</td>
</tr>
<tr>
<td>Corrections of errors from previous years (in income statement,</td>
<td>12</td>
<td>2.5</td>
<td>1.11</td>
</tr>
<tr>
<td>balance sheet)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The moment of accounting transaction – revenue recognition</td>
<td>8</td>
<td>2.6</td>
<td>0.97</td>
</tr>
<tr>
<td>The moment of accounting transaction – transfer of ownership of</td>
<td>10</td>
<td>2.6</td>
<td>1.03</td>
</tr>
<tr>
<td>tangible fixed assets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The moment of accounting transaction – capitalization of inventory</td>
<td>16</td>
<td>2.7</td>
<td>1.05</td>
</tr>
<tr>
<td>Provisions</td>
<td>15</td>
<td>2.8</td>
<td>1.04</td>
</tr>
<tr>
<td>Technical improvements and asset repairs</td>
<td>10</td>
<td>2.8</td>
<td>0.95</td>
</tr>
</tbody>
</table>

Source: Author’s own

Rating of accounting areas from the perspective of the space they provide for application of “creative accounting” is illustrated in the following chart (Fig. 3).

Fig. 3. Space for application of “creative accounting” in individual accounting areas

Source: Author’s own

All areas are rated roughly identically as providing a “small space” to “neutral” for the formation of creative accounting. Decisive deviations of individual areas assessments vary very little and are equal approximately to one degree of the assessment scale. One can thereby deduce that the concordance level of business representatives is also approximately the same in all areas. The respondents see a somewhat wider space to apply “creative accounting” in areas of technical assessment of assets and reserves and perhaps also in the area of setting the moment for inventory activation. Respondents consider financial statements to be the area providing the smallest space for “creativity”. This attitude clearly stems from the awareness of the existence of strict regulations as to the compilations thereof. However, it has to be stressed that the divergence of responses among individual areas does not appear to be statistically significant. The test of the hypothesis on median concordance led to its acceptance, the p-value = 0.272 value.
8. Discussion

The results of the research were surprising even for the authors of the article, as the majority of their initial expectations were not confirmed; on the contrary, they showed a new perspective on the researched issue and opened space for further investigation.

At the beginning of the survey, based on their long experience, the authors expected the area of valuation, the matching principle and the accrual principle to be the most susceptible to errors. The realized survey did not confirm these expectations. Enterprise representatives consider the areas of adjusting items and of conjectural items the most susceptible to errors.

Türkmen (2016) mentions that errors in accounting occur especially in the areas of financial accounts, i.e. register, bank accounts, cheques, bank credits and in receivables and liabilities from business contact. Our research did not confirm this assertion.

Vlčková and Friebel (2015) claim that error rate in accounting is influenced by the accounting method used in the enterprise. Enterprises may err in the manner of calculating depreciation and in property valuation. Yet our research rates the area of depreciation as being rather less risky.

Accounting distortion of data, so-called creative accounting has been confirmed by numerous authors. For instance, Türkmen (2016) states that firms can intentionally manipulate accounting data with the aim of acquiring more credible (better) financial statements than is standard so as to ensure a larger number of cheaper credits. In our research, respondents noticed the greatest potential for distortion of data in the areas of technical assessment, reserves and activation of inventories. In general the differences in assessment are very small. The set of answers elicits the impression that the respondents’ replies were significantly influenced by their reserved attitudes. Thus it is not equivalent to objective assessment of error rate of accounting in individual accounting areas, based on direct verification of the correctness of accounting.

It must, however, be stressed that our research stems from subjective assessments of accounting areas by enterprise representatives. Error rate and creative accounting are generally viewed as negative phenomena, i.e. accountants have to admit that they err, which could be understood as poorly executed work or even fraud where creative accounting is concerned; they are thus highly cautious when rating, which was confirmed by the research. It is necessary to search also for small deviations and statistical significance of answers. Statistical assessment of the research results shows that the sample range of enterprises questioned should be greater. A significant augmentation of the research range would allow monitoring of the dependence of monitored ratings on the size of the accounting unit, on the significant relationship of the enterprise to a foreign subject and, as the case may be, on the type of the main field of activity of the enterprise.

Conclusions

The issue of errors when managing accounting records has been researched and the results published by numerous authors. Accounting errors are fundamentally of two types. There are unintentional errors having arisen by oversight or error and intentional errors deliberately aiming towards distortion of financial statements. Research is usually based on an objective assessment of financial statements. This manner of acquiring data on errors requires considerable effort and carefulness when assessing the sources of accounting information and the resultant financial statements in a monitored sample of accounting units. For this reason, the number of assessed units is relatively small and research is usually focused on a specific accounting area.

Our research attempts to assess the issue of accounting errors from the subjective attitude of accountants in enterprises. Enterprise representatives were asked to evaluate individual accounting areas from the perspective of the risk of formation of unintentional errors and, further, from the perspective of space which such errors provide for the application of intentional errors or distortion. It stemmed from the research that the risk of
formation of unintentional errors is subjectively rated as the greatest in the areas of conjectural and adjusting items. The rating of individual areas varies very low – on the border of statistical significance. The subjective rating of the space for intentional distortion of financial statements then suggests a highly reserved attitude on the parts of the respondents. Deviations in ratings of individual accounting areas appear to be statistically insignificant. This fact can possibly be explained by a generally understandable effort (on the parts of enterprise representatives) not to draw attention to their own possibilities of intentional distortion of financial statements. Despite this, however, one can also observe that the respondents notice the widest space for distortion of accounting outputs in the areas of technical assessment of assets and reserves and in the area of fixing the moment of inventory activation.

Surveying in the area of creative accounting appears to be demanding and problematic, which has been confirmed by authors from the University of Arad, Romania (Cernusca et al., 2016). Their research is based on an investigation between students and an instructor in the field of accounting. Such research may provide data that are markedly subjective and not directly connected with business practice; on the other hand, it offers an independent view on the issue of creative accounting. The benefit of involving students as respondents is that they have no reason to cover the possibilities of distortion they sense.

The cited research led to the discovery which corresponds to our research. The authors of the article see room for further continuation of research in the possibility of conducting a similar investigation among students from the field of accounting at our university.

References


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BUSINESS MODEL FOR A SEA COMMERCIAL PORT AS A WAY TO REACH SUSTAINABLE DEVELOPMENT GOALS

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Abstract. The aim of the article is to suggest a monitoring tool for a business model to assess performance and meet sustainable development goals and indicators for the sea commercial ports. According to the 2030 Sustainable Development Agenda, building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation is one of the seventeen goals set forward. We assume that added value is the key aim of any business model creation, while business model itself is recommended to be based on multidimensional innovation and complementary assets of business. The multidimensional innovations include: market innovation, product innovation and process innovation. The introduction part here presents the description of the business model development roadmap. For the specific case of a trade port case the business model rests on four blocks: the system for added value generation, value suggestion, clients and financial model. The complementary assets’ list is presented for such a sea commercial port. Qualitative and quantitative indicators of the sea trade port business model performance are tracked down. Business model sustainable development for a sea commercial port is described. Value added is considered as the indicator of sustainable development on both micro- and macrolevels.

Keywords: business model, sustainable development goals, sustainable development indicators, added value, monitoring, ownership, commercial port

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JEL Classifications: L22, L24, L25

1. Introduction

Sustainable development goal indicators were introduced as a global framework consisting of seventeen goals and targets by the expert interagency group back in 2015 (Progress, 2016; Urbaniec, 2015). Goal 9 encompasses three important aspects of sustainable development: infrastructure, industrialization and innovation. Infrastructure provides the basic physical systems and structures essential for operation of the society or enterprises. Industrialization drives economic growth, creates job opportunities and thereby reduces poverty. Innovation advances the technological capabilities of industrial sectors and promotes the development of new skills, as reported by the UN Secretary General (Report, 2016) in the first annual report on the topic. Business model concept is one of the main inventions for business structure and one of the principles of sustainable foundation (Bilan, 2013; Tvaronavičienė, Černevičiūtė, 2015; Streimikiene et al., 2016; Mukhtar-...
va et al., 2016; Czyżewski et al., 2015; Simionescu et al., 2017; Čirjevskis, 2017; Hilkevics, Hilkevics, 2017).

Business model studies date back to the 1990s. Till nowadays the most influential theories were built by Osterwalder (2010), Slywotzky (2006), Kim, Chan, and Mauborgne (2014). The range of authors consider the external impacts of economic environment on contemporary business models. Bossidi, Charan (2007), Bereznoy (2014), Soolyatte (2010) were studying the way to adapt a business model to changing environment and introduce it as an innovative one. The attention of such scientists as Chesbrough (2007), Schweizer (2005), Debelak (2006) has been focused on classification and evolution of approaches to business models as well as on future forecasting, as in (Zott, Amit, Massa, 2011). One of the still unsolved task is introduction of a more practical approach to business models’ analysis.

The research is dedicated to the development of an experimental tool for assessing the functioning of a business model. A large number of today’s studies focus on the description of structural elements of the business models. However, there is a lack of precision in assessing the aggregate and/or intermediate results of the the business model functioning. These works take into account, in particular, the hypothesis of Battocchio A., Minatogawa V. in which they propose to combine the balanced system of indicators and a presentation method of the Kansas business model, thus leading to the construction of a roadmap. In a similar fashion, the authors suggest to build a tool for evaluating the financial structure of the business model. The business model is based on multidimensional innovation, the main purpose of its functioning is to create added value. Formation of a business model means not only unification of its key elements, concentrated around a successful business idea. Important factors in the development of any business-model are the mechanisms, methods and models for monitoring its further functioning. The bulk of the research is devoted to business models’ design, but not to the evaluation of the process of their operation. Therefore, the main research task here is developing an approach to monitoring the functioning of the business model.

To achieve this, a number of problems have been solved to answer the central research question – how to conduct a systematic evaluation of a business model, namely:

1. To form a roadmap for developing a business model.
2. To identify sources for value creation in the sea trade port.
3. To form a business model of the sea trade port taking into account the specifics of value added creation.
4. To present the approach to business model tracking in accordance with its financial structure using quantitative financial and economic indicators.
5. To develop a tool for business model tracking based on quality indicators. For this purpose, indicators will be associated with management tasks within the framework of the competitiveness model of the sea trade port and the impact of its sustainable development on the macroeconomic level.

2. Roadmap of the business model

The roadmap for developing a business-model is as follows:

1. Generation of business-ideas. The process of generation takes place on the components of the business-model.
2. Evaluation a business-idea. A typical evaluation report (see Figure 1) is a summary of the ideas; its short technical description; people who are behind the idea and their interests; novelty of the idea; vision of value: consumer and social benefits, for whom the valuable idea, the potential of the market, including the rough business model and cost-investment part; risk / cost analysis (what is needed in terms of attracting additional assets and what are the risks of their attraction).
Fig. 1. Business-idea evaluation algorithm

*Source: own development.*

The next steps that follow after evaluating an idea are checking its novelty, patent purity, the presence of market analogues, geographical constraints on the use of the idea, and other possible directions of development.

3. Business-model elements formation is presented on the figure 2.

**Fig. 2. Business-model visualization upon four blocks – Sea trade port case**

*Source: own development.*
Rothaermel, Hill Charles (2005) is concentrated in the technological discontinuities on the complementary assets perspective. Tripsas (1997) has made his input to prove the crucial role of the complementary assets while fighting the creative destruction. Pek-Hooi, Jiang (2010) described the complementary assets as a basis of business strategy. Abuzyarova (2015) describes the complementary assets as an effective tool for managing innovation projects. Buyanov (2014) uses the complementary assets for building the outsourcing model. While we are fixing the complementary assets as the basis of the business-model. The list of specialized complementary assets includes: reputation; brand; formed clusters; distribution network; specialists experience and qualification; expertise; sea port community; informative databases. Generic complementary assets are: infrastructure; equipment; control and checkpoint capacities (customs control); computer and automatization systems; social networks, ERP-networks; agreements with the state and municipality. Dolzhenkova and Kazakova (2015) introduced complementary and synergic approach to the innovative development of the social-economic systems. While Pastor-Agustín, Ramírez-Alesón and Espitia-Escuer (2011) looked to the relation of the complementary assets and investment decisions.

4. Generation of business model innovation. The structural elements of multidimensional innovation are food innovation, market innovation, and innovation of the business model itself. Formation of a business-model in the form of multidimensional innovation, which includes: innovation in market definition for the establishment of categories of competitors, including producers of goods-substitutes; product or service innovation; the innovation of a business model as a result of the impact of market and product innovation, which leads to a change in the form of a business model (See Figure 3).

Fig. 3. Business-model formation through multidimensional innovation

Source: own development.

6. Creation of the added value of the business model.

2. Value added in the sea trade port business-models

R. L. M.Vleugels proposed three approaches to determining the impact of the port on the economy:

1. Added value. It is proposed to calculate the aggregate value added created by all the enterprises or branches associated with the port. For this purpose, the added value is taken into account as equal to the sum of wages and gross profits.

2. Analysis of costs and output. This approach requires detailed data that is difficult to obtain in some countries.
3. Comparison of statistical data linking the port with the socio-economic well-being of the region (in particular, the share in GDP).

The sources of the added value generation are the process of manufacturing or providing services in the port. Generation of the added value in the ports of the fourth generation occurs in conditions of mixed cargo handling, complicated automation, complicated information, globalization of the port society and increased environmental control. Production characteristics are improved due to the emphasis on the quality of services, education of staff, while information technologies are becoming the decision-making factors. The business-model links the added value created through the commercialization of the market. There is a classification of ports according to their ownership or administration. The debate about the effectiveness of these forms attracts the attention of modern investors, government officials and academics. Typical port ownership forms are:

1) State property. It can be either full or partial.

2) Autonomous property, or management in the trust. This form of ownership was distributed before the privatization of the ports of Great Britain in the 1980’s. Trust is a quasi-managerial form of organization. It is a non-profit organization that performs unified administration of the functions of the allocated territory. In this way, the problem of fund insufficiency and certain restrictions is solved.

3) Municipal ownership form used in Rotterdam, Hamburg, Kobe and Yokohama. This form has a basic advantage – meeting the needs of the port through local cooperation. The municipality may also decide on port subsidies, because through the provision of competitive tariffs at the port and the promotion of trade, the overall welfare of the region increases. The main disadvantage is the lack of incentives for participation in national programs. The name “municipality” can change the significance of the port from the influence of the city’s image.

4) Ports of private property. Privatization may lead to redistribution of port property for new use, increase capital value of ports and stimulate the local economy. However, there are studies (Alderton, 2008), which indicate that expectations of significant competition, investment inflow and overall improvement in commercial efficiency are not the result of privatization.

5) The form of ownership of any modern port can be a combination of these four types. An example of the spread of this approach is Landlord, which in translation means the land feudal lord. In it the state owns land and approaches to the port, and it gives the terminals leasing stevedores. The state provides infrastructure, while the tenant is a superstructure (cranes, overload equipment). The port that provides both the infrastructure and the superstructure at the same time relates to the instrumental type of port (Alderton, 2008). Ports that provide not only infrastructure and superstructure, but also all types of ship and cargo services are known as Service Ports. Numerous state ports are now abandoning the service port model. However, it is known that this model was inherent to the port of Singapore until 1997, when it turned into a private company. At that time, the state port of Singapore was considered the most efficient port in the world. Today, the port authority is a widespread form of port control, which operates in accordance with their charter (see Table 1).

<table>
<thead>
<tr>
<th>Port type</th>
<th>Infrastructure</th>
<th>Superstructure</th>
<th>Stevedoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landlord</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Instrumental port</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Service port</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Table 1. Port authority responsibility*

*Source: Alderton (2008).*

Another alternative of management is contractual. It occurs when a private investor builds the capacity at the port, for some time operate on them and transfer it to the state in due time. This approach allows playing a very important role for private business in shaping and developing port facilities. An example is the Jawaharlal Nehru Port Trust Indian Port (JNPT), which signed an agreement to build a six hundred meter berth for container reloading for thirty years.
Emerging countries implement a corporate or management contract method. In the case of the sale of land and superstructure in ports it is difficult to identify long-term sales advantages compared to the model of the “landlord”, especially considering that such land will be sold at a low running price. An interesting alternative is the experience of the Sullom Voe harbor. Its owner is a city council, but the terminals are owned by thirty companies of the oil industry, which are operated by British Petroleum.

3. Quantitative monitoring of the sea trade port business model

Business-model of the company acts as a potential generator of cash flows, which affects the market value of the organization. At the same time, the company itself creates some internal factors of the model, the result of which is measured by the return on equity (Return On Equity, ROE). Therefore, on the basis of this indicator, you can analyze and assess the business-models of the company. Return on equity will be presented in the form of a three-factor model of DuPont (Du Pont model). Let’s explain that this model represents an algorithm that forms the basis of DuPont system of financial analysis, according to which ROE is calculated as a ratio of net profit to equity. In this way, the ROE model will allow a detailed analysis of the financial and economic activity of the enterprise (see Table 2).

### Table 2 Quantitative monitoring of the sea trade port business model, Ukrainian port Oktyabrsk, thous. UAH

<table>
<thead>
<tr>
<th>№</th>
<th>Indicator</th>
<th>Abbreviation</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Net sales income (for products, jobs, services)</td>
<td>NS</td>
<td>249 779</td>
<td>434 874</td>
<td>395 260</td>
</tr>
<tr>
<td>2</td>
<td>Gross profit</td>
<td>GP</td>
<td>70 658</td>
<td>235 329</td>
<td>179 601</td>
</tr>
<tr>
<td>3</td>
<td>Profit before taxation and credit payments</td>
<td>EBIT</td>
<td>61 510</td>
<td>229 399</td>
<td>163 545</td>
</tr>
<tr>
<td>4</td>
<td>Profit before taxation</td>
<td>PBT</td>
<td>62 322</td>
<td>230 082</td>
<td>164 058</td>
</tr>
<tr>
<td>5</td>
<td>Net profit</td>
<td>NP</td>
<td>48 191</td>
<td>187 400</td>
<td>132 236</td>
</tr>
<tr>
<td>6</td>
<td>Cash funds</td>
<td>CF</td>
<td>62 084</td>
<td>129 671</td>
<td>87 146</td>
</tr>
<tr>
<td>7</td>
<td>Receivables</td>
<td>R</td>
<td>21 990</td>
<td>18 533</td>
<td>72 440</td>
</tr>
<tr>
<td>8</td>
<td>Stocks</td>
<td>S</td>
<td>17 647</td>
<td>25 737</td>
<td>21 007</td>
</tr>
<tr>
<td>9</td>
<td>Other current assets</td>
<td>OCA</td>
<td>903</td>
<td>636</td>
<td>827</td>
</tr>
<tr>
<td>10</td>
<td>Fixed assets</td>
<td>FA</td>
<td>265 194</td>
<td>282 410</td>
<td>273 082</td>
</tr>
<tr>
<td>11</td>
<td>Other non-current assets</td>
<td>ONCA</td>
<td>7 842</td>
<td>59 623</td>
<td>84 614</td>
</tr>
<tr>
<td>12</td>
<td>Loan capital</td>
<td>LC</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>Equity</td>
<td>E</td>
<td>343 251</td>
<td>466 466</td>
<td>489 863</td>
</tr>
<tr>
<td>14</td>
<td>Interest-free liabilities</td>
<td>IFL</td>
<td>32 409</td>
<td>50 144</td>
<td>52 098</td>
</tr>
</tbody>
</table>

Source: Vashakmadze (2012).

Indicators and calculation formulas for the 12 factor decompositions of the return on equity are presented in Table 3.

### Table 3. Twelve factors decomposition of the Ryton on Equity (ROE) as a financial business-model structure

<table>
<thead>
<tr>
<th>№</th>
<th>Indicator</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gross margin,%</td>
<td>GP / NS</td>
</tr>
<tr>
<td>2</td>
<td>Effect from commercial and managerial costs</td>
<td>EBIT / GP</td>
</tr>
<tr>
<td>3</td>
<td>Effect from financial activity</td>
<td>PBT / EBIT</td>
</tr>
<tr>
<td>4</td>
<td>Tax effect</td>
<td>NP / PBT</td>
</tr>
<tr>
<td>5</td>
<td>Cash funds management, days</td>
<td>CF x 365 / NS</td>
</tr>
<tr>
<td>6</td>
<td>Receivables management, days</td>
<td>R x 365 / NS</td>
</tr>
<tr>
<td>7</td>
<td>Stock management, days</td>
<td>S x 365 / NS</td>
</tr>
<tr>
<td>8</td>
<td>Other current assets management, days</td>
<td>INCA x 365 / NS</td>
</tr>
<tr>
<td>9</td>
<td>Fixed assets management, days</td>
<td>FA x 365 / NS</td>
</tr>
</tbody>
</table>
An analysis of the financial structure of the business model for the Canvas elements is possible by the following indicators (see Table 4).

Table 4. Financial structure of the business-model

<table>
<thead>
<tr>
<th>№</th>
<th>Business-model elements under Canvas</th>
<th>ROE decomposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Key partners and stakeholders</td>
<td>Gross margin, %</td>
</tr>
<tr>
<td>2</td>
<td>Key activity</td>
<td>Effect from commercial and managerial costs</td>
</tr>
<tr>
<td>3</td>
<td>Value proposition</td>
<td>Effect from financial activity</td>
</tr>
<tr>
<td>4</td>
<td>Customer relationship</td>
<td>Receivables management, days</td>
</tr>
<tr>
<td>5</td>
<td>Customer segment</td>
<td>Debt load</td>
</tr>
<tr>
<td>6</td>
<td>Key resources</td>
<td>Stock management, days</td>
</tr>
<tr>
<td>7</td>
<td>Channels</td>
<td>Other non-current assets management, days</td>
</tr>
<tr>
<td>8</td>
<td>Cost structure</td>
<td>Tax effect</td>
</tr>
<tr>
<td>9</td>
<td>Revenue stream</td>
<td>Cash funds management, days</td>
</tr>
</tbody>
</table>

Source: own development.

The method of decomposition is a tool for evaluating the financial results of the enterprise. However, it does not include non-financial measurements of enterprise development, such as consumer satisfaction, internal business processes, training and growth of the corporation. The figure shows the mutual relationships between elements of the business model and the financial dimensions of ROE.

Factors that may or may hinder the development of the port’s business-model are the following (Alderton, 2008):
- changes in the internal transport infrastructure. For example, the development of the railway infrastructure leads to an increase in large ports, and a decrease in the loading of small ones. Motorways, on the contrary, promote the revival and development of small ports. This makes shipowners access to the port better. At the same time, the attraction of large container vessels encourages the growth of large ports.
- changes in trading models related to government trade agreements. Such agreements and regimes should be analyzed in terms of the strategy of attracting ports and the impact on their download.
- changes in financial and logistics considerations. Ports can be considered storage sites and as industrial zones. Recently there are many proposals for the creation of value added ports through their services. Ports can become promising distribution and marketing centers, such as the Habourg or Bremen (Alderton, 2008).
- the life cycle of the port can approach the infinity, measured for centuries. For this purpose, ports should take into account the trends of modernity and carry out reconstruction and reorganization.
- labor, in particular, an increase in the automation of service processes leads to unemployment and strikes. Necessary strategy of harmonization of robotizing processes.
- exceptional bad weather also damaged many ports, many of which were insured and could not find the necessary capital to repair damage.
- changes in the technology of movement of cargoes requiring necessary investments. In particular, you may need to invest in terminals to find guts after changing the policy of placing goods from pipelines in some areas.
Indicators that can be considered for improving port management include: reducing the cost of repairs, maintenance and administrative costs; increase of container tonnage; salary increase for staff; shorter downtime of ships in the port; increasing port loading in the form of increasing the number of working hours per day, as well as increasing the speed of handling containers and cargoes.

In accordance with the adapted model of port competitiveness Porter Diamond, competitiveness is a system with elements that mutually reinforce each other in creating industry competitiveness. In this case, the elements are mutually dependent because the state of one affects the state of another. Porter believes that the two final factors that influence success are the chance and the government. Competitive factors are the factors of production itself, more precisely: labor, land, natural resources, capital, and infrastructure. However, the main decisive in the formation of competitive advantages is the technological know-how (see Fig. 4).

A SWOT analysis can be a useful and commonly used analysis tool for assessing port development potential. Its typical elements are (Alderton, 2008):
- maritime accessibility, availability of depth and position on the main trade routes;
- the amount of transhipped cargo that the port can attract, and the capacity for storage;
- logistics, which provides added value and availability to industrial producers;
- activity of transport agencies and distribution networks of goods;
- well-trained labor force and efficient service companies;
- technologies and communication systems;
- the state of internal and external competition;
- presence and influence of port administrations;
- costs.

Fig. 4. Model of port competitiveness

Source: Alderton (2008)
4. Qualitative monitoring of the sea trade port business model

The correspondence of the sea trade port business-model to the goal 9 from the list of sustainable development goals in order to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation should meet the following targets and indicators (see Table 5).

Table 5. Business-model track for correspondence to sustainable development indicators

<table>
<thead>
<tr>
<th>Sustainable Development Target</th>
<th>Monitoring Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all</td>
<td>1.1 Share of the rural population who live within 2 km of an all-season road</td>
</tr>
<tr>
<td></td>
<td>1.2 Passenger and freight volumes, by mode of transport</td>
</tr>
<tr>
<td>2. Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry’s share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries</td>
<td>2.1 Manufacturing value added as a percentage of GDP and per capita</td>
</tr>
<tr>
<td></td>
<td>2.2 Manufacturing employment as a percentage of total employment</td>
</tr>
<tr>
<td>3. Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities</td>
<td>3.1 Percentage of medium and high-tech industry value added in total value added</td>
</tr>
<tr>
<td>4. Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020</td>
<td>4.1 Percentage of population covered by technology</td>
</tr>
</tbody>
</table>


Qualitative monitoring of modern port business-models may be carried out from the point of view of importers and exporters according to the following criteria for port selection (see Table 6):

Table 6. Qualitative indicators of the sea trade port business-model track

<table>
<thead>
<tr>
<th>№</th>
<th>Business-model elements under Canvas</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Key partners and stakeholders</td>
<td>Intermodal links</td>
</tr>
<tr>
<td>2</td>
<td>Key activity</td>
<td>Tracking systems; container facilities; consolidation services; heavy lift services; marshalling yards; bulk facilities; cold storage facilities</td>
</tr>
<tr>
<td>3</td>
<td>Value proposition</td>
<td>Road and rail services; custom handling; port security; port equipment.</td>
</tr>
<tr>
<td>4</td>
<td>Customer reationship</td>
<td>Number of sailings</td>
</tr>
<tr>
<td>5</td>
<td>Customer segment</td>
<td>Port size, proximity of the port</td>
</tr>
<tr>
<td>6</td>
<td>Key resources</td>
<td>Warehousing</td>
</tr>
<tr>
<td>7</td>
<td>Channels</td>
<td>Logistics forecasting</td>
</tr>
<tr>
<td>8</td>
<td>Cost structure</td>
<td>Interrelation to added value</td>
</tr>
<tr>
<td>9</td>
<td>Revenue stream</td>
<td>Port charges; inland freight rates</td>
</tr>
</tbody>
</table>

Source: own development based on Alderton (2008)

Although decision on the choice of port is taken by the consumer himself, his decision is influenced not only by the desire of the suppliers, but also the services offered as substitutes by other modes of transport, except for the sea. Strategic study conducted at Port Rotterdam proved that the most important factors when deciding on the choice of ports are: costs, service and movement of goods. Costs must be competitive and low for freight. The service must be reliable, fast, provide good communication and numerous departures and low traffic congestion. The movement of goods must be effective in terms of association with other modes of transport and intermodal communication.
Conclusions

The roadmap for developing a business model consists of: the process of generating a business idea on the components of the business model; the process of evaluating a business idea before its introduction; direct formation of elements of a business model; identification of complementary assets; generating business model innovation in the form of multidimensional innovation; creation of added value in business model.

The port management process is influenced by: local authorities, customers (shippers), pressure groups, trade unions, international norms, trade agreements, shipowners, competition, corruption, government.

The financial structure in which it is possible to monitor the business model is the decomposition of the return on equity.

It is recommended to monitor the business model of the sea trade port on quality indicators by means of correlation with the management tasks of the port in order to improve its competitive positions. The assessment of competitive positions is based on the criteria of port selection (port departure, internal freight rates, proximity of the port, port overload, intermodal connections, port equipment, port charges, customs clearance, port security) and port service criteria (road and rail services, accommodation for containers; systems of tracking; warehousing; consolidation services; heavy lifting services; sorting platforms; the possibility of processing bulk cargoes; storage possibilities in cooling conditions).

On the basis of conducted theoretical research we identify the perspective direction of the business-model sustainable development depending on the ownership and management structure based on the multidimensional innovation generation with the value added source and complementary assets basis for the sea commercial port (see Table 6).

<table>
<thead>
<tr>
<th>№</th>
<th>Port characteristics</th>
<th>Port type</th>
<th>Landlord</th>
<th>Instrumental port</th>
<th>Service port</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Market innovation</td>
<td>tax windows</td>
<td>replacement of the crew of the vessels</td>
<td>cruises and yachting services</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Product innovation</td>
<td>organization of excursions to the port</td>
<td>the speed of cargo handling and the documentation in terms of cost minimization</td>
<td>delivery of a sea pilot to a vessel from a helicopter or a boat</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Business-model innovation (process innovation)</td>
<td>redistribution of energy resources at the port entrance</td>
<td>hub model for port</td>
<td>conducting environmental audit</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Budget-generating port service (value added generation)</td>
<td>vessels traffic service, the provision of emergency and rescue works, navigational and hydrographic and mapping of navigation, ensuring prevention and elimination of pollution of contaminated substances</td>
<td>carrying out cargo operations, including carrying out loading and unloading operations</td>
<td>service of ships and passengers</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Priority of management aim</td>
<td>the increase of paid taxes, the level of employment of the population</td>
<td>increase in cargo turnover</td>
<td>improving the quality of transport services, increasing the number of tourists.</td>
<td></td>
</tr>
</tbody>
</table>

Source: own development.

The targets of the sustainable development Goal 9. “Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation” for the sea commercial ports should be achieved through the business-model construction and be in progress as follows:

1. Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all covered by product innovation.
2. Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry’s share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries covered by budget-generating port service (value added generation).

3. Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities covered by market innovation.

4. Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020 covered by business-model innovation (process innovation).

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INFORMATION SYSTEMS FOR SUSTAINABLE PERFORMANCE OF ORGANIZATIONS

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Abstract. Since the mid-1990s, enterprise resource planning (ERP) information systems have been installed in thousands of companies worldwide. A growing number of studies and research papers show that information systems have a significant role in the sustainable economic development assuring economic competitiveness. Modern enterprise performance management shares a strong strategic and sustainable orientation of management focused on further strategic growth and business development with parallel use of information and all highly sophisticated knowledge resulting from modern enterprise information technology. The paper focuses on research findings related to information processes and their impact on overall entrepreneurship performance. The most important results show that the companies from the selected industrial segments in Slovakia have a strong focus on the application of innovation procedures and specific business information systems. The results bring the findings that business intelligence (BI) is based on information and knowledge with a high added value has a positive long-term and sustainable effect on the overall entrepreneurship performance. By application of selected management tools such as ERP, BI information systems and others, it can be achieved a higher entrepreneurship performance of industry companies in Slovakia and EU. We believe that our study presented in this paper contributes to explore a new dimension to the existing view on business information systems in industrial companies. More detailed research results are presented in this paper.

Keywords: sustainability, sustainable performance management, information system, innovation

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JEL: M21, M15

1. Introduction

Today, innovation is increasingly complex, fast, interactive, and requires the access to external and internal knowledge in order to develop new or significantly improved good and service (Prause, 2015). Innovation is known to be one of the keys to an enterprise success. Knowledge creation and dissemination, as well as innovation, are keys to promotion of competitiveness (Aleksejeva, 2016; Tvaronavičienė et al. 2016; Čirjevskis, 2016).
Higher-quality, lower-cost information is a key to unlocking more sources of finance for SMEs (Belás et al., 2016). Many companies continue to increase their investment in implementing various types of information systems, such as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM) and Business Intelligence (BI). These solutions for decision-making support are based on the Integrated MIS, including specialized Business intelligence modules which are aimed to provide support in the decision-making process of the management (Tutunea & Rus, 2012). Most of the above progressive methods of entrepreneurship performance management shares a strategic and sustainable orientation focused on further strategic development with parallel use of highly sophisticated knowledge resulting from information technologies such as BI, or Big Data Analytics.

The aim of this paper is to identify the relationship between selected management tools such as information systems and others to overall business performance in industry companies in Slovakia. Based on the research results, we can conclude that the subjected area of research in terms of businesses Slovak industry is extremely important for enhancing companies’ performance (Rajnoha, Novák & Merková, 2016). By application of selected management tools such as ERP, CRM and Business Intelligence IS and others, it can be achieved a higher performance of enterprises. More detailed research results are presented in the following sections of this paper.

2. Literature review

The current time puts high demands on managers, as well as other employees, forcing them to think about how best to optimize business processes. Innovation and entrepreneurship are becoming key concepts for economic sustainable development in today’s complex and dynamic business world (Rosha & Lace, 2015). Today, the sustainable and secure development has become an actual and urgent matter in many countries around the world (Korauš et al., 2016; Kriviņš, 2015; Belás et al., 2016). Innovation is a perfect space, because its outputs affect the sustainability of the company and from the perspective of the customer as well as the owners of the company (Chromjaková & Rajnoha, 2009; Čirjevskis, 2016; Illmeyer et al., 2017). Innovation by Chromjaková and Rajnoha (2009) may be a strategic, it may be focused on new product development, and innovative approach to problem solving, innovation can be identified as the process of generating and implementing ideas. Innovation is understood as the result of interaction between various economic and social processes (Manley, 2003). Studies published in the last decade showed that innovation is the engine of the growth, being an important element of the development achievements (Szabo, Šoltész, & Herman, 2013; Chernov, Dorokhova & Dorokhov, 2016). Innovation activities play an important role in economic growth and can be considered as the engine of sustainable development of economies (Juřičková & Novák, 2015; Belás & Gabčová, 2016; Rosha & Lace, 2015; Čirjevskis, 2016; Tvaronavičienė, 2017; Tetsman et al., 2017; Oganisjana et al., 2017).

These activities are influenced by many factors that have mostly synergy effects and work on process and final product level. The premise is that more factors enter the innovation process and are necessary for successful innovation performance. It is necessary to analyse more factors in detail and complexity and include other factors entering innovation such as investment in research and development, human capital represented by number of researchers, the role of information technologies in the twenty first century, etc. (Juřičková & Novák, 2015; Ignatavičius et al., 2015; Tvaronavičienė, M.; Černevičiūtė, 2015; Akhter, 2017).

Since the mid-1990s, ERP have been installed in thousands of companies worldwide. ERP systems are enterprise-wide on-line interactive systems that support cross-functional processes using a common database. ERP systems were designed to provide, at least in theory, seamless integration of processes across functional areas with improved workflow, standardization of various business practices, and access to real-time up-to-date data (Mabert, Ashok, & Venkataramanan, 2003). Enterprise resource planning information systems (ERP) are highly complex business information systems. The implementation of these systems requires a high cost, corporate time and resources (Umble, Haft, & Umble, 2003). Organizations continue to increase their investment in implementing various types of information systems, such as ERP, SCM, BI or CRM, because these investments will lead to higher employees’ productivity (Hou, 2012). The commercially available ERP information system promise seamless integration of all information flows in the company (Tuček, Tučková, & Zámečník, 2009).
High dynamic environment significantly affects the overall efficiency and so also the competitiveness of companies. Competitive advantage comes from the ability of an organization to compete in new technologies and markets where flexibility, autonomy, and experimentation are needed (O’Reilly & Tushman, 2013; Čirjevskis, 2016). One of the conditions to maintain the sustainable competitiveness and performance of the company is the ability to work with information not only about past and present but especially about the future. Management of “todays” company is constantly forced to look for additional useful information especially about the future development. This task is currently being performed by ERP systems of II. development type based on BI - Business Intelligence information systems – Fig. 1 (Basl & Blažiček, 2008).

![Figure 1. Advanced enterprise information systems ERP II - Business Intelligence.](source: Basl & Blažiček, 2008)

Typical BI application scopes include: ERP, CRM, HRM (Human Resource Management), SCM and E-business (Li, Shue, & Lee, 2008). These systems convert and store the data in their databases; therefore, they can be used as a pool of data to support decisions and explore applicable knowledge. BI is often used to refer to relevant information of internal and external business environment and also refer to an organized and systematic process acquiring, analyzing and disseminating information for decision making (Lönnqvist & Pirttimäki, 2006). Building of comprehensive information, and information about the historical implications, events, interesting details and attractiveness directly in visited sites and destinations should be part of strategic communication (Štefko, Kiráľová & Mudrík, 2015). The significance of online marketing is currently increasing, as we can observe changes in the ways people communicate and also in the ways they spend their free time (Štefko, Fedorko & Bačík, 2015). ERP implementation in middle and large companies always takes several years and the whole process requires human, financial, material and other resources. Therefore, it is advisable to use project-based management approach when implementing ERP systems in companies (Rajnoha et al., 2014). An ERP system integrates core corporate activities and diverse functions, such as accounting, management of customer information, finances, human resources, supply chain, etc., by incorporating best practices to facilitate rapid decision-making, cost reduction, and greater managerial control (Wu & Wang, 2007). A lot of work has been already done to identify and classify the costs and benefits of ERP, including both the implementation and post-implementation stages (Hitt et al., 2002; Rajnoha et al., 2014). Also, the aspect of the success or failure of ERP has been widely analyzed (Wu & Wang, 2007; Rajnoha et al., 2014), resulting in the development of approaches that reduce the risk failure of an ERP implementation (Ram & Corkindale, 2014; Rajnoha et al., 2014). However, studies of the financial impact of ERP adoption suggest that benefits are uneven. On the positive side, event history analyses have found positive abnormal stock returns for firms using ERP (Stratman, 2007). Hitt, Wu, and Zhou (2002) also found evidence of improved financial performance immediately after ERP implementation. Survey data from North American manufacturing firms that have implemented ERP systems demonstrate that ERP adopters seeking operational performance improvements are likely to realize these benefits (Stratman, 2007). Also other international research studies have found clear improvements in operational metrics as a result of ERP implementation (McAfee, 2002; Cottelee, 2006).
Implementing a new information system is not always to the benefit of a company. The success of system implementation is dependent on many factors. When a business implements ERP in its drive to become more efficiently interconnected, risks arise from the new technology, which is loaded with uncertainties that evolve over time and cannot be fully known when making decisions (Wu, Ong, & Hsu, 2008). A major problem with ERP implementation process is that very few threat and risk of implementation failures are recorded in the literature, perhaps because few companies wish to publicize their implementation failures (Hakim & Hakim, 2010). The primary task of an integrated system is to maintain the data flow of an organization and to reduce data redundancy. In recent years, the advancement of information technology in business management processes has placed ERP systems as one of the most widely implemented business software platforms in various enterprises. ERP systems have the potential to integrate seamlessly organizational processes using common shared information and data flows (Relich, 2013).

The current research in the computer systems and Information technology predetermine Cloud Computing as the more effective solution in terms of effective application of BI to Enterprise (Chen, Chiang, & Storey, 2012; Rajnoha et al., 2016). BI applications allowed managers to acquire useful knowledge from the data by means of a variety of technologies, such as data warehousing, data mining, business performance management, OLAP, periodical business reports, Big Data Analytics.

3. Analysis about usage of ERP in EU countries

In recent years enterprises in the EU countries were invested a lot of financial resources into the implementation of ERP information systems. The Table 1 presents the usage of ERP IS by large enterprises (without financial enterprises) in selected EU countries in years 2012 – 2015.

The statistical results (Table 1) show that the highest rate of usage of ERP in the year 2015 is related to the large enterprises (more than 250 employees) from Germany (93 %), Austria (93%), Denmark (92%), Portugal (92%) and Slovenia (92%). The lowest rate of ERP implementation was achieved in EU countries such as Greece (59%), Romania (60%), Bulgaria (61%), United Kingdom (63%), Estonia (63%), Latvia (63%) and Ireland (64%). The highest rate of usage of ERP in V4 countries achieves Poland (83%), followed by Czech Republic (82%), Slovakia (71%) and Hungary (69%). The average rate of ERP use in European Union (28 countries) was 80% (2015).

<table>
<thead>
<tr>
<th>Country</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Union (28 countries)</td>
<td>68</td>
<td>73</td>
<td>76</td>
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<tr>
<td>Belgium</td>
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<td>86</td>
<td>92</td>
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<tr>
<td>Germany</td>
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<td>82</td>
<td>84</td>
<td>93</td>
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<td>63</td>
</tr>
<tr>
<td>Ireland</td>
<td>61</td>
<td>68</td>
<td>65</td>
<td>64</td>
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<tr>
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<td>82</td>
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<td>63</td>
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<td>79</td>
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<td>France</td>
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<tr>
<td>Netherlands</td>
<td>72</td>
<td>75</td>
<td>81</td>
<td>80</td>
</tr>
</tbody>
</table>
The statistical results about use of ERP in the year 2015 related to the medium enterprises (50-249 employees) are reflected in Table 2. The average rate of ERP use in European Union (28 countries) was only 60% (2015). The highest and above average rate of usage of ERP in EU countries achieves Germany (80%), followed by Cyprus (75%), Portugal (75%), Belgium (74%), Denmark (74%), and Austria (70%). The lowest rate of ERP implementation was achieved in EU countries such as Latvia (28%), Romania (33%), United Kingdom (39%), Estonia (40%), Bulgaria (41%), Malta (41%) and Ireland (42%). The highest rate of usage of ERP in V4 countries achieves Czech Republic (58%), followed by Slovakia (48%), Poland (47%) and Hungary (36%).

Table 2. EU medium enterprises that have implemented ERP information system (in %)

<table>
<thead>
<tr>
<th>Country</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Union (28 countries)</td>
<td>44</td>
<td>49</td>
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<tr>
<td>Belgium</td>
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<td>Ireland</td>
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<td>Greece</td>
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<td>-</td>
<td>-</td>
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<tr>
<td>Spain</td>
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</tr>
<tr>
<td>France</td>
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<td>61</td>
<td>67</td>
</tr>
<tr>
<td>Croatia</td>
<td>31</td>
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<td>-</td>
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<td>Cyprus</td>
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<td>Netherlands</td>
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</tr>
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<td>Austria</td>
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<td>70</td>
<td>70</td>
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<td>Poland</td>
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<td>Norway</td>
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<td>49</td>
<td>57</td>
<td>54</td>
</tr>
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</table>

Source: Eurostat, 2016
4. Research sample and methodology

The useful data and information we have obtained with help of an extensive questionnaire survey. We have asked 1,457 chosen businesses, representing various industries in Slovakia. The particular data about the primary database of 1,457 enterprises were received from information of various industrial associations. The questionnaires were correctly responded by 164 enterprises. We consider the size of the research sample sufficiently representative and this was 11.26% share of the total number of companies surveyed. The Figure 2 shows the survey sample in terms of size of company. The large and medium enterprises formed 40.3% share. Micro and small enterprises accounted for 59.7% share of the research sample.

![Survey sample in terms of size of company](image)

*Figure 2. Survey sample in terms of size of company*

*Source: own*

The greatest extent was represented by businesses of engineering, wood and automotive industries. In order to identify and analyze the parameters for business performance management, a key issue was the size of Return on equity (ROE). Based on this, we have incorporated enterprises in various performance categories with six scaled intervals. The differentiation of enterprises into the performance groups is shown in Figure 3.

![The enterprise categorization into the performance groups](image)

*Figure 3. The enterprise categorization into the performance groups*

*Source: own*

The results obtained by questionnaire survey were processed by statistical methods. Selected variables were processed by descriptive statistics. For one variable (frequency, relative proportions) we have used mainly Chi-square test of independence. It is used to test the categorical variable weather there is a relationship between
these variables or not. In analyzing this relationship, we started from Pivot Tables and Pivot coefficients. For the analysis of the difference between observed (empirical) and expected (theoretical) frequency, we used the Pearson chi-square test. Besides this, we also used a similar M-V chi-square test, which is based on the theory of maximum likelihood that is used in the case that there is a real dependence between variables. If the value corresponds to the chi-square probability \( p > 0.05 \), this means that the relationship between variables is not statistically significant, and vice versa, if \( p \leq 0.05 \), it is possible strong relationship between two variables tested using one of the contingency factors. The Phi coefficient determines the degree of correlation between two categorical variables for 2x2 tables. Its value ranges from -1 to 1 (total dependence) or 0 (variables are not correlated with each other). The hypothesis was verified at 5% significance level (\( \alpha = 0.05 \)).

In the research we have set these three research hypotheses:

**H 1:** Companies with a higher about average value of ROE use specialized MIS type CRM (Customer Relationship Management).

**H 2:** We assume that if enterprises only use the ERP information system, they achieve significantly a poorer performance compared to enterprises using a specialized managerial information system support type CRM.

**H 3:** Enterprises with a higher size of ROE use specialized knowledge-based IS type Business Intelligence.

5. **Research findings**

5.1. **The use of ERP information systems in Slovakia and EU countries**

The Table 3 and Figure 4 show the level of use of ERP information systems in small, medium and large enterprises in Slovakia and other EU countries in years 2012 - 2015.

Table 3. The level of ERP implementation in Slovakia and EU 28 countries (in %)

<table>
<thead>
<tr>
<th>Year Country</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Large enterprises</strong> (without financial sector)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>European Union (28 countries)</td>
<td>68</td>
<td>73</td>
<td>76</td>
<td>80</td>
</tr>
<tr>
<td>Slovakia</td>
<td>62</td>
<td>64</td>
<td>69</td>
<td>71</td>
</tr>
<tr>
<td><strong>Medium enterprises</strong> (without financial sector)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>European Union (28 countries)</td>
<td>44</td>
<td>49</td>
<td>54</td>
<td>60</td>
</tr>
<tr>
<td>Slovakia</td>
<td>34</td>
<td>44</td>
<td>46</td>
<td>48</td>
</tr>
<tr>
<td><strong>All enterprises</strong> (10 persons employed or more) - without financial sector</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>European Union (28 countries)</td>
<td>23</td>
<td>27</td>
<td>32</td>
<td>36</td>
</tr>
<tr>
<td>Slovakia</td>
<td>20</td>
<td>31</td>
<td>29</td>
<td>31</td>
</tr>
</tbody>
</table>

*Source:* Eurostat, 2016
From Table 3 and Figure 4 we can conclude, that the rate of use of ERP systems in EU enterprises and also in Slovakia in the last period of years 2012-2015 continues to grow up. Also, it can be observed the fact that the use of ERP is higher in medium and especially in large enterprises. Slovak medium and large enterprises achieve a lower level of use than other EU enterprises. In the category “All enterprises” (10 employed persons or more) is the rate of use the lowest and the difference between EU and Slovakia enterprises is moderate. In recent years 2013 - 2015 ERP information system has been implemented approximately only in 30% of Slovak enterprises. In our own research sample (N=164 enterprises), ERP IS was used by 56 enterprises, so the rate of use accounted for 34%. This rate is slightly higher, because in our survey sample was also micro sized enterprises (to 10 employees), that accounted for 29.9% share of the sample. These enterprises use ERP only quite rarely, so our own research sample was absolutely correct even in comparison to European Eurostat statistics.

5.2. The impact of ERP and MIS on business performance of industrial firms in case of Slovakia

In presenting results we focused on statistically significant dependence (p-value < 0.05, which is the alpha level associated with a 95% confidence level). On the base of our research we can conclude, that the basic information system ERP affects the business performance of the firm. However, the residue levels (Table 4) lead us to the conclusion that companies using only a basic ERP IS most often reach a negative or very low ROE of levels below 2%.

<table>
<thead>
<tr>
<th>The basic ERP information system</th>
<th>Group 1 Poor performance (ROE &lt;0, 0-2%)</th>
<th>Group 2 Medium performance (ROE 2-4%, 4-7%)</th>
<th>Group 3 High Performance (ROE 7-10%, above 10%)</th>
<th>Row totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>We do not use ERP</td>
<td>39</td>
<td>48</td>
<td>21</td>
<td>108</td>
</tr>
<tr>
<td>We use ERP</td>
<td>33</td>
<td>13</td>
<td>10</td>
<td>56</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>61</td>
<td>31</td>
<td>164</td>
</tr>
</tbody>
</table>

The observed frequency

<table>
<thead>
<tr>
<th>The basic ERP information system</th>
<th>Group 1 Poor performance (ROE &lt;0, 0-2%)</th>
<th>Group 2 Medium performance (ROE 2-4%, 4-7%)</th>
<th>Group 3 High Performance (ROE 7-10%, above 10%)</th>
<th>Row totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>We do not use ERP</td>
<td>47.41463</td>
<td>40.17073</td>
<td>20.41463</td>
<td>108.0000</td>
</tr>
<tr>
<td>We use ERP</td>
<td>24.58537</td>
<td>20.82927</td>
<td>10.58537</td>
<td>56.0000</td>
</tr>
<tr>
<td>Total</td>
<td>72.00000</td>
<td>61.00000</td>
<td>31.00000</td>
<td>164.0000</td>
</tr>
</tbody>
</table>

Expected frequency

<table>
<thead>
<tr>
<th>The basic ERP information system</th>
<th>Group 1 Poor performance (ROE &lt;0, 0-2%)</th>
<th>Group 2 Medium performance (ROE 2-4%, 4-7%)</th>
<th>Group 3 High Performance (ROE 7-10%, above 10%)</th>
<th>Row totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>We do not use ERP</td>
<td>-8.41463</td>
<td>7.82927</td>
<td>0.585366</td>
<td>0.00</td>
</tr>
<tr>
<td>We use ERP</td>
<td>8.41463</td>
<td>-7.82927</td>
<td>-0.585366</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>0.00000</td>
<td>0.00000</td>
<td>0.00000</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Observed minus the expected frequencies (residue)

Source: own
The application of the CRM information system was shown as statistically significant, but residue levels (Table 5) show that companies that apply the CRM information system typically achieve a negative or very low performance level of only up to 2%.

### Table 5. CRM Information System x performance – Frequency

<table>
<thead>
<tr>
<th>CRM information system</th>
<th>Group 1 Poor performance (ROE &lt;0, 0-2%)</th>
<th>Group 2 Medium performance (ROE 2-4%, 4-7%)</th>
<th>Group 3 High performance (ROE 7-10%, above 10%)</th>
<th>Row Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm does not use CRM</td>
<td>62</td>
<td>57</td>
<td>31</td>
<td>150</td>
</tr>
<tr>
<td>Firm uses CRM</td>
<td>10</td>
<td>4</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>61</td>
<td>31</td>
<td>164</td>
</tr>
</tbody>
</table>

The observed frequency

<table>
<thead>
<tr>
<th>CRM information system</th>
<th>Firm does not use CRM</th>
<th>Firm uses CRM</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed</td>
<td>65.85366</td>
<td>6.14634</td>
<td>72.00000</td>
</tr>
<tr>
<td>Expected</td>
<td>65.79268</td>
<td>5.20732</td>
<td>61.00000</td>
</tr>
<tr>
<td>Residue</td>
<td>-0.06082</td>
<td>-0.93972</td>
<td>0.00000</td>
</tr>
</tbody>
</table>

Source: own

The implementation of a knowledge Business Intelligence information system shows a statistically significant dependence. Residue levels (Table 6) suggest that if companies do not have a BI system in place and do not consider implementing it, the companies tend to reach a lower performance. The enterprises that currently use a BI achieve a better performance, with ROE over 4%.

### Table 6. The application of BI x Performance – Frequency

<table>
<thead>
<tr>
<th>The application of Business Intelligence (BI)</th>
<th>Group 1 Poor performance (ROE &lt;0, 0-2%, 2-4%)</th>
<th>Group 2 High performance (ROE 4-7%, 7-10%, above 10%)</th>
<th>Row totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>The observed frequency</td>
<td>82</td>
<td>35</td>
<td>117</td>
</tr>
<tr>
<td>We do not consider it</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We consider it long-term</td>
<td>15</td>
<td>11</td>
<td>26</td>
</tr>
<tr>
<td>We consider it in the near future</td>
<td>8</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>The firm already uses it</td>
<td>2</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>107</td>
<td>57</td>
<td>164</td>
</tr>
</tbody>
</table>

The expected frequency

<table>
<thead>
<tr>
<th>The application of Business Intelligence (BI)</th>
<th>Group 1 Poor performance (ROE &lt;0, 0-2%, 2-4%)</th>
<th>Group 2 High performance (ROE 4-7%, 7-10%, above 10%)</th>
<th>Row totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed</td>
<td>76.3354</td>
<td>16.9634</td>
<td>40.66463</td>
</tr>
<tr>
<td>Expected</td>
<td>76.6955</td>
<td>16.6256</td>
<td>40.3409</td>
</tr>
<tr>
<td>Residue</td>
<td>-0.3602</td>
<td>-0.0397</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Source: own
6. Discussion

Based on the results presented in the previous chapter, the following conclusions are reached for the research hypotheses formulated:

**H 1**: H0 was rejected in favour of H1 for companies using specialized managerial information systems of the CRM type, which had statistically significant impact on the level of business performance of ROE. But our research results show that enterprises applying only the CRM information system typically achieve a negative or poor performance level a maximum up to 2% of ROE.

**H 2**: H0 is rejected in favour of H1 for companies using only basic ERP IS, as these were shown to influence the firm’s performance. The firms which only use the basic ERP achieve a lower performance, with the levels of ROE being negative or very low a maximum up to 2%.

**H 3**: H0 was confirmed. The use of the IS Business Intelligence type was found to have a positive impact on the performance of the firm. The analysis shows that there are two categories of companies – companies that use a BI system which achieve ROE of over 4%, and businesses that do not even consider the implementation of an IS and whose economic performance is lower, as shown by ROE below 4%.

The survey carried out on the sample of 164 enterprises operating in Slovakia investigated the implementation, respectively using of BI in relation to company ROE value. The results show that ERP information system has been implemented approximately in 34% of Slovak enterprises, but only 7% of enterprises have implemented and use a system of BI, whereby these companies belong to the group with the ROE more than 4%. The research results showed that in the case that companies do not have the BI information system as a complex system and not take into account its implementation they tend to have a lower level of performance. On the other hand, businesses that currently use BI system they achieve a better performance with a ROE of more than 4%. It follows that the BI system has a major impact on business performance.

The most important findings of our research present also the following Figure 5.

![Figure 5](image-url)
Conclusion

Many organizations continue to increase their investment in implementing various types of information systems, such as Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM). The rate of use of ERP systems in EU enterprises and also in Slovakia in the last period of years 2012 - 2015 continues to grow up. The enterprises in the EU countries were invested a lot of financial resources into the implementation of ERP information systems. Moreover, the empirical findings suggest that the potential for investment in ERP to generate substantial productivity gains may actually be greater for enterprises in developing countries than those in developed economies. Also, it can be observed the fact that the use of ERP is higher in medium and especially in large enterprises. Slovak medium and large enterprises achieve a lower level of use than other EU enterprises. In the category “All enterprises” (10 employed persons or more) is the rate of use the lowest and the difference between EU and Slovakia enterprises is moderate. The our research results show that ERP information system has been implemented approximately in 34% of Slovak enterprises, but only 7% of Slovak enterprises have implemented and use a knowledge information system of BI. The firms which only use the basic ERP are typically underperform. This our finding is contradict to other international studies that have found positive abnormal stock returns for firms using ERP also found evidence of improved financial performance immediately after ERP implementation (Stratman, 2007; Hitt, Wu & Zhou 2002; McAfee, 2002; Cottelee, 2006). The presented empirical findings can partially be related to research on the effectiveness of ERP implementation process that shows that the ERP absorption level is achieved with significantly less efficiency and effectiveness in transition economies (Bernroider et al., 2011; Rajnoha et al., 2014), and with difficulties resulting from organizational conditions, including problems with training and consultants. This finding shows that the implementation of the basic ERP within an enterprise should be further supported by the implementation and development of an MIS. From our research is evident that the key tool in increasing the overall business performance of the enterprise in the selected Slovak industries seems to be employing a knowledge-based Business Intelligence information system. The results bring the findings that a quality BI IS based on information and knowledge with a high added value has a positive long-term and sustainable effect on the business performance of the company. We believe that our study presented in this paper contributes to explore a new dimension to the existing view on business information systems in industrial companies. Therefore, we continue in our research to bring more relevant results.

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The name of the author of the source, the year of publication and pages should be presented in the text in brackets. The list of references is given after the conclusions. The word References is spelled in small letters, 11 pt bold-regular type, left ranged and the list of references in 9 pt. The references are to be presented in the alphabetical order, in the original language; translation into English is given in square brackets. References according to the Harvard citation style, e.g. http://libguides.library.uwa.edu.au/harvard.
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