

ISSN 2345-0282 ONLINE

DOI: <http://doi.org/10.9770/jesi.2017.5.2>

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES

5(2)
2017



The International Journal
ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES

ISSN 2345-0282 (online) <http://jssidoi.org/jesi/>

2017 Volume 5 Number 2 (December)

<http://doi.org/10.9770/jesi.2017.5.2>



Publisher

<http://jssidoi.org/esc/home>

Volume 5

Number 2

December 2017

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES

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<http://jssidoi.org/esc/home>

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Dear readers,

Sustainable development of countries is tightly related to competitiveness of their industries. Technological entrepreneurship, innovations, academia-industry cooperation are crucial for building more different societies in the third millennium.

This year Almaty Technological University of the Republic of Kazakhstan celebrated the 60th anniversary. It was a great opportunity to summarize achievements and to build new ambitious plans for further development.

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With best regards

TALGAT KULAZHANOV

*Rector
of Almaty Technological University
Republic of Kazakhstan*





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NEW INFORMATION TECHNOLOGIES USE FOR LATVIAN COMPANIES FINANCIAL HEALTH EVALUATION

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Received 20 August 2017; accepted 15 November; published 29 December 2017.

Abstract. Financial health of companies in certain region is the foundation on which the prosperity of region is based. If companies in region are healthy and successful, there are good reasons to believe that all social problems can be solved relatively easy. Regional economic development in Latvia at present time happens inhomogenously – there is a growing region near Riga where economic and social development is going very good, and there are regions where results are worse. The main purpose of this paper is to describe, apply and provide critical review the existing information technologies based possibilities for Latvian companies' financial health evaluation. We focus on the set of financial ratios necessary for economic health evaluation and homepages parsing based methods for these ratios determination for Latvian companies.

Keywords: new information technologies, fundamental analysis

Reference to this paper should be made as follows: Hilkevics, S.; Hilkevica, G. 2017. New Information Technologies Use for Latvian Stock Companies Financial Health Evaluation, *Entrepreneurship and Sustainability Issues* 5(2): 178-189 [http://doi.org/10.9770/jesi.2017.5.2\(1\)](http://doi.org/10.9770/jesi.2017.5.2(1))

JEL Classifications: M2, M4

1. Introduction

The main purpose of this paper is to describe the information technologies based possibilities for Latvian companies' financial health evaluation. There are two steps in company financial health evaluation. The first step is the de-termination of the set of financial ratios used for evaluation and the second step is the ratios comparison with optimal values.

There are several approaches for the set of financial ratios determination. The common feature for all these approaches is that all of them are based on the same groups of financial ratios – profitability, operating efficiency, solvency and liquidity. The differences are related with the amount of considered ratios, from 7-8 in simple cases up to 20-30 in complicated ones, and with the degree of detalization of consideration. Differences in approaches for company financial health evaluation are related with the goals of evaluation also – usually in theoretical studies and in practical applications sets of financial ratios are slightly different (Belás et al. 2017; Paseková et al. 2017).

The classical theoretical approach in assessing the financial health of the firm is de-scribed in Analysis for Financial Management (Higgins, 2012). According to this approach main three financial statements of company – cash flow, balance sheet and income statement - are considered at first to receive “a set of objective numbers, that provide information about the firm’s performance, problems, and prospects” (Higgins, 2012). After that the following profitability, turnover-control, liquidity, leverage ratios are considered their sense for company financial health evaluation is analysed (Table 1):

Table 1. Profitability ratios

Profitability Ratios	
Return on equity	= Net income/Shareholders’ equity
Return on assets	= Net income/Assets
Return on invested capital	= (Earnings before interest and taxes) * (1 – Tax rate)/(Interest-bearing debt + Shareholders’ equity)
Profit margin	= Net income/Sales
Gross margin	= Gross profit/Sales
Price to earnings	= Price per share/Earnings per share

Profitability ratios is the first group of ratios for financial health evaluation and they form the foundation on which all the further evaluation of financial health of company is based. Strategic management theory considers (Hill, Jones, 2013) that the long term profit higher than average in industry is the decisive factor of company competitiveness.

Table 2. Turnover-Control Ratios

Turnover-Control Ratios	
Asset turnover	= Sales/Assets
Fixed-asset turnover	= Sales/Net property, plant, and equipment
Inventory turnover	= Cost of goods sold/Ending inventory
Collection period	= Accounts receivable/Credit sales per day (If credit sales unavailable, use sales)
Days’ sales in cash	= Cash and securities/Sales per day
Payables period	= Accounts payable/Credit purchases per day

Turnover-control ratios (Table 2) is the second group of ratios for financial health evaluation and also should be considered in time perspective – dynamics of sales is often considered as the second important factor after profit for company health evaluation. The positive correlation between sales growth and profit growth is the indicator of the good financial health of company. Unfortunately, for Latvian companies in several cases sales growth is observed simultaneously with profit decreasing which means the existence of certain difficulties in development. Liquidity ratios (Table 3) is the third group of ratios for financial health evaluation and is very important for the evaluation of company ability to cover short-term liabilities. There is opinion that financial health by the origin is the long-term ability to pay in time short-term debts.

Table 3. Leverage and Liquidity Ratios

Leverage and Liquidity Ratios	
Assets to equity	= Assets/Shareholders’ equity
Debt to assets	= Total liabilities/Assets (Interest-bearing debt is often substituted for total liabilities)

Leverage and Liquidity Ratios	
Debt to equity	= Total liabilities/Shareholders' equity
Times interest earned	= Earnings before interest and taxes/Interest expense
Times burden covered	= EBIT/(Interest exp. + Prin. pay.)*(1 - Tax rate)
Debt to assets	Total liabilities / Assets
Debt to equity	= (Total liabilities)/(Capitalization +Total liabilities)
Current ratio	= Current assets/Current liabilities
Quick ratio	= (Current assets – Inventory) / Current liabilities

The considered set of financial ratios is the typical example of so called theoretically oriented approach. As the typical sample of practically oriented approach for financial health evaluation let us consider the “[20 Balance Sheet Ratios to Measure a Company's Health](#)” suggested by www.oldschoolvalue.com (Table 4):

Table 4. 20 Balance Sheet Ratios to Measure a Company's Health, source: www.oldschoolvalue.com

Solvency	
Quick Ratio	= (Current Assets - Inventories) / Current Liabilities
Current Ratio	= Current Assets / Current Liabilities
Total Debt/Equity Ratio	= Total Liabilities / Shareholders Equity
Long Term Debt/Equity Ratio	= Long Term Debt / Shareholders Equity
Short Term Debt/Equity Ratio	= Short Term Debt / Shareholders Equity

Liquidity Ratios	
Days Sales Outstanding	= (Receivables / Revenue) x 365
Days Inventory Outstanding	= (Inventory / COGS) x 365
Days Payable Outstanding	= (Accounts Payable / COGS) x 365
Cash Conversion Cycle	= DSO + DIO - DPO
Receivables Turnover	= Revenue / (Average of Current and Prior Year Receivables)
Inventory Turnover	= COGS / (Average of Current and Prior Year Inventory)
Average Age of Inventory (Days)	= 365 / Inventory Turnover
Intangibles % of Book Value	= Intangibles / Shareholders Equity
Inventory % of Revenue	= Inventory / Revenue

Capital Structure Ratios	
LT-Debt as % of Invested Capital	= Long Term Debt / Invested Capital
ST-Debt as % of Invested Capital	= Short Term Debt / Invested Capital
LT-Debt as % of Total Debt	= Long Term Debt / Total Liabilities
ST-Debt as % of Total Debt	= Short Term Debt / Total Liabilities
Total Liabilities % of Total Assets	= Total Liabilities / Total Assets
Working Capital % of Price	= Working Capital / Market Cap

Comparing ratios of two company financial health evaluation approaches, we can see that they use very similar sets of ratios, but practically oriented system pays more attention to capital structure. Approximately the same sets of financial ratios use other practical oriented approaches for company financial health evaluation.

The second step in financial health of company evaluation after the set of financial ratios determination is the financial ratios comparison with optimal values. In several cases such comparison can be performed relatively easy – for example, for all profitability ratios the recommendation of strategic management theory is that in long term perspective profit should be higher, that average profit in industry. If the average profit in industry is known from statistical data – sometimes this is so and later we will consider such cases – it is not difficult to compare company data with statistical data and make conclusions about company competitiveness and financial health.

However, in many cases the determination of optimal values of financial ratios is not so simple and it is necessary to consider which financial information is available and which is not.

2. Information sources and data processing

Speaking about world level sources of companies financial reports it necessary to mention US SEC information system EDGAR at first. There are more than 21 million documents with financial reports of many thousands American stock companies since 1934 in free access there. The serious advantage of EDGAR system comparing with similar European information systems is the use of XBRL standard in financial documents, which makes the automatization of information processing possible. In Europe XBRL is supposed to become a standard for financial reports for stock companies since January 1, 2020. As result, researches have serious differences in possibilities to study American and European companies – for American stock companies it is possible, for example, to download from <http://www.nasdaq.com/screening/company-list.aspx> the list of NASDAQ, NYSE and AMEX traded stocks lists, to receive free of charge for all these companies from EDGAR forms 10-K and 10-Q with year and quarter financial reports, containing balance sheets, cash flows and income statements for last 10 years in XML format, using GAAP taxonomy extract from XML documents above mentioned ratios for company financial health evaluation and compare them with average for industry values. These average values can be calculated for industry since we know appropriate data for all stock companies in industry.

Situation is more complicated in Europe. From one side, we have stock exchanges in all European countries, we have access to data from national financial market regulators, European Securities and Market Authority and European Stock Exchanges also provide information about stock companies year and quarter reports. From another side, it is impossible to repeat for European companies the above described procedure which is possible for American companies. There is no analog of EDGAR in Europe, financial reports are available from European stock exchanges free of charge in pdf format only and it is much more difficult, but sometimes even impossible to organize automatic information receiving and processing for necessary financial ratios calculation. The only known to authors regular way to receive free of charge necessary information is to use methods similar to regular expression analysis. Let us consider at first the simple example of such approach use.

The server of the Register of Latvian companies <http://dati.ur.gov.lv> contains Latvian companies initial registration data. The manual about the rules of server use in Latvian can be found at http://dati.ur.gov.lv/ur_opendata.pdf and the list of 372590 Latvian companies can be found on the server with the data about company name, address, data of registration and registration code. More detailed information about Latvian companies can be found on the server <http://company.lursoft.lv> of company Lursoft which in addition to Register data contains information about company activities according to NACE classificatory and tax payments. Data about company Lursoft itself can be found on server by two ways – or using the link <http://company.lursoft.lv/lursoft> with company name, or using the link with company code of registration <http://company.lursoft.lv/40003053936>. It is important, that if we know from the Register server only the names of 372590 Latvian companies, we cannot automatically receive data about them from Lursoft server – there is no direct relation between the link to data and the name of company. But if we know their registration codes also, the link to company data on Lursoft server can be generated automatically. By this way we can receive information necessary for example for regional studies – if from home pages parsing we know NACE code of company activity, address and taxes paid, we can analyze different sectors contributions in regional economies. By the similar way we have confirmed the existence of pronounced regional localization of ICT sector enterprises in Latvia. Out of the total 311.34 million taxes paid by ICT sector enterprises, 282.14 million, or 90.62%, are paid in Riga. The effect of localization increases with the size of the enterprise that is the tendency to localize for large enterprises is expressed more noticeable than for a small business. If the share of enterprises with tax payments less than 2,500 euros per year is 68.86% in Riga, the share of enterprise with tax payments more than one million euros in Riga increases to 92%. Such kind of results can be used for the strategy of regional economic development creation.

The similar home pages and XML documents parsing for financial data receiving can be used in other cases also and as the second example of above described approach implementation we will consider the Latvian stock companies financial health evaluation.

3. Latvian stock companies financial health evaluation

Riga Stock Exchange, now Nasdaq Riga, is owned mostly by Nasdaq OMX and together with Vilnius Stock Exchange and Tallinn Stock Exchange is a part of Nasdaq Baltic operating in Baltic countries. This is the reason why Riga Stock Exchange follows to Nasdaq OMX regulations and American company Morning Star on the base of contract with Nasdaq OMX converts Nasdaq Riga financial reports into XML format in the same way as this is done for American companies. By this way reports of such Latvian stock companies as GRD1R (Grindeks), HMX1R (HansaMatrix), LSC1R (Latvijas kuģniecība), OLF1R (Olainfarm), SAF1R (SAF Tehnika), BRV1R (Brīvais Vilnis), LOK1R (Daugavpils Lokomotīvu Remonta Rūpnīca), DPK1R (Ditton pievadķēžu rūpnīca), GRZ1R (Grobiņa), KA11R (Kurzemes atslēga 1), KCM1R (Kurzemes ciltslietu un mākslīgās apsēklošanas stacija), BAL1R (Latvijas balzams), GZE1R (Latvijas Gāze), LJM1R (Latvijas Jūras medicīnas centrs), SMA1R (PATA Saldus), RAR1R (Rīgas autoelektroaparātu rūpnīca), RER1R (Rīgas elektromašīnbūves rūpnīca), RJR1R (Rīgas juvelierizstrādājumu rūpnīca), RKB1R (Rīgas kuģu būvētava), SCM1R (Siguldas ciltslietu un mākslīgās apsēklošanas stacija), TKB1R (Tosmares kuģubūvētava), VSS1R (Valmieras stikla šķiedra), VEF1R (VEF), RRR1R (VEF Radiotehnika RRR) are available in XML format. This gives the possibility to evaluate the above described set of financial ratios necessary for company financial health evaluation. Let us consider as the example those ratios for stock company Grindex for last 5 years (Table 5).

Table 5. GRINDEX

	2012	2013	2014	2015	2016
Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Cost of Revenue	38.24%	39.99%	45.73%	55.75%	45.35%
Gross Margin	61.76%	60.01%	54.27%	44.25%	54.65%
Operating Margin	14.86%	13.75%	-2.15%	1.75%	11.52%
EBT Margin	14.61%	13.75%	-2.15%	1.75%	11.52%
Net Margin	11.65%	11.40%	-2.87%	1.25%	9.03%
Return on Assetsf	10.06	9.29	-1.63	0.65	5.73
Return on Equity	13.7	11.94	-2.23	0.95	8.32
Operating Cash Flow Growth YOY	157.98	26.39	-66.41	-43.78	-4.58
Cap Ex as a % of Sales	-3.41%	-4.84%	-4.13%	-4.37%	-5.10%
Free Cash Flow/Sales	8.21%	9.75%	2.43%	-0.42%	-2.15%
Free Cash Flow/Net Income	0.71	0.86	-0.85	-0.34	-0.24
Total current assets	52.60%	49.05%	49.49%	50.25%	55.37%
Total current liabilities	15.16%	13.53%	24.37%	22.26%	20.81%
Total Liabilities	23.86%	20.64%	32.32%	30.53%	31.77%
Total stockholders' equity	76.14%	79.36%	67.68%	69.47%	68.23%
Liquidity/Financial Health – Current Ratio	3.47	3.62	2.03	2.26	2.66
Liquidity/Financial Health – Quick Ratio	2.86	2.84	1.41	1.49	1.75
Liquidity/Financial Health – Financial Leverage	1.31	1.26	1.48	1.44	1.47
Cash Conversion Cycle	187.15	184.08	247.43	280.27	305.24

Grindex is one of the pharmaceutical leaders in Baltic countries and one of the best Latvian companies. Grindex Gross Margin, often considered as the foundation of financial health of company, on which other financial health indicators are based, is the third largest among Latvian Stock companies. Operating Margin, EBT Margin and Net Margin are high enough, Liquidity ratios are good enough also. Cash Flow indicators are problematic, but it is necessary to take into account events around the one of Grindex products meldronium which was forbidden for use in sport. In general the financial health of Grindex can be evaluated as very good.

Situation with others Latvian companies in several cases is not so optimistic. Let us consider the shorted list of financial ratios for 24 Latvian stock companies (Table 6).

Table 6. Shorted list of financial ratios for 24 Latvian stock companies

Name of stock company	Indicator	2012	2013	2014	2015	2016
GRD1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Grindeks	Cost of Revenue	38.24%	39.99%	45.73%	55.75%	45.35%
	Gross Margin	61.76%	60.01%	54.27%	44.25%	54.65%
	Operating Margin	14.86%	13.75%	-2.15%	1.75%	11.52%
	EBT Margin	14.61%	13.75%	-2.15%	1.75%	11.52%
	Net Margin	11.65%	11.40%	-2.87%	1.25%	9.03%
HMX1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
HansaMatrix	Cost of Revenue	72.96%	76.39%	78.39%	80.06%	86.61%
	Gross Margin	27.04%	23.61%	21.61%	19.94%	13.39%
	Operating Margin	11.00%	8.58%	-17.38%	11.13%	4.62%
	EBT Margin	11.00%	8.58%	-17.38%	9.33%	3.38%
	Net Margin	10.17%	7.55%	-19.05%	8.11%	3.25%
LSC1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Latvijas kuģniecība	Cost of Revenue	79.46%	69.54%	69.27%	64.18%	85.10%
	Gross Margin	20.54%	30.46%	30.73%	35.82%	14.90%
	Operating Margin	-13.61%	-2.47%	-24.81%	1.03%	-14.99%
	EBT Margin	-29.81%	-17.28%	-33.77%	-7.40%	-26.55%
	Net Margin	-29.90%	-17.38%	-34.00%	-7.50%	-24.99%
OLF1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Olainfarm	Cost of Revenue	21.63%	21.73%	31.69%	33.18%	36.91%
	Gross Margin	78.37%	78.27%	68.31%	66.82%	63.09%
	Operating Margin	22.26%	19.09%	14.78%	18.12%	13.21%
	EBT Margin	22.26%	19.09%	14.78%	18.12%	13.48%
	Net Margin	18.43%	16.33%	13.07%	15.69%	10.46%

SAF1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
SAF Tehnika	Cost of Revenue	55.93%	76.77%	77.10%	69.96%	67.26%
	Gross Margin	44.07%	23.23%	22.90%	30.04%	32.74%
	Operating Margin	6.18%	-0.43%	-0.21%	6.11%	4.61%
	EBT Margin	8.37%	-0.05%	1.19%	11.54%	7.26%
	Net Margin	7.47%	-0.16%	0.99%	9.98%	6.75%
BRV1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Brīvais Vilnis	Cost of Revenue	86.57%	87.04%	88.26%	89.67%	93.01%
	Gross Margin	13.43%	12.96%	11.74%	10.33%	6.99%
	Operating Margin	8.15%	5.35%	2.56%	-10.07%	-12.24%
	EBT Margin	6.05%	5.35%	2.56%	-10.07%	-12.24%
	Net Margin	5.47%	4.41%	2.01%	-10.56%	-12.24%
LOK1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Daugavpils Lokomotīvu Remonta Rūpnīca	Cost of Revenue	84.72%	94.82%	93.05%	104.35%	110.54%
	Gross Margin	15.28%	5.18%	6.95%	-4.35%	-10.54%
	Operating Margin	4.53%	-0.73%	-6.19%	-13.72%	-21.21%
	EBT Margin	4.26%	-0.73%	-6.19%	-13.72%	-21.21%
	Net Margin	3.30%	-0.72%	-6.20%	-14.29%	-16.81%
DPK1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Ditton pievadkēžu rūpnīca	Cost of Revenue	80.10%	90.26%	86.80%	126.65%	98.75%
	Gross Margin	19.90%	9.74%	13.20%	-26.65%	1.25%
	Operating Margin	0.97%	0.72%	-55.75%	-66.24%	0.26%
	EBT Margin	0.04%	0.72%	-55.75%	-66.24%	0.26%
	Net Margin	0.03%	0.04%	-56.32%	-67.20%	0.26%
GRZ1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Grobiņa	Cost of Revenue	64.63%	54.42%	122.07%	102.95%	206.75%
	Gross Margin	35.37%	45.58%	-22.07%	-2.95%	-106.75%
	Operating Margin	23.86%	30.65%	-37.83%	4.32%	-129.14%
	EBT Margin	21.20%	24.47%	-54.58%	4.32%	-129.14%
	Net Margin	21.14%	21.05%	-57.56%	15.56%	-117.94%
KA11R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Kurzemes atslēga 1	Cost of Revenue	90.57%	90.46%	88.11%	92.63%	106.87%
	Gross Margin	9.43%	9.54%	11.89%	7.37%	-6.87%

	Operating Margin	0.32%	−1.72%	1.54%	0.44%	−15.30%
	EBT Margin	0.24%	−1.77%	1.47%	0.37%	−15.40%
	Net Margin	0.12%	−1.92%	1.00%	0.03%	−15.15%
KCM1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Kurzemes ciltslietu un mākslīgās apsūklošanas stacija	Cost of Revenue	52.87%	54.08%	54.41%	52.98%	52.17%
	Gross Margin	47.13%	45.92%	45.59%	47.02%	47.83%
	Operating Margin	6.07%	10.55%	−8.81%	13.04%	12.18%
	EBT Margin	6.07%	10.55%	−8.82%	12.96%	12.18%
	Net Margin	5.72%	10.16%	−9.31%	11.94%	12.18%
BAL1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Latvijas balzams	Cost of Revenue	81.09%	79.90%	77.34%	77.24%	77.29%
	Gross Margin	18.91%	20.10%	22.66%	22.76%	22.71%
	Operating Margin	10.58%	10.31%	12.98%	11.39%	12.53%
	EBT Margin	10.58%	10.31%	12.98%	11.39%	12.53%
	Net Margin	8.85%	8.85%	10.90%	9.58%	9.92%
GZE1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Latvijas Gāze	Cost of Revenue	92.34%	90.61%	89.91%	75.23%	78.90%
	Gross Margin	7.66%	9.39%	10.09%	24.77%	21.10%
	Operating Margin	5.72%	6.07%	6.99%	7.80%	11.03%
	EBT Margin	5.79%	6.09%	7.02%	7.82%	11.04%
	Net Margin	4.96%	5.13%	5.98%	6.86%	10.91%
LJM1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Latvijas Jūras medicīnas centrs	Cost of Revenue	95.24%	100.20%	92.77%	96.12%	94.04%
	Gross Margin	4.76%	−0.20%	7.23%	3.88%	5.96%
	Operating Margin	−1.48%	−6.49%	18.72%	−12.79%	1.82%
	EBT Margin	−1.48%	−6.49%	18.72%	−12.79%	1.83%
	Net Margin	−1.80%	−6.19%	18.72%	−6.48%	−1.63%
SMA1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
PATA Saldus	Cost of Revenue	90.83%	99.40%	96.30%	101.44%	96.15%
	Gross Margin	9.17%	0.60%	3.70%	−1.44%	3.85%
	Operating Margin	5.24%	−1.10%	1.99%	−3.21%	2.43%
	EBT Margin	4.82%	−1.10%	1.05%	−4.63%	1.40%
	Net Margin	4.00%	−1.15%	1.01%	−4.74%	2.27%

RAR1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Rīgas autoelektroaparātu rūpnīca	Cost of Revenue	129.67%	104.16%	134.24%	125.34%	653.91%
	Gross Margin	-29.67%	-4.16%	-34.24%	-25.34%	-553.91%
	Operating Margin	11.30%	77.87%	-40.30%	15.50%	-565.84%
	EBT Margin	12.07%	77.87%	-40.30%	15.50%	-565.84%
	Net Margin	1.32%	71.67%	-46.12%	8.42%	-565.84%
RER1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Rīgas elektromašīnbūves rūpnīca	Cost of Revenue	73.78%	76.22%	84.48%	95.05%	84.48%
	Gross Margin	26.22%	23.78%	15.52%	4.95%	15.52%
	Operating Margin	16.87%	11.46%	2.52%	0.76%	2.40%
	EBT Margin	16.87%	11.46%	2.52%	0.76%	2.04%
	Net Margin	16.24%	9.82%	1.95%	-1.25%	1.64%
RJR1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Rīgas juvelierizstrādājumu rūpnīca	Cost of Revenue	43.48%	63.66%	76.60%	70.65%	70.80%
	Gross Margin	56.52%	36.34%	23.40%	29.35%	29.20%
	Operating Margin	19.89%	5.69%	-25.33%	-0.93%	-2.81%
	EBT Margin	19.89%	5.69%	-25.33%	-0.93%	-2.81%
	Net Margin	18.97%	4.22%	-23.31%	-1.46%	-2.81%
RKB1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Rīgas kuģu būvētava	Cost of Revenue	101.61%	99.95%	99.64%	91.38%	95.28%
	Gross Margin	-1.61%	0.05%	0.36%	8.62%	4.72%
	Operating Margin	0.28%	-1.12%	-4.51%	4.59%	1.31%
	EBT Margin	0.20%	-1.12%	-4.51%	4.59%	1.31%
	Net Margin	0.08%	-1.28%	-6.08%	1.04%	0.82%
SCM1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Siguldas ciltslītu un mākslīgās apsēklošanas stacija	Cost of Revenue	41.97%	42.52%	39.06%	40.14%	43.35%
	Gross Margin	58.03%	57.48%	60.94%	59.86%	56.65%
	Operating Margin	11.19%	8.02%	15.94%	8.73%	9.58%
	EBT Margin	8.99%	8.02%	15.94%	8.73%	9.58%
	Net Margin	7.42%	6.45%	13.58%	6.85%	7.97%
TKB1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Tosmares kuģubūvētava	Cost of Revenue	92.58%	97.56%	101.96%	83.18%	90.16%
	Gross Margin	7.42%	2.44%	-1.96%	16.82%	9.84%

	Operating Margin	1.31%	-0.40%	-6.59%	4.30%	1.35%
	EBT Margin	0.21%	-0.40%	-6.59%	4.30%	1.35%
	Net Margin	-0.54%	-1.49%	-8.21%	2.37%	0.43%
VSS1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Valmieras stikla šķiedra	Cost of Revenue	52.76%	54.21%	52.60%	49.44%	53.93%
	Gross Margin	47.44%	45.94%	47.40%	50.56%	46.07%
	Operating Margin	8.15%	5.91%	8.00%	5.65%	5.82%
	EBT Margin	5.74%	5.91%	7.19%	4.95%	5.12%
	Net Margin	5.51%	5.77%	6.98%	4.52%	3.85%
VEF1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
VEF	Cost of Revenue	71.26%	72.38%	73.08%	70.44%	68.63%
	Gross Margin	28.74%	27.62%	26.92%	29.56%	31.37%
	Operating Margin	20.98%	6.74%	4.62%	8.01%	23.50%
	EBT Margin	6.64%	6.74%	4.62%	8.01%	23.50%
	Net Margin	2.92%	0.13%	-0.30%	3.08%	23.50%
RRR1R	Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
VEF Radiotehnika RRR	Cost of Revenue	97.48%	119.97%	124.41%	125.82%	110.70%
	Gross Margin	2.52%	-19.97%	-24.41%	-25.82%	-10.70%
	Operating Margin	-3.93%	-20.18%	-73.08%	57.43%	-88.18%
	EBT Margin	-10.79%	-20.18%	-73.08%	57.43%	-88.18%
	Net Margin	-17.61%	-27.48%	-81.92%	48.45%	-90.36%

Considering these data, it is possible to make certain conclusions about financial health of Latvian stock companies.

Conclusions

1. Gross Margin increased from 2012 until 2016 for 7 Latvian stock companies of 24: KCM1R (47.13% - 47.83%), BAL1R (18.91% - 22.71%), GZE1R (7.66% - 21.10%), LJM1R (4.76% - 5.96%), RKB1R (-1.61% - 4.72%), TKB1R (7.42% - 9.84%), VEF1R (28.74% - 31.37%).
2. Gross Margin decreased from 2012 until 2016 for 17 Latvian stock companies of 24: GR1R (61.76% - 54.65%), HMX1R (27.04% - 13.39%), LSC1R (20.54% - 14.9%), OLF1R (78.37% - 63.09%), SAF1R (44.07% - 30.04%), BRV1R (13.43% - 6.99%), LOK1R (15.28% - (-10.54%)), DPK1R (19.9% - 1.25%), GRZ1R (35.37% - (-106.75%)), KA11R (9.43% - (-6.87%)), SMA1R (9.17% - 3.85%), RAR1R (-29.67% - (-553.91%)), RER1R (26.22% - 15.52%), RJR1R (56.52% - 29.20%), SCM1R (58.03% - 56.65%), VSS1R (47.44% - 46.07%), RRR1R (2.52% - (-10.70%)).
3. Gross Margin is negative for 5 Latvian stock companies of 24: LOK1R (-10.54%), GZR1R (-106.75%), KA11R (-6.87%), RAR1R (-554%), RRR1R (-10.7%).

4. Operating Margin is less than 5% for 16 Latvian stock companies of 24: HMX1R (4.62%), LSC1R (-14.99%), SAF1R (4.61%), BRV1R (-12.24%), LOK1R (-21.21%), DPK1R(1.25%), GRZ1R (-106.75%), KA11R (-6.87%), LJM1R (1.82%), SMA1R (2.43%), RAR1R (-565.84%), RER1R(2.4%), RJR1R (-2.81%), RKB1R (1.31%), TKB1R(1.35%), RRR1R (-88.18%).
5. According to the condition of their financial health, Latvian stock companies can be divided on the three approximately equal groups. For approximately third part of Latvian stock companies financial health was improved during last 5 years and can be evaluated at present time as good. For the next third part the financial health remained approximately at the same level and can be evaluated as average. For the remaining third part of Latvian stock companies the financial health became worse during last 5 years and at present time can be evaluated as problematic.
6. The situation in Latvia in general corresponds to situation in European countries, where the amounts of companies who are “going up”, “going down” and “are stable” on 5 years time interval are approximately equal. There are variations between different countries, of course, but in general, situation in Latvia is similar to situation in majority of European countries. In the USA situation is different, but this is the subject for special consideration.

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ENTREPRENEURIAL ENVIRONMENT AT REGIONAL LEVEL: THE CASE OF POLISH PATH TOWARDS SUSTAINABLE SOCIO-ECONOMIC DEVELOPMENT

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Received 15 July 2017; accepted 24 October 2017; published 29 December 2017

Abstract. Globalization process creates favorable conditions for dynamic development of economic centers both at national and regional level. Yet, it may be an obstacle for growth for peripheral countries and regions. In the European Union one can confirm convergence process at national level. However, in Central European countries the convergence of national economies does not support sustainable growth at regional level and regional convergence process. This situation often leads to the problem of draining up of scarce resources from peripheral regions, which negatively affects their entrepreneurship potential and sustainable socio-economic development. In the longer run this unbalanced spatial growth can become a significant obstacle for welfare improvements. In this context, the purpose of the article is to analyze the quality of entrepreneurial environment in Poland at regional level within the context of sustainability framework. The research was done for NUTS 2 regions in the years 2010-2014. The quality of entrepreneurial environment is considered here as a multiple-criteria phenomenon that should be treated as a latent variable. Thus, in the research Structural Equation Modeling (SEM) analysis was applied. Values of the latent variable were assessed based on confirmatory factor analysis, which provided information on the socio-economic development of Polish regions, which determinates the entrepreneurial conditions. In order to group the regions to homogenous subsets natural breaks method was used. The conducted research confirms the process of improvement of entrepreneurial conditions in most of the NUTS 2 regions in Poland. From the perspective of regional convergence process, on the one hand, one can point some positive factors such as noticeable improvements in some underdeveloped regions. However, the dominance of the central region and significant disparities between the NUTS 2 are still relatively stable and extensive. From the methodological perspective the article shows the applicability of SEM methodology to national and regional analysis with application of data from national statistics.

Keywords: Entrepreneurial environment, entrepreneurship at regional level, multiple-criteria analysis, Structural Equation Modeling (SEM), regional sustainability, Poland

Reference to this paper should be made as follows: Pietrzak, M.B.; Balcerzak, A. P.; Gajdos, A.; Arendt, Ł 2017. Entrepreneurial environment at regional level: the case of Polish path towards sustainable socio-economic development, *Entrepreneurship and Sustainability Issues* 5(2): 190-203. [http://doi.org/10.9770/jesi.2017.5.2\(2\)](http://doi.org/10.9770/jesi.2017.5.2(2))

JEL Classifications: C30, C38, O14, Q01

1. Introduction

Entrepreneurship level is currently considered as one of the most important intangible growth factors in developed countries. It is crucial for building competitive knowledge-based economy. In spite of the fact that the global markets are dominated by multinational corporations in most of the European countries more than 50% of employment and national product are created by small and medium sized enterprises. Thus, in the reality of growing international competition, entrepreneurship is crucial for building effective economy both at national and regional level (Agrawal, 2016; Adamowicz & Machla, 2016; Pietrzak & Balcerzak, 2016a; Saeed et al. 2017; Kljucnikov & Belas, 2016; Mayer et al. 2016; Yan et al., 2017; Melas et al., 2017). This factor is commonly pointed in many national strategies of growth and it was strongly stressed in the Europe 2020 plan. It is an immanent part of socio-economic sustainability or sustainable development concepts and it is crucial for reaching the objectives of improving social capital in an economy (Davis, 2008; Kuc, 2014; Czarniewski, 2016; Strielkowski et al., 2016 Zemlickienė et al, 2017). In the case of countries and regions at the average level of development, which must overcome the risk of middle income trap, the high level of entrepreneurship activity and good quality of entrepreneurial environment, next to high quality of human capital or building of effective network infrastructure (Agenor et al., 2012; Balcerzak, 2016a; Kondratiuk-Nierodzińska, 2016; Pietrzak & Balcerzak, 2016b; Żelazny & Pietrucha, 2017; Gajdos, 2014; Gajdos, Żmurkow-Poteralska 2012), are commonly believed to be a condition for overcoming the thread of middle income trap and improving the chances for higher pace of convergence process (Agenor & Canuto, 2015).

However, it is believed that globalization process and international integration of economies create favourable conditions for more dynamic development mostly for economic centers both at national and regional level. In the same time these both factors tend to be an obstacle for growth for peripheral countries and regions. These factors are confirmed for European economy, where in the case of European Union empirical research proofs convergence at national level. On the other hand, in many countries the convergence of national economies does not support socio-economic sustainable growth at regional level, which would lead to regional convergence process (Kuc, 2017a; 2017b). This situation often leads to the phenomenon of draining up of the most valuable resources from the peripheral regions, which negatively affects their entrepreneurship potential and sustainable socio-economic environment. In the longer run this unbalanced spatial growth can become a significant obstacle for improving macroeconomic growth and welfare of national economies.

In the above mentioned context the main objective of the article is to propose a method and to measure the quality of entrepreneurial environment at regional level in Poland in the years 2010-2014. Polish economy can be considered as an interesting case study for the proposed scientific problem, as it is the biggest economy in Central Europe that is considered to be an example of relatively effective transformation from centrally-planned to market-oriented economy. Poland has been able to take advantage of convergence process with the developed European economies, but it is currently considered as a country facing the problem of middle income trap. Thus, improving the quality of entrepreneurial environment at regional level is currently considered as one of the main objectives of regional policy for Polish government.

The entrepreneurial environment is analyzed here as a multiple-criteria latent phenomenon within the context of sustainable development objectives and socio-economic sustainability framework. As a result, Structural Equation Modeling (SEM) methodology was used here.

The paper is organized as follows. In the next section the methodology of the Structural Equation Modeling used for assessing the measure of quality of entrepreneurial environment is presented. In this part the assumptions applied in the process of selecting potential diagnostic variables are given. This section is finished with presentation of hypotheses for empirical part. The next part is devoted to the presentation of the empirical model and assessing its statistical quality. Then, the two following sections concentrate on the analysis of the obtained

results in regard to changes of ratings and groupings of the regions in the analyzed period. Finally, the paper ends with the conclusions, discussion of its limitations and prospects for two potential directions for future research.

2. Assumptions, methodology and hypothesis of the empirical research

Based on the literature review regarding factors influencing entrepreneurial activity and entrepreneurial environment there are two main assumptions of the empirical contribution. First of all, it is assumed that the entrepreneurial conditions, especially at the regional level, are strictly related to the socio-economic development of regions (Barkowiak-Bakun, 2017; Pietrzak, 2017). This assumption was crucial from the perspective of selection of potential diagnostic variables. Then, from the perspective of the possibilities of measurement of the quality of entrepreneurial environment at regional level, it was assumed that it should be considered as a multiple-criteria latent variable (see: Kawiorska 2016; Knatko et al. 2016; Mayer et al., 2016; Kot et al. 2016; Balcerzak, 2016b; Ključnikov et al., 2016; Dobeš et al., 2017; Ivanova, 2017; Balcerzak & Pietrzak, 2017).

Based on the above mentioned assumptions, it was possible to apply Structural Equation Modeling (SEM) in the analysis (Loehlin 1987; Bollen, 1989; Kaplan, 2000; Brown, 2006). SEM methodology is commonly used in the empirical research, which is based on the survey data (see Kooshki & Zeinabadi, 2016; Ebrahimi & Mirbargkar, 2017; Kozubíková et al. 2017; Smaliukienė et al., 2017). However, it can be also effectively used in the case of research that is based on aggregated macroeconomic or regional data coming from public official statistics (Pietrzak et al., 2012; Balcerzak & Pietrzak 2016a; 2016b). When the research is limited to the identification process and measurement of latent variables, SEM methodology enables to conduct confirmatory factor analysis. In that case only the external model (measurement model) is applied, which can be given with equations 1 and 2:

$$\mathbf{y} = \mathbf{C}_y \boldsymbol{\eta} + \boldsymbol{\varepsilon}, \quad (1)$$

$$\mathbf{x} = \mathbf{C}_x \boldsymbol{\xi} + \boldsymbol{\delta}, \quad (2)$$

where:

$\boldsymbol{\eta}$ - the vector of endogenous latent variables,

$\boldsymbol{\xi}$ - the vector of exogenous latent variables,

\mathbf{y} , \mathbf{x} - the vector of observable variables,

\mathbf{C}_y , \mathbf{C}_x - matrices of factor loadings,

$\boldsymbol{\varepsilon}$, $\boldsymbol{\delta}$ - measurement error vectors.

The parameters of the model are usually estimated with application of maximum likelihood method, generalized least squares method and asymptotically distribution-free method. In the case of the normal distribution for the observable diagnostic variables the maximum likelihood method should be applied. Otherwise, the two mentioned remaining methods are used (Balcerzak & Pietrzak 2016a; 2016b).

After estimation, the model is verified in regard to the significance of parameters and a degree of fit of the obtained model to empirical data (Bollen, 1989; Kaplan, 2000). The verification of the model is based on the comparison of the obtained model with a saturated and an independent model. There are to most commonly applied measures for this purpose: *IFI* (*Incremental Fit Index*) and *RMSEA* (*Root Mean Square Error of Approximation*).

The values of the *IFI* measure should fulfill the condition $0 < IFI < 1$. In the case of models which are based on the survey data, it is commonly assumed that its value should be higher than 0,9, which means that the model can be considered as the one with sufficient fit to empirical data.

For *RMSEA* measure it is assumed that the lower value of the *RMSA* estimated for the given model, the better degree of the empirical model is obtained. Thus, it is commonly assumed that $RMSA < 0,1$ indicates that the model is well fitted to empirical data.

However, it should be emphasised that in the case of models estimated for aggregated data obtained from macroeconomic or regional statistics, the above mentioned limits are usually less restrictive (Balcerzak & Pietrzak 2016a; 2016b).

Based on the previous preliminary research of the authors (see Pietrzak & Balcerzak, 2016c; Pietrzak, 2017) the following two empirical hypotheses were proposed:

1. In the years 2010-2014 the quality of entrepreneurial environment in Polish regions has improved.
2. Significant disparities of quality of entrepreneurial conditions between central and peripheral regions in Poland are relatively stable in time.

3. The empirical model

The research study was devoted to the measurement of quality of entrepreneurial environment at regional (NUTS 2) level in Poland in the year 2010 and 2014. The short period of the analysis is restricted with the comparable data at regional level, which is provided by Central Statistical Office of Poland. The data were available in two bases: Local Data Bank (<https://bdl.stat.gov.pl/BDL/start#>) and Sustainable Development Indicators / Regional module (<http://wskaznikizrp.stat.gov.pl/>).

The three assumed pillars of quality of entrepreneurial environment at regional level, which were the theoretical base for selection of potential diagnostic variables, are given at figure 1. The pillars were identified on the basis of the previous literature review in the field (see more Pietrzak & Balcerzak, 2016c; Pietrzak, 2017). One can expect that there are interrelations between the pointed pillars. However, in current model, which should enable to assess the applicability of the separate diagnostic variables for measurement purposes, these potential interrelations were not modeled deliberately. As a result table 1 provides specific information on the diagnostic variables applied for the model. The diagnostic variables were classified as stimulants and dis-stimulants. The stimulants fulfill the condition: $x_{i,j}^s > x_{k,j}^s \rightarrow O_i \succ O_k$ for X_j^s for every two values $x_{i,j}^s, x_{k,j}^s$ that refer to objects O_i, O_k , where \succ means that object O_i is preferred to O_k . Thus, for stimulants a maximum value of variable is preferred. The dis-stimulants fulfill the condition: $x_{i,j}^s < x_{k,j}^s \rightarrow O_i \prec O_k$ for X_j^s for every two values $x_{i,j}^s, x_{k,j}^s$ that refer to objects O_i, O_k , where \prec means that object O_k is preferred to object O_i . This means that a minimum value of variable is preferred (Balcerzak & Pietrzak, 2016b; Kruk & Waśniewska, 2017).

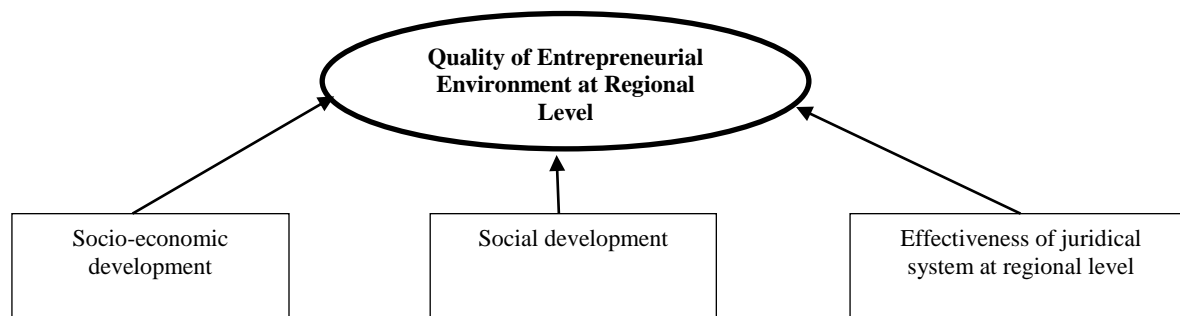


Fig. 1. Factors influencing quality of entrepreneurial environment at regional level

Source: own work

Table 1. A set of factors affecting quality of entrepreneurship environment within sustainability framework

Socio-economic development	
Area 1– Fundamental economic conditions	
X ₁ – Gross domestic product per capita at regional level. It presents the final result of the activity of all entities of the national economy. GDP is the sum of gross value added generated by all national institutional units, increased by taxes on products and decreased by subsidies on products.	stimulant
X ₂ – Investments outlays per capita. It presents the value of total investment expenditure in the private and public sector per 1 inhabitant. Investment expenditures include financial or material outlays which aim is to create new fixed assets or improve (extension, reconstruction or modernization) of existing objects of fixed assets, as well as expenditure on so-called first investment equipment.	stimulant
Area 2 – Effectiveness of labour market	
X ₃ – Employment rate by age. It shows the share of total employed in the total population of a given category aged 15 and more (average annual data based on Labour Force Survey (see detailed explanation for X ₄ variable).	stimulant
X ₄ – Unemployment rate (Labour Force Survey). It is a representative survey conducted on a quarterly basis using the continuous observation method, which means that economic activity is examined each week throughout the entire quarter (in each of the 13 weeks of the quarter 1/13 part of the quarterly sample). The results from the sample are generalized to the whole population based on the national census. The results of quarterly surveys are translated into average data for the year. The study covers persons aged 15 and more who are members of households - the study does not cover persons staying outside the household (eg they were abroad) 12 months or more (up to 2Q 2012 it was over 3 months).	dis-stimulant
Area 3– Innovativeness	
X ₅ – Expenditure on R&D activity in relation to GDP. Research and development (R & D) is a systematic creative work carried out in order to increase the stock of knowledge and to find new uses for this knowledge).	stimulant
Social development	
Area 1 – Demography	
X ₆ – Ratio of balance of permanent migration person at working age (Intervoivodship migration). It is a difference between inflow (immigration) and outflow (emigration) of the population for permanent residence in relation to the working-age population.	stimulant
Area 2 – Poverty and Social Exclusion	
X ₇ – At-risk-of-poverty rate after social transfers. The percentage of people whose disposable income (when taken into account social transfers) is less than the poverty line of 60% of median equivalent disposable income in a given country.	dis-stimulant
X ₈ – People in households benefiting from the social assistance at domicile in percentage of the total population. Measured as the share of people in households benefiting from community social support in the general population. The community social assistance is granted as financial, material assistance or assistance in the form of service aid through a social assistance center.	dis-stimulant
X ₉ – Average monthly available income per capita in private households. Household disposable income is the sum of current household income from individual sources minus the value of taxes and the value of social security and health insurance contributions.	stimulant
Area 3 – Education	
X ₁₀ – Adult persons participating in education and training. Measured as the share of people aged 25-64 studying and training in the total population in the same age group (within four weeks before the survey – Labour Force Survey).	stimulant
X ₁₁ – Children covered by pre-school education in percentage of the total number of children at the age 3-5	stimulant
Effectiveness of juridical system	
X ₁₂ – Rate of detectability of the delinquents of ascertained crimes. The index is calculated as the ratio of the number of crimes detected in a given year (including those detected after redemption) to the number of offenses found in a given year, plus the number of offenses identified in the proceedings and remitted in previous years due to non-detection of perpetrators.	stimulant

Note: a precise description of the variables and the methodology for data collection is available at <http://wskaznikizrp.stat.gov.pl/>.

Source: own elaboration

Based on the diagnostic variables from table 1 confirmatory factor analysis was conducted. For the selected diagnostic variables Alfa-Cronbacha (see Cronbach, 1951) coefficient was assessed. The value of Alfa-Cronbacha equal to 0,71 for the twelve pointed diagnostic variables indicates that the diagnostic variables should properly describe the latent variable. The hypothetical SEM model applied in the research study is given in figure 2.

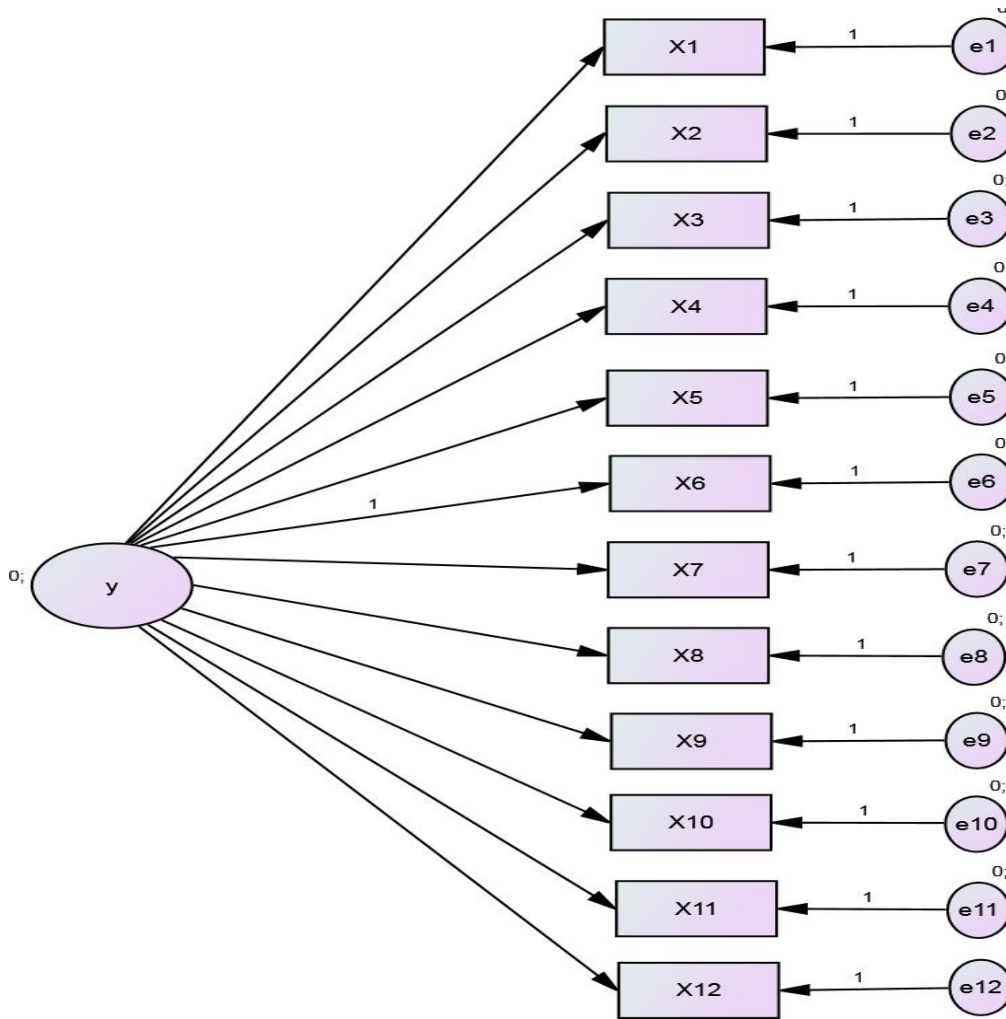


Fig. 2. Hypothetic SEM model for estimation of quality of entrepreneurial environment at regional level in Poland

Source: own elaboration

The estimation of the parameters of the model was done in the AMOS package. In the case this research study some of the variables did not fulfill the condition of normal distribution. Thus, in order to estimate the parameters of the model, asymptotically distribution-free (ADF) method was used. The results of the estimation procedure are given in Table 2.

Table 2. Estimations of parameters of SEM model for quality of entrepreneurial environment at regional level

Variable	Parameter	Estimate	Standardized estimate	p-value
X_1	α_1	44.907	0.934	~0.00
X_2	α_2	4.853	0.807	~0.00
X_3	α_3	6.929	0.635	~0.00
X_4	α_4	1	0.597	-
X_5	α_5	70.307	0.844	~0.00
X_6	α_6	-11.982	-0.548	~0.00
X_7	α_7	-7.085	-0.655	~0.00
X_8	α_8	682.236	0.889	~0.00
X_9	α_9	3.356	0.591	~0.00
X_{10}	α_{10}	16.569	0.527	~0.00
X_{11}	α_{11}	-4.383	-0.584	~0.00
X_{12}	α_{12}	17.468	0.715	~0.00
Model	IFI	RMSEA		
Default	0.766	0.194		
Independence	0.000	0.359		

Source: own estimation based on data form Central Statistical Office of Poland: Local Data Bank (<https://bdl.stat.gov.pl/BDL/start#>) and Sustainable Development Indicators / Regional module (<http://wskaznikizrp.stat.gov.pl/>)

The parameters of the estimated model are statistically significant. It can indicate proper selection of diagnostic variables for the latent variable. The verification of the quality of the model in regard to the degree of fit to empirical data was based on *IFI* and *RMSEA* measures, which are also given in table 2. In that case *IFI* was equal to 0,766, and *RMSEA* was equal to 0,194. In spite of the fact that these values do not fulfill the limits usually applied for SEM models based on survey data, they can be accepted in the case of models for aggregated data from official national statistics.

Table 3. Factor Score Weights for the SEM model

Latent variable	Observable variables					
	X_1	X_2	X_3	X_4	X_5	X_6
Socio-economic development	0.021	0.054	0.081	0.015	0.006	-0.006
	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}
	-0.015	0.001	0.024	0.003	-0.018	0.009

Source: own estimation

In the next step of the research the values of latent variable (quality of entrepreneurial environment at regional level) for the year 2010 and 2014 were assessed based on the sum of product of values of Factor Score Weights (table 3) and the values of observable variables. Based on the obtained results it was possible to propose a ranking of the NUTS 2 regions for both years (see table 4). Additionally, with application of Natural Breaks method the regions were grouped into four relatively homogenous classes, where class four includes the NUTS 2 regions with the best entrepreneurial environment, while class 1 encompass these which achieved worst results. The final results are presented in table 4 and figure 3.

Table 4. Ranking and grouping of NUTS 2 regions in regard to quality of entrepreneurship environment

Quality of entrepreneurial environment at regional level in Poland							
2010				2014			
NUTS 2 region	SEM	rank	class	NUTS 2 region	SEM	rank	class
mazowieckie	0.744	1	4	mazowieckie	0.925	1	4
wielkopolskie	0.425	2	3	dolnośląskie	0.576	2	3
dolnośląskie	0.423	3	3	pomorskie	0.519	3	3
śląskie	0.422	4	3	wielkopolskie	0.500	4	3
pomorskie	0.410	5	3	małopolskie	0.468	5	3
małopolskie	0.394	6	3	śląskie	0.464	6	3
łódzkie	0.356	7	3	łódzkie	0.449	7	3
lubuskie	0.309	8	2	opolskie	0.369	8	2
opolskie	0.303	9	2	zachodniopomorskie	0.359	9	2
kujawsko-pomorskie	0.276	10	2	kujawsko-pomorskie	0.311	10	2
zachodniopomorskie	0.254	11	2	podlaskie	0.307	11	2
podlaskie	0.226	12	1	lubuskie	0.301	12	2
świętokrzyskie	0.187	13	1	podkarpackie	0.238	13	1
podkarpackie	0.184	14	1	lubelskie	0.222	14	1
lubelskie	0.180	15	1	warmińsko-mazurskie	0.208	15	1
warmińsko-mazurskie	0.163	16	1	świętokrzyskie	0.190	16	1

Source: own estimation based on data from Central Statistical Office of Poland: Local Data Bank (<https://bdl.stat.gov.pl/BDL/start#>) and Sustainable Development Indicators / Regional module (<http://wskaznikizrp.stat.gov.pl/>)

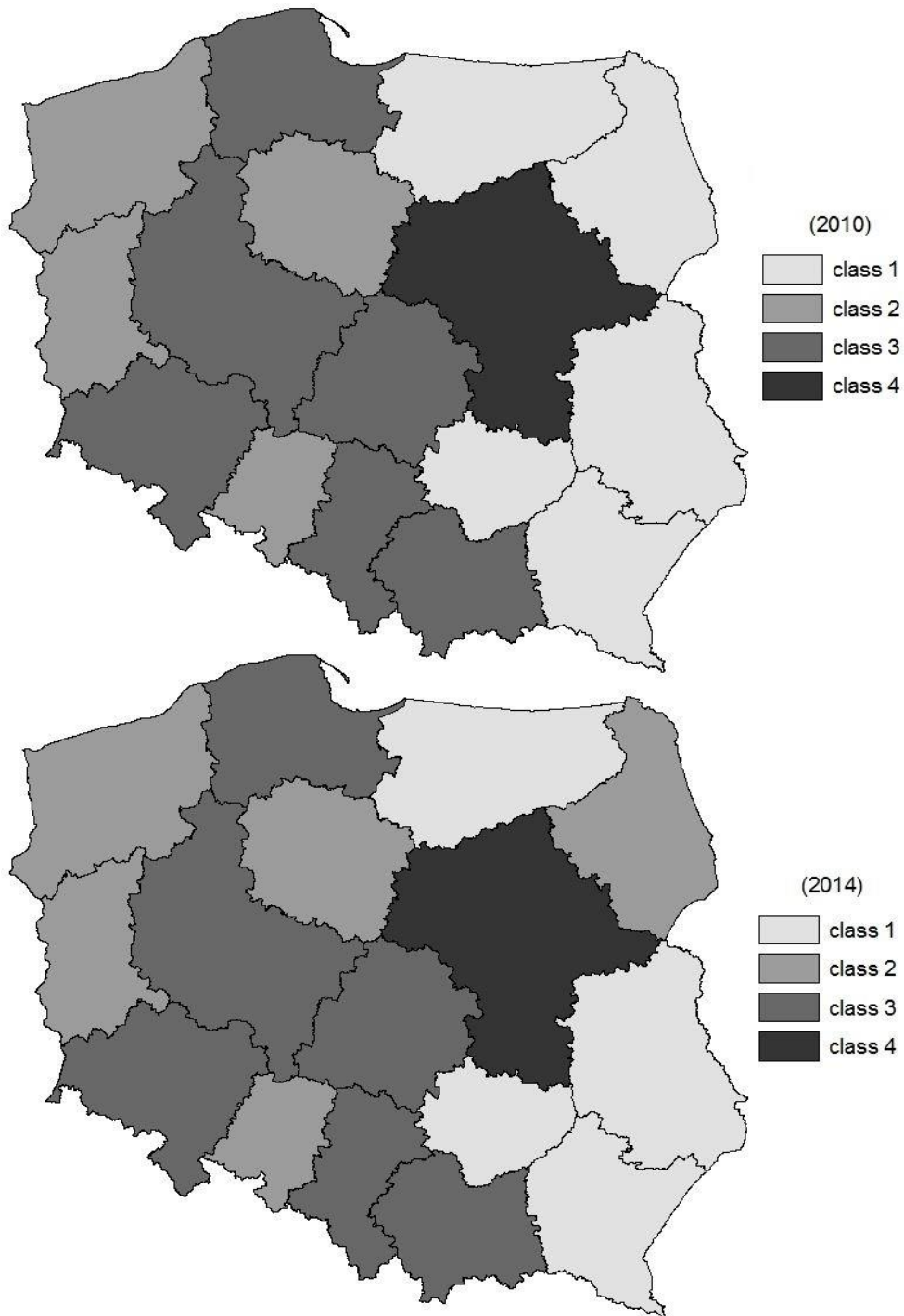


Fig 3. The NUTS 2 regions grouped based on quality of enterprenerial environment in Poland in the years 2010 and 2014

Source: own estimation based on data form Central Statistical Office of Poland: Local Data Bank (<https://bdl.stat.gov.pl/BDL/start#>) and Sustainable Development Indicators / Regional module (<http://wskaznikizrp.stat.gov.pl/>).

4. Results

Based on the obtained results it can be concluded the quality of entrepreneurial environment at regional level has generally improved. This positive picture can be seen in the differences in grouping the regions in the year 2010 and 2014. In the first year of the analysis in the first class there were five NUTS 2 regions, whereas in the last year of the research only four regions could be found. Thus, one should stress the progress obtained by the podlaskie region, which managed to move from the first class in the year 2010 to the second class in the year 2014. In the case of the region with the best conditions for entrepreneurship in both years one can find mazowieckie NUTS 2 region, which in both years of the research makes the class 4. This region with the capital city metropolis is also considered as the best economically developed part of Poland. In the third class with relatively high quality of enterpenerial environment one can find dolnośląskie, wielkopolskie, pomorskie, łódzkie, śląskie and małopolskie NUTS 2 reions. In the year 2014 in the second class with average quality of entrepreneurial environment there are the following NUTS 2 regions zachodniopomorskie, podlaskie, opolskie, kujawsko-pomorskie and lubuskie. In the first class with the worst conditions for entrepreneurship in the year 2014 one could find warmińsko-mazurskie, podkarpackie, lubelskie and świętokrzyskie NUTS 2 regions.

5. Discussion

As it has been already mentioned in the previous section the obtained results confirmed that in the analyzed period the quality of entrepreneurial environment at regional level has significantly improved, which enables to confirm the first hypothesis of the research. It is especially important when one takes into consideration the fact the analyzed period has been still influenced by the negative consequences of the global financial crisis from the years 2008-2009.

However, one should also stress that in spite of this progress there are still significant disparities at regional level, which can be seen especially in the level of obtained value for the latent variable in both analyzed years. This result is consistent with the previous research of the authors in the field (see Pietrzak, 2017; Pietrzak. M. B. & Balcerzak, 2016c) and recent research on the convergence process at national and regional level conducted by Kuc (2017b). The results can be considered as strong arguments in favour of the second empirical hipotehes of the article. The empirical contribution can indicate significant challenges for Polish policy makers and decision makers at regional level, as the constant disparities between the regions can be the source of instability of the whole economy and the factor negatively influencing its growth potential. In longer run that situation negatively affects socio-economic sustainability of the whole economy.

Conclusions

The presented research study was devoted to the problem of quality of entrepreneurial environment at regional level in Poland in the context of regional sustainability framework. In the research structural equation modeling was applied. From the methodological perspective most of the research in the field is based on taxonomic or multiple-criteria analysis tools. However, this research due to applying SEM methodology treats the analysed phenomenon as a latent variable, which can be considered as a value added in the field. Additionally, it enables to assess the applicability of potential diagnostic variables in the research concerning quality of entrepreneurial environment at regional level, which can be important information for standard multiple-criteria and taxonomic research, where the selection of diagnostic variable is arbitral or is based on taxonomic information value criteria.

However, one should be aware of important litmitation of curent empirical proposal. First of all, the choice of the diagnostic variables used in the research can be the source of discussion and critics. However, this factor is mostly the result of availability of comparable data at regional level, which can be the source of important information in the given sphere. The second most important limitation of the research is attributed to the short period of the empirical analysis, which is mostly the result of availability of comparable data at regional level.

There are also important possibilities for future research in the field. First of all, as it was mentioned one should be aware that there are interrelations between the pillars of quality of entrepreneurship environment at regional level: a) socio-economic development, b) social development, c) quality of juridical system, which were not analysed in the current article. This empirical gap should be the next step in the modelling process of changes in the case of entrepreneurial environment in Poland.

The second direction of empirical research could be found in the comparison of the results obtained based on aggregated data form national statistics as it was done in current analysis, with a perception of entrepreneurial environment at regional level measured with application of survey research conducted among entrepreneurs.

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REVIEW OF THE EGYPT SCIENCE AND TECHNOLOGY SYSTEM; SWOT ANALYSIS

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Received 18 June 2017; accepted 10 October 2017; published 29 December 2017

Abstract. In this review, we conduct an exploratory study to assess Egypt Science and Technology System by the utilization of the Delphi survey combined with “Electronic Town Meeting” protocol following a preliminary evaluation of research and innovation performance at the national level. The application of this protocol was directed toward a realization of national science and technology SWOT analysis. Within this analytical framework, we examined different components of Egypt Science and Technology System in addition to competencies, bottlenecks and opportunities with the aim of providing a concrete assessment view and draw useful directions that could be rapidly utilized in different settings. We recommend using this combined protocol in the different strategic planning settings and actions.

Keywords: Science and Technology, SWOT analysis, research assessment, innovation system.

Reference to this paper Radwan, A.; Sakr, M. 2017. Review of Egypt Science and Technology System *Entrepreneurship and Sustainability Issues* 5(2): 204- 211. [http://doi.org/10.9770/jesi.2017.5.2\(3\)](http://doi.org/10.9770/jesi.2017.5.2(3))

JEL Classifications: O1; O3

Additional disciplines: political sciences; sociology

* This research was supported by the project, which has received funding from the European Union's Horizon 2020 research and innovation programme European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme Marie Skłodowska-Curie Research and Innovation Staff Exchanges ES H2020-MSCA-RISE-2014 CLUSDEV MED (2015-2019) Grant Agreement Number 645730730



European Research Council
Established by the European Commission

1. Introduction

The differences in science and technology systems are prominent among developing countries and between developed and developing countries (O'Brien et al., 2013; Melas et al., 2017; Tvaronavičienė et al., 2017; Štiglic, 2017).

The recent dynamics following the Arab spring in the North African region implied further developments in the national system of science and technology. Several countries in this region exerted a lot of efforts in reviewing and revisiting current legislations, policies and strategies (Etzkowitz & Leydesdorff, 2000). An increased focus in the measures to optimize the research and innovation performance at the national level became a central component of national strategies (Bermejo Ruiz & De Pablos-Heredero, 2013a; Ghinolfi et al., 2014). In this respect, assessing the current system and structures became a paramount and prerequisite for any development plan (Ghinolfi et al., 2014). The analysis of strength, weakness, opportunities and threads (SWOT) is a commonly conducted analysis and defined as comprehensive method to study the system environment (Phadermrod, Crowder, & Wills, 2016). SWOT has been used extensively to assess industries and has been also used recently to assess national systems for science and technology (Bermejo Ruiz & De Pablos-Heredero, 2013b). Although the importance of such assessment, few attempts were done in the North African region. Several computing analytical techniques were used to engage stakeholders in the strategic planning process and the use of electronic town meeting (ETM) protocol has evolved quickly since it was firstly introduced in late 1990s when it was used in the USA for engaging citizens and different stakeholders in the policy planning process (Becker, 2001). It was demonstrated that electronic town meetings could be used widely in Science, Technology and Innovation planning process (George, Nunamaker Jr, & Valacich, 1992). In this respect, the aim of this analysis is to analyze the national science and technology system in Egypt and visualize the research and innovation landscape from a wide strategic angle.

2. Research Methodology

2.1 Study framework

This assessment was done through two phases; the first phase includes the creation of theoretical-methodological corpus based on primary and secondary sources in the fields research and innovation performance. Based on the findings of the first phase, an exploratory research study was performed using Delphi technique combined with electronic town meeting protocol in constructing SWOT analysis. Benefiting from the grounded theory, an iterative process has been conducted in each round of surveys and the last inputs were captured while considering the majority consensus (Charmaz & Bryant, 2010). The theoretical-methodological corpus was used to define a set of indicators including “operational indicators”, “performance indicators” and “functional indicators”. The questionnaire design followed Oslo Manual of OECD and a short version has been produced to reflect the correlation of the identified indicators with policies, strategies and technological roadmaps (Organisation for Economic & Development, 2010).

The SWOT analysis consisted of three phases

1. Selection of analytical parameters;
2. Data collection; and
3. Analysis and reporting.

SWOT analytical parameters

Based on the theoretical methodological corpus, we have used the confrontation matrix model in selecting the analytical parameters of the SWOT analysis (Kearns, 1992). These parameters include:

- Human resources Capacity
- Research infrastructure
- Funding
- Regulations and legislation system

- Local innovation ecosystem
- International prospective
- Utilization of IPR and research investments

2.2 Data collection and analysis

The application of the Delphi method has been deployed in this assessment based in two questionnaires. Each parameter was analyzed with multiple questions through the distribution of semi-quantitative, and qualitative questionnaires. The articulation of the investigational points was addressing the main drivers, challenges, obstacles and opportunities facing the science and technology system in Egypt with specific emphasis on facilitating the articulation of relevant recommendations.

The generated responses were organised through “Electronic Town Meeting” (ETM) protocol (Becker, 2001). ETM is a community meeting that allows people to participate and interact via digital technology to influence decision-making processes (George, Nunamaker, & Valacich, 1992). Participants were invited to fill the questionnaire and participate afterwards in a group discussion. Interaction and exchange of ideas between the different groups is facilitated by a real-time transcription system that allows sending the results of each group discussion to a theme coordinator who is responsible of delivering an instant report few minutes after the end of a round of discussion. Furthermore, electronic survey tools were used to integrate discussions so that participants can further validate the group answers. The discussions results are presented during the same day for an additional round of inputs and a majority consensus is realised through an electronic polling system. Participants were then invited to fill individually the second questionnaire following the same process. This state of the art methodology helped all participants to actively participate in a democratic way where all ideas are instantly captured, thus concrete results are produced.

Data collection was done through the organisation of two ETMs where each has 100 invited experts. To have a representative sample, experts were carefully selected to present all stakeholders where a quarter of all participants represented industry, and 40% represented equal participation from universities and research institutions, while Technology Transfer offices were represented by 15%, and each of local authorities, international agencies, media and scientific journalists, and civil societies was represented by 5%.

Questionnaires were answered according to participants’ expertise, knowledge, and involvement in the innovation ecosystem activities. Qualitative answers were counted as positive (strength) or negative (weakness), semi-quantitative answers received a score ranging from one (maximum weakness) to five (maximum strength). Questionnaires contained a total of 54 questions, 32 of which were enclosed in the internal factor analysis and 22 in the external factor analysis.

3. Reporting of findings

Table 1. Strengths and weakness of the national science and technology system

	Strength points	Weakness Points
Human	Availability of good research base of more than 100,000 research, 50 universities, 120 research centers and growing number of civil societies with supportive role to Science and Technology	Poor distribution of researchers’ headcount in relevance to available competencies
	Research community in Egypt is highly productive, as indicated by publications’ count in the last 10 years.	Full time equivalent researchers don’t constitute more than 45% of the total count of researchers
	Large number of qualified scholars in diaspora.	Low number of qualified supporting staff in higher education establishments in addition to poor availability of skilled technicians
	Active international mobility of young scholars.	Low number of effective mechanisms for empowering and engaging young scholars in

resources' Capacity	Population demographic pattern shows a great potential for wide spectrum of development with the existence of large percentage of young.	policy planning.
		Poor recruitment structure in hiring well qualified scholars (and not only own graduates).
		Routine career path of researchers that is not incentivized enough with regard to excellence in science and technology.
Infrastructu re	Availability of good physical networks and connectivity of research institutions in Egypt	Low number of scientists in physics and mathematics when compared other disciplines
	Availability of scientific databases, digital libraries and data management applications	Lack of national programs for assessing and upgrading of research facilities.
	High bandwidth internet connectivity that support research applications	Most of the private universities have poor R&D infrastructure and thus, are not qualified enough to conduct significant R&D projects.
	Numerous specialized research networks including high energy physics, nanotechnology, nuclear research and viral hepatitis C.	Less awareness about the existence of high qualified facilities and labs.
	Good distribution of functional equipment across universities and research centers	Lack of comprehensive inventory of all available infrastructure regarding functions, specs, maintenance log and expected lifetime
	Establishment of new private research centers, especially in the medical field.	Poor accessibility and use of existing infrastructure in public research institutions.
Funding	Diversified mechanisms of public funding on R&D.	Low number of excellence centers in Science and Technology
	Allocation of more than 1,000,000 euros annually for scientific missions abroad.	National funding of Scientific research is highly fragmented.
	Gradual increase in public expenditure on research and development which shall reach 1% of GDP according to Egypt constitution.	Lack of effective evaluation and monitoring scheme of the different funding schemes and accordingly, the economic and technological impact.
Regulations and legislation system	National R&D funding increase to 1% of GDP according to the new national constitution. This is the first time this has been stipulated in an Egyptian Constitution.	Business expenditure in R&D is lower than expected average and insufficient.
		The lack of sufficient skills in writing competitive proposals or managing collaborative research and innovation projects.
	Boosting the capacities of the national system with new entities like the presidential council for scientific research in addition to activating the supreme council of research.	The existence of national laws that prohibits research organizations to establish spin-off companies
Innovation ecosystem	Growing number of actors in the innovation ecosystem including business competitions, venture capitalists, incubators and specialized civil societies.	Lack of specific regulations in particular domains like clinical research and clinical trials.
	A recently established system for monitoring and evaluation of research and innovation at the national level.	Significant rate of research plagiarism at the national level with insignificant preventive regulations.
	Growing number of initiatives and programs that focus on raising scientific culture and popularization of sciences.	More focus at the national level on Information and communication Technologies and less emphasis on other technological areas.
	New schemes for public private partnerships and technology alliances.	Lack of an effective national strategy for research and innovation. Existing technology roadmaps and strategies are not binding to the relevant actors. No sufficient incentives that could encourage the implementation of national strategies.
		No significant coordination measure among public innovation support organisations.
		Primary focus at the institutional settings on research excellence based on the constricted and routine definition with regard to the production of knowledge rather than the use of knowledge.

		Routine workflow of the governmental sector that doesn't encourage research and innovation practice.
		Low interest in socioeconomic studies with less significant funding or supporting scheme.
International perspective	High scientific productivity in the fields of Chemistry, Medicine, material sciences. High impact of scientific fields like mathematics, physics and agriculture.	Low rank in the global innovation index.
	Ongoing efforts in indexing local scientific journals in the international publishers' databases.	Insignificant impact of the public and International relations offices in public research institutions
		Lack of internationalization strategy at the level of institutions.
The use of Intellectual property rights and research investments	Existence of technology transfer and IPR offices at the majority of Egyptian universities.	Economic return of Egypt intellectual property rights is weak.
	Existence of many public initiatives to transform research results into economic value.	Low number of patents' files and awarded patents.
		Lack of IP and patents' portfolio analysis at the national and institutional levels.

Table 2. Opportunities and threats of the national science and technology system

	Opportunities	Threats
Human resources' capacity	Ongoing growth rate of number of researchers in different disciplines	Gender imbalance in vertical and horizontal segregation of women's in science.
	Significant percentage of young researchers among the total research population	Research and education are greatly dominated by the public sector
	Existence of well-trained experts in research investment and funding, indicators and evaluation	Misuse of the potentiality of human resources; repetition and overlap of several research activities at the national level.
	Thousands of Egyptian experts abroad with high scientific capabilities and industrial experience.	Extensive Brain drain towards gulf area and some European countries.
Research infrastructure	Existence of number of centers of excellence located in different governorates	Research infrastructure is very concentrated in Cairo and delta region
	Political support in establishments of science parks and new science cities.	Research expertise distribution is indirectly proportional to the existence of good infrastructure
	Egypt membership in many international scientific and technological networks and unions.	Research activities not oriented to businesses' needs in addition to less utilization of existing capabilities.
	Wealth of equipment distributed widely among research centers and universities.	Lack of financial tools that support the upgrading and acquisition of research and innovation equipment.
Funding	Existence of diversified public funding of basic and applied research	Routine research administration and its effect on institutional competitiveness in the international funding programs.
	Increasing public R&D expenditure	Market dominated by big enterprises with the significant presence of informal sector
		No sufficient program to leverage resources and engage SMEs in R&D activities in cooperation with academia.
Regulations and legislations	Existence of many initiatives and projects to revisit laws including research incentive law.	Excessive changes within the national innovation system.
	Increase utilization of IPR policies in universities and research centers.	The lack of enforcement to policies with unclear incentive scheme to encourage research

		performers to consider the local and national policies.
	Clear pathway and system for introducing new law, specific amendments and regulation	Legislative obstacles that decrease the flow of technology and know-how transfer.
Innovation ecosystem	Growing capacities of several actors in the innovation ecosystem including non-governmental organizations	The independence perception of universities and public research performers.
	Growing number of institutional policy development	Education reform resistance
	Significant number of international collaboration activities	The continuity of the lack of evidence based strategic planning at the level of research performers.
	Emerging competencies in specific disciplines especially in psychology, neuroscience, veterinary, economics and social sciences.	The continuation of establishing science parks and research facilities that are not equipped enough to perform the desired activities.
		No specialized institute for science and innovation policy
	Emerging initiatives that support innovation in rural areas.	Private universities are now allowed to undertake postgraduate programs
	Development of national technology platforms and innovative business clusters.	The percentage of illiterate population
		Scope of work inconsistency of the several public administration actors with high overlapping responsibilities.
International perspective	Good cooperation capacities with Europe and North Africa in addition to growing demand of African cooperation.	The national political and security stability could affect the research and innovation performance.
	Agriculture, food and medical research fields have high potential for collaborative activities based on bibliometric analysis.	No significant presence in international competitive research programs with less representation in the mega scale project and international consortiums.
The use of Intellectual property rights and research investment	Good geographical coverage of technology transfer offices among research performers and industry.	The Egyptian industry lack of trust in the scientific local expertise.
	Existence of mega scale projects like new suez canal, Grain stock exchange and new valley investments.	Less competitiveness in the international markets
	New investments opportunities in renewable energy and transportation.	Weak coordination measures between investment and economic agencies with science and technology agencies.
	Political support in optimizing the local manufacturing and Egypt specialized industry like textiles, pharmaceuticals and petrochemicals.	Insignificance of existing mechanisms to link industry and academia

Conclusions

Egypt science and technology system was built few decades ago as static and linear system that doesn't allow quick adaptation to the current dynamics (Rezk et al., 2016; Radwan, 2015). Some authors have indicated that the non-linear and dynamic national systems could facilitate the technological development and allow better market uptake of research results, as well as boosting product innovation capabilities (Quitow, 2015; Samara, Georgiadis, & Bakouros, 2012). One main recommendation concluded from this study emphasizes on the importance of promoting evidence based strategic planning at the level of research institutions in Egypt. Many previous studies underscored the importance of evaluation and monitoring system of science and technology as essential component of the development process (Etkowitz & Leydesdorff, 2000; O'Brien et al., 2013). Having a continuous and effective evaluation and monitoring mechanism embedded in the national system of science and

technology is paramount for effective utilisation of existing capabilities and resources. The findings of the SWOT analysis of national systems would contribute in building the conceptual framework needed in further development of policies.

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Aknowledgements

This research was supported by the project, which has received funding from the European Union's Horizon 2020 research and innovation programme European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme Marie Skłodowska-Curie Research and Innovation Staff Exchanges ES H2020-MSCA-RISE-2014 CLUSDEV MED (2015-2019) Grant Agreement Number 645730730



European Research Council

Established by the European Commission

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MANAGEMENT TEAM DEVELOPMENT OPPORTUNITIES: A CASE OF LITHUANIAN FURNITURE COMPANY

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Received 13 June 2017; accepted 26 September; published 29 December 2017

Abstract. The accelerating implementation of innovations in business "drags" the enterprise management teams into a chain of constant changes which requires rapid adaptation to the process of changes, becoming a routine. Development as an issue of a systemic qualitative change and of the increasing internal organisational potential is one of the most important issues in the advancement of modern organisations. The article introduces to the opportunities of the management team development as one of the main activity trends seeking to ensure the possibility of successful team management, continuous improvement of the members, and increasing competitiveness of the organisation. Upon conducting qualitative research in a Klaipėda region furniture manufacturing company, its findings, i. e. the opportunities of the management team development are presented: to encourage all the members of the management team to become leaders; to identify the goals of the personality and the competences development; to find out which competences each member wants to improve and to allow them to undertake additional activities that would enable the improvement of those competences; to set the operational goals for the members which would also allow (help) them to pursue their personal goals; to coordinate the values of the organisation and the team members on the basis of needs, when the need for self-realisation prevails over their hierarchy; to give more responsibility to the team members who wish and seek it; and to authorise each member of the team to resolve conflicts independently.

Keywords: production company, management team, development

Reference to this paper should be made as follows: Giedraitis, A.; Stašys, R.; Skirpstaitė, R. 2017. Development possibilities of the management team within a production company, *Entrepreneurship and Sustainability Issues* 5(2): 212-222. [http://doi.org/10.9770/jesi.2017.5.2\(4\)](http://doi.org/10.9770/jesi.2017.5.2(4))

JEL Classifications: M12

Additional disciplines: psychology; educology

1. Introduction

The accelerating implementation of innovations in business "drags" the enterprise management teams into a chain of constant changes which requires rapid adaptation to the process of changes, turning into a routine. The aspiration of enterprises to exist today and to remain in the future is inseparable from consistent work in the formation and development of management teams whose successful performance depends on the potential and skills of their members and their desire to constantly improve. Therefore, every member of the team has to be encouraged to constantly analyse their experience and prospects and to transform the obtained data to pursue the management team development goals. The activity of the management team is related to such outcomes as the growth of the income, market share, and profitability.

As a rule, researchers agree that the main hindrances in the management team development are inside the organisation. If the management team is not developed, there is no use talking about its spontaneous development, as the team cannot develop by itself, without an artificial stimulus. It is very important to identify and remove the hindrances, since the internal potential with a stimulus and without hindrances promotes development and helps each member of the management team to reveal their potential. In that way, the potential of each manager increases, and the synergistic effect is strengthened among the members of the team; and that is the key to success, innovation, and creativity (Smith, 2006). Since most authors have different perceptions of the prerequisites and goals of the management team development, the process of the management team development has not been sufficiently described, and its further research issues remain relevant.

Scientific problem: the developmental opportunities of the management team have not been adequately addressed in scientific literature and have not been proved in practice.

Research object: the management team in a production company.

Research aim: to establish the opportunities for the management team development in a production company.

The objectives: to identify the key elements in the production team development and to establish the opportunities for the management team development in a production company.

Methodology. In order to identify the key elements in the management team development, the method of a systemic analysis of scientific literature was applied, and to establish the opportunities of the management team development in a production company, a qualitative research method – a semi-structured interview was chosen. The research participants- informants were 8 managers of all levels. The research was carried out in a furniture manufacturing company in Klaipėda region in April 2016.

2. A theoretical model of the management team development

As defined by V. Diska and A. Marčinskas (2013), a manager is an employee who is able to make decisions within his area of competence in different fields of activity of the team entrusted to him, responsible for the performance of the entrusted division and exerting influence upon the entrusted team by specific management instruments. The situation of each manager in a company is different due to the difference in the number of subordinates, the area of management, the position occupied in the structure of the company, and the stage of the company's development (Staniulienė, 2008).

In the performance of management functions by *top-level managers*, the emphasis on leadership ought to be evident, as it is related to having a vision, the ability to model, and a broad approach to the developing phenomena. Middle-level managers need more administrative abilities, as they accept the role of mediators, i. e. get the tasks formulated by higher authorities and distribute them to their subordinates. In such cases, the managers do not need to have any special creativity, and they do not create future visions. They only pass instructions and control how these are executed. The role of an administrator ought to be combined with leadership: such a manager ought to motivate employers for productive work and increase their involvement in the company's activity. A manager-administrator is also necessary at the *low level of management*, where the technical skills are the most important.

Each manager in any enterprise, from the top to the low level, has to have clear aims which should support the goals of the managers of the higher hierarchical levels of management (Zakarevičius, 2003). Both the ability of the team to realise the possessed potential and the efficiency of the company depend on the optimality of the management team of the company. Such a management team has greater interoperability.

In order to establish the elements of the management team development complex, it is important to define the concept of the team. To quote S. Raižienė, A. Endriulaitienė (2007) and I. Beniušienė, J. Vveinhardt, G. Merkys, M. Dromantas (2005), a team is a small group of people whose knowledge and experience complement one another in the pursuit of a common goal. In accordance to R. Hirschfeld et al. (2006), a team is a structured group of people who interact in the achievement of the goals and certain objectives set for collective performance. The team must ensure the implementation of the strategy and appropriate conditions that enable purposeful use of all the possessed resources in order to achieve the company's efficiency and success (West, 2012). The members of the team must be responsible not only for themselves, but also for the other members of the team.

Of all the individual's capabilities and qualities, development is the most important. The development of the management team is inseparable from the development of the potential of each team member and of the relationships between the team members. When the potential of each team member increases, combined with the strengthening of the relations between employees and due to the synergy effect, the results of the company's activity will increase proportionately. Development is a process which includes self-awareness and self-observation, identification of strengths and weaknesses, an individual-initiated desire to change, long-term commitment to change, the onset of change, and the recognition of a potential failure. Therefore, the following formula of the management team members' development can be proposed (Kvedaravičius, 2006):

$$P \text{ of the management team} = \Sigma P \text{ of the team members} + \Sigma R \text{ of the team members} + \Delta S \text{ of the management team,}$$

where **P** is potential, **R** is relationships, and **S** is the synergistic effect.

The resources for manager's development lie in the individual himself, however, a development-friendly milieu is necessary, i. e. a team. The management team will only develop when each member of the team develops. A manager's desire for development must come from the inside, the team cannot make him change, however, the team can provide development-friendly conditions when the members of the management team face new challenges, are encouraged to improve, and can reveal their inner potential.

B. Tuckman in 1965 proposed the first group development model. He said that four phases (forming–storming–norming–performing) are all necessary and inevitable in order for the team to grow, face up to challenges, tackle problems, find solutions, plan work, and deliver results. However, the model proposed by him changed, as the development of a management team is an artificially natural process of a sociocultural system where the internal qualitative potential is acquired by the team members mastering the new and improving the old competences in order to more effectively work in and for the company.

The management team must first of all have an exemplary head of the team, i. e. leader. The mission of the management team leader is to get together the best team and help it achieve its goals. He needs to get together an effective, hard working team, to be able to promote its creative potential, to skillfully manage the emerging conflicts, and to solve problems. The leader must have clear activity goals and evaluation criteria, to promote the company's development, and to know and stimulate the team members (Drucker, 2009; Kasiulis, Barvydienė, 2004). The leader shares the position of leadership with all the team members. In each situation, the management team is to have a leader who best performs certain functions. However, the managers' potential of leadership is not sufficient yet, and that frequently becomes a significant obstacle to the further development of the company.

Competences are the basis of teamwork, therefore, the members of the management team have to have different competences. Each member of the management team has to share his own competences and to be able to make use of the competences of other team members. The "mix" of the competences of the management team members is the combination of the pursuit of the set goals (Savanevičienė ir kt., 2008; Žydžiūnaitė, 2003; Robbins, 2003). All the forms of activity (knowledge, abilities, and skills) never become values by themselves until the team member gives prominence to them, provides them with significance, and relates them to his own experience.

The management team ought to choose members who are energetic, enjoy active work, cope with their emotions, and are ready to openly express their opinion. The team members are to be highly motivated and seek to improve and to be leaders. Every team member has to have a possibility to improve. Innovation formation and implementation has to be a continuous and dynamic process (Misevičius, Urbonienė, 2006; Robbins, 2003; Dlugoborskytė et al., 2015). It is especially important to promote the creative productivity of activity. Without a material "basis", the management team tends to act without any plan and spontaneously respond to the requirements of the environment (customers or consumers). Their priority becomes the ensuring of the minimal level financial resources needed to maintain the company and its employees, and they move away from the implementation of the company's mission and goals.

The management team members have to understand the team's goals and to seek their compatibility. Well-balanced goals bring positive results to the team and team members. The goals of the team members have to be clearly defined and comply with their competences (Diska, Marčinskas, 2013; Jezerskytė, Žydžiūnaitė, 2005; Yuen, 2004). The goals and objectives of the company keep changing, and depending on that, the roles of the management team members may change, too. The management team is characterised by unity, as only interrelated team members affect one another; the presence of all the team members is necessary for the implementation of a common goal and for meeting individual needs of each member. The failure to properly convey the goal may lead to a number of management problems. The ambiguity of the goal causes the employees' tension, uncertainty, dissatisfaction, and confusion. A poor result is obtained when the goals of the company change, and the employees' expectations do not; when the goals of the company do not change, and the employees' expectations do; or when the goals of the company and the employees' expectations do not change or change too late.

The compatibility of the leader's personal values with the values and standards of other team members and the company as a whole has a positive impact on the employees' emotional commitment to the company and stimulates their wish to stay in it. The compatibility of the values of the company, team, and each team member is possible when the chosen behaviour leads to internal satisfaction (Hamid, Yahya, 2011; Meyer ir kt., 2010; Gregory ir kt., 2010; Turnbull, 2005). In the dissemination of values in the management team, it is important to have a strong interrelationship between the team members. It depends on the ability of the management team members to create a system of values. The value is closely related to the search of the meaning of human life and its ultimate purpose. The management team ought to demonstrate a moral commitment, understood as self-identification with the goals and organisational values.

J. Albrechtas (2005), P. R. Scholtes et al. (2003), W. Bennis, B. Nanus (1998) argue that there has to be a clearly defined individual and joint responsibility of the management team members and clearly distributed areas of their responsibilities. The most important thing is to cherish respect, mutual understanding, and responsibility. The members must assume responsibility for respective decisions and to use efficient ways of activity. The leadership responsibility ought to be shared between all the members. Active participation of the management team members in decision making increases their responsibility, gives more energy and desire to implement the goals set by themselves, and helps to better understand the meaning of the work being done. The responsibility for decision making of each manager, independently on the level of management in the company, "melts" in the efficient (or inefficient) activity of the management team.

Effective communication between the management team members is a must. The members of the management team commit themselves to open and honest communication. Objective assessment of the activity of each management team member and mutual trust is a necessary condition for cooperation, as only then the ideas and alternatives are freely expressed (Loureiro et al., 2009; Teresevičienė, Gedvilienė, 2003; Menshikov et al., 2017). The roles performed by the team leader are related to the leader's relationships with the team members, which should be based on the humaneness principles. To have effective interaction between the management team members, mutual assistance is emphasised as the assessment of abilities and opportunities, recognition of achievements and mistakes, and the result of motivation and the efforts made, of the possibilities to develop

competences and the self-realisation. Only good and strong interrelations between the management team members create a synergistic effect, therefore, the company has to improve its communication processes.

When looking for the best decision, small conflicts often occur in the management team. Due to them, one can make the right decisions and to create a communication-friendly atmosphere. To reduce the number of conflicts, the psychological climate in the management team is improved. The best outcome of the conflict resolution is openness, reduction of tension, normalisation of relations, and increasing confidence (Komskienė, Birbalas, 2013; Ivančikaitė-Ustinovienė, 2009; Kvedaravičius, 2006; Ignatjeva et al, 2017).

In order to resolve conflicts more effectively, one first needs to identify open and hidden conflicts between the members of the company. The willingness and the ability of the team leader to successfully control his own and the team members' behaviour has a huge practical and economic value. The members of the management team have to share not only the achievements, but also the bitterness of defeats.

The theoretical complex of the elements necessary for the management team development, based on the systemic analysis of scientific literature, is presented in Figure 1. The complex of the elements of the management team development is understood as a construct of the team understanding and special efforts of the team members.

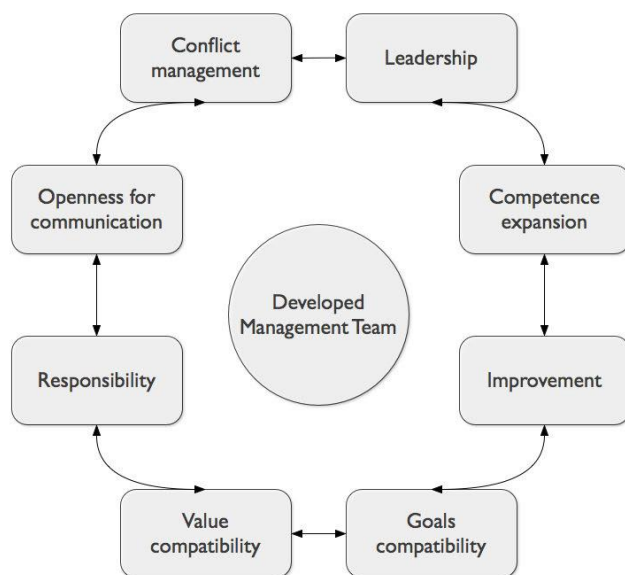


Figure 1. A theoretical model of the management team development

To summarise the above-discussed opportunities of the management team development, one can argue that management teams, being open, develop their competences, reflect on their experiences, change the environment by expanding the opportunities for activity, and initiate qualitative changes in a team. Thus a possibility appears to more flexibly and accurately respond to the changes in the environment and the organisation itself. The developing team of managers enrich the intellectual resources of the organisation, as, when collaborating with colleagues, the competences acquired by a team member become a joint asset of the company. Therefore, we argue that the management team can develop when: it has a leader; the selected team members have additional competences and a great desire for improvement and leadership; when the activity is based on matching goals and harmonised values and on common and individual responsibility; and when the team is able to constructively resolve conflicts. By developing in accordance with those elements, the management team is maturing.

3. Research methods

The research was conducted in a medium-sized furniture manufacturing company in Klaipėda region. The main buyer of the company's products is the Swedish concern *Ikea*.

The methodology. *The aim of the research* was to establish the feasibility of the management team development in a manufacturing company. As the disclosure of the phenomenon required an in-depth approach to the problem, qualitative research was chosen. A qualitative method allows the researcher to focus on the individual experience of the investigated subject which best reveals the subjective reality. Most importantly, qualitative research enables the researcher to more flexibly obtain exhaustive data and provides him with better opportunities to formulate the main conclusions of the research, based on the real-life entrepreneurial experience. The qualitative research sought to find out each manager's of the team subjective understanding of the development experience.

The data collection methods was a semi-structured interview to find out how the management team members behaved in different management situations and what development opportunities existed at the individual and team levels. The questionnaire included the informants' demographic data (age, education, and work experience) and the questions related to the eight main elements of the management team development. The data were recorded by a voice recorder. The recorded interviews were later transcribed, the keywords marked, and the environment was described as much in detail as possible; moreover, the emotions of the respondents were observed. During the research, we sought to keep the question formulation and the process of the interview of each informant uniform, as the same phenomenn was investigated.

Table 1. Demographic data of the informants

Level of management	Age (in years)			Education		Work experience (in years)		
	25–35	35–45	> 45	Higher	Higher non-university	5–10	10–15	> 15
TOP			2	2				2
MIDDLE	1	1		2		1	1	
SUPERVISOR	1	3		2	2	1	2	1

The data processing method was a content analysis method. The method is used to analyse the answers to the questions, to select certain meaningful units from the text, to calculate the frequency of their use, etc. (Kardelis, 2005; Tidikis, 2003). The method is divided into stages: 1) reading of the text in accordance with identified categories; 2) the division of the category content into subcategories; 3) interpretation of the categories and subcategories and justification by the text. In the analysis of the obtained research data, one looks for meaningful units that would reflect different aspects of the informants' experience and views related to the research object. The empirical indicators (statements) were grouped into sub-categories by notional similarity and calculated.

Selection of interviewees. In the research, a criterion-based selection was used, when the informants were selected in accordance with a certain researcher-established criterion (Rupšienė, 2007). The research participants were selected, based on the following criteria: 1) the manager's competence; 2) the manager's work experience (no less than 5 years); 3) a full-time position. *The informants and their demographic data:* the research participants included representatives of all management levels, including 2 top-level, 2 middle-level, and 4 low-level managers.

4. Analysis of the findings

On completion of the qualitative research in accordance with the compiled questionnaire, which sought to identify the behaviour of the management team members in management situations and the possibilities of the team development, meaningful statements were selected from the managers' answers and the frequency of their use was calculated. The summarised research findings are presented in Table 2.

Table 2. The findings of the qualitative research

ELEMENTS	SUBCATEGORIES AND NUMBER OF STATEMENTS
1. Leadership	Be able to hear (10 statements); be able to constrain the members to take care of their matters (9 statements); to show example (9 statements); be vigorous (8 statements); to cope with emotions (8 statements); have own opinion (8 statements); don't be afraid of other opinions (5 statements); to initiate the development (5 statements).
2. Competence expansion	New roles (15 statements); additional skills (12 statements); adjustment of features (10 statements); to seek a career (8 statements).
3. Improvement	Important position (10 statements); increased responsibility (10 statements); self-confidence; appreciation (10 statements); professional sophistication (6 statements); self-realisation (5 statements);
4. Goals compatibility	Purpose oriented goals (60 statements); realised goals (19 statements); long-term goals (13 statements); goals for giving sense to subsistence (5 statements).
5. Value compatibility	The most important individual values (22 statements); manager's responsibility for spread of values (19 statements); company's system of values under construction (15 statements); identification of the company values with the values of employee (6 statements);
6. Responsibility	Manager-leader is the delegate of powers (19 statements); monitoring of responsibility (18 statements); limits of responsibility (5 statements).
7. Openness for communication	Effective communication between team members (37 statements); empathy (17 statements); correlation of the members (10 statements); constrictive relations (8 statements).
8. Conflict management	Often critical situations (28 statements); effective solutions (17 statements); certified methods of conflict solution (15 statements); rapid solutions (10 statements); compromises (7 statements).

1. A management team needs a leader. The team leader's status makes an impact on the activity of all the team members. The management team leaders are empathetic, communicative, and able to take care of the remaining team members. As proved by the research findings, the leadership potential of the company managers was not sufficient, and that frequently became a serious barrier to further development of the team. The manager-leader has to match the capabilities of each individual member with the requirements set for them, given the strengths and weaknesses of each member.

2. The members of the management team seek to obtain additional competences. The research findings suggested that good financial reward was the most important thing for the team members. Even though the managers understood that in the present-day reality there were constant changes in the environment, their resolution to improve themselves was insufficient. It is necessary for the management team members to understand the personality improvement through individual needs, given the objectively limited possibilities. The management team brought together managers with different competences and different attitudes who were consciously pursuing the common goals of the company, who interacted in decision-making, and assumed responsibility for the manufactured product or service.

3. The striving of the management team members for excellence and a strong desire to be a leader. The management team members in the investigated company were communicative and ambitious executives (team members), planning to work in a desired position and seeking for a high status. The managers were well aware and appreciated the importance of will-power. Some of the management team members were worried about their future in the organisation. The statements illustrated the self-realisation aspect when the professional activity became an integral part of their identity. It could also be associated with the specialty idealisation which was undoubtedly caused by the pleasant feelings related to a managerial job. The attitude was evidently presupposed by a permanent pursuit to be the best, the leader, and win at all costs. The needs of the management team members activated the internal forces of a person and unconsciously awakened his activity. That was the need for success and achievement, the desire to do for the team all that one was able to.

4. The management team sought the compatibility of the company and personal goals. In the context of the present research findings, a career was defined as the pursuit of the managerial goals and satisfaction of personal ambitions. That suggested that a clear understanding of the goals mainly resulted in their successful realisation.

The managers found the goal realisation to be complex and problematic, as it was necessary to find a trade-off between professional aspirations. There might have been a shortage of knowledge and skills. The team members understood professional development as a way of the life goals implementation leading to a successful career and material well-being. Frequent dimensions of the informants were a good job, good income, and a high social status. The activity of the management team members had to be coordinated and harmoniously focused on the pursuit of the corporate goals and the implementation of strategic plans. The management team members made decisions together, planned their implementation together, and were interested in the pursuit of common goals.

5. The compatibility of the members' values sought by the management team. As suggested by the research findings, the management team members pursued their values, and that was their direct development dimension. The following values were identified: sensitivity, goodness, caring, a wish to help, and tolerance. The conditions that formed in the interaction of the management team member with the environment formed a favourable context for the development of values. The analysis of individual indicators led to the conclusion that some members of the team felt a lack of economic and (or) spiritual values. Those informants related their wishes and plans to the finding of meaning. The development of values of the management team members is especially topical as it predetermines the values that the team members justify their goals with and the conceptions that guide them in decision making.

6. All the management team members sought individual and shared responsibility. As proved by the qualitative research, most of the informants unambiguously advocated the sovereignty of the team members and the harmonisation of the powers and responsibilities. The empowered members of the team assumed responsibility for the efficient use of resources and the pursuit of an appropriate result. By reflecting, the team leader could evaluate how well the team members were prepared to assume responsibility for the roles assigned to them and how conscious their perception of the assumed responsibility was. The team members' personal responsibility had to be permanently strengthened, as it was the basis of overall management.

7. The aspiration of the management team members to openly communicate and collaborate. The research findings proved the informants' efforts and the ability to empathise with other person's feelings and their state. Empathy is a necessary element of all the management team members' communicative abilities that leads to open and sincere communication. The disharmony between the team and personal relationships means a mismatch between the personal goals and the ability of the team to satisfy them. The management team has to collaborate and to exchange information, knowledge, and experience both among themselves and with other staff members. Each member of the management team has to understand another person's situation, feelings, and motives.

8. The management team seeks to constructively resolve conflicts. The findings of the research proved that the members of the investigated management team were best at the resolution of the conflicts arising due to different ideas and preconceptions, as well as due to the experience, reflection, and meta-cognition. The attitudes of some informants suggested their gratitude and indebtedness to their colleagues for their moral support in conflict resolution. For the effective functioning of a management team, a positive conflict is beneficial, since it promotes openness, the reduction of tension, normalisation of relations, and increased confidence. Successful use of self-regulation skills in conflict resolution can help to handle day-to-day business problems more efficiently and improve the performance of the company.

To sum up the findings of the conducted qualitative research, we argue that the management team's leader must encourage each member of the team to look for the meaning of development (meaning-oriented goals: 60 statements), i. e. the identification of one's own strengths and weaknesses in development in order to effectively function in professional activity. It is necessary to create appropriate conditions for the management team to develop by communicating in a defined and/or chosen direction (effective communication of team members: 37 statements). Particularly great attention ought to be paid to the development of team members in a crisis situation (frequent modeling of emergency situations: 28 statements). Crises emerge due to the lack of knowledge how to

behave in a newly encountered situation. Therefore, management teams members have to develop: critical thinking, the ability to justify decisions, application of the monitoring possibilities, problem identification possibilities, empathetic experience, and conflict management abilities.

Conclusions

The development of the management team is an artificially natural process of the socio-cultural system in which the internal qualitative potential is acquired by the team members' mastering of the new and improving of the old competences when seeking to more effectively work in the company. The set of elements of the management team development, based on the analysis of scientific literature, helps the management team to timely respond to the changes in the environment, makes them flexible, and requires continuous development in order to achieve efficiency. The participation of the management team in a development programme enables the development of the team members as personalities and as professionals: in that way, conditions are created to increase their performance first at the individual, and then at the team level. The development of the management team focuses on greater future opportunities, aspirations, and goals.

Upon conducting qualitative research in a furniture manufacturing company – a semi-structured interview (8 informants), we can propose the guidelines for the management team development: to encourage all the member of the management team to become leaders; to identify the goals of the personality and the competence development; to find out which competences each member wants to improve and to allow them to undertake additional activities that would enable the improvement of those competences; to set the operational goals for the members which would also allow (help) them to pursue their personal goals; to coordinate the values of the organisation and the team members on the basis of needs, when the need for self-realisation prevail over the hierarchy; to give more responsibility to the team members who wish and seek it; and to authorise each member of the team to resolve conflicts independently.

It is necessary to make not only the head of the team – its leader, but also the team members be interested in identifying the hindrances that interfere with their individual and team development and constantly search for new opportunities to disclose their inner potential. Only when developing in such a way the managers at all levels of the company can function as one harmonious team of managers pursuing a common goal: the development of the managers, the management team, and the potential of a manufacturing company.

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SUSTAINABLE MARKETING COMMUNICATION STRATEGIES OF RUSSIAN COMPANIES UNDER THE IMPORT SUBSTITUTION POLICY

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Received 15 July 2017; accepted 26 October 2017; published 29 December 2017

Abstract. The sanction standoff between Russia and the West opened up new opportunities for Russian food manufacturers. A new import substitution policy declared by the government restricted the access of the leading foreign countries to the market and unlocked a potential for internal development. Russian producers spotted new niches in the food market. There exist numerous obstacles to assimilating new market prospects: organizational (logistics, infrastructure, etc.), investment, legal, economic, etc. The paper underlines that the problem of enhancing the effectiveness of food companies' marketing policy in the context of import substitution is among the most formidable challenges. The article generalizes the problems of implementing the marketing policy of Russian enterprises. It reviews the core findings of the research studies on exploring consumers' attitude towards Russian and foreign-made food products. The author formulates recommendations about executing sustainable marketing communication strategies of Russian companies under import substitution.

Keywords: marketing communications, import substitution, food products, consumer goods

Reference to this paper should be made as follows: Chernova, V. Y.; Zobov, A. M.; Starostin, V. S.; Butkovskaya, G. V. 2017. Sustainable marketing communication strategies of Russian companies under the import substitution policy, *Entrepreneurship and Sustainability Issues* 5(2): 223-230. [http://doi.org/10.9770/jesi.2017.5.2\(5\)](http://doi.org/10.9770/jesi.2017.5.2(5))

JEL Classifications: Q13, Q18, M30

1. Introduction

The recent global geopolitical crisis and subsequent events have caused a large number of dramatic changes in the economic policy employed by national governments. For example, in response to the restriction of Russian companies' access to Western financial resources, technologies and other economic goods associated with specific economic sectors, the Russian government adopted a set of measures aimed primarily at import substitution or a gradual substitution of imported products with domestically produced goods.

The idea of import substitution is not new to Russia. However, it was not until 2013–2014 that the country started actively implementing this concept. The ban on importation of agricultural products from several countries to the territory of the Russian Federation led to both positive and negative consequences for the Russian economy (Edict, 2014). For many years, foreign-made food products have been dominating the Russian food market, especially during the period from 2000 to 2013, and it could not but influence the current behavioral patterns and food preferences of Russian consumers. A number of foodstuffs items were perceived by Russian manufacturers as purely foreign products with consistent quality. The situation was aggravated by the fact that Russian consumers displayed a comparative attitude towards particular types of foreign-made and domestic food products. Undoubtedly, under such conditions, in order to guarantee substitution of imported food products for domestically produced foodstuffs, it is necessary to resolve problems with product perception and require from Russian manufacturers to mount appropriate marketing efforts, including communication.

Thus, in modern conditions there emerged a problem of adapting marketing communication strategies of Russian producers. The scholarly significance of the present study lies in systematization of Russian consumers' incentives to choose food products of domestic production. The practical importance of the paper resides in designing a set of recommendations that can be taken into account when formulating sustainable marketing communication strategies for ensuring risk sustainability of companies' activity (Guseva and Kuzmin, 2016; Kuzmin, 2017).

The purpose of the study is to identify the special features of transformation of the motives behind behavior and choice of food products by Russian consumers in the context of implementing the import substitution policy. To achieve this purpose, we plan to perform the following research tasks: (1) to analyze the extent to which the problem of forming a marketing strategy under import substitution is rectified; (2) to suggest the author's interpretation of the findings of the research studies on the Russian consumer's behavior in the food market; and (3) to provide a set of recommendations to boost the effectiveness of sustainable marketing communication strategies of Russian food manufacturers in the context of the import substitution policy.

2. Literature review

Undoubtedly, implementation of the import substitution policy, in addition to the issues of marketing communication support, encounters a range of other equally important problems. This is the reason why the majority of the Russian scientific research are devoted to resolving the issues of legal, financial, infrastructure-technical and other support for implementation of the import substitution policy.

Nevertheless, there emerge more and more research studies on marketing problems associated with the introduction of the import substitution policy and its specific aspects. In particular, we can mention the following. Vinogradova (Vinogradova, 2017) argues that in today's conditions the expansion of agricultural marketing is impossible without transforming marketing activity of concrete economic entities. In their work, Grishchenko and Sumina (Grishchenko and Sumina, 2015) discuss the issues of strategic planning of Russian companies in the context of the import substitution policy. Some scientists believe that autarky measures (which incorporate the import substitution policy) pose a threat to economic security and damage the welfare of the population while reducing the number of possible alternatives to consumer choice (Kuzmin, 2015; Kuzmin, 2016).

The research study by Marchenko (Marchenko, 2016) specifies the methodological base of import substitution in the sectoral markets, identifies the main factors encouraging the development of the sectoral market and formulates a set of measures to increase the effectiveness of the import substitution policy in the sectoral market. Having studied the theoretical base of marketing and marketing communication, Mechikova (Mechikova, 2017) suggests a set of measures to improve the activities of Russian companies in this sphere. Moskaev (Moskaev, 2017) looks at the strategy of differentiation of market entities' product brands as the major competition tool in the conditions of the import substitution policy. Yudina and Pirogova (Yudina and Pirogova, 2017) consider

individual techniques for developing and executing advertising campaigns under the import substitution policy. However, the publications mentioned above pay little attention to the issues of formation of effective and sustainable marketing communication strategies in the context of the import substitution policy, but deal with only certain aspects of this problem.

In addition to the aforementioned publications, it is worth mentioning the research studies exploring preferences of Russian consumers in the food market. Amongst such works are investigations conducted by the Institute of Public Opinion “Anketolog” (Anketolog, 2015), the Public Opinion Fund “Fond Obshchestvennoe Mnenie” (FOM, 2015), as well as publications by Bondarenko, Babich and Chertyanina (Bondarenko, Babich and Chertyanina, 2016), Guziy and Ondreyovichova (Guziy and Ondreyovichova, 2015), Marakova, Sharafutdinova and Krishtafovich (Marakova, Sharafutdinova and Krishtafovich, 2016), et al.

3. Research results

In the course of implementing import substitution measures, Russian companies have managed to accumulate sufficient experience in performing marketing communication strategies. To evaluate this experience, the author carried out a research study of various enterprises engaged in production or selling of food products. The fundamental hypothesis of the research is that in the new environment Russian manufacturers do not take into account the ongoing transformations in the structure of the needs of the national consumer. The survey was conducted from March to May 2017. During the study, 164 respondents from marketing departments of different companies were interviewed. In the course of the research, the author used a structured interview. The table 1 below shows characteristics of the survey participants according to main parameters.

Table 1. Sampling of the research

Parameter	Number of respondents	% of respondents
Geographical spread of participants, including:	164	100,0
Moscow	56	34,1
Saint Petersburg	48	29,3
Krasnodar	14	8,5
Rostov-on-Don	13	7,9
Saratov	9	5,5
Kazan	9	5,5
Nizhniy Novgorod	8	4,9
Pskov	7	4,3
Sectoral specialization, including:	164	100,0
meat products	69	42,1
dairy products	58	35,4
fruits and vegetables	37	22,5
Type of organization, including:	164	100,0
manufacturing	34	20,7
trade and manufacturing	56	34,1
trade	74	45,2

We analyzed the findings of the survey and arrived at the following conclusions:

- 1) in most cases (65% of respondents), food companies do not increase the budget for communication support of their products;
- 2) the majority of the companies under consideration (78% of respondents) do not have clear long-term goals formulated in the form of a strategic marketing communication plan regarding their future prospects;

- 3) marketing communication strategies are executed without in-depth studies at regional level (this is especially true in regard to small and medium-sized companies);
- 4) in most cases (56%), when formulating their marketing communication messages, Russian companies do not pay attention to large-scale studies and consumer motives.

5. Discussion

5.1. Review of representative research

In our view, it is worth analyzing the main results of representative studies that characterize Russian consumers and their attitude towards food products in the context of import substitution. As mentioned above, in recent years there have appeared a large number of research that can shed light on the key parameters of Russian target audience in the food markets.

These studies demonstrate that most Russians are in favour of the ban on importing certain goods from the EU countries. For instance, according to one of the surveys, 46% of 1149 respondents indicated that retaliatory sanctions introduced recently can become a solid support to domestic food manufacturers and regarded these measures as positive (Guziy and Ondreyovichova, 2015).

When analyzing behavioural aspects of Russian consumers, it is important to touch upon the problem of their comparative attitude towards particular types of foreign-made and domestic food products. For example, the research undertaken by the Public Opinion Fund “Fond Obshchestvennoe Mnenie” (FOM, 2015) produced quite interesting results when comparing consumers’ attitude towards the quality of food products of domestic and foreign production (Fig. 1). The study was held among Russian citizens above 18 years, 1500 respondents in total; in 104 populated localities situated in 53 subjects of the Russian Federation.

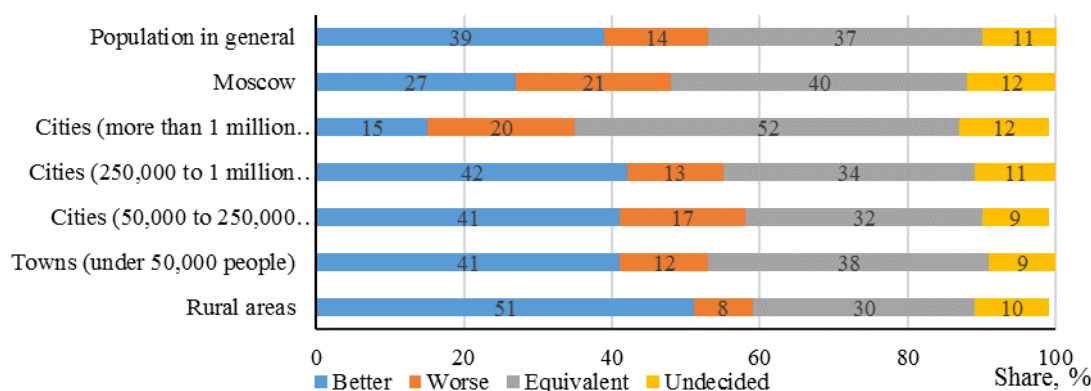


Figure 1. Attitude of Russian consumers towards the quality of food products of domestic and foreign production

Source: Domestically produced food products vs. imported food products (FOM, 2015)

As we can see, the Russian population, in general, is favorably disposed towards domestically produced goods. However, from the territorial aspect, the results vary significantly. The most critical view of Russian produced goods is characteristic of large cities with population over 1 million people – only 15% of respondents said that domestic products were of a better quality than imported goods, and only 20% expressed the dissenting opinion. The situation is radically different in rural areas, where 51% of respondents believed that the quality of Russian

food products was higher if compared with foreign-made foodstuffs. The given data allow us to draw the following practical conclusions:

1) in human settlements with population less than 1 million people, Russian consumers have more trust in domestic food products than in urban areas with population over 1 million inhabitants. In this regard, Russian food manufacturers, especially of the federal level, can differentiate their communication policy (in terms of forming a budget for communication, depending on the intensity of using communication media) according to consumers' attitude;

2) a more detailed differentiation is required in the sphere of utilizing marketing communication tools in large urban areas and human settlements with population less than 1 million people.

At the same time, according to scientific research, there is a decrease in Russian consumers' confidence in food products of domestic production (Fig. 2).

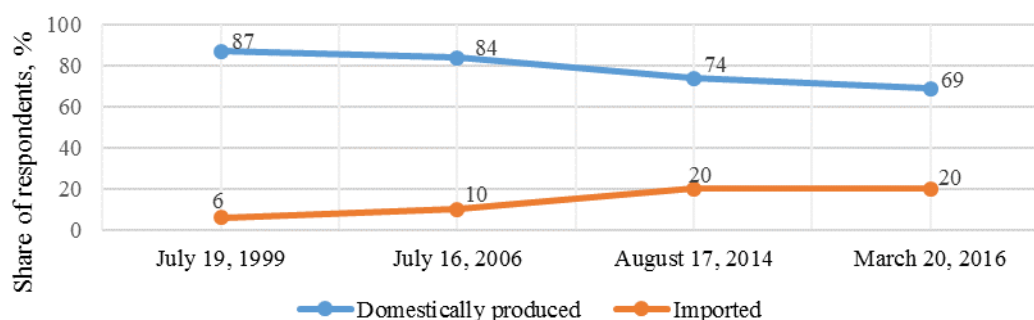


Figure 2. Dynamics of Russian consumers' attitude towards domestically produced and imported food products in 1999–2016

Source: Domestically produced food products vs. imported food products (FOM, 2015)

As we can notice, despite the fact that Russian consumers still prefer domestically manufactured food products, their indifference to the country of origin of foodstuffs is becoming more obvious. The Russian food market, in terms of the number of brands presented, is still at the nascent stage. A gradually decreasing interest of Russian consumers in domestic food products signifies the absence of strong brands that could be serious competitors to foreign analogues. The increase in indifference of consumers is also attributed to their poor loyalty. Hence, investing in brand creation, despite its high cost, is among strategically important tasks of mapping out sustainable marketing communication strategies for manufacturers seeking long-term profitability.

When implementing a marketing communication strategy, it is of practical interest to examine Russian consumers' motives for purchasing domestically produced food products. Incentives can become the basis for creating communication messages. According to the research conducted by the Public Opinion Fund (FOM, 2015), such incentives embrace the following: better quality of Russian food products (18% of respondents); organic food products without GMOs or harmful food additives (17%); greater reliability, confidence in a product (16%), patriotic motives (13%); better palatability (5%); more attractive prices (5% of respondents).

Other research underline similar motivations for choosing products of domestic production. For example, according to the survey performed by the Institute of Public Opinion "Anketolog" (Anketolog, 2015), Russian consumers identified the following incentives for buying domestically manufactured goods: adequate prices (75% of respondents), the use of organic raw materials (71%); acceptable quality of production (50%); product reliability (30%); durability (25%); a wide product range (14%); high functionality of products (10%); product appearance (5%); stylish design (3% of respondents).

The above-listed factors and motivations for purchasing domestic products cannot be used in all market niches in the same way. Without a doubt, every company has to identify the objectives of enhancing the effectiveness of communication strategies, the structure of consumer preferences, motives and factors in purchasing a specific product. While forming a sustainable marketing communication strategy, companies should also take into account the motives behind the purchase of foreign-made products. The recent study (Guziy and Ondreyovichova, 2015) demonstrated that such motives include: confidence in a product (41% of respondents); higher quality (32%); information availability (26%); better brand awareness (23%); better palatability (14%); more attractive prices (5% of respondents). Thus, identifying of consumer preferences, their dynamics and structure becomes one of the determining factors in building effective marketing communication strategies in the context of the import substitution policy.

5.2. Recommendations

There are numerous approaches to the formation of marketing communication strategies, but ultimately all of them pursue common communication objectives. Summarizing the results of the present study, we can formulate the following recommendations to improve the effectiveness of marketing communication strategies of Russian manufacturers of food products under the import substitution policy:

- (1) The funds channeled by Russian companies into marketing research are insufficient. Under the conditions of import substitution, it is equally important, when constructing sustainable marketing communication strategies, to utilize the results of secondary marketing studies of Russian consumers, as well as the findings of primary marketing research corresponding to the specific goals and tasks of particular companies;
- (2) “Patriotic” motivations do not always prevail even under import substitution. This factor can be taken into account in the process of formation of marketing communication strategies, but it should not be viewed as central and basic;
- (3) Building sustainable marketing communication strategies requires the territorial factor to be considered. Under modern conditions, it is advisable for Russian food companies, especially those operating in several regional markets or nationwide, to adapt their communication strategies to specific conditions of every local market individually;
- (4) Formation of marketing communication strategies of Russian companies is associated with communication strategies of chain retailers. This fact should be taken into consideration in long-term strategic plans.

Conclusion

In the course of implementing import substitution measures, Russian companies have accumulated extensive experience of executing marketing communication strategies. The findings of the analysis indicate that in most cases (65% of respondents) food companies do not increase their budget for communication support of products and the majority of organizations (78% of respondents) do not have clear long-term goals represented in the form of a strategic plan of marketing communications regarding the company’s position in the future. All this proves the necessity to gradually alter marketing communication strategies of Russian manufacturers. In this connection, identifying the avenues for boosting the effectiveness and sustainability of marketing communication strategies in the context of import substitution requires taking into account the distinguishing features of consumer behavior. The recent trends allow us to conclude that Russian consumers are increasingly less concerned with the country of origin of food products. Thus, it is of crucial importance to analyze consumer preferences, as well as their dynamics and structure, in order to form effective and sustainable marketing strategies.

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CULTURAL AND CREATIVE INDUSTRIES (CCI) AND SUSTAINABLE DEVELOPMENT: CHINA'S CULTURAL INDUSTRIES CLUSTERS*

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Received 20 May 2016; accepted 18 October 2017; published 28 December 2017

Abstract. The cultural and creative industries link the traditional knowledge to the ultimate consumer in their capacity to serve both cultural and economic objectives. In this regard, the cultural and creative industries can be seen as consistent with the sustainable development paradigm. Cultural industries cluster is playing an increasingly important role in the development of Chinese cultural industries. This article looks at the Cluster Development Strategy of Chinese Cultural Industries and tries to draw a map of cultural industries clusters in Beijing according to the data gathered from 19 cultural industries clusters in Beijing. With the clusters as a case study, we argue that in the course of development clusters are weak in production research and innovation, combined effect and public service although there is much achievement. At last, the suggestions to promote the sustainable development of cultural industries clusters will be discussed.

Keywords: sustainable development; cultural and creative industries; cultural clusters; cultural system reform

Reference to this paper should be made as follows: Yang, J.; Černevičiūtė, J. 2017. Cultural and Creative industries (CCI) and sustainable development: China's cultural industries clusters, *Entrepreneurship and Sustainability Issues* 5(2): 231-242. [http://doi.org/10.9770/jesi.2017.5.2\(6\)](http://doi.org/10.9770/jesi.2017.5.2(6))

JEL Classifications: O31; O32

1. Introduction

The last forty years interest in the economic objectives of cultural policy have been increasing. In the focus has been directed to development of cultural and creative industries at local and regional level in Europe and over the world. Reflecting to the those processes the European Commission released a paper entitled *Unlocking the*

*This research was supported by the projects the Overseas' Cultural Industries Clusters Construction in the Framework of the Belt and Road Initiatives and the Study on Cultural Industries Clusters in Beijing, which has received funding from Communication University of China and the National Cultural Industries Innovative Experimental Zone in Beijing

Potential of Cultural and Creative Industries in 2010, in which it is formulated what strategies, specific tools and partnerships facilitate regional development and trigger spillover effect of cultural and creative industries (CCI) in Europe (European Commission 2010).

Role of culture in sustainable development policy: cultural and creative industries. The paradigm of the centrality of economic growth (based on measuring only material gains) in development policy was shifted to broader (human-centred) notions of development (expanding to such aspects as health status, literacy levels, access to education etc.) This shift was accelerated by UNDP's *Human Development Reports*, which began publication in 1991 by the works of economist Amartya Sen, who characterised development as "human capability expansion", i.e. enhancement of capacities of people to lead the lives like they desire, including access to cultural resources and cultural participation. The role of culture in development policy thinking was brought into focus by the World Commission on Culture and Development (WCCD 1995). The Commission pointed to the cultural dimensions of a human-centred development paradigm and proposed placing culture in the centre of human-centred development paradigm. UNESCO elaborated these questions in *World Culture Reports*, published in 1998 in 2000 (UNESCO 1998, 2000). The concept of cultural and creative industries has provided a new approach for cultural policy: it was recognised that work of creators and artists allows to generate significant levels of both tangible and intangible cultural capital. It was recognized that national economies can produce creative goods and services for domestic and international markets. This approach towards cultural and creative industries interpret the role of culture in economic development. For CCI it opens a possibility to develop with recognition being one of driving forces of economic development, what means that CCI and economic development is interrelated (UNCTAD 2008).

Significant contribution to understanding of the role of the cultural and creative industries in economic development was done by Culture Unit in UNESCO's Bangkok office report (Jodhpur Initiatives 2004) and UNCTAD's Creative Economy Report in 2008 (UNCTAD 2008). Both reports treat traditional knowledge and distinctive cultural practices as fundamental resources on which CCI depend. The transformation of traditional knowledge into creative goods and services reflects significance of the cultural values for separate country. At the same time, CCI goods and services have economic potential. The essential feature of the cultural and creative industries that links the traditional knowledge, at one end of the chain, to the ultimate consumer, at the other end of the same chain, is their capacity to serve both cultural and economic objectives in the development process. In this regard, the cultural and creative industries can be seen as consistent with the sustainable development paradigm for policy formulation in the developing world, because these industries bring together economic and cultural dimensions of development within holistic policy framework (Strazdas et al. 2015).

The concept of "sustainable development" took more substantial shape in 1987 report of the World Commission on Environment and Development *Our Common Future*, which defined sustainable development as "development that meets the need of the present without compromising the ability of future generations to meet their own needs" (WCED 1987:43). Integration of culture into development process was recognized in the Cultural Diversity Convention in two of its Articles: in Article 2, para, 6 on *Principle of sustainable development* and Article 13 on integration of culture in sustainable development (UNESCO 2000). While adapting these principles to define *culturally sustainable development*, it is possible to identify close connected economic, social, cultural and environmental systems, based on holistic approach, recognizing interconnectedness between economic and cultural development. The best way for introducing culture into the development policy agenda is by demonstrating how the cultural and creative industries can contribute to sustainable development through the contribution that cultural production, dissemination, participation and consumption make to economic growth, cultural enrichment and social cohesion. Such an approach does not imply that economic objectives should take the pas of cultural ones. Achievement of sustainability in the development of cultural and creative industries requires fostering artistic and cultural activities, and foundation upon which the wider industries are built. Recognising the economic potential of the cultural and creative industries provides a practical way for introducing culture into a broader economic development agenda. An essential element of culturally sustainable development

policy will be attention to long-term investment in infrastructure, including physical infrastructure to support cultural production, distribution and consumption.

2. Cultural and creative industries clusters as driving force of sustainable growth

Governments elaborate a wide range of tools for stimulating the cultural and creatives industries, reinforcing the linkage between these industries and the wider economy, and promoting the achievement of sustainable growth. One of such tools is support of cultural and creatives industries clusters. The phenomenon of the clustering of economic activity has been recognised by Michael Porter in his “cluster theory” through the effect of proximity to other firm and social networking, promoting cooperation and information sharing. In his article “Cluster and the new economic competition” Porter indicates three sources of competitive advantage for enterprises:

1. The *advantage of productivity*, which can be achieved owing to access to specialists and skilled labour force, specialised information and industry knowledge, and possibility to develop mutually complementary relations between enterprises, industries and universities contributing to knowledge transfer;
2. *Opportunities for innovation* resulting from the interaction with other industries and pressure for innovation under circumstances in which costs in the face of competition are similar;
3. *New business formation opportunities* – better access to information and resources needed to start a business (local capital, skilled labour force), reduce barriers to withdraw from an existing business amalgamation, and business amalgamation is easier when there is geographical proximity between large and small enterprises (Porter 1998).

Several sorts of cultural and creative industries clusters exemplify the ways in which these ideas are implemented into a specifically cultural context:

- 1) The urban cultural precincts, taking advantage of the concentrations of visitors. A typical cluster would be a gallery quarter in a city: their proximity is interesting for all involved, they strengthen each other, as every gallery might draw customers, and then share them with others in the same street or quarter.
- 2) Clustering of CCI businesses in search for economies of scale and scope, looking for agglomeration benefits. There is a specific focus on knowledge spill overs - knowledge is generated and transmitted more efficiently in a local system (Audretsch 1998).
- 3) The cultural districts that is based on securing a trademark for its product. (Throsby 2010:138).

Cluster theories bring together two trends:

- 1) the tendency towards localization, or the clustering of firms in similar or related industries in a particular city or region, and the positive externalities that can arise from such co-location;
- 2) those regions where value adding to primary product had occurred through cluster developments that had a global impact – from the wine making in Chile to film production in Los Angeles or fashion and furniture in Milan.

Phenomenon of clustering and peculiarities of cluster performance continue receiving increasing attention in contemporary scientific literature (e.g. Ignatavičius et al. 2015; Tvaronavičienė, Černevičiūtė 2015; Razminienė et al. 2016; Razminienė et al. 2017; Zemlickienė et al. 2017; Tvaronavičienė 2017).

3. The development of Chinese cultural industries clusters

China's cultural industries clusters was an important carrier for Chinese cultural industries (Zhou 2012) until year 2015, when more than 2500 provincial-level cultural industries clusters emerged. It is estimated that there will be hundreds of municipal-level clusters in China. The large of clusters are prompting Chinese cultural industries, but there are no official standards to evaluate development and guide them developing sustainably. This paper attempts to find out what factors lead to sustainable development of clusters.

The cultural industries cluster appeared in 1990s. Commonly, Chinese researchers consider that the establishment of Cultural Industries Department under the Ministry of Culture in 1998 is the start point of cultural industries. In 2003, the Centre Government advocated to start reform and innovation in cultural system. The main aim is to make these cultural units become market-orientated. One of the effective methods in the reform is the cluster development strategy. The concept refers to the combination of series of cultural enterprises in a certain area according to the value chain, which is related to production, consumption, markets, trade, creative labour, creative cities, cultural policy and intellectual property (Flew 2012).

In a perfect world, clusters would just exist without much effort. But the truth is, tha it takes a very focused and strategic approach to bring companies and organizations from the value chain together to form partnerships for funding, research and revenue opportunities. In China, the State-level Ministries such as the General Administration of Press, Publication, Radio, Film and Television and the State Ministry of Culture have published series of policies to support clusters. The governments invest much in cultural clusters construction. The reform has unlocked the potential of cultural productions, the government plans different cluster to draw cultural companies. In the 13th five-year development plan, the cluster construction is still an important project. Nearly all the provincial government takes cultural industries as an important task in their eleventh-five year and twelfth-five year plan.

With the support of government, the cultural industries cluster is developing fast. At the end of the year 2002, there were just 48 cultural clusters. In 2010, there were 1234 cultural industries clusters and the number reach to 2506 in 2014. The government published a comprehensive classification to manage clusters by different level including provincial level, city level and so on. These clusters developed with different characteristics and help the industries develop fast. In 2016, the added value of Chinese cultural industries has reach to 3025.4 Billion RMB and takes 4.07% of Chinese GDP, in which cultural industries clusters have made a great contribution. The Number of Chinese Cultural Industries Clusters is constantly increasing (Report on Chinese Creative Industry), Figure 1.

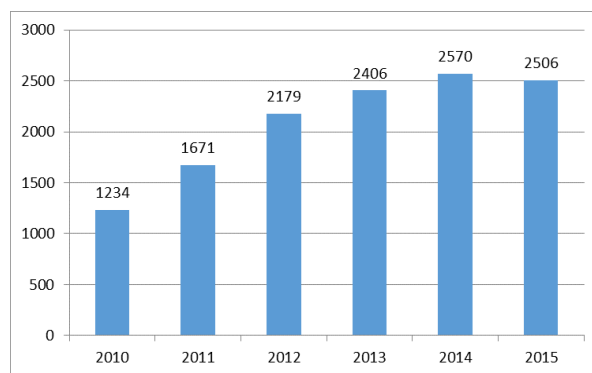


Figure 1. Dynamics of clusters' development in China

Centre Government has published a series of new cultural policies to promote cultural industries cluster including tax-cut policy, low-profit loan and land policies for them. For example, the sixth session of the 17th CPC Centre Committee made a decision to establish China as a strong nation in culture in 2012. In 2013, the 18th plenary meeting of CPC Centre Committee was open in Beijing. It decided to develop cultural industries as a polar industry. These new policies promoted steps of cultural companies in the last two years. Cultural enterprises are encouraged to gather in a certain area on the geographical space in the perspective of production or industrial chain. Sometimes, government will invite some big companies settled in the cluster. Gradually, some other medium and small sized companies will arrive and develop in the cluster. At the same time, the cluster always

provides space and equipment for companies with very low room rate. Besides, there are some other preferential policies, which will help companies cut cost to a large extent for cluster residents.

The Problems of Cultural Industries Clusters

From the practice of cultural industries clusters, we can see some of them are quite successful in economic benefit and social brand, especially those in Beijing, Shanghai, Hangzhou, Shenzhen and Guangzhou. Meanwhile, there are still many problems for sustainable development. According to a statistic, there are more than 70% of cultural industries clusters are under deficit, while only 10% of them can make benefit (Report on Chinese Creative Industry). The reasons are quite various. For example, the commercial mode is not good, or the manage skill is weak and some others. These elements resulted in the low advantage to make benefit, many of which are dead in 5 years even less. How to make clusters develop sustainably has been an important task in the circle of Chinese cultural industries.

In China, many experts focused on the issue and have discovered some good research outcomes. They advocate some index to evaluate and promote clusters, which provide a solid condition for the further development. There are two disadvantage of this kind of research. The first one is about its methodology. Many researches start with cluster theory and discuss the function of clusters and will find some elements, which will influence the function. In this kind of research, if one can handle these elements well, the cluster will develop at a good pate. In this kind of research, there are too much subjectivity, one-sidedness and superficiality and there is little data to support the conclusions. The second disadvantage is the incomplete data. Their data comes from managing side of the clusters and has little information form cultural enterprises and worker in clusters. They neglect that the demand of enterprises will influence the sustainable development of clusters.

We perform survey and find out that certain problems occur between companies in their clusters. They have different view on the same development issues. The paper will suggest solutions how to resolve issues and develop better.

The Evaluation of Dimensions of Cultural Enterprises Demand

Clustering phenomenon is comparatively new in China and therefore there are no criteria adopted by governments for clusters development evaluation. This paper will suggest 4 Dimensions approach taking into account demand of cultural enterprises in the cluster. Authors will base their insights on critical review of scientific literature.

(1)Enterprise Demand Theory

Demand theory is a theory relating to the relationship between consumer demand for goods and services and their prices. Demand theory forms the basis for the demand curve, which relates consumer desire to obtain certain amount of goods available. As more of a good or service is available, demand drops and therefore so does the equilibrium price.

Enterprise is considered as an organism and it has the same demand like people both in material and spiritual perspectives. In different phase, the demand is different. Comparatively to the man's demand, enterprises demand can be divided into three phases: existence need, development need and social demand.

1. In the first phase, the enterprise struggle for the benefit and the profit is the strong power to be survival. Enterprises will try to every means to make money as much as possible and cut cost as large as possible.
2. In the second phase, the enterprises aim is to development when the survival problem has been solved. The enterprise will take a long-term view. For instance, perusing the market share is much more important to earn every coin.
3. In the third phase, sustainable development will make the social demand become the most important demand of the enterprises, which will expand its social profit. Usually the enterprises try to establish its brand by social activities and communication.

The demands of the enterprises provide good evaluation index to promote the competitive power of cultural industries clusters.

Four Dimensions of Clusters' Sustainable Development

After scientific literature analysis, four dimensions of clusters' sustainable development have been distinguished.

Dimension 1: Infrastructure

Infrastructure can be considered as one basic elements of productive resources. Many researchers consider infrastructure as an important index to evaluate the clusters' potential.

Dimension 2: Public Service

In China, government appoints committees or state-owned companies to manage clusters; besides there are some clusters operated by private companies. The managing side should offer different services for the enterprises in a cluster. It is believed that managing skill is the real source of power. Good management and public service would promote the sustainable development of clusters.

Dimension 3: Cluster Effect

Cluster is geographic concentrations of interconnected companies and institutions in a particular field. Enterprise in the cluster would have cooperation ties in order to make a good effect of "1+1>2" according to the value chain.

Dimension 4: Exterior Condition

Outer environment embraces economic, transportation, culture and policy, what are important factors for enterprises to decide whether to operate in a cluster or not.

These four dimentions are the important evaluations of the clusters'demand and can ne used for measuring their compleitive power. Authors of this paper believe that infrastructure, public service, clustering effect and outside conditions are basic facets of the compleitive power to maintain sustainable development. We provide critical interpretation of the provided dimentions and transform them into respective indexes.

Table 1. Enterprises' Demand Model

Elements	Second level index	Service provided by the cluster
Infrastructure	Room Rent	
	Working facilities	Electricity ,water ,desk
	The style of the room	Meeting room, working space
	living facilities	Stores, banks, coffers and etc.
	Public facilities	Gym, toilet
	Cultural infrastructures	Sculpture, landmark and etc. in the cluster
Public service	HR resource	Enrolment, training and other service
	Capital Service	Venture capital, financial guarantee and others
	Information Consultancy	Production exhibition, policy and IP consultancy and so on
	Technology Sharing	Free WIFF, digital media and digital lab for all in the cluster
	Exhibition and trade platform	Exhibitions, fair trades and other trade platforms
	Incubator	Hacker space, meetings for makers,
	Publicity	Different platforms for communications such as official website, culture events and media
	Charity activities	Such as Charity evening gala, Donation activities and etc.
Cluster effect	Smart management	Smart parking, centre control system
	Scale effect	Enterprises can cooperates in the industry value chain
	Learning effect	Technology and knowledge exchange
	Brand effect	The brand of the cluster
Cultural condition	Policy support	Investment and other policy support
	Transportation condition	Express and public transportation
	Commercial business	Restaurant, shopping mall and other entertainment places
	Social Environment	Working ties with neighbouring companies
	Cultural atmosphere	Cultural facilities including landscape, library, music hall, theatre, museum and etc. around the cluster

Enterprises' demand, infrastructure, public service, clustering effect and cultural conditions condition potential of enterprises to develop and enhance productivity

4. Empirical analysis

Samples collection. In recent years, Beijing has paid much attention to cultural industries. In this process, Beijing has established number of cultural industries clusters in TV, design, film, animation, music and other areas. It is a city, which contains many of containing various ammounts of companies of diverse qualitative features. Thus, authors of this research tries to investigate clusters from side of their management and employees in order to find out the reasons hindering sustainable development of clusters. The authors tackle six characteristic clusters in Beijing and interrogate cultural companies in the clusters about their demand. Authors distribute 100 questionnaires and 98 of them are received back. Among received there are two invalid questionnaires; therefore the number of valid ones is 96. The effective rate is 96%.

Data Analysis. The questionnaire is designed so, that 4 dimentions described above were reflected. The obtained results are processed by SPSS.

Authors finished the factor analysis according the Enterprises' demand factor list. Adopted principles of analysis are provided below:

- Eigenvalue is greater than 1
- Accumulated variance contribution rate should be greater than 60%
- Factors at the turning point in the Scree Plot

The turning point started at the five factors and Accumulated variance contribution rate is 66%. From the screen plot we can five factors, a turning point, and curve later become smooth. Thus we will take five factors to start research to check the demand and use orthogonal rotating design method to get the comparative figure tables called "Rotational component matrix" (Table 2).

Table 2. Rotational Component Matrix

Is this service import?	Component				
	1	2	3	4	5
Production exhibition, policy and IP consultancy and so on	0.804	0.006	0.149	0.062	0.172
Venture capital, financial guarantee and others	0.797	0.099	0.071	0.069	-0.197
Exhibition, trade fair and other platform for trading	0.775	0.070	0.017	0.135	0.333
Technical Sharing including Free Wi-Fi, digital media and digital lab for all in the cluster	0.736	0.141	0.025	0.210	0.175
Hacker space, meetings for makers,	0.729	0.151	0.061	0.154	0.299
Recruitment ,personnel training and other service	0.613	0.198	0.071	-0.191	0.006
Different communications including forum, cultural event and other activities	0.609	0.243	0.036	0.214	0.306
Cooperation ties with neighbouring companies outside of the cluster	0.171	0.742	0.176	0.245	0.306
Enterprises can cooperates in the industry value chain	0.494	0.670	0.193	0.115	-0.100
Express and public transportation	0.073	0.662	0.298	0.232	0.005
Special fund, governments' awarding and etc.	0.455	0.598	0.129	0.017	0.450
Technology and knowledge exchange	0.551	0.589	0.088	-0.098	-0.110

Cultural facilities including landscape, library, music hall, theatre, museum and etc. around the cluster	-0.083	0.597	0.281	0.222	0.426
The brand construction of the cluster	0.303	0.543	-0.053	0.447	0.110
Living facilities including store, bank ,coffer and etc. in the cluster	0.068	0.133	0.832	0.225	0.116
Gym, toilet and others in the cluster	0.155	0.396	0.761	-0.059	-0.016
Creative scenery including sculptures ,landmark and etc. in the cluster	0.203	0.298	0.502	0.148	0.292
Facilities including electricity, water, Office furniture and etc. in the cluster	0.068	0.236	0.210	0.835	-0.001
Room Rent in the cluster	0.124	0.170	0.064	0.779	0.004
Meeting room, working space and etc. in the cluster	0.021	0.137	0.586	0.591	0.009
Restaurant, shopping mall and other entertainment places	-0.037	0.654	0.317	0.238	0.373
Charity evening gala, Donation activities and etc.	0.229	0.078	0.015	-0.048	0.079
Smart parking, centre control system and etc.	0.412	0.151	0.270	-0.016	0.057

Correction of the former Model of Cultural Enterprises Demands

Authors recognized the service list according to the rotational component matrix from highest data to the lower ones. The following results are obtained (look at Table 2):

- For the component 1: all the items are related to professional service from 0.084-0.609 by clusters, what show that generate high demand.
- For the component 2: all the items are related to the exterior condition from 0.742-0.03 around the cluster including the combined effect.
- For the component 3: all the items are related to supporting facilities from 0.832-0.502 in the clusters. Since it is cultural cluster, these facilities have very clear characteristic of culture, which is quite different from that in manufacturing cluster and other kinds of clusters. Hence, the entire group can be attributed to be the cultural facilities.
- For the component 4: all items are related to infrastructure from 0.835-0.238 in the clusters.
- For the component 5: the higher data is “Charity evening gala, Donation activities (0.079) and “Smart parking, centre control system and etc.” (0.057).

The rest data is of quite low even negative significance. This abdicates that the two services are special ones. Actually, this service just can be provided in some high-level clusters. In the average level, most of the clusters cannot offer this kind of service. They are some special service. Thus, the former Enterprise demands’ can be optimized according to the “Rotational Component Matrix” and its results (Table 3).

Table 3. The Optimized Model of Cultural Enterprises Demands

Dimension	Concrete Service Index
Professional Service	Information consultancy
	Capital service
	Exhibitions and trade platform
	Incubator and innovation
	Technology Sharing
	HR service
	Publicity and Communication
Exterior Condition	Industries environment
	Commercial facilities
	Transportation condition
	Cultural atmosphere
	Policy support

	Scale effect
	Learning effect
	Brand effect
Infrastructure	Working facilities
	Room Rent
	The layout of the space and the style of the room
	Social Environment
Cultural Facilities	Living facilities
	Public facilities
	Cultural infrastructures

5. The Strategy to promote the sustainable development of the clusters

In the perspective of the enterprise demand, professorial service, exterior condition, infrastructure and cultural facilities can facilitate increasing popularity of clusters. Those dimensions are important elements allowing evaluation of clusters. And these four dimensions could be considered as source of competitive advantage allowing to promote clustering. Basing on in-depth interviews, the following suggestions for sustainable development of clusters are formulated:

(1) To Optimize the Professional Service

Professional service is the most important facet of clusters' competitiveness. In the reform era of Chinese cultural system, clusters become one of the most important spaces for cultural enterprises. It should provide much more professional service to support enterprises in the clusters. The research showed that enterprises pay more attention to information consultancy, financial solutions, and exhibitions, trade platforms etc. That is, what an enterprise needs, therefore a cluster should work towards indicated direction. At first, a cluster can establish collaboration ties with research institutions and universities. The experts can give effective guidance. The second, a cluster should pay more attention to smart industry with "Internet +" strategies initiated by the state council in Beijing. The third, a cluster should invest much in research to find better solutions for financial issues and sharing technology, service providing to enterprises. Besides, a cluster should encourage enterprises to invest into research of new products for obtaining extra benefit. A cluster can establish a fund to help and teach enterprises to innovate. Nowadays, most of clusters provide services just like a servicing business company. Clusters should improve themselves in order to raise capabilities of offering better professional services in supporting enterprises' development.

(2) To optimize the Exterior Conditions

Exterior Condition will provide stimulus or postpone the development of a cluster and will make important influence on enterprises belonging to clusters, what is another important element of competitiveness. From the Optimized Model of Cultural Enterprises Demands, we can see that all of these components incorporate industries' environment, commercial facilities, transportation condition, cultural atmosphere, policy support; combined effect (Scale effect, Learning effect and Brand effect) and should be optimized in order to meet enterprises' demand. It is beneficial for enterprises to exchange ideas, strengthen the cooperation ties, and construct the brand of the cluster and etc. At first, cluster should make a clear statement, formulate development plan and define its cultural characteristics, which is the basis for sustainable development. The second, a cluster should pay more attention to brand. Only good brands can attract enterprises into the cluster. Governmental support as well plays very important role. The third, a cluster should promote the combined effect. That means, the cluster should promote economic development by improving the cooperation of one or several specific business sectors. Enterprises in a cluster can get a big economic effect by working together. Any cluster should foster the social responsibilities in culture.

(3) To Improve Cultural Facilities

The cultural consumption is the distinctive feature of creative people. When creative class gathers, need for good cultural facilities arises. For sustainable development, the cluster needs to improve its cultural facilities for

creative class and the enterprises. On the one hand, it clusters should create cultural spaces for stakeholders of various cultural experiences. In some leading cultural clusters, it may be theatres, music halls or public libraries established or created in the result of transformation of old wasted factories. In reality, many clusters pay little attention on indicated aspects. Usually clusters just create space for renting it to cultural enterprises. They look as office buildings but not as cultural clusters then. On the other hand, clusters should pay more attention to developing related businesses for entertainment, commercial communications and catering, and provide cultural consumption for creative enterprises, which would use comfortable environment for working and living. Besides, cultural events are still important. A cluster should establish platform and organize or encourage enterprises to take part in these activities. It is a good way to realize their social responsibility as cultural organizations both for cultural clusters and enterprises.

(4) To improve infrastructure in clusters

The infrastructure is quite important for a cluster. It is a good foundation to attract and develop enterprises. Implemented research provided possibility to evaluate services of clusters. 93.3% of interviewed enterprises chose good infrastructure as the most important reason for them to enter the cluster. According demand requirements, a cultural industries' cluster should improve the infrastructure and make a good environment there.

- I. Firstly, a cluster should invest heavily into construction of a good working environment for enterprise, including capacious rooms with different functions, Internet, working facilities and so on. In perspective, a cluster will just like a manager and manage all the logistics services for the enterprises to large extent and allow creative class or its enterprises to have more time and energy to work.
- II. Secondly, a cluster should enhance the information technology use. Nowadays, Chinese government advocate "Internet +" strategy. That means, all industries should improve their Internet connection and start Internet economy such as BAT, the best example in China. The quality of Internet has been a hot requirement for creative industries, especially, for the Internet companies and some international cultural trade companies. Internet is also an import component of clusters' construction at this moment.
- III. Thirdly, a cluster has to create some space for young people in order they could start their businesses, and construct some public exhibition space for workers here, and neighbouring residents. An internet platform is required.

Conclusions

- This paper focuses on the conceptual overview of cultural and creative industries as culture-based sustainable development driving force, allowing to reach economic objectives of cultural policy.
- The perspective of *enterprises demands theory* and model evaluating needs of enterprises was introduced and used for analysis of economic performance of Chinese cultural industries' clusters.
- For evaluation of sustainability of clusters' development Sustainability indexes were applied; a survey of a hundred of cultural enterprises in cultural industries clusters in Beijing was performed.
- Survey data analysis, applying the rotational component matrix revealed different indexes in the perspective of enterprise demand and allowed to suggest how to accomplish the former model to a new optimized model, which reflects four important dimensions allowing improve clusters economic performance, taking into account the professional service, exterior conditions, cultural facilities and infrastructures.
- Analyses reveal concrete tools for enhancing for sustainable development of clusters in the four provided perspectives.

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Acknowledgement

This research was supported by the projects the Overseas' Cultural Industries Clusters Construction in the Framework of the Belt and Road Initiatives and the Study on Cultural Industries Clusters in Beijing, which has received funding from Communication University of China and the National Cultural Industries Innovative Experimental Zone in Beijing.

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PROTECTION OF THE NATIONAL FINANCIAL SYSTEM FROM THE MONEY LAUNDERING AND TERRORISM FINANCING *

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Received 16 May 2017; accepted 25 October 2017; published 29 December 2017

Abstract. The contribution deals with national risk assessment of the money laundering and the terrorism financing at the national level. The contribution shows what are decisive criteria to evaluate the national system of anti-money laundering and counter terrorism financing examining the legal frame, the institutional frame, the competency of the personnel, the infrastructure to prevent, avoid and respond such a threat. It identifies how every product, sector and all designed non-financial business and professions should be evaluated. It elaborates on the factors that may aggravate or mitigate the risks of the proposed variables. The contribution tries to draw a complexity of conducting the national risk assessment as well it hints what may be the data sources for the evaluating process. It compares the variables, its risks and description with the FATF recommendations, FATF methodology and FATF risk assessment as the main open sources but goes further and tries to adjust it to the local level and makes it “more customizing”.

Keywords: effectiveness, criminal proceeding, confiscation of assets, sanction, vulnerability, statistics

Reference to this paper should be made as follows: Kordík, M., Kurilovská, L. 2017. Protection of the national financial system from the money laundering and terrorism financing, *Entrepreneurship and Sustainability Issues* 5(2): 243-262. [http://doi.org/10.9770/jesi.2017.5.2\(7\)](http://doi.org/10.9770/jesi.2017.5.2(7))

JEL Classifications: K14, G1, G3, G4

Additional disciplines: Criminal Law

1. Introduction

As a part of our long-term scientific project we have developed risk assessment tool to evaluate the threats of the money laundering and terrorism financing in the country. The proposed criteria are drafted to be fully compliant with the FATF standards and methodologies with the possibility to put in the national specifics and adjustments.

* This research was supported by the project Guidelines and tools for effective elimination of unlawful acts in relation with potential insolvency, which has received funding from the Slovak Research and Development Agency under the contract No. APVV-15-0740

The main purposes of the Anti-money laundering (following as “AML”) and counter-terrorist financing (following as “CTF or TF”) risk assessment[†] are:

- to identify[‡] the vulnerability of each of the (relevant) businesses and professions that make up the country’s financial sectors and designated non-financial businesses and professions,
- to identify businesses/professions of high vulnerability and identify, on a needs basis, the products/services offered by the businesses/professions with high ML/TF vulnerability and
- to prioritize the action plans that will strengthen anti-money laundering controls (AML/TF controls) in the sectors.
- The ML/CTF Risk Assessment should be used to inform policy measures and improve data collection. ML and TF cases may take a long time to investigate, prosecute, and adjudicate. Considering that in many countries CTF regimes have only recently been adopted, data collection periods will also depend on the availability of the data.[§]

To conduct such an assessment the following list provides sources that can be used for completing the assessment:^{**}

- Statistics (national and international).^{††}
- Intelligence.
- Interviews with relevant authorities/interest groups/market participants.^{‡‡}
- Focus group meetings with relevant authorities/interest groups/market participants.^{§§}
- Surveys of general public or focus groups.^{***}
- Reports by international organizations (e.g., United Nations, World Bank Group, International Monetary Fund, World Customs Organization, and World Trade Organization).
- Reports by international standard-setting bodies (e.g., Financial Action Task Force and FATF Style Regional Bodies).
- Reports by governments/think-tanks/civil society organizations/private institutions.^{†††}
- Books/articles/reports based on academic research.
- Press/internet/other sources of public information.

[†]FATF Methodology FATF, 2013 p. 6, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

[‡]Acc. FATF National Moneylaundering and Terrorist Financing Risk Assessment, FATF, 2013 p. 3, Available on: <http://www.fatf-gafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html>,

[§]Inter alia Acc. 1. Recommendation of the FATF recommendation, 2016, available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf. Also see FATF Methodology FATF, 2013 p. 6, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>

^{**}Acc. FATF National Moneylaundering and Terrorist Financing Risk Assessment, FATF, 2013 p. 13-16, Available on: <http://www.fatf-gafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html>, FATF Methodology FATF, 2013 p. 23-25, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

^{††}Inter alia Acc.recommendation 33 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf

^{‡‡}Inter alia Acc.recommendation 33 and 34 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf

^{§§}Inter alia Acc.recommendation 33 and 34 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf

^{***}Inter alia Acc.recommendation 33 and 34 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf

^{†††}Inter alia Acc.recommendation 33 and 34 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf

2. AML risk assessment

This assessment applies to each relevant product within the financial sector and business sector and profession within the non-financial sector as DNFBP. This means that all the firms and individuals in the assessed business/profession need to be assessed together per business/profession type. The AML control variables are as follows.^{†††}

2.1. Size of the product/business/profession^{§§§}

This variable assesses the total number of a particular product provided by the assessed business/profession (if applicable).^{****}

The total number of a particular product may be indicative of the level of ML vulnerability that this product can introduce into the assessed business/profession (if the relevant risks are not mitigated).

The actual number of product provided may be very difficult to determine. What is required is a judgment as to whether or not the scale of the number of the product provided is significant in the assessed country's economy.

The objective of this indicator is to assess the importance of a particular product within the assessed business/profession, in comparison to other products offered by the assessed business/profession. The most appropriate indicator of the total number of a product in the business/profession depends on the nature of the product being assessed.

This variable includes also the total number of providers (firms and individuals) in the business/profession. This information is taken to be indicative of the level of ML vulnerability that they can introduce into the business/profession (if the relevant risks are not mitigated). For some categories (especially unregulated ones), the actual number of providers may be difficult to determine.

^{†††}Acc. FATF National Moneylaundering and Terrorist Financing Risk Assessment, FATF, 2013 p. 13-16, Available on: <http://www.fatf-gafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html>.

^{§§§}Inter alia Acc.recommendation 1,10 and 11 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf and FATF Methodology FATF, 2013 p. 13,132, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

^{****}Possible sources of the data on total number products and providers (firms and individuals, licensed and unlicensed) within the assessed business/profession: Interviews/consultations with regulatory/supervisory authority (e.g., an self-regulatory bodies (further as "SRB") or other competent authority); Interviews/consultations with assessed business/profession's representatives, including an SRB and professional associations; Surveys of management and staff of firms that make up the assessed business/profession; Interviews with and data compiled by private sector research or consulting firms.

It needs to be considered also whether the particular product can be provided in the jurisdiction only by licensed businesses or professionals, or are permitted to be provided by "informal" or unlicensed firms and individuals (including informal trustees such as friends and family who serve as trustees of wills/estates or a business providing company secretarial services without a need for licensing as such); and/or are not permitted within the jurisdiction, but the product is being provided by "informal" or unlicensed firms and individuals (because of lack of clarity in the laws or regulations or lack of effective enforcement against unlicensed firms or individuals). A.g. compare inter alia to .recommendation 1,10 and 11 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf and FATF Methodology FATF, 2013 p. 13,132, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

The most appropriate indicator of the total number of providers within the business/profession depends on the nature of the product being provided. In other words, if the country licenses company service providers, but unlicensed company services firms or individuals are also permitted to provide such services, efforts should be made to ascertain (even if only a best estimate) the number of both licensed and unlicensed providers. For lawyers and other professionals, consider only the number of those that provide financial intermediary services. It may indicate a problem itself, if the country is not able to identify the number of providers.

2.2. Product business/profession client base⁺⁺⁺

This variable assesses whether the type of client that generally uses the product or the business/profession being assessed increases the risks of money laundering abuse of the assessed product or business/profession.

The term “client” may refer to natural persons or legal persons or arrangements; they may also be end-users of the business/profession or professional intermediary firms through which products are provided to the end-users.

All forms of clients should be considered in the assessment. The client-base profile of the business/profession should be assessed to carry a higher risk if it involves⁺⁺⁺⁺: Domestic/international politically exposed persons (further as “PEPs”), High net-worth individuals, Nonresident clients, particularly from high-risk jurisdictions, Clients with foreign business or personal interests, Clients with business links to known high-risk jurisdictions, Clients with criminal records or past administrative and/or supervisory actions against them; Clients that are legal entities or arrangements with a complex, opaque ownership and control structure (including layered ownership and control, multijurisdictional or involve high-risk jurisdictions); Clients obtained through introduced business, particularly from unregulated professional intermediaries or regulated PIs in jurisdictions with low AML controls (including customer due diligence (further as “CDD”) and recordkeeping, availability and timely access to beneficial ownership of legal entities and legal arrangements, licensing and supervision, and enforcement); Professional intermediaries in jurisdictions with low or no CDD requirements; Professional intermediaries in high-risk businesses/professions in country context.

⁺⁺⁺Inter alia Acc. recommendation 10 and 11 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf and FATF Methodology FATF, 2013 p. 40-47, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

⁺⁺⁺⁺Possible sources of the relevant data: Regulatory framework for risk-based classification of clients; Regulatory framework for identifying and monitoring foreign and domestic PEPs; Any product-related statistics on PEPs and other higher-risk clients; Data on jurisdictions of origin of end-user clients and professional intermediary firms; Financial sector and DNFBP sector data by business/profession on transactions with high-risk jurisdictions; Data on clients obtained through introduced business; Interviews/consultations with regulatory/supervisory authority (e.g., an SRB or other competent authority); Interviews/consultations with assessed business/profession’s representatives, including an SRB and professional associations; Surveys of management and staff of firms that make up the assessed business/profession; Interviews with and data compiled by private sector research or consulting firms; Criminal data, including typologies on high-risk clients and ML cases where a business/profession was used for ML by high-risk clients; Statistics on and information from the business/profession with regard to high-risk clients; Statistics on the foreign jurisdictions where mutual legal assistance (following as “MLA”) or informal information sharing requests were received and sent by relevant authorities, including by supervisors, law enforcement, the Financial Intelligence Unit (following as “FIU”) , and tax authorities.

See also: FATF Methodology FATF, 2013 p. 40-47, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

While assessing the client-base profile for each product and business/profession, it needs to be assessed whether this business/profession is being used by clients who pose a higher ML risk, when compared to “standard” clients. §§§§

To assess this variable, one should determine if the assessed product and business/profession has put in place appropriate mechanisms to identify and monitor high-risk individuals (including PEPs).

If such monitoring/analysis mechanisms are not in place, the business/profession may not be able to provide such information. It needs to be carried out certain activities (including acting as financial intermediaries and incorporation services), are required to undertake customer due diligence, which includes verification of the beneficial ownership of legal persons and legal arrangements.

Thus, the financial institutions and DNFBPs should be able to identify nonresident clients, and determine which kinds of products they use. A more advanced analysis, based on the countries that such non-resident clients originate from, will provide further insight into the risk level. Assessment of this indicator will require judgment, unless the country has appropriate mechanisms for identifying and monitoring high-risk clients (including PEPs). If there is no data that can support the assessment, one should work on the basis of the worst-case scenario and be conservative in its assessment since the lack of ability to analyze the client-base profile will pose a risk in itself. *****

2.3. Level of cash flows within the business/profession^{††††}

This variable is associated with the level of cash activity associated with a specific business/profession, both whether the use of cash is permitted and to what extent that occurs. The more the business/profession being assessed is cash-based, the greater its vulnerability to money laundering. ††††

2.4. Other vulnerabilities of the business/profession^{§§§§§}

This variable is linked whether there are any additional factors that render a particular business/profession vulnerable to the risk of money laundering.

The presence of the following typical factors may increase the ML vulnerability of the assessed business/profession^{*****}: Use of agents^{†††††}, Possible anonymous use of the product in the

§§§§§Inter alia Acc. recommendation 12 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf. and FATF Methodology FATF, 2013 p. 40-47, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

***** Risk based approach

†††††Inter alia Acc. recommendation 14, 15 and 16 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf

†††††Possible sources: Interviews/consultations with regulatory/supervisory authority (e.g., an SRB or other competent authority); Interviews/consultations with assessed business/profession’s representatives, including an SRB and professional associations; Surveys of management and staff of firms that make up the assessed business/profession; Interviews with and data compiled by private-sector research or consulting firms; Criminal data, including ML cases where a business/profession was used for ML because of the possibility of transacting in cash (including payment of fees for service provided).

§§§§§Inter alia Acc. recommendation 14, 17,24,25 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf

*****Possible Sources of Information and Data: Criminal data, including ML cases where a business/profession was used for ML, indicating vulnerability due to the above-mentioned factors; Data or statistics and qualitative information from MLA and formal or informal requests from supervisory authorities, law enforcement, the FIU, and tax and other relevant authorities to share information/intelligence; Interviews/consultations with regulatory/supervisory authority (e.g., an SRB) and other

business/profession⁺⁺⁺⁺⁺, Difficulty in tracing the transactions (including attorney/client privilege and professional secrecy for lawyers and accountants; work [document]/product privilege), Existence of ML typologies on the abuse of the business/profession, Use of the business/ profession in tax/fraud schemes, Non-face-to-face interaction with the client⁺⁺⁺⁺⁺.

A further example of a vulnerability factor is the use of agents or other professional intermediaries to deliver the product. In this case, ML vulnerability may be increased due to the weak AML systems of the agents or professional intermediaries (including weak systems of the countries in which they operate or reside). To limit vulnerability, the agents or professional intermediaries should be subjected to adequate AML controls and monitoring/supervision by the principal of the financial institution or the business/profession in the country providing the product⁺⁺⁺⁺⁺.

It should be assessed whether anonymous use of the product is possible for the assessed product or assessed business/profession. Also, please consider whether the beneficial owner of the transaction is always identified and verified. Does the business/profession allow for anonymous use (where a firm or an individual known to the assessed business/profession uses the product on behalf of several firms or individuals who are unknown to the business/profession)? Anonymous transactions are vulnerable to money laundering, as the beneficial owner(s) of the funds involved in the transaction is/are not known or are unverified. The transaction is executed for the client on behalf of others. The real owners are not known and hence not subjected to customer due diligence.⁺⁺⁺⁺⁺

It should be assessed whether transactions executed in the course of delivery of a product by the business/profession are properly recorded and whether access to those records can be readily obtained for CDD/Enhanced due diligence (following as “EDD”). The difficulty in tracing the records would depend on the quality of the assessed business/profession’s AML CDD and record-keeping systems. For example, the overbroad application or misuse of professional secrecy and privilege provisions, which may also hinder timely access to relevant records by competent authorities.

Existence of ML typologies on the abuse of the product or business/profession means whether the business/profession is known for abuse for ML purposes. This does not necessarily need to be in the country context. It should be considered also the global level, regardless of whether it was detected or not detected in the country.⁺⁺⁺⁺⁺

competent authorities; Interviews/consultations with assessed business/profession’s representatives, including an SRB and professional associations; Surveys of management and staff of firms that make up the assessed business/profession; Interviews with and data compiled by private-sector research or consulting firms.

See also FATF Methodology FATF, 2013 p. 49-54, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

⁺⁺⁺⁺⁺Inter alia Acc. recommendation 17 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf

⁺⁺⁺⁺⁺Inter alia Acc. recommendation 24 and 24 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf.

⁺⁺⁺⁺⁺Inter alia Acc. recommendation 17,24 and 25 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf.

⁺⁺⁺⁺⁺Acc. FATF Methodology FATF, 2013 p. 48, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

⁺⁺⁺⁺⁺Acc. FATF Methodology FATF, 2013 p. 48, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

⁺⁺⁺⁺⁺Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p. 43-44, Available on: <http://www.fatf-gafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html>

Assess the use of the business/profession in fraud or tax evasion schemes or other predicate offenses. For this purpose, it may be useful to refer to crime and tax enforcement data to find the businesses/professions that are most vulnerable to actual and potential misuse. The use of the business/profession in tax evasion or fraud schemes or other predicate offenses may indicate a vulnerability to ML abuse as well. §§§§§§

Availability of non-face-to-face initiation of a business relationship with respect to a product or a business/profession (or product) raises ML vulnerability. If an individual is able to secure the product via the internet or telephone with no face-to-face contact with the professional or business, there is ML vulnerability. Even in the cases where non-face-to-face initiation of a product is not allowed, but non-face-to-face use of the product is, there is a possibility of ML vulnerability. But in the second case, the vulnerability of the product can be less, depending on the quality of CDD/EDD done during the face-to-face product initiation and existence of other controls that limit the use of the product by persons other than the account holder.

2.5. Legal framework*****

It should be assessed whether a country has comprehensive AML laws and regulations regarding AML preventive measures and AML supervision for the assessed product in the financial sector and business/profession within the nonfinancial sector. It is related to the AML legal and regulatory framework.

A country has comprehensive AML laws and regulations on preventive measures and supervision in force for the assessed business/profession if they conform to international standards on customer CDD (risk-based, including verification of beneficial ownership of customers that are natural persons and legal entities and legal arrangements) and record-keeping. It should include the enhanced DD for PEPs and high-risk countries and reliance on Customer Due Diligence by third parties, including introduced business, sufficient Suspicious Transaction Reporting (following as “STR”) incl. tipping-off and confidentiality, internal controls, foreign branches, and subsidiaries and licensing and supervision for AML compliance.

2.6. Effectiveness of the Supervision+++++

This assesses the effectiveness of AML supervision/oversight activities for the assessed business/profession. An effective supervisory regime is one that has a comprehensive legal and regulatory framework and is supported by appropriate powers and is well resourced, and which employs risk-based approach to on-site and off-site monitoring and inspections. §§§§§§

§§§§§§ Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p. 43-44, Available on: <http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html>

***** Inter alia Acc. recommendation 20-28 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf

+++++ Inter alia Acc. recommendation 26,27 and 28 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf

***** Possible sources for this assessment it should be consulted: Relevant laws and regulations, policies, procedures, and manuals (including how the risk-based approach is determined); Statistics on the number of supervisory staff, and information on their training, knowledge, and skills; Information on the type(s) and methods of off-site supervision activities and findings; Statistics on the number of firms/professionals actually being monitored or inspected (on-site/off-site), and information as to scope, frequency, and intensity of the supervision/ oversight activities; Statistics and information on main findings of on-site/off-site inspections; Interviews/consultations with regulatory/supervisory authority (may be a SRB) and other competent authorities; Interviews/consultations with assessed business/profession’s representatives, including a SRB and professional associations; Surveys of management and staff of firms that make up the assessed business/profession.

The AML supervision/oversight activities are effective where the supervisory body (which can be a self-regulatory body or both, depending on country practice) is clearly identified in the laws and regulations and has appropriate authority and mandate to conduct AML compliance supervision. When it carries out its supervisory activities within a comprehensive supervisory framework that includes clear supervision policies, procedures, and manuals. It possesses good understanding and appreciation for the ML risks of the assessed business/profession. It has sufficient number of staff and trains the staff and equips them with necessary skills and up-to-date knowledge— including understanding of the nature of the firms and clients and the products of the assessed business/profession—to carry out AML supervision. It has other necessary resources to ensure AML compliance (such as the technical capacity, budget, and tools). It carries out a comprehensive, risk-based supervisory program that consists of on-site and off-site monitoring and on-site inspections on both regularly scheduled cycles and periodic spot-checks (risk-based and as necessary). It reports and records the examination results in a systematic way and is able to effectively use these records for policy purposes. It exercises moral suasion that has a significant impact on the assessed business/profession's management and is sufficient to positively influence behavior patterns. It can be demonstrated that supervisory powers are exercised effectively and impartially. §§§§§§§§

2.7. Availability and Enforcement of Non criminal (Administrative) Sanctions §§§§§§§§

This variable assesses whether the country has a wide range of effective, proportionate and dissuasive administrative sanctions applicable to natural or legal persons in case of noncompliance with AML laws and regulations. §§§§§§§§ Sanctions should be applicable to firms as well as individual directors, management and staff. The more the sanctions are effective, proportionate and dissuasive, the more likely it is that management and staff members will comply with AML laws and obligations. §§§§§§§§

It includes also the assessment whether the country takes administrative enforcement actions against a firm or individual members of management or staff in case of noncompliance with AML obligations. Consider the number of administrative actions taken against the firms and their staff. §§§§§§§§

§§§§§§§§FATF Methodology FATF, 2013 p. 69-72, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

§§§§§§§§ Inter alia Acc. recommendation 26,27 and 28 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf. Also see FATF Methodology FATF, 2013 p. 69-72, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

§§§§§§§§ Possible sources of information and data: Specific legal and regulatory provisions on administrative sanctions; Statistics on numbers (by type) of past administrative enforcement actions by relevant authorities; Information as to steps taken (or not taken) by the assessed business/profession to remedy infractions; Interviews/consultations with regulatory/supervisory authority (may be a SRB) and other competent authorities; Interviews/consultations with assessed business/profession's representatives, including a SRB and professional associations (including as to forms of sanctions they enforce, such as disciplinary hearings or revocation of membership); Surveys of management and staff of firms that make up the assessed business/profession.

Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.39-41 , Available on: <http://www.fatf-gafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessmentent.html> and acc. FATF Methodology FATF, 2013 p. 69-72, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

§§§§§§§§ Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.39-41 , Available on: <http://www.fatf-gafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessmentent.html>. Also see FATF Methodology FATF, 2013 p. 69-72, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

§§§§§§§§ Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.39-41 , Available on: <http://www.fatf-gafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessmentent.html>. Also

The following criteria indicate that effective, proportionate, and dissuasive administrative sanctions are in place- a wide range of administrative sanctions (such as monetary penalties, administrative actions and removal of critical staff, and suspension/revocation of business/professional licenses) in force for noncompliance with AML obligations. The administrative sanctions are sufficient to positively influence the assessed business/profession's firms' management and staff behavior. The following criteria indicate that a country enforces its AML obligations in case of noncompliance^{*****}: Most persons working in the assessed business/profession believe that administrative enforcement action would be initiated in case of noncompliance with AML requirements. There is a record of administrative enforcement actions taken in the past by law enforcement authorities regarding noncompliance with AML requirements in the assessed business/profession.

The adequacy of the administrative sanctions may need to be assessed in context with the criminal sanctions. The balance and preference between the administrative and criminal sanctions may differ among countries.

2.8. Availability and Enforcement of Criminal Sanctions⁺⁺⁺⁺⁺⁺

This criteria assesses whether the country has a range of effective, proportionate and dissuasive criminal sanctions applicable to natural or legal persons in case of noncompliance with AML laws and regulations.^{*****} This should include sanctions for serious and deliberate (or criminally negligent) breaches that can be ancillary to the money laundering offense. Sanctions should be applicable to firms (legal persons) and to individual managers and staff in relation to the conduct of their activities within or from the country.^{§§§§§§§§}

see FATF Methodology FATF, 2013 p. 69-72, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

^{*****}Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p39-41 , Available on: <http://www.fatf-gafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html>.

and acc. FATF Methodology FATF, 2013 p. 69-72, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

⁺⁺⁺⁺⁺⁺Inter alia Acc. recommendation 3-7, 30-31 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf and. acc. FATF Methodology FATF, 2013 p. 26-37, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

^{*****}Possible information and data sources: Relevant laws (specific provisions on criminal sanctions and enforcement), including relevant ancillary offenses to ML; Statistics on past and ongoing criminal investigations, prosecutions, and convictions by domestic law enforcement and other relevant authorities with respect to the assessed business/profession; Statistics on criminal enforcement actions carried out by foreign law enforcement and other relevant authorities against the firms and individual members or staff of the assessed business/profession, and whether (and in what form and to what extent) the country provided informal or formal assistance to the investigation and prosecution; Interviews/consultations with regulatory/supervisory authority (e.g., a SRB, law enforcement agency, or prosecuting agency); Interviews/consultations with assessed business/profession's representatives, including an SRB and professional associations; Surveys of management and staff of firms that make up the assessed business/profession.

Compare to FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.41-44, Available on: <http://www.fatf-gafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html>. and FATF Methodology FATF, 2013 p. 26-37, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

^{§§§§§§§§}Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.41-44 , Available on: <http://www.fatf-gafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html>. and. acc. FATF Methodology FATF, 2013 p. 26-37, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

The criteria assesses not only the legal framework, but also the actual enforcement actions against firms and individual members of management or staff (of the assessed business/profession) in cases of noncompliance with AML obligations.*****

The following criteria indicate that effective, proportionate, and dissuasive criminal sanctions are available and effective- There are appropriate criminal sanctions in force for noncompliance with AML obligations. Persons in the assessed business/profession regard the criminal sanctions regime as sufficiently dissuasive to positively influence individual behavior patterns. Criminal sanctions are also applicable for appropriate ancillary offenses to the offense of money laundering.

The following criteria indicate that a country enforces its AML obligations in case of noncompliance++++++:

- Most persons working with the product or in the business/profession believe that criminal enforcement action would be initiated in case of noncompliance with AML requirements.
- There is a record of convictions, and criminal enforcement actions taken in the past by law enforcement authorities regarding noncompliance with AML requirements in the assessed business/profession. Consider the number of investigations, prosecutions, and convictions, as well as other available evidence on enforcement.
- The criminal enforcement against the business/profession's firms and their staff with regard to other financial crimes (such as fraud) may also give an idea of the "enforcement perception" of the assessed business/profession.

2.9. Entry Checks Availability and Effectiveness++++++

This variable assesses the availability and effectiveness of entry controls, including licensing, registration or other forms of authorization to operate. A country has effective entry controls if there is a comprehensive legal and regulatory framework, which provides authorities with appropriate powers and sufficient level of staff and other resources to carry out their duties vis-à-vis the assessed business/profession.*****

***** Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.41-44 , Available on:

<http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessm ent.html>. and FATF Methodology FATF, 2013 p. 26-37, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

++++++ Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.41-44 , Available on:

<http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessm ent.html> and FATF Methodology FATF, 2013 p. 26-37, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

++++++ Inter alia Acc. recommendation 26,27 and 28 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf. Also see FATF Methodology FATF, 2013 p. 69-72, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

***** Possible Sources of Information and Data: Licensing and registration laws and regulations, policies, procedures (including application forms and supporting documentation) and manual for supervisory staff; Statistics on license applications received and actually granted; Statistics and information on licenses not granted or later suspended or revoked for failure to meet AML controls; Interviews/consultations with regulatory/supervisory authority (may be a SRB) and other competent authorities; Interviews/consultations with assessed business/profession's representatives, including a SRB and professional associations; Surveys of management and staff of firms that make up the assessed business/profession.

Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.39-41 , Available on: <http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessm>

Effective entry controls help reduce money-laundering vulnerabilities and ensure a higher level of compliance with AML requirements, including preventing systemic problems in the assessed business/profession. The entry controls are effective if the licensing body is clearly identified in the laws and regulation, it possesses good understanding and appreciation for the ML risks of the assessed product or business/profession, it effectively carries out its licensing and entry controls duties, it has a clear and comprehensive framework for licensing and registration requirements for the assessed business/profession, including *****: A fit and proper test designed to prevent criminals or their associates from being granted a business or professional license or being the beneficial owner of a significant controlling interest in the business or holding a significant management position. Appropriate educational and professional certification requirements for key directors and senior management. Requirement for all licensees to have adequate AML compliance controls in place, including compliance manuals and appointment of well-qualified internal controls/compliance staff. Possesses adequate resources to ensure the quality implementation of entry controls for the assessed business/profession, including a sufficient number of well-trained and highly skilled personnel to screen, vet, and approve all applications and supporting documentation.

2.10. Integrity of the Staff*****

This variable assesses whether the directors, managers and staff of the firms (including sole practitioners) act with integrity. This means that the staff does not act in a willfully blind manner or collude with criminals or act corruptly. In addition, they take care that they do not become unwittingly involved as “innocent agents” on behalf of criminals seeking to use their products and specialized knowledge and skills.*****

[ent.html](#) and acc. FATF Methodology FATF, 2013 p. 69-72, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

***** Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.39-41 , Available on:

<http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessm ent.html> . and acc. FATF Methodology FATF, 2013 p. 69-72, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

***** Inter alia Acc. recommendation 18-23 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf.

***** Possible Sources of Information and Data: Relevant laws/regulations (including specific provisions on confidentiality mechanisms in place for the staff when reporting suspicious or other relevant transactions); Information as to staff vetting and training programs (of the assessed business/profession); Statistics on integrity breaches by the managers and staff in firms (of the assessed business/profession) and information on disciplinary actions taken; Statistics on the number of criminal cases, including money laundering cases, concerning staff of the firms in the assessed business/profession; Findings of firms’ (of the assessed business/profession) AML on-site inspections and off-site monitoring; Statistics on number (and types) of administrative enforcement actions against firms and individuals working in the assessed business/profession; Review of reports/records of internal control/compliance units in firms of the assessed business/profession; Historical data of incidents /breaches by staff (kept by firms for operational risk management purposes); General levels of integrity or the operating environment in the country (refer, for instance, to the Transparency International Corruption Perceptions Index); Assessed business/profession’s reputation on involvement in financial crimes, including tax evasion; Interviews/consultations with a regulatory/supervisory authority, which may be a SRB or other competent authority; Interviews/consultations with assessed business/profession’s representatives, including an SRB (particularly internal control or compliance units) and professional bodies; Surveys of management and staff of firms that make up the assessed business/profession.

Compare to FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.39-40 , Available on: <http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessm ent.html> . and acc. FATF Methodology FATF, 2013 p. 56-62, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>

If staff members collude with criminals or undermine AML controls by acting corruptly, firms are vulnerable to money laundering abuse. Consider the effectiveness of staff vetting programs in the assessed business/profession; the incidence of disciplinary action for breach of integrity-related rules; and the number of criminal cases against staff members. Professionals and staff of firms of the assessed business/profession act with integrity if the firms generally regard their staff members as secure from corruption by criminals. The incidence of integrity failure (e.g., negligent or “willful blindness” to suspicious transactions) involving the business/profession’s staff is low (but consider whether there is underreporting of incidences of integrity failure). There is an appropriate mechanism in place to protect the business/profession’s managers and staff against any negative consequences as a result of reporting suspicious transactions or other actions to comply with AML obligations. \$\$\$\$\$\$

2.11. AML Knowledge of the Staff*****

This variable assesses how well the professionals and staff of firms in the assessed business/profession know and understand their duties and responsibilities. Professionals and staff of firms in the assessed business/profession have the required AML knowledge if there are appropriate AML training programs and materials for professionals/staff. Training programs are designed to ensure that all appropriate staff members are trained.†††††††††† All professionals and staff members are required to undergo ongoing training to ensure that their knowledge of AML laws, policies, and procedures is appropriate and up-to-date. Keep in mind that if the firm conducts business with clients and professional intermediary firms in other jurisdictions, their knowledge should also extend to AML laws and regulations of those jurisdictions. Professionals/staff have a good knowledge of and are regularly updated on domestic and transnational money laundering schemes and typologies, including those involving the misuse of the business/profession and specialized knowledge and skills of its professionals and its products and services. Professionals/staff are aware of AML compliance and reporting procedures and obligations. ††††††††††

\$\$\$\$\$\$\$\$\$Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.39-40 , Available on:

<http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html> and acc. FATF Methodology FATF, 2013 p. 56-62, Available on: <http://www.fatfgafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

*****Inter alia Acc. recommendation 18-23 of the FATF recommendations, FATF, 2016, Available at: http://www.fatfgafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf.

††††††††††Possible Sources of Information and Data: Relevant legal and regulatory framework pertaining to professionals and staff knowledge, including as part of entry controls/renewal of business or professional licenses or certifications; Statistics and information on overall quality of AML training activities by the firms of the assessed business/profession and whether such training is mandatory or voluntary; Data on frequency of training, hours of training, number of trainees, level and type of staff/professionals trained; Statistics on AML training given by authorities to individuals in the assessed business/profession; Information on AML training programs and training materials of firms (of the assessed business/profession); Findings of business/profession’s AML on-site/off-site inspections and monitoring; Interviews/consultations with regulatory/supervisory authorities (e.g., an SRB or other competent authority); Interviews/consultations with assessed business/profession’s representatives, including an SRB and professional associations; Surveys of management and staff of firms that make up the assessed business/profession.

Compare to FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.39-40 , Available on:<http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html> and acc. FATF Methodology FATF, 2013 p. 56-62, Available on: <http://www.fatfgafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

*****Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.39-40 , Available on:

<http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html> and acc. FATF Methodology FATF, 2013 p. 56-62, Available on: <http://www.fatfgafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

2.12. Effectiveness of Compliance Function (Organization)§§§§§§§§§§§§

This variable assesses whether firms (including sole practitioners) in the assessed business/profession have an effective compliance function that is comprehensive, risk-based, and well resourced, with an independent AML compliance function. The assessed business/profession possesses effective internal AML compliance functions if most firms (including sole practitioners)*****: Possessing internal compliance programs that are commensurate to the level of the risk of the firms, taking into account factors such as jurisdictions of end user and professional intermediary clients, clients that have complex or opaque legal structures, the volume and nature of products provided, client-base profile transaction patterns, and cross-border nature of transactions; Have appointed a sufficiently resourced, independent AML compliance officer at the senior management level; Take disciplinary actions against their staff in cases of breaches of compliance policy; Perform internal and/or external AML audits.††††††††††††

2.13. Effectiveness of Monitoring and Reporting*****

This variable assesses whether the products or firms of the assessed business/profession have effective and appropriate systems for record keeping, monitoring and STR reporting to support their AML policies and procedures. A well-designed manual system may be adequate for a small firm with a single branch or for a sole practitioner, while large businesses and firms will require more sophisticated systems.§§§§§§§§§§§§ A good record-

§§§§§§§§§§§§Inter alia Acc. recommendation 18-23 of the FATF recommendations, FATF, 2016 ,Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf.

*****Possible sources of information and data: Relevant regulatory framework in relation to the compliance function; Information on internal compliance function and policies of firms in the assessed business/profession; Findings of the AML on-site inspections and off-site monitoring; External (if any) and internal audit reports on adequacy and effectiveness of compliance function; Statistics on disciplinary actions taken by the firms (of the assessed business/profession) against their staff for breaches of compliance policy; Statistics on new clients or business declined or business relationship terminated, based on recommendations of the compliance staff; Interviews/consultations with regulatory/supervisory authority (e.g., an SRB or other competent authority); Interviews/consultations with assessed business/profession's representatives, including an SRB and professional associations; Surveys of management and staff of firms that make up the assessed business/profession. Compare to FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p. 39-40, Available on: <http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessm ent.html> and acc. FATF Methodology FATF, 2013 p. 56-62, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

††††††††††††Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.39-40 , Available on:

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§§§§§§§§§§§§Possible Sources of Information and Data: Relevant legal and regulatory framework in relation to AML monitoring, record-keeping, and STR reporting obligations of the assessed business/profession; Findings of AML monitoring and supervision with regard to the effectiveness of the firms' (of the assessed business/profession) STR systems (for example, how many firms are compliant, how many are not compliant, and how this affects the overall effectiveness of the STR system for the assessed business/profession); Statistics on the number and quality of STRs filed by the firms/professionals (of the assessed business/profession), including numbers filed "defensively" (after being alerted to suspicious activity or investigation by authorities); Statistics on numbers of STRs relating to monitoring lapses, etc., originating from the firms/ professionals (of the assessed business/profession); Statistics on numbers of STRs by the firms/professionals (of the assessed business/profession) referred to law enforcement agencies; Statistics on number of detected complex, unusually large transactions that were recorded by the reporting entity and not reported; Information on quality and accessibility of the firms' (of the assessed business/profession) transaction and CDD records; Findings of firms/professionals' AML on-site/off-site supervision; Interviews/consultations with regulatory/supervisory authority (e.g.,

keeping system is a pre-requisite for an effective monitoring system. Any problems and deficiencies in record keeping should therefore be assessed under this variable. The firms of the assessed business/profession have adequate and appropriate AML-monitoring and STR reporting systems if the firms have information systems that enable and facilitate the monitoring of client transactions and comparing them against the client's profile. Transactional records are available in a format that facilitates AML screening and monitoring. The systems support the firms in the assessed business/profession in performing effective PEP screening. The systems assist the business/profession and its staff to effectively identify and record all complex, unusual large transactions. The systems assist the business/profession and its staff to effectively identify and report suspicious transactions. Staff should have a good understanding of the scope of their reporting obligations on suspicious transactions and activities, including what activities are covered or not covered under laws or rules on professional secrecy and professional/client privilege.

2.14. Availability and Access to Beneficial Ownership Information *****

This variable assesses whether it is easy for criminals to hide their beneficial ownership in corporations, trusts or similar structures registered in or administered from within the country. Assessment criteria Transparency relating to beneficial interests in corporations, trusts or similar entities is in place if comprehensive information on the structure, management, control, and beneficial ownership in corporations, trusts and similar vehicles is readily available and can be accessed in a timely manner by competent authorities and is available to AML-regulated institutions and businesses and professions to facilitate their Customer Due Diligence requirements.

an SRB or other competent authority); Interviews/consultations with assessed business/profession's representatives, including an SRB and professional associations; Surveys of management and staff of firms that make up the assessed business/profession.

Compare to FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.39-40 , Available on: <http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessm ent.html> and acc. FATF Methodology FATF, 2013 p. 58-59, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

***** Inter alia Acc. recommendation 22-27 of the FATF recommendation's, FATF, 2016, Available at:

http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf.

***** Possible sources for data: Information as to whether regulated businesses or professions (e.g., lawyers, notaries, or Trust and Company Service Providers) are required to form, register or administer a legal entity or legal arrangement; Information as to the mechanism chosen by the country to collect and maintain basic and beneficial ownership information of legal entities formed or registered in the country, and beneficial ownership information of legal arrangements formed or administered in or from the country; The relevant regulatory framework and the effectiveness of beneficial ownership information Customer Due Diligence requirements (pertaining to natural persons and legal entities and legal arrangements); Statistics or information on crimes (including money laundering involving the use of shell companies or other opaque structures) and whether accurate, adequate, and current beneficial ownership information can be accessed in a timely manner by competent authorities; Interviews/consultations with the reporting entities and their supervisory authorities, law enforcement agencies, tax authorities, and, if applicable, the supervisors of Trust and Company Service Providers; Interviews/consultations with Trust and Company Service Providers, law firms, and accountancy firms; Surveys of reporting entities' management and staff; Experience and opinion of the public authority or private agency that registers corporations and other legal entities.

Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.39-40, Available on: <http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessm ent.html> and acc. FATF Methodology FATF, 2013 p. 60-67, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

2.15. Availability of Reliable Identification Infrastructure*****

Financial transparency and customer identification and verification processes are enhanced when AML-regulated institutions are able to verify the identity of customers using reliable, independent source documents, data or information. A good identification infrastructure will also prevent the use of fake documents and false identities. Fake documents and false identities hamper the ability to detect and investigate money laundering and trace the proceeds of crime. Assessment criteria "A" good identification infrastructure exists and information is available if AML-regulated institutions can rely on the country's identification infrastructure. For instance, there is reliable and secure government or private sector documentation, data or information to identify and verify the identity of the clients. The infrastructure may consist of a secure national identification system with government-issued identity documents, whether issued by the national or a local authority, and/or comprehensive and reliable public information systems that assist in the verification of details of clients' details.

2.16. Availability of Independent Information Sources*****

This variable assesses the availability of independent and reliable sources of information to determine transaction patterns of clients. Customer due diligence processes are easier to perform, and are generally of a higher quality, if such sources are available. They can be used to identify or verify clients' transactional patterns and commercial history. Such information may include data held by credit bureaus, details of previous banking relationships, accessibility to former employers, and the availability of utility bills. Assessment criteria Independent and reliable information sources are available if sources of comprehensive and reliable historical financial information and other information about clients are available and can easily be accessed by AML-regulated institutions.

*****Inter alia Acc.recommendation 10-11, 24-25, 33-34 of the FATF recommendations, FATF, 2016, Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf.

*****Possible sources: Information about the national identification system; Information on national identification (ID); infrastructure database and its suitability and availability for ID verification purposes (if available); Information on available identification documents and installed anti-counterfeit measures; Statistics (or experience) concerning the frequency of cases that involve the use of fraudulent ID documents; Statistics relating to the part of the population that lacks proper ID documents; Information on any community, social group (such as immigrant communities, tribes, etc.) whose members have no ID documents or have no access to ID documents; Discussions with reporting institutions on the usefulness of the identification infrastructure; Discussion of reasons why the national identification system and practices are not working ideally.

See acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.39-44, Available on: <http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessmant.html> and acc. FATF Methodology FATF, 2013 p.41-47, 64-68, 79-80 Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>

*****Inter alia Acc.recommendation 10-11, 24-25, 33-34 of the FATF recommendations, FATF, 2016, Available at: http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf.

*****Possible sources: Interviews/consultations with the reporting entities and their respective supervisory authorities; Surveys of reporting entities' management and staff; Interviews with credit bureaus, utility companies, etc., with regard to information available on clients.

Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.39-44, Available on: <http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessmant.html> and acc. FATF Methodology FATF, 2013 p.41-47, 64-68, 79-80 Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>

3. CTF risk assessment

It should be assessed whether the jurisdiction has effectively and comprehensively criminalized terrorism financing in its laws, and assess the strengths/weaknesses within the jurisdiction's legal capacity to prosecute and apply criminal sanctions to the persons that finance terrorism. ++++++

It should be also assessed whether the jurisdiction has effective and comprehensive laws and regulations in place that implement targeted financial sanctions that comply with the UN Security Council's resolutions. This specifically refers to the resolution that requires countries to freeze, without delay, all funds or assets related to terrorism, and to ensure that no assets are made available to, or for, the benefit of persons and entities designated by the UN Security Council under Chapter VII of the Chapter of UN resolutions, 1267 (1999) and its successor, 1373 (2001). ++++++ For this assessment, it should be consulted ++++++: Relevant laws, regulations, and enforceable directions; Findings, Interviews/consultations from supervisory and regulatory authorities; Interviews/consultations with assessed business/profession's representatives, including a SRB and professional associations; Surveys of management and staff of firms that make up the assessed business/profession.; Reports from governments and/or international organizations; Reports from academia and/or civil society organizations.

Quantitative indicator sources of the CTF ++++++ should be used as follows:

- Judicial system database
- Prosecutor's Office database
- Law enforcement database
- FIU database
- Research reports and academic studies

+++++Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p. 5-8, Available on:

<http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html>. Also see FATF Methodology FATF, 2013 p. 6, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>

+++++Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.5-8 , Available on:

<http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html>. Also see FATF Methodology FATF, 2013 p. 6, Available on: <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf>.

+++++Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p.39-44

Available on:

<http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html>.

+++++Acc. FATF National Money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p. 13-16,39-44

Available

on:<http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html>.

Qualitative indicator sources of the CTF***** should be consisted of:

- Intelligence
- Reports by government agencies
- Academic studies and publications
- Publications by international organizations
- Open sources (e.g. Internet, and public news)
- Surveys with focus groups or the general public
- Interviews with focus groups or experts

Assessment of the Terrorism Financing Threat should be based on data gathered. The enforcement data should include:

- Number of TF cases investigated
- Number of TF cases prosecuted
- Number of TF cases convictions
- Number of persons convicted for TF
- Number of case files on TF sent to LEAs
- Number of International Assistance requests received
- Number of International Assistance requests sent
- Amount of TF funds seized or frozen
- Amount of TF funds confiscated

3.1. Direction of the Terrorism financing*****

- Funds generated in the home jurisdiction, for operations within the home jurisdiction.
- Funds generated in the home jurisdiction, for operations in a foreign jurisdiction.
- Funds generated in a foreign jurisdiction, for operations in the home jurisdiction.
- Funds generated in a foreign jurisdiction, for operations in foreign jurisdictions (transit point).

Financial flows related to terrorism financing can be distinguished by their direction. The funds might be generated in the home jurisdiction, but used for operations elsewhere. Conversely, the funds might be generated in another jurisdiction, but used to fund terrorist operations in the home jurisdiction. Or, the funds may simply pass through the home jurisdiction, using it as a point of transit. It is needed to establish the direction of the flows, as this information is relevant in determining which controls need to be adopted or strengthened.

*****Acc. FATF National money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p. 13-16, 31-32, 39-44.

Available on: <http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancinriskassessment.html>.

*****Acc. FATF National money laundering and Terrorist Financing Risk Assessment, FATF, 2013 p. 13-16, 31-32, 39-44.

Available on: <http://www.fatfgafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancinriskassessment.html>.

Conclusions

Identifying, assessing, and understanding ML/TF risks is an essential part of the implementation and development of a national anti-money laundering / countering the financing of terrorism (AML/CFT) regime, which includes laws, regulations, enforcement and other measures to mitigate ML/TF risks. It assists in the prioritization and efficient allocation of resources by authorities. The results of a national risk assessment, whatever its scope, can also provide useful information to financial institutions and designated non-financial businesses and professions (DNFBPs) to support the conduct of their own risk assessments. Once ML/TF risks are properly understood, country authorities may apply AML/CFT measures in a way that ensures they are commensurate with those risks – i.e., the risk-based approach (RBA) – which is central to the FATF standards as is set out in Recommendation 1, its interpretive note (INR 1), as well as in other Recommendations (e.g., Recommendations 10, 26 and 28).

The outcome of the Money-laundering and Terrorist financing risk vulnerability assessment is necessary for:

- Designing action plans for more effective AML policies and practices in the sector
- Evaluating the impact of different interventions by regulatory (and other relevant) authorities
- Comparing the level of vulnerability of a business/profession in the DNFBP sector with other businesses/professions, and the vulnerability level of each of the assessed business/profession in relation to other financial sectors
- Ensuring efficient resource allocation
- Developing specific AML controls for high-risk businesses/professions in the DNFBP sector and their products.

The form, scope and nature of ML/TF risk assessments should ultimately meet the needs of its users – whether these are policy makers, supervisors, operational agencies, financial institutions, DNFBPs, etc. The number and diversity of users of an assessment varies according to the purpose for which it is carried out; however, typical users of risk assessments might include:

- Policy makers and other authorities, for example, in order to formulate the national AML/CFT policies, make reasonable decisions on the legal and regulatory framework and the allocation of resources to competent
- Operational agencies, including law enforcement, other investigative authorities, financial intelligence units (FIUs), relevant border agencies, etc.
- Regulators, supervisors and self-regulatory bodies (SRBs).
- Financial institutions, and designated non-financial businesses and professions (DNFBPs), for which the national-level ML/TF risk assessment is a critical source contributing to their own ML/TF risk assessments and risk-based obligations.
- Non-profit organisations (NPOs).
- AML/CFT assessors and assessment bodies more broadly, along with other international stakeholders.
- The general public, as well as academia, specified individuals, etc.

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Aknowledgement

This research was supported by the project Guidelines and tools for effective elimination of unlawful acts in relation with potential insolvency, which has received funding from the Slovak Research and Development Agency under the contract No. APVV-15-0740

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PROBLEMS OF CORRUPTION AND TAX EVASION IN CONSTRUCTION SECTOR IN BELARUS*

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Received 25 August 2017; accepted 18 November 2017; published 29 December 2017

Abstract. Construction sector is one of the most closed and corrupted sector in many countries. Belarus is no exception. For understanding the real situation with corruption and tax evasion in construction sector in Belarus the survey of 50 construction companies was done. According to achieved results, a large share of respondents agreed that some companies of the sector have hidden income, pay salaries “in envelopes” and spend some money for resolving problems with state institutions. At the same time construction enterprises that participated in tenders on municipal procurement underline many problems in this specific sphere. All these problems can be divided by administrative, economic and problems associated with the existence of corruption and the shadow economy. The most popular answers include corruption, unfair competition and imperfect legislation. On the base of international experience and the results of the survey we develop the list of recommendations for decreasing the level of corruption and tax evasion in construction sector that will support to create favorable environment for business development of the country.

Keywords: corruption, tax evasion, construction, shadow economy, municipal procurements

Reference to this paper should be made as follows: Luzgina, A. 2017. Problems of corruption and tax evasion in construction sector in Belarus, *Entrepreneurship and Sustainability Issues* 5(2): 263-282. [http://doi.org/10.9770/jesi.2017.5.2\(8\)](http://doi.org/10.9770/jesi.2017.5.2(8))

JEL Classifications: H26, H57, H83

1. Introduction

The problems of corruption and tax evasion are very relevant for most countries in the world. However, in some states the level of corruption remains very high, while in other countries it is at a rather low level. The size of corruption and tax evasion can differ not only by country, but also by sector. For example, construction is traditionally an area with a very high risk of corruption and the development of shadow economy. For the countries of the post-Soviet space, the problems of corruption are also very actual. For example, in the Baltic States, there are a number of empirical and research works, which analyse the level of shadow economy in details. At the same time, there are practically no studies on this issue in Belarus. In order to underline the importance of the topic for Belarus we analyse the level of shadow economy in the international comparison in the third part of the paper.

* This research was written in the framework of the project “Corporate engagement in fighting corruption and tax evasion”. The project is financed by Nordic Council of Ministers.

According to our opinion, measures to fight corruption and tax evasion must be developed and approved constantly. However, it is very important to determine the reasons and conditions that provoke the growth of shadow economy. When we understand and know the main problems, it is necessary to develop conditions that will be favourable for the development of legal business and decrease the level of corruption schemes.

The object of the research is the level of corruption and tax evasion in construction sector. Proceeding from this, the main goal of the paper is the development of measures' list for reduction the level of corruption and tax evasion in the construction sector of the Republic of Belarus. The construction sector wasn't accidentally chosen for research. In many countries this sphere of the national economy traditionally are less open and transparent for control. In addition, construction is one of the main sectors of the Belarusian economy.

To understand the problem, a survey in the construction industry was conducted. Enterprises were asked a number of questions that helped to understand the real picture. This survey has been done on the base of the method developed by Talis Putnins and Arnis Sauka. In the framework of this approach we formed the Questionnaire, which includes indirect questions about situation in corruption and tax evasion in construction sector in Belarus. First part of questions supports to understand the current situation in the company and includes such indicators like level of employment, growth (decline) of profit, the average level of salaries in the company and etc. The second part of questions contains information about informal sector, such as: the share of unofficial salaries and employees or the level of hidden income. This part also includes questions about main barriers for business development, quality of national legislation and government support. Last but not the least part of the research supports to understand obstacles in the sphere of public procurements. The companies has been asked about quantity of participants in an average public procurement tender, problems and obstacles of legislation in the sphere.

To process the obtained data, such methods like statistical, graphical, method of grouping, detalization and information summarizing, as well as the method of comperison have been applied. The Survey analysis helped to understand the real situation and underlined the main challenges, which construction companies have placed. The results of the Survey, as well as the analysis of national legislation and international experience allowed to identify main reasons and conditions of the shadow economy in the construction sector of the Republic of Belarus. At the end of the research the list of measures for declining the level of corruption and tax evasion in construction sector of Belarus has been developed.

Publications of Belarusian and foreign authors were used in the paper. Much attention was paid to the research of public procurement procedure. For understanding this issue, the OECD approaches and the experience of Sweden were considered, as well as the national legislative acts of Belarus regulating procurement in construction. Papers of Talis J. Putnis and Arnis Sauka have become a base for conducting and analysing the survey of Belarusian companies in the field of corruption and tax evasion in construction. A lot of information was received from the work "Social Identity cards in the European construction industry", which describes main peculiarities and the positive effect of introducing identity cards in construction in European countries. The paper of Litina, A. and Palivos, T. "Corruption and tax evasion: reflections on Greek tradegy", as well as paper of Schneider F. and Williams C.C. "The shadow economies" could understand the issue of shadow economy in more details. The paper of Igor Pelipas and Irina Tochitskaya was very important for our research because it assess the corruption from the small and medium-sized enterprises point of view in Belarus. At the same time articles about Georgian experience of E-Government system creation was used for better understanding the influence of Government digitalization on shadow economy level.

2. Main issues of construction sector development in Belarus

Construction is an important component of the Belarusian economy. Since the beginning of independence, one of the main priorities of economic development has been the successful work of the construction sector. Turning to the statistics for the last seven years, it can be noted that the share of construction in GDP in 2010 was 9.4%, and

in 2014 the performance of this sector exceeded 10% of GDP. In recent years, the significance of the construction sector has somewhat decreased (Fig. 1).

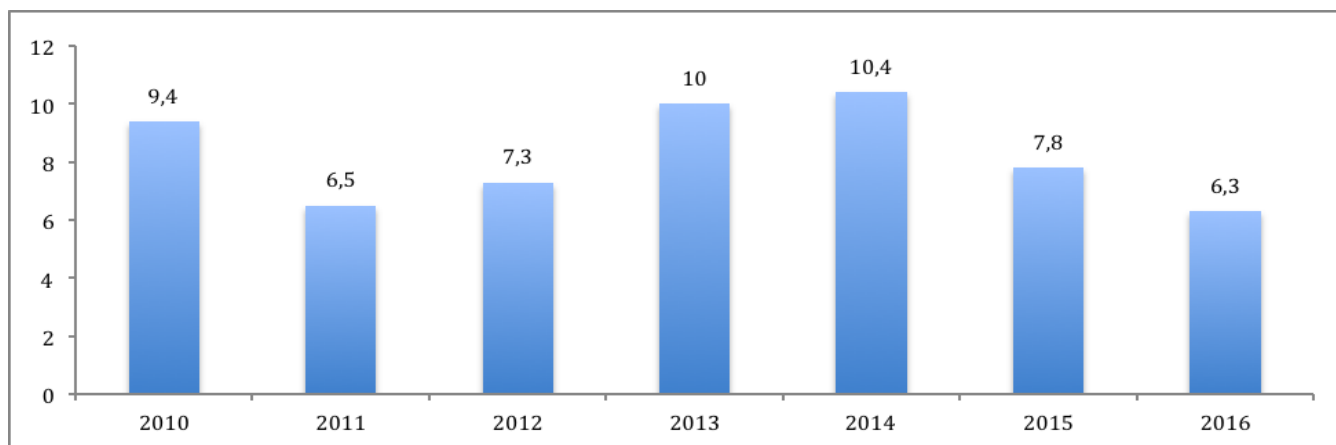


Figure 1. The share of construction sector in GDP (in %)

Source: Belarusian National Statistical Committee

Such trends can be explained by reduction of the share of preferential loans in housing construction, as well as a slowdown in business activity, negative influence of external factors and reduction in domestic demand. As follows from the graph below, in 2016 compared with 2010, the main difference between the structure of sources of housing finance was a sharp reduction in preferential loans in housing construction. At the same time, there was growth of the share of housing construction financing provided by the population from their own savings. Given that the income of the population has also declined due to the economic recession, the volume of housing construction has had a negative growth rate (Fig. 2).

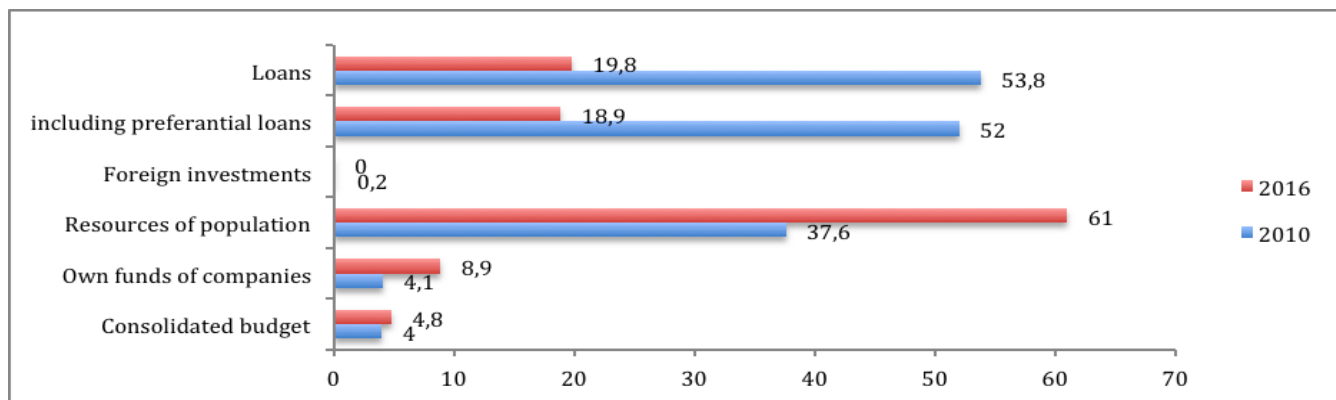


Figure 2. Structure of housing construction by source of financing (in %)

Source: Belarusian National Statistical Committee

The economic slowdown observed in recent years also supported to a reduction in aggregate investment activity, which had a negative impact on the housing construction and commercial real estate. Nevertheless, construction is still an important sector of the national economy. About 8% of total labour force of the country is concentrated in this sector.

The main part of construction organizations has a private form of ownership. Despite the fact that about 7.5

thousand construction companies are registered, more than 90% of them are represented by small and medium-sized businesses. The vast majority of construction companies are presented by firms with less than 100 employees (Fig. 3). It is also worth noting that foreign companies in the construction sector occupy slightly more than 1% of the total number of organizations. Thus, for today there is no serious interest of foreign capital to invest into construction sector of the Republic of Belarus (Fig. 4).

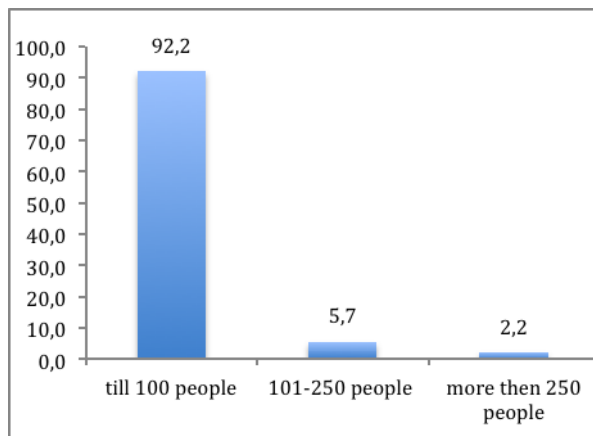


Figure 3. Structure of construction sector organizations by number of employees at the beginning of 2016[†] (in %)

Source: Belarusian National Statistical Committee

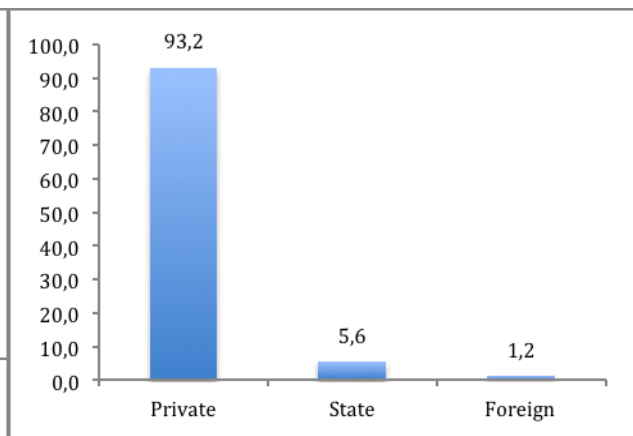


Figure 4. Structure of construction sector organizations by ownership form at the beginning of 2016 (in %)

Source: Belarusian National Statistical Committee

Therefore, despite the decline of the construction share in recent years, this sector is still one of the main resource of GDP formation. A high share of private capital says about the attractiveness of construction for business. At the same time, foreign investors in the construction market are represented insignificantly. It should be noted that the development of the construction sector depends on the economic and legal environment, as well as on transparency and openness of transactions. One of the problems limiting the growth of the efficiency of the construction industry in the country is the existence of shadow economy elements in this segment.

3. The level of shadow economy and its calculation

Existence of shadow economy, which includes corruption practices and tax evasion, is typical for many countries. However, in some states the level of shadow economy is relatively low, while in others it has a relatively high share in GDP. Clearly determine the real level of shadow economy is very difficult. It is too problematic to specify the situation with corruption and tax evasion in the construction sector. One of the most popular indexes, allowing to assess the level of corruption in a country is the Corruption Perceptions Index. This Index is calculated annually for more than 170 countries. The Republic of Belarus also participates in this survey (Table 1). According to the latest survey, it was revealed that the level of corruption directly affects the level of equality and equitable distribution of wealth.

[†] Organizations of construction sector include companies with the main economic activity - "Construction". These include legal entities of all forms of ownership, separate units of legal entities, small and microorganizations without departmental subordination, performing work under agreements of construction (subcontracts) classified by economic activities as "Construction."

Table 1. Corruption Perceptions Index 2016

2016 Rank	Country	2016 Score	2015 Score	2014 Score
1	New Zealand	90	88	91
3	Finland	89	90	89
4	Sweden	88	89	87
5	Switzerland	86	86	86
44	Latvia	57	55	55
54	Slovakia	51	51	50
79	Belarus	40	32	31
131	Russia	29	29	27
131	Kazakhstan	29	28	29

Source: Official website of Transparency International. Available on the Internet: <https://www.transparency.org/>

The index' calculation is based on a comparison of the countries participating in the survey, according to the points scored by them. The more points received the country, the higher will be its rating. Traditionally the top ten leaders are Scandinavian countries, Switzerland, Great Britain, Denmark, Canada, Singapore, New Zealand and the Netherlands.

As for the countries of the former Soviet space, the situation with the level of corruption has significant differences depending on the state. For example, Belarus occupies the 79th position in this rating. This level means a much higher level of corruption compared to Latvia, which ranks 44th place in this list. At the same time, the situation in Belarus is much more favourable compared with Russia and Kazakhstan, which shared 131 lines in the rating. As for the aggregate level of the shadow economy in the country, the data on this issue vary greatly. The Ministry of Taxes, as well as the Belarusian National Statistical Committee, inform that the level of shadow economy is not exceeding 11-12% of GDP. At the same time, the experts from the National Bank has announced that this indicator can reach the level of 35% of GDP. Of great importance in this matter is the methodology of calculation and its systematic. The lack of constant monitoring of the situation and special methodology absence creates a certain ambiguity and inconsistency of the data.

In our view, for understanding the most problematic points in the sphere of the shadow economy it would be useful to start calculating the index of the shadow economy in Belarus, following the experience of the Baltic States. This index is calculated on the basis of data from the annual survey of companies in Latvia, Lithuania and Estonia. This survey allows us to determine not only the aggregate level of the shadow economy, but also to calculate the amount of unaccounted incomes and the level of illegal activity by the main sectors of the economy, as well as by the regions of a country, the size of enterprises and other parameters. Conducting this research would undoubtedly increase the quality and effectiveness of measures which to support the reduction of the shadow economy level in the country.

Despite the lack of detailed data, experts and officials say that the construction sector is one of the most problematic sectors of the Belarusian economy in terms of opacity of transactions and abuses. Problems arise as

on the stage of state procurement procedure so on different stages of economic activities of the construction organizations. In order to understand the real situation in the sphere of the shadow economy and analyse the prerequisites for its development, a survey of construction sector enterprises was conducted. The survey was based on a method developed by Latvian experts (Arnis Sauka and Talis Putnis). The survey of enterprises consists of three parts. The first part includes indicators that allow us to evaluate the work of enterprises in construction sector from an economic point of view. Such indicators include the number of employees, the form of ownership of enterprises, the year of foundation, the amount of profit, the average wage and etc. The second group of questions makes it possible to understand the existence and the share of the informal sector in construction, by determining such indicators as the number of unregistered workers, the level of hidden income and the main problems that the respondents face. Finally, the third part of the survey concerns public procurement, including an assessment of the legislation' quality and problems in this area.

Despite the fact that the survey was conducted anonymously, many respondents reacted cautiously to some survey questions. Therefore, this report can be considered as one of the stages of work on assessing and monitoring the level of shadow economy in the country. It allows to identify the most problematic points that made it possible to develop recommendations on reduction corruption and tax evasion in the construction industry.

4. Results of the Survey

50 companies of construction industry took a part in the survey. The distribution of companies was as follow: 20 construction enterprises were interviewed in Minsk and Minsk region; 30 organizations of construction sector were interviewed in other 5 regions of Belarus (6 organizations were interviewed in Grodno region, 6 – in Brest region, 6 - in Vitebsk region, 6 – in Mogilev region and 6 – in Gomel region). The main part of the respondents has a private form of ownership. At the same time, 28% of the surveyed companies were state-owned.

The survey revealed that 32% of companies were created even before the collapse of the Soviet Union. However, the creation of the most part of the companies (44%) was in the period from 1991 to 2011. At the same time 24% of construction companies appeared in the last 5 years (Fig. 5).

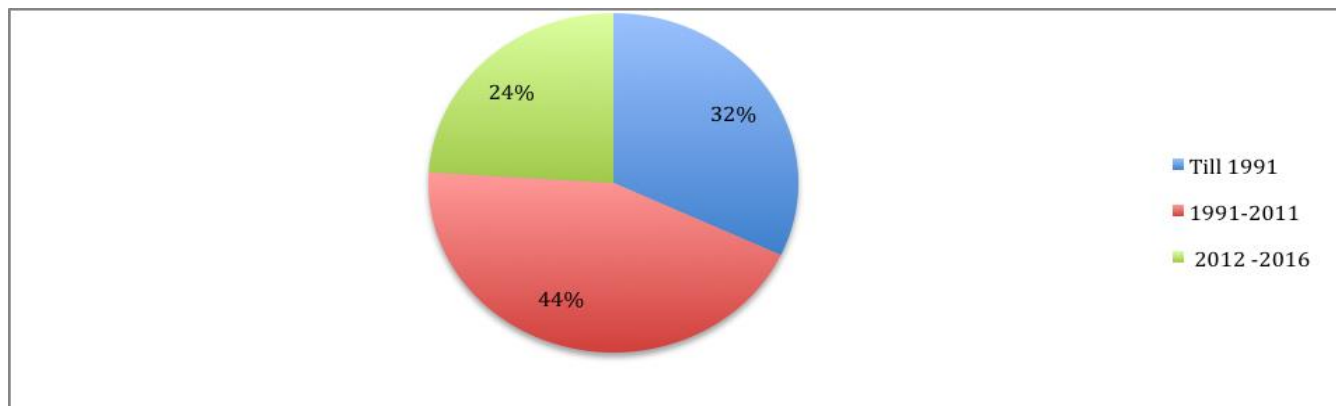


Figure 5. Companies' distribution by period of starting work in construction sector

Source: Results of the Survey

The sample of construction companies as a whole reflects the nationwide structure of construction companies, depending on the size. Small and medium-sized enterprises account for almost 43% of all respondents. Another 26.5% can be attributed to microenterprises and individual entrepreneurs. At the same time, only slightly more than 30% of the companies surveyed can be classified as large. The division of companies by size was based on the number of employees. The reason is that in accordance to the Belarusian legislation large companies include organizations with more than 250 employees. Microenterprises have a staff, which cannot be more than 15

employees. At the same time, the number of employees in small and medium-sized businesses can vary from 16 to 250 people (Fig. 6).

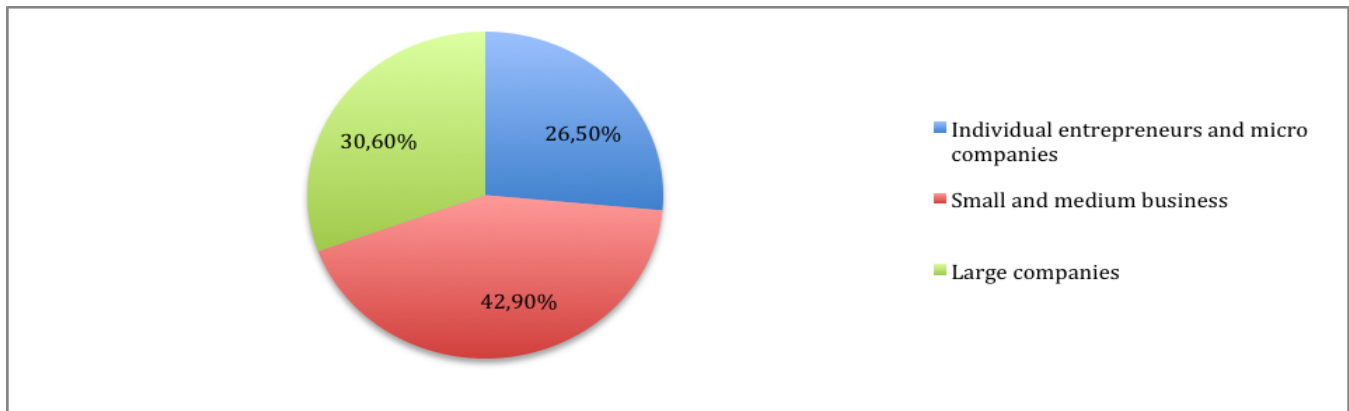


Figure 6. Companies' distribution depend on size

Source: Results of the Survey

More than half of the surveyed companies had an average salary in the range of 300-500 euros in 2015-2016, while 36% respondents indicated a relatively low wage, which did not exceed 270 euros on average for the enterprise. And only 6% of respondents admitted that the average salary in this period was about 550-750 euros in equivalent. Thus, it can be noted that in most of the surveyed companies in the construction industry, the level of payment was comparable to the average wage in the country (Fig. 7).

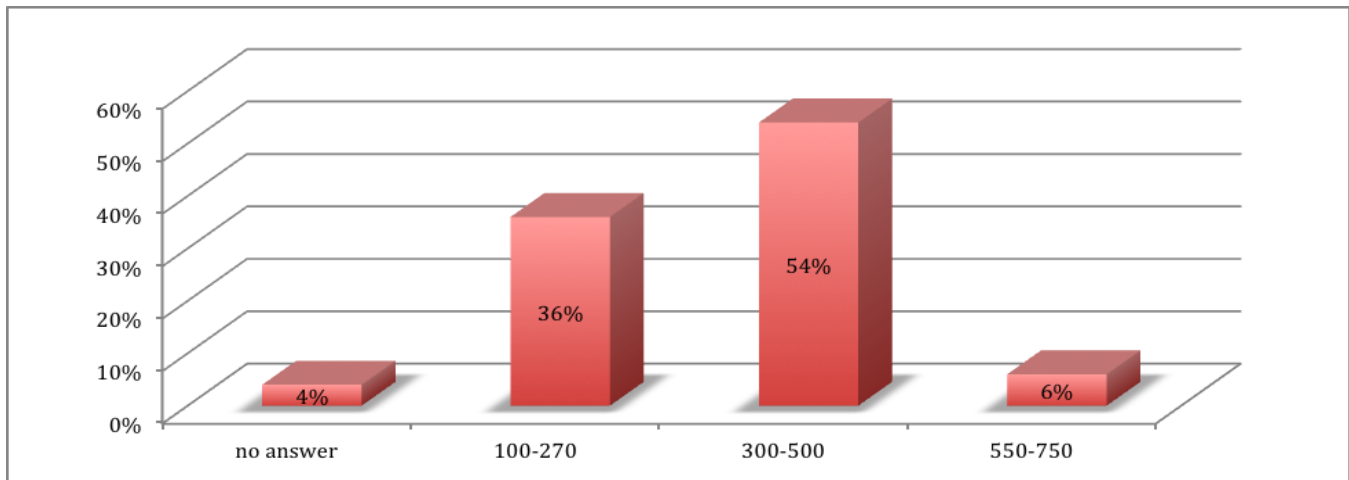


Figure 7. Distribution of the average level of wage in 2015-2016 by respondents (X-axis – average wage in euro equivalent)

Source: Results of the Survey

It should also be noted that the survey of corporations was conducted in the conditions of economic recession, which affected on the importance of problems that are obstacles for the successful work of construction organizations. In these conditions, economic factors came to the fore. Managers and management of companies are concerned about finding out the markets, attracting new customers and reducing risks in conditions of high inflation and exchange rate volatility. As can be seen on the graph below, more than 40% of the respondents

interviewed admitted that the net profit received in 2016 decreased compared to the level of 2015. At the same time, only 28% of enterprises noted positive growth of this indicator (Fig. 8).

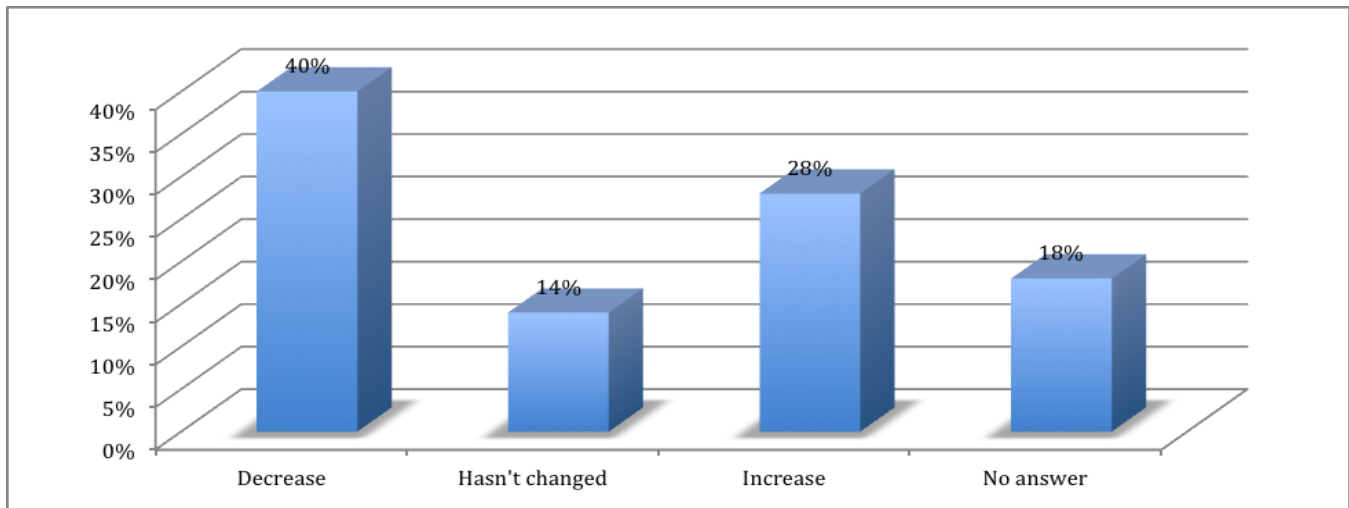


Figure 8. Changes of net profit in 2016 compare to 2015 (Y axis – % of answers)

Source: Results of the Survey

The worsening of the financial situation also affected on the level of employment in the organizations of construction sector. Based on the survey results, 34% of construction companies experienced a reduction of the number of employees in 2016 compared to 2015. Only 22% of respondents noted an increase of the number of employees. This dynamics is similar to the general trend in the whole country. According to the National Statistical Committee, in January-December 2016, compared to January-December 2015, the number of employees hired in construction amounted to 74.7% of the total number of employees who were dismissed at that period. It should be noted that in the whole economy this ratio was equal to 89.6% (Fig. 9).

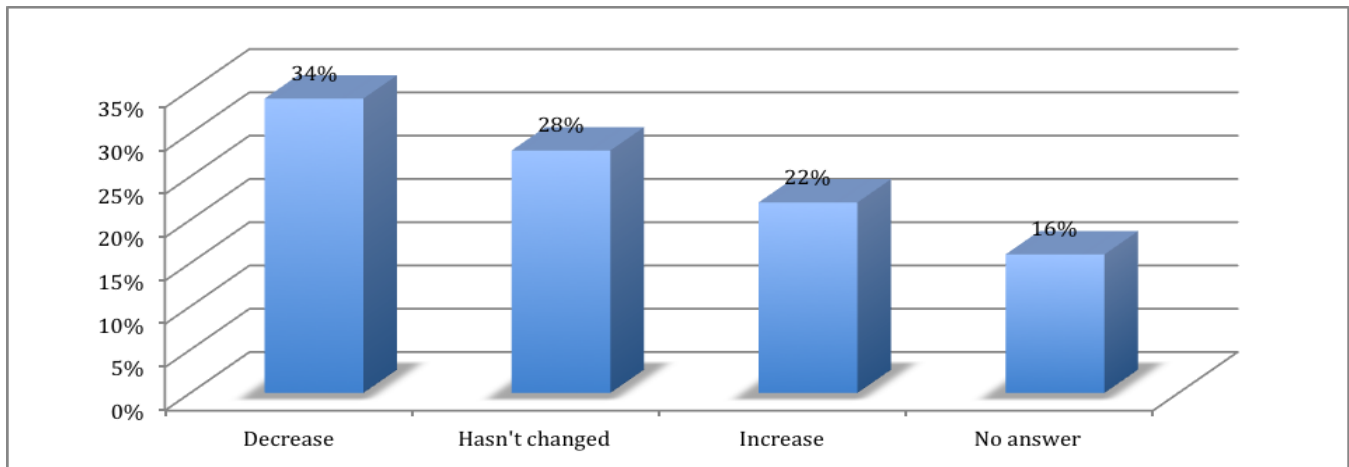


Figure 9. Changes of employment (Y axis – % of answers)

Source: Results of the Survey

More than 60% of respondents noted that some construction organizations receive some part of income in hidden form. At the same time, 18% simply refused to answer the question (Fig. 10). Among the respondents, about 50%

of total companies believe that construction companies do not always show the actual number of employees. A certain number of hired people can be employed unofficially (Fig. 11).

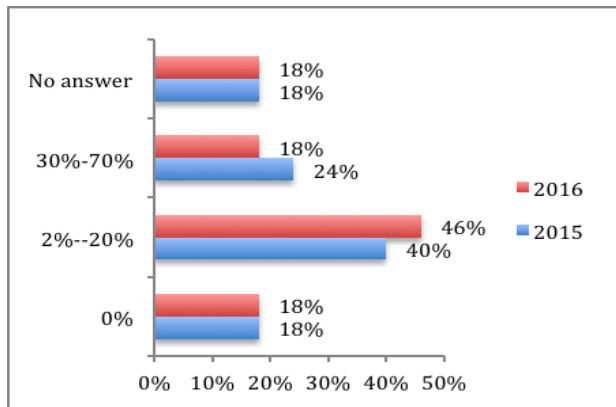


Figure 10. Approximate level of underreporting of income (hidden income) in construction industry (X axis - % of respondents which are agree with this statement)

Source: Results of the Survey

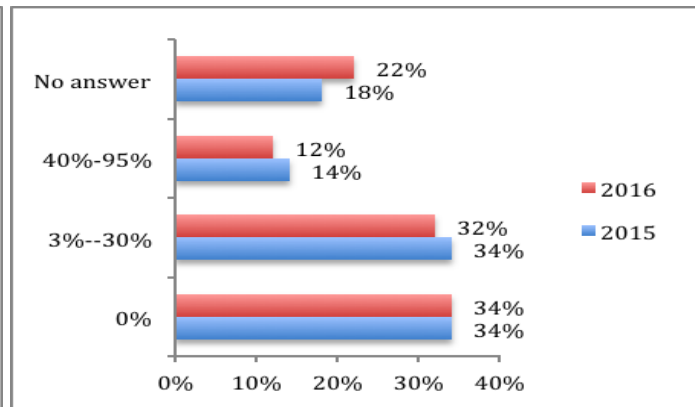


Figure 11. Approximate level of underreporting employees in the construction sector (X axis - % of respondents which are agree with this statement)

Source: Results of the Survey

As it turned out during the survey for the construction industry, there is a problem of paying wages "in envelopes". Approximately 50% of the interviewed companies agreed with this statement. From the total number of respondents, 26% believe that the share of hidden wages in both 2015 and 2016 ranged from 21 to 50%. Some respondents said that unofficial payments to their employees could reach more than 50% of the total volume of payments (this was noted in 12% of companies in 2015 and 14% in 2016). At the same time, some firms refused to answer on the question. It is also alarming that about 60% of the respondents believe that part of the industry's production is carried out by unregistered companies. This means, on the one hand, a shortage of the generation of taxation revenue, and on the other - the absence of any control over the activities of such pseudo-firms. As an example of such illegal production, we can cite the repair services provision for apartments and private houses by unregistered construction firms (teams) (Fig. 12; Fig. 13).

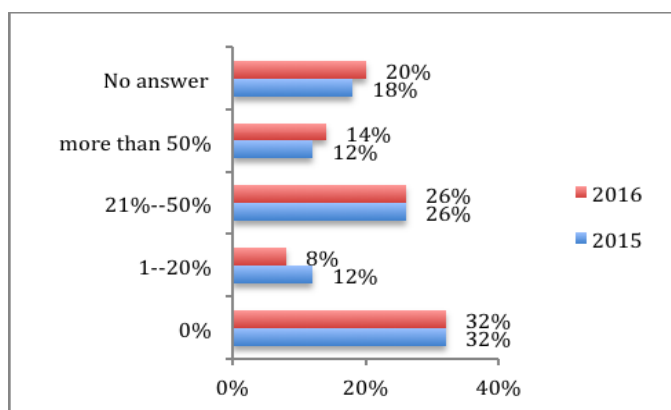


Figure 12. Estimation of the approximate level of hidden salaries ("wages in the envelopes") in construction industry (X axis - % of respondents which are agree with this statement)

Source: Results of the Survey

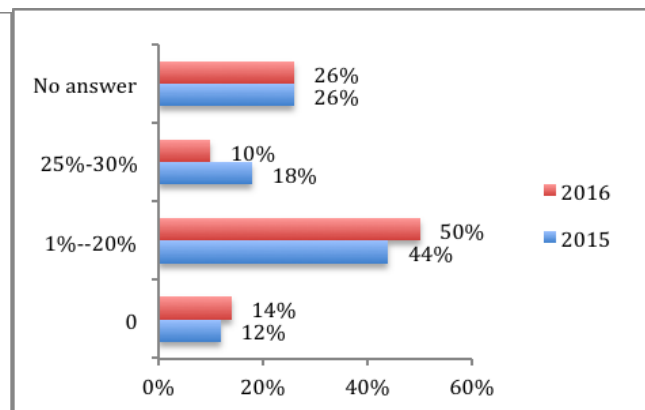


Figure 13. Estimation of approximate share of production of unregistered firms in the total volume of production in construction industry (X axis - % of respondents which are agree with this statement)

Source: Results of the Survey

Proceeding from the foregoing, it can be assumed that the Belarusian budget has lost some of the revenues in the form of taxes on corporate income, social contributions and wage taxes due to underreporting by the construction industry companies of total income, payments wages ‘in the envelopes’, and informal hiring of some share employees.

As for issues directly related to corruption schemes, some respondents refused to answer on some questions. When we asked about the share of income that firms pay unofficially to ‘get things done’, more than 30% of respondents noted that this percentage can vary within 10%. Some companies said they answered that this figure can reach even more then 30% of total income. A roughly similar division of answers was received on the question of the share of contract value that is usually offered by companies in the form of unofficial payments in order to sign a contract with the state. More than a quarter of the companies refused to answer on these questions (Fig. 14, Fig. 15).

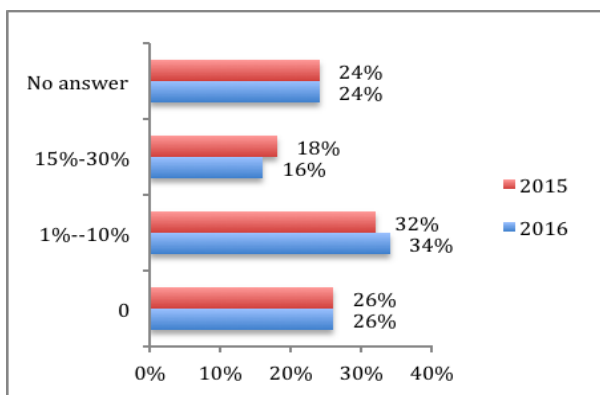


Figure 14. Estimation of the approximate level of income that firms pay unofficially to ‘get things done’ (X axis - % of respondents which are agree with this statement)

Source: Results of the Survey

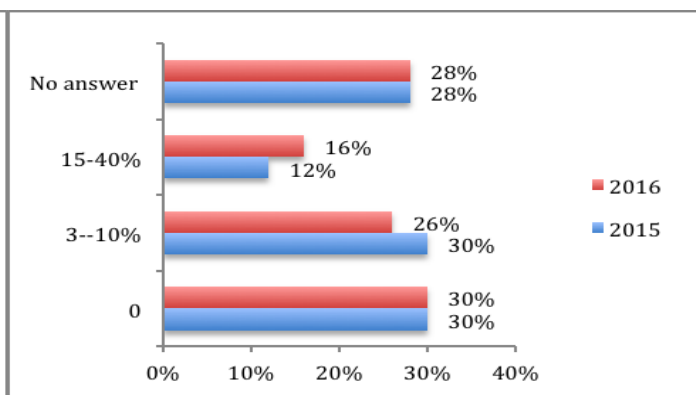


Figure 15. Estimation of aapproximate percent of the contract value would firms typically offer in unofficial payments to ‘secure’ the contract (X axis - % of respondents which are agree with this statement)

Source: Results of the Survey

Enterprises were also asked to agree or not with statements which can be obstacles for business development. The results of the answers are given in the Table 2.

Table 2. Main barriers to the business development in construction sector in Belarus

	Completely agree	Agree	Neither agree nor disagree	Disagree	Completely disagree
Taxes are too high	36,0%	50,0%	14,0%	0,0%	0,0%
Frequent changes in tax policies	14,0%	46,0%	36,0%	4,0%	0,0%
Inconsequent business legislation	26,0%	40,0%	28,0%	6,0%	0,0%

Implementation of business legislations by the government as a consequence of bad administration and lack of personnel	16,0%	32,0%	32,0%	20,0%	0,0%
Information provision by the government to small and medium firms	14,0%	32,0%	36,0%	18,0%	0,0%
Lack of specific consulting advice on marketing, financial, psychological issues	12,0%	20,0%	40,0%	26,0%	2,0%
Lack funds for business investments	26,0%	42,0%	22,0%	8,0%	2,0%
Access to credits	20,0%	38,0%	32,0%	8,0%	2,0%
Too many tax inspections	12,0%	30,0%	50,0%	8,0%	0,0%
Crime and racketeering	2,0%	8,0%	24,0%	52,0%	14,0%
Payment behaviour of clients	18,4%	49,0%	24,5%	6,1%	2,0%
Attitude the government towards business in general	20,0%	28,0%	32,0%	16,0%	4,0%
Time spent negotiating with tax inspectors	10,0%	26,0%	40,0%	20,0%	4,0%
Governmental corruption	18,0%	34,0%	18,0%	28,0%	2,0%
Motivation of employees	12,0%	26,0%	22,0%	32,0%	8,0%
High competition from legal business	10,0%	26,0%	44,0%	20,0%	0,0%
High competition from illegal business	8,2%	30,6%	32,7%	22,4%	6,1%
Low purchasing power	44,0%	38,0%	14,0%	2,0%	2,0%
Shortage of qualified workers	12,0%	28,0%	22,0%	32,0%	6,0%
Shortage of qualified managers	20,0%	14,0%	38,0%	26,0%	2,0%
Inflation	22,0%	54,0%	24,0%	0,0%	0,0%
Low product/ service demand from customers	26,0%	34,0%	22,0%	16,0%	2,0%
Inability to grow into new markets	24,0%	28,0%	34,0%	12,0%	2,0%

Source: Results of the Survey

The above-mentioned factors can be divided into three groups. These are administrative obstacles, economic difficulties and problems associated with the functioning of the shadow economy. Based on the results of the Survey, it can be concluded that all three groups of factors have a negative impact on business development, for more or less extent. First of all, companies are concerned with taxation issues, unsatisfactory state-to-business relations, and inconsistency of legislation in the sphere of business regulation. Among the economic factors, we can highlight a high level of inflation, credit problems, the inability to grow on new markets, as well as low demand from customers and buyers. As for questions about corruption, the majority of respondents confirmed the impact of this negative factor. More than 50% of respondents believe that the presence of corruption has a negative impact on business development and 18% noted that they rather agree than disagree with this statement.

At the same time, 30% of respondents did not agree with this fact. An approximately similar structure of responses is observed about the assertion about the negative impact of competition from the informal business. A positive fact is that most organizations have excluded crime and racketeering barriers on business development. Thus, the problems of corruption and the existence of a shadow economy worry most of the companies surveyed, and the discontent with the level of corruption is more pronounced. It should be noted that inefficient state regulation, as well as economic problems, indirectly create the basis for the development of "grey" schemes both in the economy as a whole and in the construction sector in particular. In the third part of the survey, respondents were asked to answer the questions related to the implementation of public procurement. It should be noted that this list of issues was perceived negatively, as a result of which some respondents refused to answer most of the questions posed about public procurement. From the fifty companies, twenty nine said that they had participated in public procurement over the past two years. At the same time, twenty four companies noted that during this period they were able to win the tender (Fig.16).

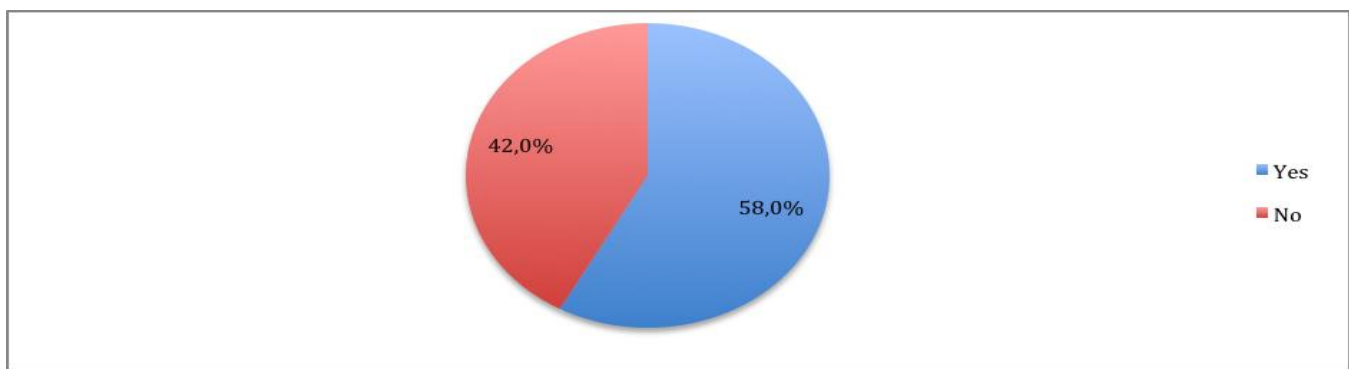


Figure 16. Answer on the question: Have your company participated in municipal procurements over the past two years?

Source: Results of the Survey

When asked about the number of organizations participating in a single tender for public procurement, the opinions of the respondents were also different. 20% of companies said that in tenders where they took part, up to 5 companies were participated usually, but 42% of construction companies noted that the number of competitors could vary from 6 to 20 companies. Thus, in this sphere there is a fairly high level of competition between the participants in the construction market. However, the presence of competition does not always prevent corruption dealings and schemes. For example, on the question about competitions in the sphere of public procurement, which your company lost due to unfair competition, 40% of respondents said that such cases have happened with them. Proceeding from the fact that more than 40% of the companies surveyed have not participated in tenders at all in the last two years, it can be assumed that most of the enterprises that had such experience believe that they faced unfair competition (Fig. 17).

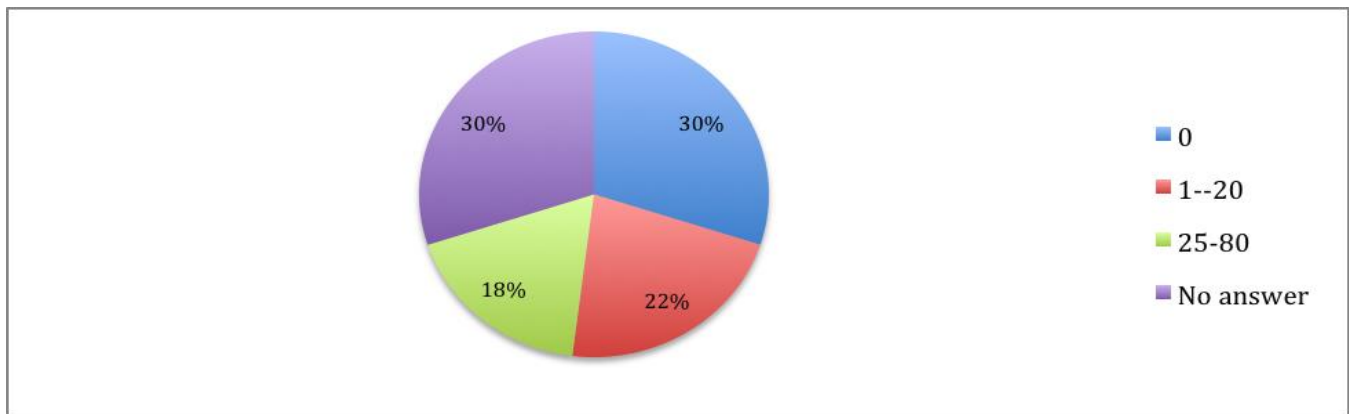


Figure 17. Answer on the question: On average, approximately what percent of municipal procurement competitions did you lose because they have been exposed to unfair competition? (Legend – range of lost tenders in %)

Source: Results of the Survey

Based on the received answers, we could conclude that one of the reasons that create problems in public procurement is the imperfection of legislation. Only 8% of organizations noted that they are satisfied with the legislation on public procurement. At the same time, 42% of the respondents found this question is difficult for answering, that can be explained by the lack of experience of companies' participation in such competitions. At the same time, 46% of the respondents, that is the majority of those who have participated in public procurement in the last two years, have expressed their dissatisfaction with the current legislation in the field of regulation of public procurement (Fig. 18).

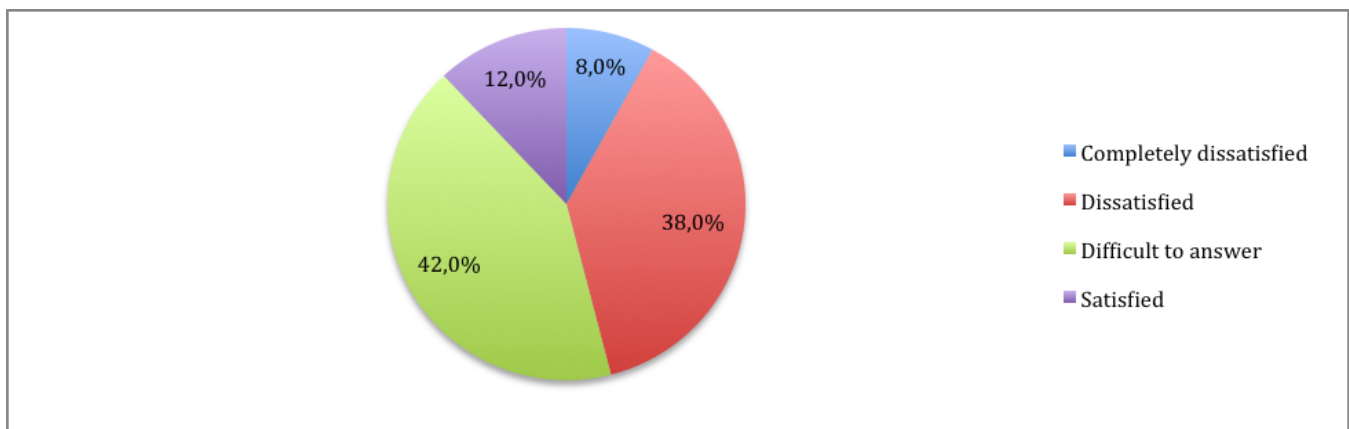


Figure 18. The level of satisfaction of legislation quality in the sphere of public procurement.

Source: Results of the Survey

A special role in the research is given to main problems that companies face when participate in public procurement tenders. As part of the survey, companies were asked to underline three main problems in this area. Respondents named a fairly wide range of problems. The main part of the received answers is presented below and divided into three categories: administrative reasons, economic factors and problems, problems associated with the existence of the shadow economy and corruption.

Problems of public procurements system from the companies' point of view:

Economic

Inflation;
 High competition;
 Low level of profit;
 Incompetence, high demands and bad fulfilment of obligations by customers;
 Low consumer abilities of the population;
 Non-performance of obligations on the financing;
 Financing.

Administrative:

Low level of information technology implementation in the public procurement procedure;
 Complexity of necessary documentation preparation;
 Unequal conditions for public and private enterprises;
 A large number of fines and public inspections;
 Bureaucracy;
 Imperfection of legislation.

Problems associated with the existence of corruption and shadow economy

Personal agreement, nepotism, everything is decided in advance;
 Corruption;
 Unfair competition;
 Non-transparency of competitions' procedures;
 Non-commercial relations between companies;
 The system of kickbacks;
 Untimely notice of the beginning of the competition.

The chart below shows the main problems that are most popular among companies' responses (Fig. 19)

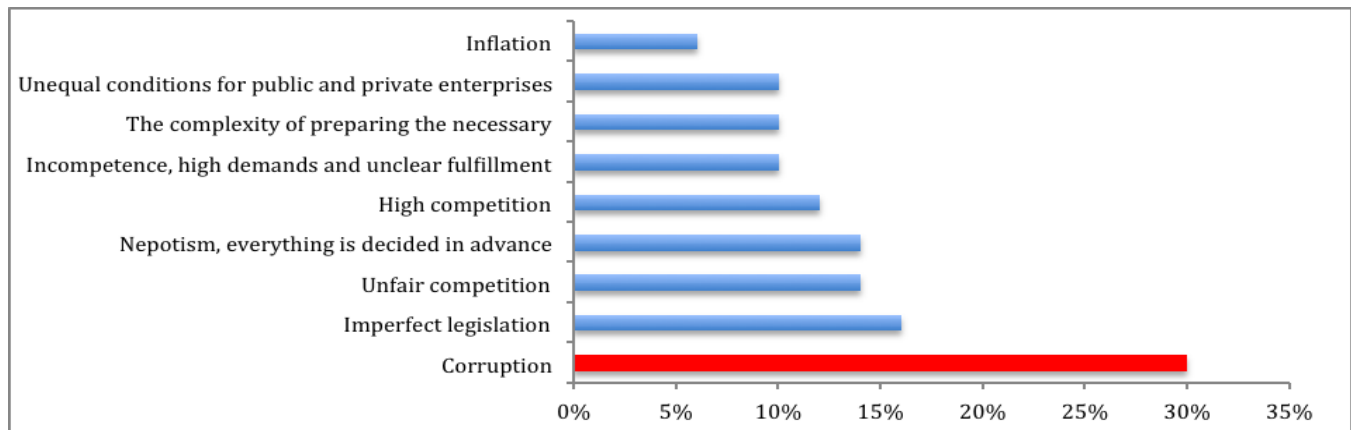


Figure 19. Main problems that companies face when participate in public procurement tenders (X axis - % of respondents, which are agree with this statement)

Source: Results of the Survey

As we can see on the chart above, the most important problem in public procurement is the problem of corruption. This factor was highlighted by 30% of the respondents. In addition, a number of companies noted that important problems for them are also related with unfair competition and nepotism, everything is decided in advance. Among the administrative barriers, the most important factors include the imperfection of the legislation, and the complexity of the documentation. Finally, among the economic barriers most popular answer include the problems of working with customers and unequal conditions for public and private enterprises.

5. Ways of declining the level of corruption and tax evasion in construction sector of Belarus

Thus, based on the analysis, we can conclude that Belarusian construction companies face a number of problems and risks in their activities. Undoubtedly, one of the important conditions that indirectly stimulates the growth of corruption transactions and shadow economy development is the inconsistency and variability of legislation. Due to the fact that the rules for public procurements are constantly changing, it is very difficult for enterprises to follow them constantly.

As an example, we can cite legislation in the field of procurement, construction works and services. Till the beginning of 2017, the implementation of purchases, wholly or partly, carried out by the resources of budgetary funds, state extra-budgetary funds and procurements from non-state sources were regulated by various legislative acts. From the beginning of the year, all purchases in the construction sector should be conducted in accordance with Presidential Decree No. 380 "On Procurement of Goods (Work, Services) during Construction"[‡]. This document is valid for the period until the end of 2018. Then, perhaps, some conceptual changes will be made again.

In accordance with new legislation, the procurement of goods can be carried out by means of tenders, negotiations or exchange tenders, and for the procurement of works and services, it is necessary to apply contractual tenders or negotiations. In the legislation of public procurement in generals, the ways of implementing them are more diverse. At the same time, contract tendering in construction must be mandatory only when housing construction is carried out, if the total cost is more than 6 thousand base units and construction is fully or partially financed by resources from budgetary funds, if the total cost is more than 6 thousand base units, as well as for construction of facilities from the resources of state organizations and legal entities with the share of state ownership, if the cost of construction according to the contract is more than 100 thousand base units. The tender is optional if it was declared invalid because the winner is not determined or refused the contract. It is also possible to exclude the tender procedure if the contract was signed between general contractor and subcontractors. On the one hand, these changes in legislation simplify the procurement process as well as selection of contractors and subcontractors. On the other hand, they do not significantly increase the transparency of transactions. In addition, the adopted norms will be valid only for 2 years. After that, cardinal changes can occur again. However, instability, and the complexity of legislation are often main factors that stimulate the shadow market development. In this regard, it would be optimal to develop the basic legislative norms, which regulate the construction sector and then carry out only their improvement.

Based on national and international experience, it is necessary to raise the problem of the relationship between the contractor and subcontractors. In Belarus, as in many other countries, these operations remain relatively opaque even for those projects that are financed from the budgetary funds. In the case of a multilevel structure of interaction between subcontractors, it is very difficult to trace the effectiveness of the resources use. In addition, there is the issue of transparency of the procurement process, if the tender was declared invalid. In this case, it is possible to apply the negotiation procedure, which reduces the level of openness of the transaction also. Based on the conducted survey of enterprises there is a problem of subjectivity of the procurement process. This means that the procedure cannot be carried out without direct interaction between the tender organizers and the contractors. Minimizing the human factor reduces the risk of abuse. This is especially true in the sphere of public

[‡] Public procurement in the construction sector was regulated by the Law «About Public Procurement of Goods (Work, Services)». Private procurements regulated by Decree of the President of the Republic of Belarus No. 591 of 31.12.2013 «About Conducting Procurement Procedures in Construction» and by Government resolution No. 88 of 31.01.2014 «About organization and implementation of procedures for the procurement of goods (works, services) and settlements between customer and contractor in the facilities construction».

procurement. Therefore, according to our opinion, the digitalization and general openness of the process is very important in the conduct of public procurement auctions in the construction sector. These changes will reduce the level of corruption without tightening penalties.

A positive example in this area is Georgia's experience. In this country, trades are conducted in electronic form on the basis of Agency of Public Procurement. Organizers of the auction don't know which of the suppliers participate in the tender. It is possible because each participant is assigned his own impersonal number. In addition, information about the auction is known in advance and is constantly available in Internet. At any time of the day interested persons can get information about required documentation and, thus, timely prepare for the tender. Each participant can challenge the decisions in Electronic Court for Dispute Resolution. After the tender, information about the winner becomes fully open. Also on the site of public procurement everybody can see what kind of payments were made and get detailed information about previous tenders.

The experience of Georgia is an example of the policy implementation in the sphere of open data. The essence of this system means the access by an ordinary user to any source of information in a machine-readable format with the exception of classified materials. In Russia, for example, this process is regulated by the Law on Open Data. A permanent dialogue between the state and society on the need to open this or that information is being conducted. One of the problems that experts face when developing this direction is the admission of errors in huge amounts of information. For example, when publishing public procurement data, a number of technical errors can be made. However, based on Russian experience, it can be concluded that these inaccuracies can be corrected by developing appropriate software. Thus, if detailed information is published on the ongoing transactions, procedures and processes, then this is mean that additional cooperation between society and the state is created. In such situation it is more difficult to hide the facts of abuse, including operations in the construction sector.

The next problem in the framework of construction is the verification of compliance of construction projects to the norms of the Belarusian legislation. In this case commissioning or non-commissioning of an object depends on the decision of individual experts from state institutions. And this is also a sphere for corruption. In this case it will be nice to propose the creation of independent organizations that would be interested in the fact that the objects, inspected by them meet, all necessary regulatory requirements and be put into service timely. These companies would be able to work as consultants and give an independent assessment of compliance. Such organizations can be compared with independent audit firms that help their clients to put in order bookkeeping without imposing any sanctions on them.

An important stage in reducing the level of the shadow economy is the digitalization of state organizations work, as well as transfer to the electronic format the interaction between state and business entities. In this case, we would like to suggest an e-government system creation. It should be noted that in Belarus there is still no clear plan of action for building an e-government system, as well as a regulatory or legislative act that regulate this area. There is only the program "Electronic Belarus". But if we turn to the experience of Estonia, for example, so in this country practically all state procedures can be carried out on-line. The avoidance of a personal contact in obtaining permits and licenses between state bodies on the one hand and legal entities and individuals on the other excludes the possibility of corrupt schemes. More over, next suggestion is related with organizing state procedures on the basis of blockchain principle. In this case, all participants of electronic network have the opportunity to see all transactions that are being performed. In addition, the committed transaction can not be cancelled or revoked, which allows everybody to track the chain of operations on each contract.

In continuation of the foregoing, we can also mention the need to create an effective electronic document system between state bodies, customers and contractors in construction. At present, the exchange of documents in electronic format is still duplicated by documents on paper. The economy and higher degree of openness of electronic documents will reduce the time and administrative costs, as well as will allow to increase the transparency of transactions. Thus, in order to reduce the level of corruption and "gray" schemes in construction,

it is necessary to think about the speedy introduction of a full-scale digitalization of document circulation as well as formation of an e-government system. Possible risks in this direction can be related with costs of necessary changes. Belarus has much more population than Baltic states, Georgia or Finland. In this regard, the restructuring of the state institutions work will lead to significant material costs. Therefore, in order to adapt the world experience to national peculiarities and implement only effective projects, it should be possible to implement innovations on small territories (regions) on the basis of pilot projects. This suggestion also works for regulation and control of the construction sector, In this case, the implementation of certain actions in the field of the processes digitalization will not be accompanied by substantial capital investments. Successful projects should be further developed throughout the country, and less effective ones can be cancelled with minimal losses.

An important measure for declining the level of taxes evasion and reducing the risk of corruption schemes in the construction sector is the development of payments in a non-cash form. Despite the fact that according to the general rule enterprises and organizations must implement and accept payments in a non-cash form, a certain share of transactions remains in cash. This mainly concerns to operations between legal entities and individuals. Reduction the share of payments in cash form could be reached by decreasing of the maximum amount for conducting transactions in cash.

One of the most common examples of tax evasion is the execution of finishing works in private houses or apartments by unregistered construction teams or the lack of proper registration of contracts by legally functioning construction companies. Usually, such works performed by small businesses and individual entrepreneurs. «Grey» wages of construction workers are also quite a big problem for tax authorities. Currently, there is the possibility of hiring employees for a minimum payment. In this case part of incomes goes in the form of unaccounted (hidden) earnings. Partial solution of this problem could be the ID cards implementation for each employee. In this case, it would be clear how many people actually work and how their work is evaluated. The experience of Finland could be useful for Belarus. In this country, every employee of any construction company and employer must have his/her own ID card with the name of card's owner, taxpayer's number and the name of the employer. Tax authorities can check the information on the ID card on-line. The appropriateness of the information indicated on the card is verified by special labor inspectors. Sometimes checks are also conducted with the participation of police and tax authorities. In case of identified violations, personal responsibility is imposed.

In Finland cards implementation helped to identify all employees and employers working on the construction of a particular facility. At present, it is not difficult to obtain information about all workers and companies employed in the construction of a particular facility. In addition, the openness of the taxpayer's number allows the authorities to monitor the timely payment of income tax.

An important factor in the framework of tenders on public procurement in construction is the price. According to our opinion, the crucial importance of this particular criterion is not always justified. In Belarus some construction organizations can find the possibility to use correction factors for the price (for example, when hiring 50% of disabled staff) and unreasonably win the tender. In this case, it is advisable to take into account not only price like main parameter but also such indicators as manufacturability of the trading object and its financial return. In addition, it is possible to revise the list of entities that have incentives when participating in competitions.

Finally, as Georgia's experience shows, the level of corruption can be reduced by providing competitive salaries to employees of state institutions. High income level allows to attract well qualified specialists in the public sector. Economic interests can be created as by raising the level of wages, so by offering a social package. The formation of an effective system of control and punishment for unlawful acts is an important, but not the only element in fighting corruption in construction sector. The most important factor in this sphere is the openness and transparency of the work of state authorities, as well as the possibility of constant dialogue between state authorities and society.

Conclusions

The survey of construction companies has showed the presence of problems associated with corruption and tax evasion in the construction sector. Based on the assessments of enterprises there are examples of concealment of the part of companies' income, as well as payments wages "in envelopes". Sometimes employers go on informal hiring of their employees, or spend part of their income unofficially to 'get things done'.

There are a lot of problems in the public procurements' system. The main negative factor in this area is corruption. In addition, construction companies identified such problems as nepotism, everything is decided in advance and unfair competition. Economic and administrative reasons have a negative impact on the public procurement system also. Many of these obstacles are related to the imperfection and variability of national legislation in the field of public procurement.

The world experience, as well as the analysis of construction companies' opinions, showed the need to develop a number of measures to reduce the level of corruption and tax evasion in the construction sector of Belarus. Among the main measures we can underline next:

- Improving the effectiveness of legislative acts (including the sphere of procurement in the construction sector) can be achieved by ensuring their stability and simplification of legislative norms execution.
- Increasing the transparency of procurement transactions in construction, as well as relations between contractors and subcontractors, can be enhanced by the unification of contract forms and transactions' transfer into electronic format.^{[1][SEP]}
- Implementation of employees and employers identity cards is necessary for reduction the level of tax evasion.
- Ensuring the openness of data within the framework of the e-government system formation can be increased through the blockchain based procurement system implementation in construction.
- For reduction of excessive costs, it is possible to implement innovative solutions on the territory of one or several regions (pilot projects). In case of economic efficiency, successful projects should be further developed throughout the country.^{[1][SEP]}
- Information about past and future tenders should be available to all interested parties.
- The development of a non-cash payment system should also stimulate the transparency and openness of the transactions in construction sector.
- It is necessary to review the legislation for possible reduction the list of benefits and preferences for certain categories of organizations.
- Conducting trades should not always take into account the price as the main factor of tenders. In many cases, manufacturability of the trading object and its financial return have to be more or less equal importance.
- Increasing the status of civil servants, as well as providing them high wages, would reduce incentives for corruption, including in the construction sector.
- For constant monitoring of the shadow economy level, it is necessary to assess and research the level of corruption and tax avoidance, as at the country' level, so at the level of main economic sectors.

Thus, many steps have been done for reduction of shadow economy. According to the rating of Corruption Perception Index, the country places the better position than Russia or Kazakhstan. However the experience of such countries as Finland or Sweden shows opportunities for further reduction the level of informal sector and illegal operations. The focus should be done not only on punishment, but on creating attractive environment for business' development and reducing stimulus for corruption and tax evasion.

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Aknowledgements

This research was conducted in the framework of the project “Corporate engagement in fighting corruption and tax evasion”. The project is financed by the Nordic Council of Ministers.

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THROUGH ECONOMIC GROWTH TO THE VIABILITY OF RURAL SPACE*

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Received 15 August 2017; accepted 19 November; published 29 December 2017

Abstract. Rural areas as a necessary component of living space for the population is an increasing focus both in official documents of various EU institutions and in research investigations. Both the documents and the research papers stress the necessity to enhance and maintain the viability of rural areas. The viability of rural areas is ensured by employment opportunities and the readiness of residents for active and innovative economic activity. The authors' research focuses on an analysis of vertical and horizontal changes in entrepreneurship in the period 2009-2015 and their effects on changes in the living space in the territories analysed, which primarily involves the country's regions, but a special focus is placed on the mentioned processes in territorial units of the regions – municipalities –, as the life of residents is influenced not only by national policies but also by on-going processes in the administrative territories of local governments. Zemgale region was chosen for an in-depth analysis of these processes. LURSOFT data for the period 2009-2015 and Central Statistical Bureau data for the period 2013-2015 were used as information sources. The data were processed by quantitative (growth) and qualitative (structural change) statistical analysis methods. The Eurostat methodology and a methodology developed by the authors for classification of industries were employed for the analysis of structural changes in the national economy. The development level-rate matrix method was employed for an in-depth examination of the research results. The research results showed that regardless of the global economic crisis, both vertical growth and positive horizontal change processes took place in the national economy in all five regions of Latvia, nine cities of national significance as well as in all 110 municipalities that composed the rural areas of Latvia. The analysis of the information allows concluding that, first, performance trends were observed in the rural space, which contributed to economic growth; second, there was no direct causal relationship between the population density of rural territories and economic activity in the rural territories; however, third, it leads to an opinion that the economic growth in the rural territories was greatly affected by the quality of local governance and local community residents' readiness for active, innovative and inclusive action.

Keywords: living space, structural changes, knowledge-based economy, local governance, local community

Reference to this paper should be made as follows: Rivza, B.; Kruzmetra, M. 2017. Through economic growth to the viability of rural space, *Entrepreneurship and Sustainability Issues* 5(2): 283-296. [http://doi.org/10.9770/jesi.2017.5.2\(9\)](http://doi.org/10.9770/jesi.2017.5.2(9))

JEL Classifications: P25, R11

* *This research was supported by the National Research Programme ECOSOC-LV project 5.2.3 „Rural and Regional Development Processes and Opportunities in Latvia*

1. Introduction

In the last decade, prospects for national development have been in focus in Latvia several times. On 10 June 2010 the Parliament approved the Sustainable Development Strategy of Latvia until 2030 “Latvia 2030” (Latvia 2030). Two years later, a new policy document was produced – the National Development Plan 2014-2020, which was adopted by the Parliament on 20 December 2012 (NDP). This means that officially the strategy documents have been produced and priorities have been set. One of the most essential objectives is to approach the averages of EU Member States in all the areas of life and, first of all, in economic development, which functions as an important tangible factor in smart growth (Bacon, Brewin 2016). A question remains – what is the progress in achieving the targets?

In terms of area and population living in this area, Latvia is actually close to the averages of the European Union (EU-28). In the EU, rural territories occupy 44.1 % and intermediary territories – 44.4% of the total area, while in Latvia it is 40.2% and 43.6%, respectively. A similar situation is observed with regard to the distribution of the population. In the EU, 19.2% of the total population live in rural territories and 36.4% in intermediary territories; in Latvia it is 22.2% and 27.0% (CAP 2016). At the same time, labour productivity in Latvia is less than 75% of the EU – 28 average and, consequently, GDP per inhabitant in Latvia is less than 75% of the EU – 28 average. The Global Competitiveness Index does not show any improvement – on the contrary – a deterioration was observed (in 2015/2016, Latvia ranked 44th, while in 2016/2017 it ranked 49th) and among the three Baltic States Latvia performed the worst (Global Competitiveness 2016/2017). For this reason, a topical problem in research is the promotion of viability of the rural space, which is composed of 110 municipalities and where 49.2% of the total population live, through smart growth and forming vital rural areas, as the role of rural space in the wellbeing of the population increases (Making Europe 2016).

The theoretical framework of the present research involves the understanding of viability of rural areas and of the role of a knowledge-based economy in the mentioned processes. The understanding of rural vitality and viability has become an important research problem in the beginning of the 21st century. First of all, the meanings of the concepts have to be explained. Vital rural territories are the territories where strong, active and inclusive relationships among residents, the private sector, the public sector and civil society organisations function in the economic, social and environmental spaces. Vital communities are those that are able to cultivate and enhance these relationships in order to create, adapt and thrive in the changing world (Sott 2010). Vitality is increasingly portrayed as a complex, multi-dimensional concept that increased use of the skills, knowledge and ability of local people, strengthened relationships and communication, improved community initiative, responsibility and adaptability, sustainable, healthy ecosystems with multiple community benefits, appropriately diverse and healthy economies (Grigsby 2001, Fabuš 2017).

However, rural viability is explained as the ability of a local community to succeed by using available physical and human resources of this territory. Particularly effective leadership within the community is necessary in order to assert successful community action, encourage entrepreneurship, and improve community viability (Grenčíková et al. 2017; Slinták 2017, Ignatavičius et al. 2015).

A significant role in both vitality and viability is played by economic activity. The health of the local economy is viewed as one of the key factors for maintaining the viability of a territory inhabited by a community (Sott 2010, Grigsby 2001, Tvaronavičienė, Gatautis 2017).

Creative and diversified economic activity has to be promoted, which contributes to employment and, therefore, makes a territory populated as well. Integrated economic sectors and strong local economies are necessary (Bacon, Brewin 2016; Naldi et al. 2015). There are three priorities in the field of economic development:

developing an economy based on knowledge and innovation, promoting a more resource efficient, greener and more competitive economy and fostering a high-employment economy delivering economic, social and territorial cohesion (European Commission, 2010). As Latvia joined the European Union in 2004 and integrated into the OECD country group in 2016, the formation and development of a knowledge-based economy has become a practical task and an object of research. “The knowledge based economy” is an expression coined to describe trends in advanced economies towards greater dependence on knowledge, information and high skill levels, and the increasing need for ready access to all of these by the business and public sectors (OECD, 2005, The Measurement...). The aim of the research: to assess vertical and horizontal changes in entrepreneurship in the period 2009-2015, placing a special focus on trends in the changes in the knowledge-based economic segment. The research performed an assessment of the changes in: a/ Latvia as a whole; b/ five regions of Latvia; c/ local administrative units of the regions – municipalities, which form the entire rural space of Latvia. LURSOFT data for the period 2009-2015 and Central Statistical Bureau data for the period 2013-2015 were used as information sources. The data were processed by quantitative (growth) and qualitative (structural change) statistical analysis and development level-rate matrix methods.

2. Vertical changes in entrepreneurship in the period 2009-2015

The period for which an analysis was performed was complicated. It involved both an economic crisis and a post-crisis period. Since knowledge-based economic growth has been prioritised in the 21st century, the research simultaneously analysed economic growth both in the entire economy and in the knowledge-based economic segment, which was the focus of the research. Such an approach is in line with the OECD strategy on development that technology is bringing unprecedented changes in rural areas (Innovative Rural Regions). According to the EUROSTAT methodology, the knowledge-based economic segment consists of high tech, medium high tech manufactories and knowledge intensive services (HT, MHT, KIS) (European Commission, 2008).

By comparing the key indicators of entrepreneurship – the number of enterprises, the number of employees and net turnover – both in the cities of national significance and in the 110 municipalities, one can get insight into what took place in entrepreneurship in the period of six years (Table 1).

Table 1. Growth of entrepreneurship in the period 2009-2015 (vertical growth – percentage change)

	Number of enterprises	Number of employees	Total net turnover	Net turnover per employee
Cities of national significance (9 cities)				
All enterprises	152.9%	114.8%	143.7%	125.2%
KBE segment	185.1%	129.7%	146.9%	113.3%
Rural territory - 110 municipalities (incl. towns in municipalities)				
All enterprises	179.6%	128.5%	169.2%	131.8%
KBE segment	236.6%	143.1%	133.1%	133.8%

Source: authors' calculations based on LURSOFT data

The number of enterprises increased at a faster rate than the number of employees, total net turnover and particularly net turnover per employee. This trend could be observed both at national level and in rural territories with regard to entrepreneurship as a whole and the KBE segment. However, the growth of the KBE segment both in the cities and in rural territories considerably exceeded an increase in the number of all enterprises. This means that innovative economic activity strengthened, as the growth of the KBE segment contributes to the new knowledge and skills of beginners in entrepreneurship. Not a less important finding is that rural areas as a space, in terms of entrepreneurship, climbed at least a step towards the level of cities, as growth rates were higher in the rural territories (municipalities) than in the cities, which decreased disparities between the cities and the rural areas.

The overall situation in Latvia is important, but only for comparison with its neighbouring countries – first of all, Estonia and Lithuania – and the country's internal territorial units, which can reveal similarities and differences in development processes in the territorial units or reveal how successfully the spatial aspect of cohesion is being implemented (Table 2).

Table 2. Growth of entrepreneurship in the regions in the period 2009-2015 (vertical growth – percentage change)

Growth of entrepreneurship as a whole						
	Zemgale	Pieriga	Vidzeme	Latgale	Kurzeme	9 cities
Number of enterprises	177.1	198.0	165.1	160.8	158.7	152.9
Number of employees	123.8	137.3	124.4	110.7	121.0	114.8
Total net turnover	164.1	171.6	175.4	151.0	165.9	143.8
Net turnover per employee	132.5	124.9	132.8	136.4	137.2	125.2
Growth of knowledge-based entrepreneurship (KBE)						
	Zemgale	Pieriga	Vidzeme	Latgale	Kurzeme	9 cities
Number of enterprises	236.8	255.3	202.5	177.6	207.8	185.1
Number of employees	125.2	159.8	127.3	122.4	129.8	129.7
Total net turnover	135.0	128.4	186.9	144.8	146.9	146.9
Net turnover per employee	107.6	119.1	134.8	116.8	227.1	112.3

Source: authors' calculations based on LURSOFT data

The processing of the LURSOFT data showed that the growth of entrepreneurship as a whole and the vertical growth of its KBE segment were observed in all the regions, as well as in the country's nine cities of national significance. However, the growth of entrepreneurship as a whole in all the regions was faster than that in the nine cities of national significance, even though the growth rates in the regions were different. It is necessary to stress the growth of the KBE segment in particular, which outpaced that of entrepreneurship as a whole both in terms of number of enterprises and in terms of number of employees. The mentioned faster growth took place not only in the cities but also in all the regions. Two regions – Vidzeme and Kurzeme – should be particularly highlighted, as the net turnover per employee in the KBE segment exceeded that in the regional economy as a whole.

3. Horizontal changes in entrepreneurship in the period 2009-2015

Horizontal changes in entrepreneurship as a whole reflect not only the size of any particular segment but also its influence. The greater the number of enterprises of some segment is, the greater the number of individuals is employed in the segment and, what is more important, the significantly greater proportion of net turnover of the segment is in the total net turnover and a greater focus is placed on the segment's problems in the economic development strategy. The greater focus could be associated with both positive and negative trends.

Table 3. Similarities and differences in segmental restructuring processes in the regions in the period 2009-2015 (structural change in %-points)

Manufacturing segment						
Indicators	Zemgale	Pieriga	Vidzeme	Latgale	Kurzeme	9 cities
Number of enterprises	-1.77	-1.07	-0.79	-1.93	-0.34	-0.60
Number of employees	+1.21	-1.49	+0.85	-0.53	+0.29	-1.89
Net turnover	+7.16	+0.50	-1.76	+6.01	-0.65	-0.65
Segment of agriculture, forestry and fisheries						
Number of enterprises	+1.41	-0.31	+5.61	+10.75	+7.11	+0.1
Number of employees	+1.29	-0.45	+1.72	+5.53	+3.20	+0.10
Net turnover	-0.74	+1.72	+5.36	+9.32	+7.67	+0.24
Services segment						
Number of enterprises	-1.44	+2.39	-4.83	-7.70	-5.81	+1.9
Number of employees	-3.32	+1.25	-2.98	-2.65	-3.10	+2.74
Net turnover	-6.95	-1.70	-5.50	-2.59	-7.36	+6.20
Segment of other industries (construction, environmental and communal services, mining)						

Number of enterprises	+1.78	-0.93	+0.01	-8.12	-0.97	-1.33
Number of employees	+0.82	+0.69	+0.41	-2.35	-0.39	-1.09
Net turnover	+0.53	+1.34	+2.08	-2.76	+0.34	-5.79
Knowledge-based economic segment						
Number of enterprises	+4.08	+6.54	+2.72	+0.99	+2.68	+5.47
Number of employees	+0.14	+2.28	+0.26	+1.2	+0.41	+3.30
Net turnover	-1.10	-3.77	+0.29	-0.26	-0.61	+0.21

Source: authors' calculations based on LURSOFT data

The data of Table 3 reveal these trends. There are two positive ones. First, the influence of agriculture, forestry and fisheries rose, as this segment's proportion increased in terms of numbers of enterprises and employees in four regions, which led to an increase in the segment's proportion of net turnover in the total net turnover. The greatest growth of this segment was observed in Latgale region where the maintenance of rural vitality is of great importance due to both the decrease in the population, the long distance from the capital city of Riga and the location close to the border. Second, the growth of the KBE segment was quite significant. In all the regions and cities, an increase in the proportion of this segment took the form of increase in both the number of enterprises and the number of employees. Unfortunately, the proportion of net turnover increased only in Vidzeme region and the cities. The maximum decrease in the proportion of net turnover of the KBE segment in the total net turnover was observed in Pierīga region, which could be explained by increase in the proportions of net turnover in a number of other economic segments and a minimum increase in net turnover (18.2 %-points) in the segment of knowledge-based services in the six-year period of analysis as well as by the fact that the mentioned services dominated (96.3%) particularly in Pierīga region. In the world, the so-called gentrification process intensifies, which manifests itself as the movement of competent and quite wealthy individuals to peri-urban territories, thus providing opportunities for themselves to live in a favourable natural environment and do distance work or provide knowledge-intensive services on the Internet at the place of residence (Kruzmetra 2011).

A negative trend is a decrease in the proportion of manufacturing, although it is an economic segment that considerably contributes to the value added created during production. The number of this segment's enterprises decreased in all the regions and cities. The proportion of individuals employed in this segment decreased in two regions and the cities. According to survey data, manufacturing provided the greatest proportion of jobs (21.86% of the total employees) right behind the segment of services (53.8%), and employment and incomes are among the key factors contributing to retaining population in rural areas (Making Bioeconomy Work for Sustainable Development 2015, The Rural Challenge 2010, Bacon, Brewin 2016). Progress in this segment could be expected if the processing of organic produce increases, innovative of the bioeconomy is implemented (e.g. Azimova et al. 2017; Svetlanská et al. 2017; Ryabchenko et al. 2017). Second, an increase in the proportion of the knowledge-based economic segment in terms of numbers of both enterprises and employees has not yet resulted in an adequate increase in net turnover, although one can expect a maximum increase in this particular indicator.

4. Vertical and horizontal changes in entrepreneurship in Zemgale region in the period 2009-2015

Since both official EU documents and research papers increasingly stress the local territory approach (Making Europe 2016, Sott 2010, Janvry 2007, Tvaronavičienė, Černevičiūtė 2015, Yang, Černevičiūtė 2017) the present research also performed a vertical and a horizontal analysis at regional level, choosing Zemgale region consisting of 20 municipalities as an example. The research results convincingly showed that there were significant disparities in both vertical growth and segmental distribution also within the regions, which have to be taken into consideration in the smart growth strategy.

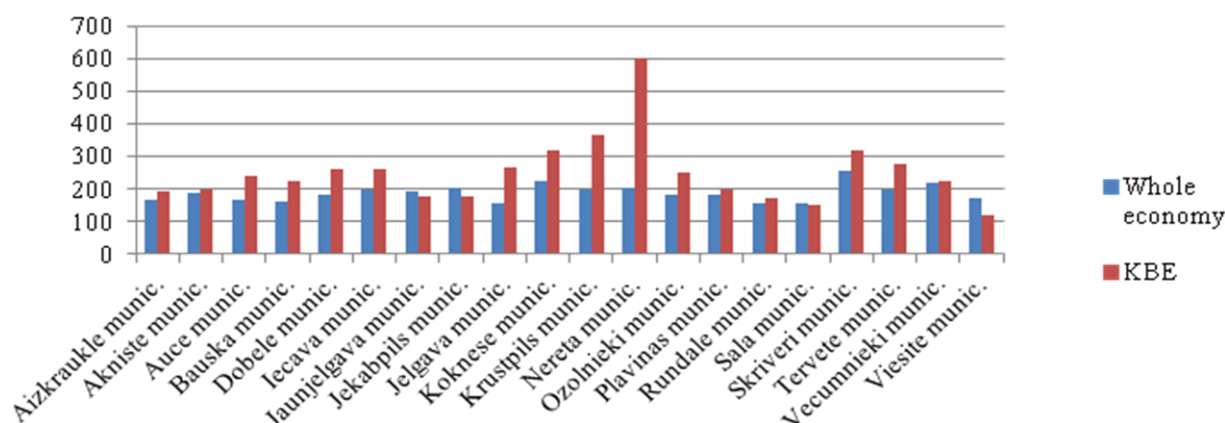


Figure 1. Vertical growth of entrepreneurship in the municipalities of Zemgale region in the period 2009 – 2015

Source: authors' calculations based on LURSOFT data

A comparison of quantitative growth in the whole economy and the knowledge-based economic segment revealed that the growth of the KBE segment in terms of numbers of enterprises and employees and particularly in terms of net turnover in 16 municipalities of the region exceeded that in the remaining four municipalities (Jaunjelgava, Jekabpils, Sala and Viesite), convincingly proving the role of the KBE segment in maintaining the vitality of rural areas and, to a greater extent, their viability, which is significantly affected by economic growth (Fig. 1). The data showing the processes lead to one more conclusion that the key factor of disparities was not the location of a municipality because the municipalities of Nereta (with the greatest increase in the number of employees and the second greatest increase in net turnover) and Viesite (with decreases in the number of employees and net turnover) are neighbouring municipalities, both are situated far away from the capital city and both lie close to the border of Latvia and Lithuania. One can assume that such performance have been affected by other factors influencing entrepreneurship.

Disparities across municipalities within a region are also indicated by the sizes of segments of entrepreneurship (Figure 2). Agriculture and forestry is the dominant segment in six municipalities out of the twenty municipalities of Zemgale region: 59.68% in Jekabpils, 53.97% in Akniste, 47.83% in Viesite, 46.15% in Tervete, 44.12% in Krustpils and 43.14% in Nereta. Manufacturing ranged from 15.95% in Auce municipality to 0.0% in Akniste municipality. Both municipalities lie close to the border with Lithuania, and the only difference is that they are not neighbouring ones. This means that the location is not the key influencing factor. The segment of services was specific to the majority of market sector statistical units in the municipalities, and it was the dominant segment in 14 municipalities. It is useful to remember that retaining rural vitality also involves meeting the need of residents for various services, which contributes to maintaining population in the rural space.

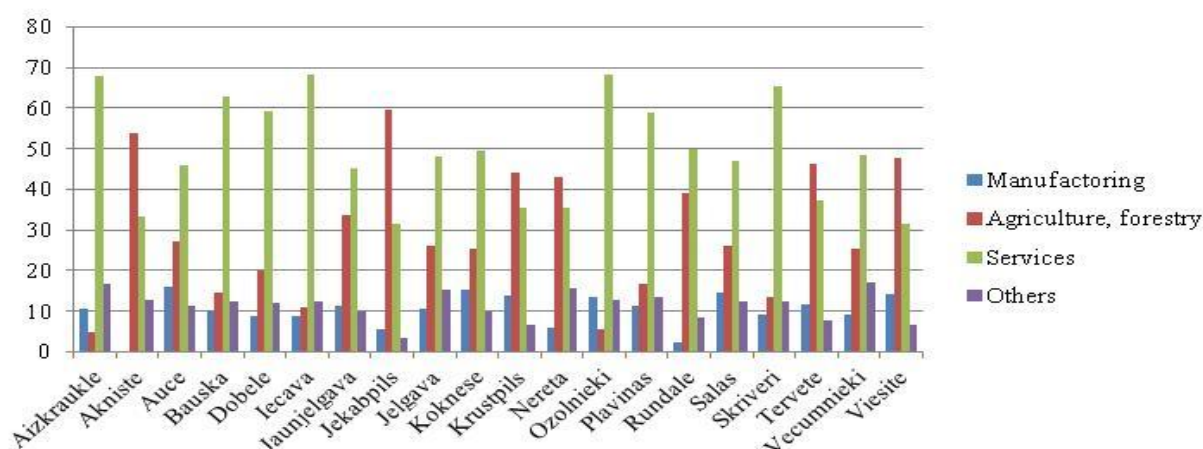


Figure 2. Percentages of segments of entrepreneurship in the municipalities of Zemgale region in 2015

Source: authors' calculations based on LURSOFT data

The knowledge-based segment could be singled out from the list of registered enterprises in the LURSOFT database, and its position and role in the economy of a municipality could be assessed. The proportion of the knowledge-based segment ranged from 5.65% (Jekabpils municipality) to 25.9% (Ozolnīki municipality). A proportion of more than 20.0% was observed in three municipalities, in five municipalities it was in the range of 15.1-20.0%, in seven municipalities – in the range of 10.0- 15.0% and in five municipalities it was less than 10.0% (Figure 3). In all the municipalities, without an exception, there were provided such knowledge-intensive services as educational, health, cultural and sport services. There are more problems with the entry of HT and MHT manufacturing. Entrepreneurs have to identify niche products being competitive in the international market, as domestic demand for innovative products is very insignificant. The complicity of this process is confirmed by the research results. In seven municipalities, a component of this segment existed already before 2009, and it remained during the entire period of analysis. In four municipalities, HT and MHT enterprises started operating in the period of analysis, which means that a segment has emerged that has been able to survive. In two municipalities, there were activities aimed at establishing this component of the segment, yet stability was lacked there (it vanished after it appeared). Finally, there were seven municipalities where only knowledge-based services were provided. This means that the establishment of a knowledge-based segment in the economy of a municipality requires both the understanding of the need for such a segment and competence in forming the segment practically, and it particularly relates to the foundation and maintenance of HT and MHT enterprises and the assessment of their performance (Fig. 3).

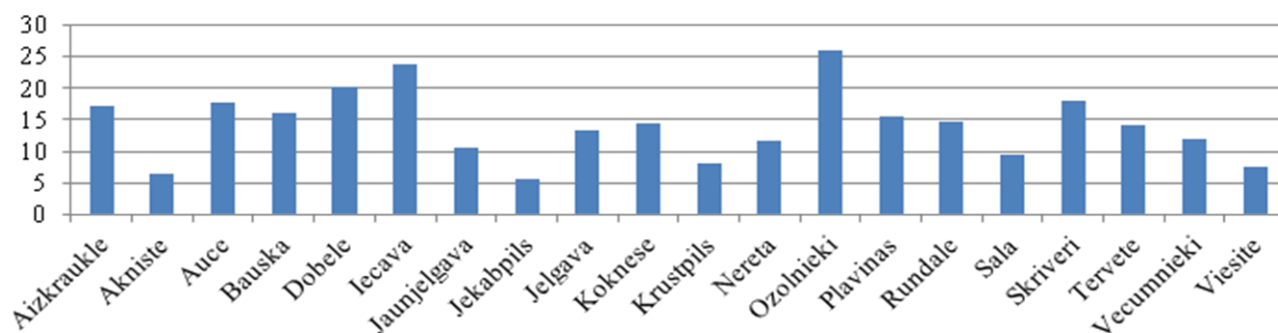


Figure 3. Percentage of the knowledge-based economic segment in the economy of Zemgale region municipalities in 2015

Source: authors' calculations based on LURSOFT data

The data were analysed taking into account two segments of the knowledge-based economy. The segments are comprised of high and medium high technology enterprises and knowledge-intensive services (Eurostat).

Table 4. Increase in the number of knowledge-based economy enterprises (%) in Zemgale region in the period 2009- 2015

	Enterprises		Employees		Net turnover	
	HT, MHT	Scientific services	HT, MHT	Scientific services	HT, MHT	Scientific services
Jelgava	136.4	204.2	65.8	54.2	370.5	148.4
Jekabpils	150.0	190.4	366.0	326.2	210.4	124.5
Municipalities	164.0	244.4	102.2	131.8	118.0	157.2

Source: authors' calculations based on Lursoft data

The Table 4 data indicate that growth was reported in both economic segments in Zemgale region. A LURSOFT data analysis performed by the authors also give insight into both segments of the knowledge-based economy broken down by detail, placing a special focus on the researched processes in the twenty rural municipalities of Zemgale region.

According to the LURSOFT data, the number of high and medium high technology enterprises doubled in the municipalities of Zemgale region over seven years. It has to be especially stressed that the number of high technology enterprises increased from two to six, and their area of activity also increased – from two to five municipalities.

Table 5. Increase in the number of knowledge-based economy enterprises in Zemgale region municipalities in the period 2009- 2015

Knowledge-based manufacturing	2009	2015	Growth
High Tech			
C21.20 Manufacture of pharmaceutical preparations	0	1	+1
C26 Manufacture of computer, electronic and optical products	2	5	+3
Media High Tech			
C20 Manufacture of chemicals and chemical products	10	20	+10
C27 Manufacture of electrical equipment	1	1	=
C28 Manufacture of machinery and equipment n.e.c.	7	12	+5
C29 Manufacture of motor vehicles, trailers and semi-trailers	1	2	+1
	21	41	+20

Source: authors' calculations based on Lursoft data

As shown in Table 5, in 2015 in the segment of high and medium high technology, two major kinds of economic activity were the most apparent in the municipalities of Zemgale region:

- manufacture of chemicals and chemical products (C20) and
- manufacture of machinery and equipment n.e.c. (C28),
- manufacture of computer, electronic and optical products (C26).

Growth in the mentioned tree kinds of economic activity was the most significant. However, just like any phenomenon, high and medium high technology businesses did not expand homogenously in all the municipalities. At least five scenarios of progress for the knowledge-based economy could be highlighted (Table 6).

Table 6. Spatial perspective of growth in the knowledge-based economy

Group	Division of municipalities by indication	2009	2015	Municipalities and their number
1	Municipalities where this group of enterprises operated in 2009, continued operating in 2015, yet the number of enterprises has not changed	7	7	Two municipalities – Auce, Ozolnieki
2	Municipalities where this group of enterprises operated in 2009, but the number of enterprises significantly increased until 2015	9	20	Four municipalities – Bauska, Dobeles, Skrīveri, Vecumnieki
3	Municipalities where this group of enterprises operated in 2009, but the number of enterprises decreased or the group stopped its activity until 2015	5	2	Two municipalities – Aizkraukle, Sala
4	Municipalities where this group of enterprises did not exist in 2009, but it emerged until 2015	0	12	Six municipalities – Iecava, Jekabpils, Jelgava, Krustpils, Plavinas, Viesīte
5	Municipalities where this group of enterprises did not exist in 2009 and has not emerged until 2015	0	0	Six municipalities – Aknīste, Jaunjelgava, Koknese, Nereta, Rundale, Tervete
		21	41	20 municipalities

Source: authors' calculations based on Lursoft data

The facts acquired in the analysis raise a number of questions, the answers on which have to be given in further research:

- to what extent the experience built up in the particular area affects this process, which refers to Group 2 of municipalities;
- how progress in the segment of high and medium high technology businesses affects the municipality's natural and financial and especially human resources (Groups 4 and 5);
- what kind of cooperation between scientists and practitioners is necessary in order to contribute to the establishment of high and medium high technology enterprises in the rural space of the country.

The Table 6 data indicate such a possibility, yet the problem is how to increase the pace of enterprise establishment.

At the same time, the Table 4 data indicate that particularly the number of providers of knowledge-intensive services increased both in regional towns and rural municipalities. However, it should be taken into consideration that, according to the Eurostat methodology, knowledge-intensive services are classified into four categories: first, services directly associated with high- and medium high-technology; second, market services; third, financial services; fourth, services of social nature, such as educational, cultural, sports and entertainment services, Eurostat (Table 4).

Table 7. Increase in the output of knowledge-intensive services in Zemgale region municipalities in the period 2009- 2015

Group	The knowledge-intensive services	2009	2015	Growth
1	High-tech knowledge-intensive services	38	135	3.6x
2	Knowledge-intensive market services	135	643	4.0x
3	Knowledge-intensive financial services	27	61	2.3x
4	Other knowledge-intensive services	80	778	9.7x
	Together	280	1617	5.8x

Source: authors' calculations based on Lursoft data

In the period of analysis, the number of HT and MHT enterprises almost doubled, while the number of providers of knowledge-intensive services grew at a considerably higher rate. Their number in Zemgale region rose almost

six times. The maximum increase occurred in the segment of social services, which includes education, healthcare and leisure-time spending activities.

Since the 1st group of services is the one that is directly associated high technology and high knowledge intensity, while the 2nd and 3rd ones represent support service activities, the authors performed an analysis of the internal structure of knowledge-intensive services and of trends in structural change. The analysis of the data for the municipalities of Zemgale region revealed two not very positive results. First, in 2009, the first three groups of services comprised 71.4% of the total share of knowledge-intensive services, while the 4th group made up only 28.6%. However, in 2015, the first three groups accounted for only 51.9% of the total share of knowledge-intensive services, while the 4th group of services increased its share to 48.1%.

Referring back to the perspective of vertical growth, one can find that in the period 2009-2015, the share of the first three groups of knowledge-intensive services rose 4.2 times, while the number of providers of 4th group services rose 9.7 times. To assess the vertical and structural changes, the authors decided to perform one more calculation. Jelgava municipality was the only one where no high and medium high technology enterprises were reported in 2009. Until 2015, five such enterprises emerged, and part of them demonstrated an increase in net turnover, i.e. they were successful. The distribution of knowledge-intensive services by group in Jelgava municipality in 2009 and 2015 was as follows:

- 1 group - 2009 ----17.2%; 2015 -----17.1%;
- 2 group - 2009 ---- 55.2%; 2015 ---- 57.1%;
- 3 group – 2009 ---- 6.9%; 2015 ---- 1.4%;
- 4 group - 2009 ---- 20.7%; 2015 ---- 24.4%.

The distribution of knowledge-intensive services did not change significantly.

Proportion of 1 – 3 group 2009 - -- 79.3%; 4 group ---- 20.7%

1 – 3 group 2015 ---- 75.6%; 4 group ---- 24.4%

It has to be concluded that in Jelgava municipality knowledge-intensive services (main ones and support service activities) maximally contribute to the knowledge-economy. In further research, of course, it has to be made clear whether this is an exception or an indication of interrelation between the two segments of a knowledge-based economy and how significant it is. Prerequisites for the successful entry of the KBE segment are the availability of both tangible and intangible capital. Intangible capital, more generally, knowledge capital should be such an important driver of modern economic growth (Corrado et al. 2006; Kendiukhov, Tvaronavičienė 2017). An analysis of the indicators of Zemgale region's municipalities showed that depopulation did not directly correlate with a decline in economic activity – the situation was even vice versa. The population in a municipality decreased, while economic activity in it increased. It was observed in most of the region's municipalities (Table 8).

Table 8. Comparison of changes in the population and the number of market sector statistical units per 1000 capita in the period 2009-2015 (in %-points)

<p>1. Significant increase in the population Ozolnieki (+3.9) <u>Significant increase in economically active statistical units</u> Bauska (+88.5), Iecava (+107.69), Jaunjelgava (+74.36), Nereta (+65.12), Ozolnieki (+64.3), Plavinas (+76.5), Rundale (+114.3), Skriversi (+116.13), Vecumnieki (+117.2)</p>	<p>2. Above-average decrease in the population Iecava (-4.5) <u>Above-average increase in economically active statistical units</u> Aizkraukle (+40.4), Auce (+47.4), Dobele (+42.2), Jekabpils (+11.7), Jelgava (+29.5), Koknese (+47.8), Tervete (+40.4), Viesite (+32.8)</p>
<p>3. Below-average decrease in the population Aizkraukle (-9.56), Akniste (-8.85), Bauska (-8.48), Dobele (-8.0), Jaunjelgava (-6.3), Jelgava (-7.6), Koknese (-5.5), Krustpils (-6.6), Rundale (-9.5), Sala (-8.8), Skriversi (-7.4), Vecumnieki (-8.4) <u>Below-average increase in economically active statistical units</u> Krustpils (+10.8), Salas (+1.26)</p>	<p>4. Significant decrease in the population Auce (-11.6), Jekabpils (-11.7), Nereta (-10.1), Plavinas (-10.7), Tervete (-10.4), Viesite (-10.6) <u>Insignificant increase in economically active statistical units</u> Akniste (-2.9)</p>

Source: authors' calculations based on LURSOFT data

The survey of experts representing the regions focused on the skills of local governments to perform not only administrative functions but also actively implement the role of the leader of a community, mobilising residents for the multifaceted enhancement of their common life space. Smart growth is possible only if local residents are ready for change in their economic and social life and in the surrounding environment (Rivza et al. 2016; Kruzmetra, Rivza 2015). Logically, a need emerges to perform a further in-depth examination of the entire range and variations of local government activities done to maximally contribute to the viability of local space, engaging residents in the formation of a smart territory. The public has to accept the truth that the 21st century is a period of fast change, and it equally relates to urban and rural territories (Kruzmetra 2011).

Conclusions

1. Upward trends in economic processes were observed in Latvia as a whole in the period of analysis. The growth of entrepreneurship took place both in the cities of national significance and rural areas consisting of 110 municipalities; besides, the growth was faster in the rural areas than in the cities. This is, of course, a positive trend. The knowledge-based economic segment grew faster than the whole economy did. If taking into consideration the deterioration of the Global Competitiveness Index for Latvia and the fact that the country lagged behind the other Baltic States, the growth pace has to be regarded as insufficient.
2. At regional level, economic growth in the national economy as a whole was observed in all the regions, and the growth in all the regions was higher than that in the cities. However, the growth trends began differing. Higher growth rates both in the whole economy and in the knowledge-based economic segment in terms of numbers of enterprises and employees were reported in Pierīga region, which were higher than those in the cities. Knowledge-based services maximally contributed to this trend in the region, as the proportion of the services in the KBE segment in Pierīga region was the highest among the regions. However, a comparison of increases in net turnover per employee in the whole economy and in the knowledge-based economic segment in the regions revealed that the highest increase was reported in Kurzeme region, which makes us consider that the new economic pattern in this part of Latvia yields higher returns. This implies that when promoting an increase in the knowledge-based economic segment, the focus has to be placed on quality instead of quantity.
3. The research clearly showed that an analysis of progress in smart growth and the viability of rural space at regional level does not yet provide the real implementation of the local approach strategy, as municipalities within a region differed in a number of essential indicators. First, there were differences in the proportion of economic segments between manufacturing or agriculture and forestry, as the segment of services dominated in any municipality. Second, there were internal differences in the KBE segment, which was represented by only knowledge-based services or by both the mentioned services and products produced by HT and MHT enterprises that made a greater financial contribution than service providers. Municipalities currently focus on knowledge-intensive services, less focus is placed on high-tech and medium-high-tech manufacturing industries. A logical question arises – how to solve this problem.
4. The research findings made during the present research make the authors focus on the effects of intangible capital on the vitality and viability of rural areas in their future research in order to make progress towards the formation of smart space, as communities build capacity for smart growth with the public, private and non-profit sectors.

Recommendations – proposals

1. With regard to scientific research:
The current research results mostly give an opportunity to describe what occurs, where it occurs and how fast it occurs. However, it is more important to find answers to the following questions – why it occurs particularly in this territory, is it sustainable and how it affects the viability of rural space? Therefore, the started research direction has to be continued, seeking answers to such questions as:

--what are the determinant factors for the growth of economic activity if there is economic growth and, at the same time, depopulation in a territory;

- what are the most appropriate economic development directions for a knowledge-based economy in the rural space, which would give an opportunity to mobilise the resources of the territory and use the latest technologies in order to move towards a bioeconomy and a circular economy;

-what could be the most profitable niche products for entering the global market because the domestic market is constrained.

2. With regard to practical activity:

- to expand cooperation with scientists of other countries in order to identify best practices for maintaining the viability of rural areas and to seek new ways of tackling the problem;

- expand cooperation among scientists and the “growth agents” of rural space through the exchange of opinions and discussion, which would give a cognitive vision of the on-going processes in the rural space;

Politicians, government officials as well as rural residents do not follow findings in scientific publications, while statistical publications provide information only about regions and not local territorial units – municipalities –, which the rural space of Latvia is comprised of. The information is necessary for the development of a smart growth strategy and the implementation of it in practice, and the information could be provided by research studies.

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Aknowledgements

This research was supported by the National Research Programme ECOSOC-LV project 5.2.3 „Rural and Regional Development Processes and Opportunities in Latvia

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USERFOCUS - TOOL FOR CRIMINALITY CONTROL OF SOCIAL NETWORKS AT BOTH THE LOCAL AND INTERNATIONAL LEVEL

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Received 17 June 2017; accepted 20 October 2017; published 29 December 2017

Abstract. There are many benefits, but also risks related to using the social networks. Among the benefits of social networking belong an easy way to be kept in touch, sharing news, photos, videos and statuses with friends, colleagues, but also meeting new people with similar interests. The risks include, in particular, loss of privacy, misuse of shared records, abuse of personal data, unknown real identity of social network members, and even addiction on social networking. The paper focuses the need to invent a complex tool of prevention in the field of controlling the criminality in particular the users of social networks. In the papers is introduced a proposals how to develop a specific prevention tool called "Userfocus". Further, there are described techniques to implement this tool into the social networks. The work comprises a research (questionnaire survey) aimed at users of social networks and their understanding of prevention in social networks. The results showed that the communication (interaction) among social network users is a main reason to actively use those services, loss of privacy is the most negative aspect of social networking, the perceiving of users related to the fight against anti-social networks is mostly negative, they strongly agree with the necessity to apply preventive methods focusing the user of social networks and consider the developing the preventive techniques and their application by competent authorities in prevention of crime on social network.

Keywords: social network infiltration, Userfocus, profile, intervention, anonymity, security

Reference to this paper should be made as follows: Šišulák, S. 2017. Userfocus - tool for criminality control of social networks at both the local and international level, *Entrepreneurship and Sustainability Issues* 5(2): 297-314. [http://doi.org/10.9770/jesi.2017.5.2\(10\)](http://doi.org/10.9770/jesi.2017.5.2(10))

JEL Classifications: K14, C88

1. Introduction

Crime prevention is a very important tool in fighting the crime and other antisocial activities. The better chosen form of prevention results in more effective fight against crime. Prevention tools, in general, must reflect the evolution of society and use the opportunities that generate generational progress, whether at technical, social or economic level. This times offer a great deal of information, which the individual, as a cell of the society, is not able to process in a quality, to provide him with adequate value. It was therefore necessary to develop a system capable to store the information in sufficient quality and to create useful databases, which concentrate the quantity and can classify it, so the user, respectively the end user of information is able to quickly and easily find what he need. Today it can be said it is not so important to know the information, but it is important to know where to find this information. Large amount of easily available information allows the communication between the users, who seek this information. Over the last decade, the technologies that were primarily developed for communication among people, they are well advanced to create a more global structure, which can be called a social network.

Now, we do not talk explicitly about online social networks, but the complex structure of the relationships that are created without limitations of space and social disparities, that are removed due to the possibilities of new technologies. The virtual reality is a phenomenon of the 21st century and we cannot say that the growing trend of Internet and online social networks in particular, will shortly have decreasing trend. But also the freedom in communication and diffusion of technology into everyday life has its pitfalls and dangers that without the proper protection of the individuals themselves will grow. The use of new technologies often brings situations that directly threaten the safety and even the lives, health and property of individuals. In connection with the development of new communication tools, particularly via social networks, there comes to the fore the question whether the global nature of this phenomenon cannot be used as a mean of targeted crime prevention. Crime prevention is a very specific discipline, which must respond to the new criminal demonstrations, not only applying the theoretical knowledge, but mainly by practical fighting the crime in its origin environment. This fact may be extended also to another fact that crime prevention can be primarily effective, respectively more effective, even in an environment that does not evoke the individuals themselves to be in a criminal environment outwards. This means that the prevention of crime against the individual types of crime can be more effective if its tools would be used appropriately and properly in an environment, in which the individual feels safe and well, and therefore is not under the pressure of disturbing circumstances, e.g. under the impacts of crime on his live.

1.1. Crime prevention

The society as a whole needs a set of specific rules to ensure its smooth operation and fulfillment of elementary needs of its individual parts, especially people themselves, for its function. However, it is obvious that in such a complex social structure of human society, which is influenced by customs, traditions, religion and other accepted opinions, arise situations which result in the violation of not only the established moral and ethical rules, but also in illegal activity, enshrined in various legal norms.

Therefore it is necessary to adapt the social relations by legal regulations and other generally binding regulations which violation is followed by sanctions or criminal penalties. Such a procedure of authorized bodies is important and irreplaceable from the society protection point of view, but broadly speaking, it is necessary to look at the possibility of preventing the illegal activity, in particular its most serious forms. In this case we are talking about the crime prevention or about the prevention of illegal activity.

Crime prevention can be generally defined as a set of social and legislative measures and strategies aimed at reducing the risk of illegal activity and their potential harmful effects on society and individuals. The crime prevention, in general, involves a complex structure of institutions and processes, involving not only the state authorities, but also non-governmental organizations and individuals. The aim of this process is particularly the positive impact on the individual subjects of society not to commit the illegal activities and vice versa to avoid becoming a victim of anti-social activities.

The crime prevention can be approached in terms of different models and typologies. There should be noted especially the most basic hierarchy that includes:

Primary prevention – it identifies the assumptions, causes and conditions in the social environment that creates the opportunities for committing the illegal activities and further defines procedures that are effective to be used in coping with the adverse events. It operates globally and generally.

Secondary prevention – it includes early identification of potential offenders on the basis of certain characteristics and predispositions in risk groups and aims at acting in the way to have positive impact on the social environment to avoid the harmful consequences to the various subjects.

Tertiary prevention – it has an influence on the subjects that have previously illegal committed and works toward preventing a repetition of the criminal phenomena in the social environment, in principle.

Such a division of the types of prevention can be applied globally. However, the prevention structure includes much wider typology that is developing on the basis of the development of the society through social, legislative and economic perspective. Using a more specific division we come to the clear conclusion that the use of primary, secondary and tertiary prevention features can be implemented in various subsystems of different typologies of crime prevention in a horizontal plane. Nowadays, we can define several ways to approach prevention alone, each one has its irreplaceable role in prevention policy and the particular approaches are interrelated. Thus, we can define:

Criminal Justice Crime Prevention – specific kind of prevention, directly joining the crime prevention and repression into the system of crime control by the competent authorities. This type of prevention is active only after engaging in illegal activity and its mission is to eliminate another potential committing a crime not only by the offender himself, but also by others, uninvolved actors in the criminal legal process. In particular, it is the use of such tools, which use alone deter the committing of illegal activity, particularly the type of punishment, its fair imposition, efficiency and speed of the criminal process, causality between the illegal act accomplishment and subsequent integration into the society, etc. This is a very difficult process of creating such tools to be sufficiently effective, but legislative negotiable. Such prevention is directly dependent on legal norms of particular states and their national criminal law policy.

Situational crime prevention – form of prevention used in a social environment in specific situation or event. Generally, it is focused on the prevention of anti-social activities in the risk environment, but it is important to exploit its full potential, namely the development of a preventive strategy in a particular environment, which includes the specific environment and subjects whose behavior is not as much variable as at the global level. Situational prevention is very good to use, e.g. in the environment of the Internet, social networks, but also in the communities.

Crime Prevention Through Environmental Design – this type of prevention is very similar to situational prevention, but it is focused on the fact that crime is not distributed linearly throughout the territory of a country, respectively globally, but there are so called "hot-spots", where there is an assumption of increased incidence of criminal phenomena, based on social, economic, political and other influences. It is therefore necessary to focus not only on the positive influence of subjects in this area to commit illegal activities, but also on the preventive action in places that may have the potential to become such "hot spots" in the future.

Community and Social Crime Prevention – based on the premise that crime affects many social, legislative, economic factors that can be influenced by effective prevention tools to reduce the risk of committing crime and its prevention. We are talking mainly about direct changes of the poor social and economic factors in risk groups as well as educational and legislative activities. The most effective prevention strategies in this area are strategies targeted at specific disadvantaged or vulnerable community subjects. A prerequisite of such prevention is to strengthen the community through specific programs and selected services provided in order to raise awareness of the risks and consequences of the illegal activity and even the risk reduction in relation to potential offenders.

Individual systems for the prevention of crime and their very specific subsystems include comprehensive preventive strategies and measures that result in prevention projects and programs, which are followed by the specific prevention activities and actions, and imply different prevention tools and techniques of crime control. If we want to create an effective comprehensive or partial tool for crime prevention, it is necessary to create a strategy with a clear focus and vision that is long-lasting and has a definite aim.

Advanced technologies of communication, implemented in cyberspace are specific phenomena and therefore prevention in this space must reflect these specificities and to establish its direct activity on the overall condition

of the structure and in the cyberspace. It is therefore necessary not only to develop strategies and measures, but also specific tools used for immediate control of crime, fighting it and development of educational solutions to users. However, it is not necessary to use a global instrument, but rather specific, situational applications, aimed at a specific group of users or individuals themselves. In this group of preventive tools, respectively prevention activities, the Userfocus can be included as a tool for direct performance of prevention in the cyberspace, particularly in the social networks environment. At the same time, it can be subsumed under the situational crime prevention, operating in a certain specific location (social network) in real time.

1.2 Crime prevention in cyberspace

Crime prevention, in general, is not only prevention of the commission of illegal activities, but it is rather large methodical, empirical and training institute, which is based on knowledge, experience and practice, implementing the appropriate tools and techniques in the global and critical environments. The cyberspace can be assigned to those critical environments. It is a virtual space that is far beyond the possibilities of the real "material world", with its specific processes. Based on the past experience and trends, there is no doubt that it is possible to commit a number of illegal activities in this environment, which amount and intensity increases in proportion to the expansion of this environment among the users and also with the innovation and the development of advanced communication and information technologies. It is therefore important to highlight not only the reasons, the conditions and the possibility of committing the illegal activities in the cyberspace, but mainly the ways to act on users preventively, using the appropriately selected tools and techniques.

In a virtual environment, it is necessary to approach the prevention in correlation with the specificities it brings. However, it is important that the procedures of the individual competent authorities are based on a validated methodology from available information sources verified in practice. Here comes the necessity of aggregating the knowledge and assessment of their applicability in the real prevention, applied to users in cyberspace. Definition of prevention, or its individual tools, is an important milestone in the effective fight against illegal activities of individuals or groups. The logical consequence of these facts is the created summary of knowledge published in the field of crime prevention in cyberspace.

Smyth (2005) in her essay "Crime prevention and community safety: From realspace to cyberspace" introduced the need to prevent crime in cyberspace, noting applicability of preventive tools used in real space to be applied also in the virtual one. She gives an emphasis on so-called "community policing", public supervision of cyberspace in co-operation with the competent authorities, recalling also the legal or application problems, posed by the implementation of preventive tools in the virtual space.

According to Sadhukhan et al. (2015), the attacks in the cyberspace pay attention mainly due to the risk of violation of privacy or confidential security of sensitive information, as well as financial transactions, but does not explicitly need to focus on such mechanisms and crime prevention methods, which are generated from the perspective of the attacker. It considers the protection of cyberspace to be an obstacle rather than an opportunity for the offenders of illegal activity.

Work of Somer, Hallaq and Watson (2016) presented at the "European Conference on Information Warfare and Security" is aimed at understanding the strategic importance of cyberspace and its use in many areas of life. Those are logically also under attack of individuals or groups, who act illegally in this environment. It also shows a way of using areas outside the cyberspace, in crime prevention, right in the risk environment. According to the authors, using the mapping of attackers procedures and monitoring of methods of attack, it is possible to properly understand the actions of offenders and then to target individual tools and techniques on the prevention of specific issues.

Akatyev and James (2015) expressed the need to focus not only on the definition of "cyber war" and the corresponding response of the competent authorities of the state of crime in the virtual environment, but especially on "cyber peacekeeping", thus keeping the "peace" conditions in cyberspace, endeavoring to define this term as the possibility of preventing illegal activity in this area.

"Hacking and Cyber Crimes: A Preventive Guide" created by Moustafa et al. (2013), defined the trends in web and network security in the context of detecting and preventing crime in cyberspace. This study analyses the important types of cybercrime such as hacking, Denial of Service (DoS), the spread of computer viruses, digital piracy, credit card fraud, spam, phishing, spoofing and social engineering, and proposes different countermeasures tools in terms of prevention and repression.

For prevention of crime in cyberspace, Sekgwathe and Talib (2011) expressed the need to detect and protect the cyberspace against the cyber terrorism, outlining the basic procedures of offenders in the attacks, as well as their motivation. The paper published in "Communications in Computer and Information Science", is aimed at provision of a broad overview of the challenges, facing the world of cybercrime and the problems faced by law enforcement agencies, and experts in the field of information and communication technologies security. But they also point to the benefits that can be obtained from the international community and of course from the public and private sector in the prevention, detection and investigation of cybercrime.

Looking at the above mentioned publications, there is a clear need in the definition of crime prevention in the cyberspace as well as creating the theoretical basis for new prevention tools, which must be the result of real experience of users and competent authorities. The possibilities that virtual reality offers, must not only be observed and described, but also applied in the fight against the anti-social activities.

A real and useful tool in this way is the Userfocus. The aim of this paper is not only to describe it precisely and theoretically, but also to give real examples of its use in cyberspace, particularly in the area of social networks. Social networks represent a special environment that requires a specific approach, due to the number and variety of users, and in particular the application parts related to social networks, high complexity. It is an interconnected environment with strong social background that reacts to any change or implementation of new technology to their specific way.

1.3. Userfocus

The crime prevention tools, as was mentioned above, must, in a global context of the illegal activity, directly reflect the real possibilities for the perpetrating of such activity, and thereby create tools that can effectively prevent the manifestation of the illegality elements. Following this idea, we cannot overlook the fact, that in present technologically advanced period, the concept of a crime prevention tool has a new dimension. The use of virtual tools and social networks for communication, as the prevention techniques of the primary and secondary prevention, is an important factor for the realization of power and possibilities of the virtual environment, in the context of preventing anti-social activities. So, if we focus on the socially most important environments in the virtual environment, i.e. social networks, we can talk about new opportunities for prevention, using an environment of social networks and its original tools, that were developed for the purpose of communication and social interaction among users and virtual environment, including its capabilities. In terms of these facts, there is a question, how it is possible to create a framework of measures in the sphere of crime prevention, which would comprehensively cover the use of social networks and virtual environments for instant communication of user, completed with prevention tools. This issue cannot be considered as the standard issue of development of new preventive techniques and tools, because in this perception the non-standard tools application should be considered, that do not interfere with the prevention of crime in general. In terms of the development of crime, in particular the development of illegal activities in the virtual environment and via information and communication technologies, it is necessary to establish a concept that would reflect this development, which practically will be

capable to effectively fight against criminal manifestations in such environment. However, with crime on social networks, such as computer and information criminality, the certain patterns of reflection depending on the virtual environment are changing.

This is not a fundamental proposition of criminology, which states that every object is reflected to the surrounding environment and to other objects and this process is mutual for all objects in the environment (Krajnik, 2005). It is rather complexity and demandingness, which should be considered in documenting the incident site, which a social network can undoubtedly be. However, we cannot state the conclusion that the term "prevention technique" is the only best solution for the future, since the environment and signs of anti-social activities are proportionally developed, too. Therefore, it is necessary to start with a preventive tool that embraces a wide range of users and is able to individualize prevention to a particular user at the same time. Userfocus concept or focus on specific user includes a preventive tool and the related preventive techniques, which implies using adequate possibilities of social networks and other virtual resources for the prevention of anti-social activities at each user individually. It means maximizing the potential use of preventive tool, following the development of individual techniques for a particular user or group of users with the same or similar characteristics.

Based on this definition the Userfocus may specified and precisely defined as a crime prevention tool, used to control, operata and evaluate the prevention techniques in the environment of social networks. The Userfocus as such can be seen in the two spectra, in the narrower and wider, while the narrower is talking about strictly focusing preventive techniques for a specific user (i.e. "superuserfocus") and wider is talking about a set of preventive techniques that are used on social networks in preventing the commission of anti-social activities of their users. Social network, in this definition, is specified as an object of the Userfocus, the tool of prevention, and the user as a specified subject. Their properties can not be generalized, because in cyberspace, there are so many types of social networks with different focus and different users, who behave differently in the specific social networks, even if it is the user, who use multiple social networks. Therefore, we can talk about these two major components of the Userfocus concept, the special subject and object, which are specific just for this prevention tool.

Looking at the complexity of the structure and the amount of data contained in the social network, it is required to view the issue of prevention in this area as a complex problem that requires well-defined processes and structures, which output is a comprehensive tool, serving fulfilling the needs for harmonization of preventive practices in the social networks environment. In comparison of the above mentioned and the concept of Userfocus itself, we can say that this preventive instrument fulfills the conditions imposed on it. It is necessary to take this issue as a dynamic problem, constantly evolving, along with the content, and application part of the social networks.

The socialization of the society via social networks creates wide virtual space that is attended by a large number of people who have exchanged a myriad of information. Right this activity is the main source for the formation of anti-social activities and dissemination of sophisticated and latent criminality, while the possibilities and abilities of users are increasing in proportion to the development of new technologies that the social networks reflect. It is the result of the efforts of social networks to maintain their potential on market with information and information channels, while this market, deployed mainly in virtual space, we can consider for the strongest and most widely used in this context.

Userfocus as such should be based on some basic facts and on realistic tools that on social networks work for holding users interest. In particular, those are the marketing and media tools, application parts of social networks and interest groups that bring together a large number of users. Userfocus can be called prevention tool that uses specific techniques, which are developed in accordance to the interests and needs. Their number cannot be determined, and their development should reflect the development of information technology and in particular the development of the social networks. The basic principles of Userfocus, as a means of prevention, are:

1. *Focus on a specific user and user groups* – the principle of Userfocus is precisely to develop such prevention techniques to reach a large number of users, while they must be individually designed for an individual or a group with the same or similar characteristics. Another important aspect of the Userfocus is the real focus on prevention in general, but also specifically in the environment with the great potential of major crime situations.

2. *Use of existing effective tools for social networks* – the interest of users of social networks and their tools is enormously large, which can be seen mainly on the fact that the need to be on one of the social networks and actively establish contacts on it, it is considered to be a standard today. Today's mobile platforms that are a common part of our lives (e.g. mobile phones, tablets, personal computers, laptops and even watches) practically enforce, with its predefined application, often to use the social networking services, because the applications are included directly in the software. This fact is well understood by the groups that need to promote their products or services and therefore have developed a tool, applying which they can successfully reach a large number of users, with minimal effort and investments. In order to effectively preventatively operate in a particular environment, it is necessary to use tools which are effective in that environment. By the modifications of particular effective tools for the prevention needs, respectively Userfocus itself, we can obtain user-friendly and interesting techniques that can reach a large number of users and achieve real results.

3. *Direct communications with users* – Userfocus should provide preventive techniques consisting of direct application part and the users of the social networks would be motivated to reflect on the primary objective of the specific preventive techniques, by using this part. It means to develop a user interesting and effective preventive tools, using which the user would better understand the prevention principle, create a positive relation to the prevention of anti-social activities, and would be motivated enough to be able to continue to act preventively to his surroundings. It is important to note that such prevention should be focused on a particular type of anti-social activities, and embedded in a specific environment, what is a designation of the Userfocus, as a mean of prevention.

4. *Complexity, individuality and flexibility of preventive techniques* – The most important aspect of Userfocus is the individuality of its techniques. This individuality is mainly based on the diversification of social networking environment and its users. This fact means that it is not possible to develop a general preventive tool that would effectively cover such a large amount of users and still really operate against anti-social activities. However, all techniques that Userfocus contains represent a basis for building a comprehensive system that has its own rules and aspects, focusing mainly on primary and secondary prevention. It is also important that the Userfocus reflects the development of modern technology and the progress of social networks in the sphere of new tools and application parts development.

5. *Evaluation of the real results* – if we would like to develop a real functioning tool of crime prevention, it must be developed in terms that this tool is measurable and evaluable. The Userfocus must therefore be designed so that the results can be statistically evaluated. It means not only to evaluate how many users were affected by each technology, but particularly the evaluation of the state and development of anti-social activities in the environment, or between users, where each technique was focused.

The purpose of these principles is to develop a new preventive tool that can operate effectively in a wide range of users, while also develop such preventive techniques, which are actually measurable. To properly define the Userfocus, it is important to build a comprehensive system for defining users into specific categories and then develop a system of individual preventive techniques. It is also necessary to point out the key features of the *Userfocus in the whole context of prevention* – the Userfocus is not just a method of crime prevention in the environment of social networks, but primarily an effective preventive tool in the global aspects to perpetrate crimes as such. It should be mentioned, however, that this type of crime, which includes various illegal activity manifestations, has its own specificities that characterize it (Metenko et al., 2004).

1.4. Target groups

The Userfocus as a preventive tool should pre-eminently be focused on the user. We cannot look at this issue globally and develop techniques that will try to cover a wide variety of users, while their outcome will be vaguely measurable, due to the wide scope. It is therefore necessary to diversify the target group of prevention in this case to the categories, related to the certain characteristics of the individual users. The ideal application of the Userfocus is specifically focusing the individual users and setting such techniques that reflect the interests, personality and environment of users, not only from virtual, but also real life. In this case, we can talk about technically very difficult process that must be developed based on the experiences and techniques results, focusing the user groups. These can be divided to the following categories:

Groups divided by the age – one of most elementar divisions, which is based on the age structure of users and divide them into the groups according to age. The Userfocus on social networks can create very specific age division, even down to the individual user age and this way to direct the specific technique for different age groups. Age is an important factor in developing preventive techniques, as understanding and perception of prevention is commonly based on the user age. Therefore the age as a factor in the use of preventive techniques cannot be ignored, even when it is used for other classifications. It is also an important factor in determining the priorities in the prevention as such, respectively in determining the appropriate techniques based on risk factors and risk groups. Age also determines the number and frequency of preventive techniques applications within the Userfocus. With regards to social networks, this means that the most important groups - children and young people - in terms of prevention must receive much more real prevention through social networks. Also the bullying via the information and communication technologies has its origins in the opportunities that present time provides mainly for young people (Tomkova, 2016).

Groups divided by the gender – gender is also an essential factor in the division of users to groups. In real context, we should come out from the fact that one group, the women, are more vulnerable, regarding the violent crime in particular. In terms of gender, there can be distinguished only two groups, while we should not forget the importance of distinguishing the prevention among women and men.

Groups divided by the interests – in the context of social networks we can talk about groups of people, where the Userfocus preventive techniques can be applied most effectively. Since in the area of social networks, there are so many users with different interests, it logically resulted in their associating in this environment and creation of groups, where they can share experiences, communicate with other users, etc. The division of interest to subgroups and setting the preventive techniques of the Userfocus, depending on the risks and problems of particular interests logically result in a very effective technique that can directly intervene and operate specifically on a large number of users with real results. However, the groups of interests should be classified to risky and less risky. Risky interest groups are particularly extremist groups, groups that promote criminal or other antisocial activities and so-called group "on the sharp", whose activity is not illegal, but live in an environment in which the users can create values and opinions that can affect certain user groups inappropriately.

Groups divided according to the social environment – in the Userfocus, it is the most demanding division / classification of users, since the social networks are not yet able to define the real social status and environment of their users. However, the development of technology for social networks does not exclude the possibility that the users would eventually be divided into social groups in the future. For the Userfocus tool it means it will have particularly qualitatively better application of its preventive techniques, too. Various social groups need different preventive techniques and different prevention scope. Diversification of social user groups is particularly important in relation to individual types of crime and techniques that can operate against perpetrating the anti-social activities. This division should not be perceived as casting of individual users, but there must be comprehensively applied the potential, which in future will bring social networking tools for more effective prevention in this environment.

Group divided by the quantity of contacts – this division is very specific and reflects the socialization of users on social networks, in particular. The division based on the quantity of contacts is aimed mainly at preventing the perpetration of crime and other antisocial activities on social networks, because there moves a large number of perpetrators of criminal frauds and other criminal and illegal acts in this environment, who use suggestive techniques to accomplished their deeds, where just a user of social networks is suffered. A large number of contacts and their very high anonymity can cause many problems to the users of social networks and therefore is important very sophisticatedly to apply the social networks tools for effective prevention, measurable particularly in terms the users begin to consider adding the suspicious or unknown people to their contacts.

Groups divided by the education – education is a measurable feature, but does not reflect the factual level of education and intelligence of individual users. Therefore, in this case is difficult to develop preventive techniques to effectively engage a wider range of users. But even education need not to be excluded in the dividing / classification of users, because it is a factor that affects the prevention and user communication settings applying various techniques.

Individual approach – in this case, we are not talking about the division of the users, but about the so-called perfect Userfocus, which techniques are created based on information from real and virtual life of individuals, who use the social networks. The basic principle of individual approach in the Userfocus is such a development of preventive techniques and outputs of these techniques that reflect the individual personality of each user. This process is a long-term goal of the Userfocus and is currently technologically very difficult. But this may be real in a short time, especially due to the progress of technology and social networking. In principle, the individual approach can be understood, in the context of existing social networking tools, as the establishment of properties by the above-mentioned and other classifications and harmonized into a complex system. However, it should be also mentioned that with the development of social networks also an individual approach to the user will be developed. It will result in the development of more effective preventive techniques of the Userfocus.

In the context of the Userfocus and dividing the users into groups, it should be noted that this issue is complex and should be therefore understood in relation to each other. This is an important point that should not be missed. The individual users must be classified into several groups, which clearly facilitate the individual approach to individual and creating of less wide broad preventive tools. The effectiveness of prevention on social networks must be measurable, while its outcomes will help to develop the preventive techniques and the Userfocus itself.

1.5. Userfocus techniques

In the context of the Userfocus preventive tool, it must be pointed out that without the adequate techniques serving for direct interaction with social network users there would be no reason to create any preventive tool. Therefore, it is necessary to create groups, types of techniques that should have specific outcomes and would create the concept of prevention in the social networks themselves. It is also necessary to develop techniques reflecting innovation on social networks and focusing the continuous progress of tools and applications used by social networks. The Userfocus techniques can be divided, based tools and applications used by social networks, as follows:

Techniques using interest groups – in this case we are talking mainly about the integration of prevention of certain interest to the community of people who join together and communicate based on the interest. If we define the risks associated with certain interests, you need to create a counterpart to the risk, which means creating, respectively of infiltration in which we wish to act preventively. When you create an interest group that focuses on crime prevention (especially, but also globally), it must be ensured clarity of thought, clarity of content, focus on active users and especially the motivation of association in the present group. Groups and pages on social networks are the best starting point for Userfocus as such and we can work on them with a wide range, and social

networking tools. In practical terms, we can say that the creation of such a group, and in particular properly managed can be achieved by grouping a large number of users with a specific interest, which can be defined as specific, and based on their presence in the group to act preventively using the techniques of Userfocus. Creating posts, status, add videos, creating applications and other social networking tools, in combination with appropriate techniques of Userfocus, can clearly define its objectives and measurable results clearly recorded.

Techniques using the social networking tools – following the group of previous techniques, it can be stated that the user integration itself is not enough to create a successful prevention tool. It is necessary to use all the tools that social networks offer and to implement the Userfocus techniques to these tools. Those are particularly the tools that are subjected to the interaction of users and also the possibility of the impact of these tools on the user, mainly the application parts of social networks, sites and groups. It should also be noted that the Userfocus must essentially reflect and react to new technological tools of social networks and to implement them in their techniques. Social networking tools, in this case, fulfill the role of direct contact and interaction with the user, while cannot be only a simple flow of information without feedback, but the effect of prevention using these tools with real results. Communication of users, with directly specified information on the prevention, means mutual interaction and creation of an environment, where the users think about the purpose of preventive techniques and especially about the fight against crime and other antisocial activities issues. Social networks tools provide options that are inherently unique, while the effect of prevention, respectively Userfocus, is practising every time the user logs on to the social network site. However, the main problem of this issue is the suitability and appropriateness of developing the preventive techniques and their application itself.

The use of marketing tools (Perina, 2011) – the massive expansion of social networking among common users logically resulted in entering the marketing and media tools into this environment and the creation of a specific market with advertising and promotional tools. These tools are used to distribute information about products and services, and that is why they must have their indisputable place in the context of the Userfocus. In this case we are not talking about the development of the Userfocus tools themselves, but rather about their faster and more efficient distribution among common users. Marketing tools have very strong distribution opportunities, but their use requires having expertise in marketing and funding. Therefore, it is necessary to use all available information and practical experience in advertising and marketing, to minimize costs for the Userfocus techniques distribution.

Gamification (Guštáfk, 2016) – this term refers to the use games in non-game environments. Gamification is a powerful way of positive influencing especially the children and youth, and especially in their natural environment, which is a social network undoubtedly. This method of interectation with users is a suitable technique, where it is necessary to recognize the need to create application part with the form and content to be preventive tool. The game focusing the preventive action should be easily manageable, logical, undemanding and motivating, whereby it is necessary to use a social networks application environment. This method is the most effective to distribute the game with prevention character to a wide range of users. Game, respectively playing the interactive games, can also be one of the factors to focus on a particular user. In case of the Userfocus, there should be created several types of games, which in the global aspects will cover more user groups and individuals and will have a higher success rate. Looking at the use of Gamification, e.g. in education, we can conclude that this method of Userfocus preventive techniques can have a very large percentage, as is understandable and acceptable for all types of users of social networks.

Special profiles – in this case we are talking mainly about using one of the tools of social networking and its assigning among the special techniques of the Userfocus. In practical terms it is to create the user – preventer profile, who, based on his active influence on the users, creates a preventive effect. In particular, he comments the events on the social network, communicates with users, adds the positive contributions and statuses - in terms of crime prevention, etc. The main feature of the special profile is mainly the credibility, because also via the Userfocus, there should be pointed out the screening of their own contacts with specialized profiles, while the

specialized profiles can, based on their transparency and meaningfulness, assist in this sphere. Also in terms of the Userfocus, we can talk about the variety of specialized profiles, focusing on the different groups of users or other means of prevention, respectively prevention of various types of crime.

Talking about the concept of preventive techniques of the Userfocus, it is important to note that their use is not confined to use only one technique, the best and most effective way to achieve the desired goals and the result applying the Userfocus, is to use a combination of different techniques, while focusing on a specific group. It maximizes the achievement of the desired goal, which may be really measurable, when using the highly specific techniques of the Userfocus. It should be noted that the various techniques of the Userfocus are developed together with the social networking tools. The producers of these techniques must have a certain degree of creativity in developing these techniques and their implementation into the social networks. Thus, the Userfocus can occupy a very clear and important role in the prevention within this modern and virtual environment such as the social networks, after the development of appropriate techniques.

1.6. Particular examples of Userfocus techniques

The basic precondition of the Userfocus as a preventive tool is the reality of its techniques development, aimed at defining the appropriate roles and procedures in the implementation of individual processes in the environment of social networks. In the broad context of social networking tools, there can be developed a large number of techniques of the Userfocus. There are introduced some of them:

Positive massaging – The principle of this technique is to create a profile on the social network in order to act preventively to other users, while the task of the user responsible for this profile is to act in direct manner, thus creating the blogs, commenting, messaging and using the communications tools of the social network. In this case, we can also talk about the possibility of forming a structured system of users, aimed at different groups of users, respectively focused on individual prevention thematic blogs (drugs, cyberbullying, pornography, grooming, etc.). In the real context it comes to writing positive comments about individual products of the social networks (photos, statuses, etc.), that are capable of acting illegally, respectively antisocially, due to their nature and the way of presenting. Responsible user, therefore, despite the hateful commentary, writes positive comments to manage the already existing problem. This means, it is not a cyber hate or a hate in the Internet environment, that represents a set of illegal speeches directed against ethnic, racial, sexual or religious groups and their members, using the information and communication technologies (Bihariová, 2012). Applying this technique, the user may not only act preventively. Of course, there are statuses, comments and messages of a preventive nature, pointing out or referring the address of certain issues in the environment of social networks, with the relationship to avoidance of antisocial activity. Positive massaging is a technique directly confronted with the users and therefore it is very important to develop methodologies and a user base that knows the social networking tools and can respond to changes in a virtual environment. In case of this Userfocus technique we are talking about the primary prevention.

Individual intervention – In case of this Userfocus technique we are talking about direct interaction with individual users. This technique focuses on secondary prevention, i.e. on subjects where there is an increased risk of becoming perpetrators or victims of crime. There are applied the tools of social networks, directly related to preventive action on the subject. Individual prevention is divided into several stages, the first of which is monitoring the environment and searching for the target entity. In the second phase is collected and evaluated information about the subject and in the third phase comes to the intervention itself, in the form of targeted advertising, targeted positive massaging and other targeted techniques of the Userfocus. The aim of this method is to search for users and user groups at risk and act not only preventively on those users, but also to obtain information and practical knowledge on the structure of social networks, new forms of crime, etc. Individual intervention is a complex technique of the Userfocus that uses also other techniques of the Userfocus effectively to achieve the objectives of this preventive tool.

Anonymbox – The aim of this technique is to create an anonymous mailbox, into which you can virtually "send / insert" the message, while the principle of this technique is collecting messages with character of illegal activity. In real terms, it is a mailbox, where users can send / insert their experience, expertise and knowledge on the illegal activity on social networks. After sending / inserting such message to the mailbox, this one is evaluated and subsequently, there are adopted measures to prevent possible illegal activity.

Following the examples of techniques of the Userfocus, it is important to note that the operators of social networks themselves create the conditions for the implementation of preventive tools in virtual environments and has also implement measures of preventive and repressive character to prevent illegal activity in this environment. But still remains the question, whether such influence of the social networks on the user is adequate and in terms of further development of social networks sufficient.

1.7. Implementation of the Userfocus into the environment of social networks

The social networks are complex environments with a wide range of users who create their content and also determine the technological and social development to a large extent. In such difficult conditions, it is important to create a plan under which it is possible to implement the Userfocus as a preventive technology in this environment and to set its techniques at the same time, to effectively meet the desired goal – really positively act in the sphere of prevention of anti-social activities, especially the crime activities. The plan of implementation is a process that can be defined in several points:

Defining the objectives (target group, crime type) – First of all, it is necessary to define, as by any preventive tools, the aim which the Userfocus should meet. As mentioned above, Userfocus is specifically aimed at a certain group of users and also we can state, to achieve the greatest efficiency, Userfocus must in any case of prevention be focused on a specific type of crime or anti-social activities. If Userfocus is used as a preventive tool on social networks, we can talk about the so-called setting the Userfocus "campaign", that covers all the important techniques to achieve the desired goal. It must also be remembered, that it is necessary to define realistic goals that are achievable by the Userfocus. This part of the Userfocus implementation process in an environment of social networks is the most difficult and is based not only on theoretical knowledge and technological possibilities of social networks, but mainly on practical experience related to using the social networks tools from other spheres.

Creating a "campaign" of the Userfocus and determination of appropriate techniques – In the second step, it is necessary to create a "campaign", so a summary of the techniques and processes that will be used for preventive action on the different groups of users or on individual users. The campaign also includes a timetable and the time range, during which the prevention authority through a campaign will positively influence the users of the social networks. Ultimately, we can talk about the Userfocus "campaign" as the its manifestation outwards, while this includes all the necessary techniques, which have their application schedule and are used specifically for a certain type of anti-social activities and the specific group of users or individuals.

Launch of the "campaign" – Under this term we can understand not only the actual launch of the Userfocus campaign in an environment of social networks, but also the subsequent guidance of techniques and implementation of other Userfocus techniques according the course of the campaign itself. This means that the Userfocus campaign is not strictly intended for the only use of defined techniques, but reflects the development of the campaign and using other techniques makes the preventive action more efficient.

Collecting the results – The most important part of the Userfocus implementation process to the social networks environment is a real capability to measure the campaign results. This means, in particular, monitoring the Userfocus campaign course and recording the results. In principle, it is related mainly to the number of users

affected by individual techniques, the interaction of users with technology, feedback to developed techniques as well as the interest of users of each technology from the time aspect - frequency of interactions, application of techniques developed, with regard to the application environment, etc.

Evaluation of the "campaign" – In the last step in the implementation process is important to evaluate the campaign and also the success of individual Userfocus techniques. Meeting the goal must be measured in absolute terms, while the effectiveness of the Userfocus, as a tool, can be compared with more databases containing statistical data, such as statistics on the perpetration of various types of crime. Also the Userfocus techniques efficiency can bring their more practical use as well as definition of the range of their use and their actual improvement according to the obtained practical experience. The campaign as well as the Userfocus itself must be based on the exact approach and its evaluation is decisive for the further development of this tool. Within the campaign evaluation, there should be mentioned that it depends on the objective specified, as well as on the course of the campaign itself. Even the results must provide explicit conclusions on the success of the campaign.

In connection with the implementation of the Userfocus as a tool of prevention in the environment of social networks, it should be noted that the reality of this process determines also the classification of the Userfocus among the tools of prevention in general terms. The success in this case is defined in particular by the specific environment in which Userfocus operates and narrow specification of techniques used. The particular campaigns of the Userfocus can have diverse objectives defined and can have the multi-level form, that allow defining the milestones in each campaign. Here we should mention also the fact that the globalization of the objective of the Userfocus may result in less efficiency of techniques and campaigns set, and hence demanding real fulfilment of the desired objectives.

2. Experiment and results

When defining the Userfocus, it was necessary to find, how the users themselves perceive the antisocial activity on social networks, as well as the prevention and avoidance of such activities by the competent authorities. The survey was evaluated by completing the survey form by 82 users of social networks. The users, respectively responders, responded five questions. There should be noted especially the relevant facts related to the need of implementation of the Userfocus techniques in this environment. The survey was disseminated via Facebook social network and the responders were only the users of the Facebook social network (random selection).

This approach was chosen purposefully, because this social network is in terms of its tools, options and social interaction most developed and complex. It must also be remembered that Facebook is globally the largest social network. That means that it concentrates a very large number of users. From this fact follow the consequences in the form of a higher rate of incidence related to anti-social activities and the occurrence of new, mostly latent and highly specific forms of such activity, notably because of the nature of the social network and activities of its users.

In particular, the aim of the work was to establish the current view of users of social networks to approach of the competent authorities in the prevention of anti-social activities in this environment, but also to extract the real user experience with crime on social networks. A specificity of the methodology was the fact that the survey was not directly aimed at a particular group of users of social networks, but focused a very broad group of respondents, while the only limitation was the language of the survey - Slovak.

When choosing the right method, it was needed to manage the specificities of the social networks in conjunction with real threats and the consequent possibility of using a preventive tool that would be directly applicable in this specific area. It was therefore necessary to determine the current state of empirical knowledge of the users and then to compare that experience with the proposed techniques of the Userfocus prevention tool. In the end, however, it is not sufficient to draw stark conclusion about the necessity of setting up a specific prevention

mechanism, but in particular to propose the specific procedures to reach this state, in comparison with previous findings of other authors who have solved this issue. It should be also noted that the aim of work was also to document the current mood of users in the field of prevention and follow-up usage of the survey results for the purposes of other related research and studies.

Question survey focused on five important factors. First, it was necessary to find out for what reason the users of the social networks actively use their services. The graph on Fig. 1 shows, that majority of respondents considered the greatest benefit of social networks in the opportunity to communicate with friends and find quickly updated information. It can be therefore stated that the responders use the social networks in particular because their high social interaction (43%) and information profitability (39%).

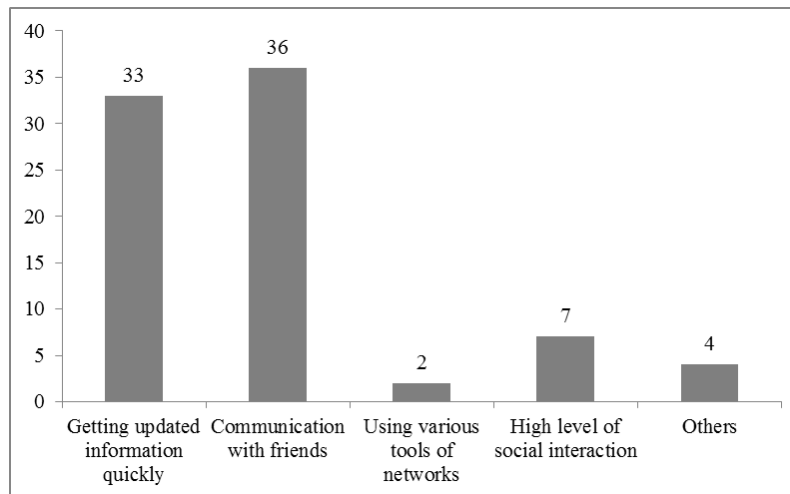


Figure 1. Greatest benefits of social network specified by the responders
Source: Author – realised survey

In the next question of the survey, which results are shown in a graph in Fig. 2, responders expressed the opinion related to the identification of the most negative aspect of social networking. According to users responds, the biggest problem of social networks is the loss of privacy (35%). However, it should be noted, that social networks provide tools that can prevent the leakage of private information.

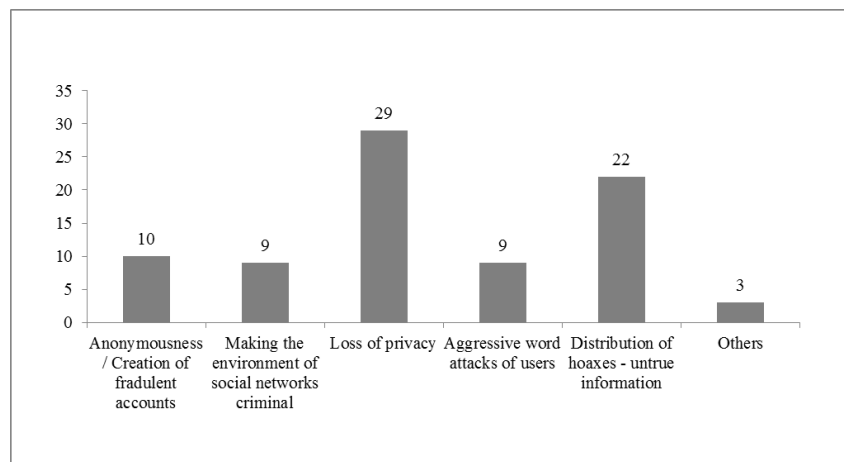


Figure 2. Most negative aspect of the social networks specified by the responders
Source: Author – realised survey

The users of social networks could also to express how they perceive the fight against anti-social activities on social networks. In the graph in Fig. 3 are shown the results, which are divided into two categories - the measures taken by the provider of a social network and measures taken by the competent authorities. The results shown, that the responders evaluated the fight against the negative effects as inadequate (49% / 55%).

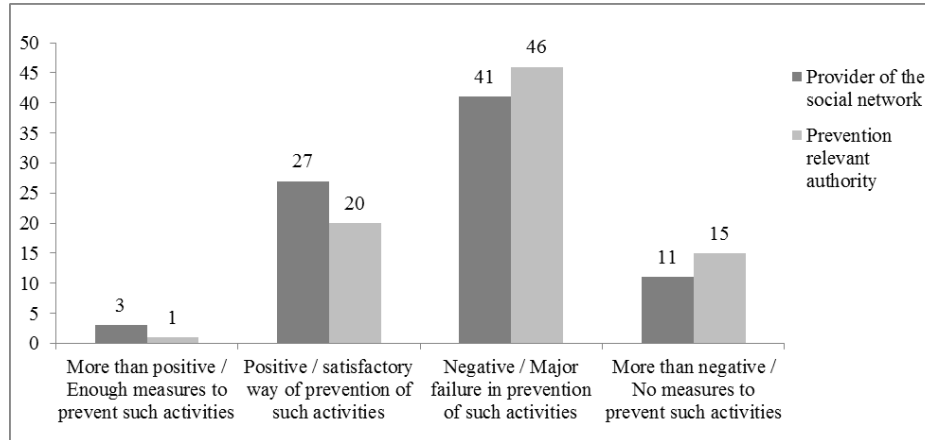


Figure 3. The perception of the fight against the negative effects on social networks
Source: Author – realised survey

An important part of the survey was the question, whether the users of social networks have met with any form of prevention on social networks. As many as 51 respondents (62.2% of respondents) have not met any form of prevention on social networks. That question was accompanied by an open question, while as the forms of prevention, with which users of social networks met, they assigned in particular the measures taken by the social network provider – blocking the inappropriate content, blocking the fraudulent accounts, etc. They also introduced the efforts of the provider of a social network to develop some form of alerts related to security risks, in connection with the creation of passwords, their entering, etc. The graph in Fig. 4 shows the users' opinion on the fact whether is necessary to apply preventive methods focusing the users of social networks. The users were further asked to explain their answers. The most important finding coming from the answers was the fact that the users (64%) perceive the prevention as needed and necessary to prevent the perpetration of anti-social activities and even more effective than repression measures taken by the competent authorities.

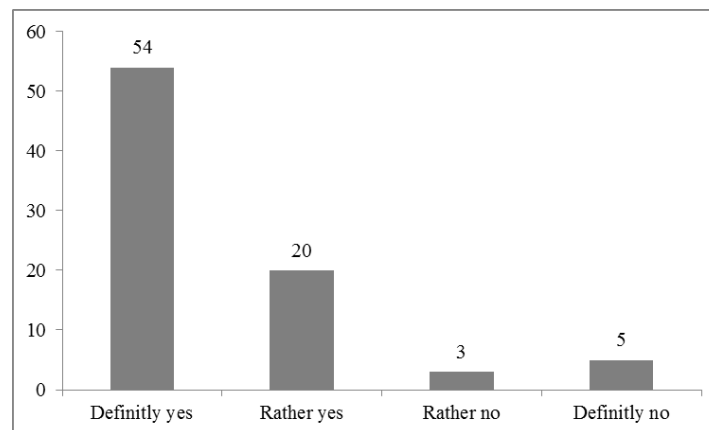


Figure 4. The necessity to apply preventive methods on social networks
Source: Author – realised survey

At the end of the survey, the users of the social networks, was asked to express their opinion on the action of the competent authorities in relation to the prevention of crime on social networks (graph on Fig. 5). Almost 30% of responders expressed their will to develop preventive techniques to prevent negative activities in the social networks environment. The will to apply the crime prevention measures on social networks, directly in risky groups in the schools expressed 27% of responders.

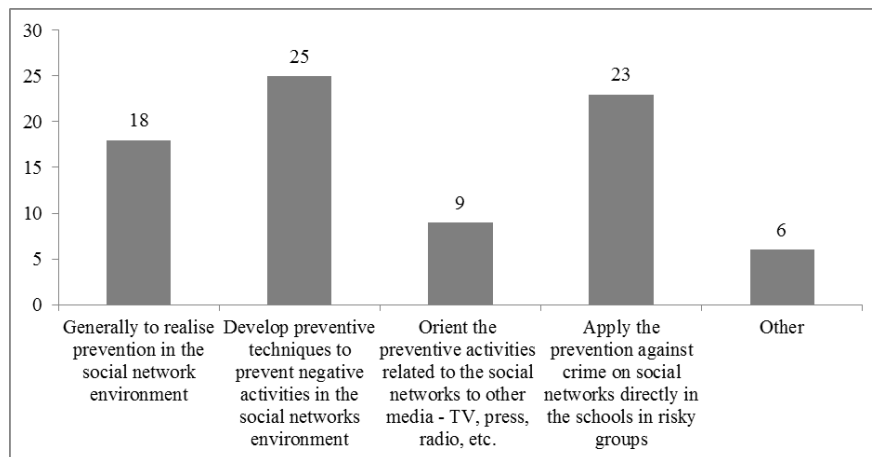


Figure 5. The perception of the fight against the negative effects on social networks
Source: Author – realised survey

3. Discussion

A clearly defined role and objective of determining the concept of Userfocus in this study was to provide a basic framework and outline of preventive instrument, which due to its specification extends the boundaries beyond the conventional method of prevention in the cyberspace. The aim of this process was not only to describe the theoretical structure of the instrument itself but also to bring real-life examples of its use in practice, what is the most important part of the experiment. As part of work was to identify and reflect the experience of social networks users with the prevention of crime in this area as well as their perception of the prevention tools that are used on social networks. It is clearly evident that the majority of the respondents sample considered the action of the competent authorities or the actual operator of social network in the field of prevention to be insufficient, and this fact showed that it is more than necessary to seek and develop new prevention tools that effectively and comprehensively cover such diverse environment of social networks. Looking at the structure, meaning and purpose of Userfocus, it can be stated that it is one of the appropriate tools to be implemented in this environment, however, the results achieved with this tool, even they are really measurable, can be detected during its real application.

In comparison with already published studies in the field of crime prevention in cyberspace, it can be stated that there raises a real need for the creation of these prevention tools and techniques which are applicable in the real environment of social networks, respectively in cyberspace and are intended to reduce or eliminate straight antisocial activity, educate users and act on potential offenders or persons who have committed the offenses. It is crucial to apply the knowledge from this area to create a kind of "knowledge and experience network", serving for exchange of experience and finding new opportunities in the field of crime prevention, not only in the cyberspace. In case of Userfocus, we are talking about a particular specification of a useful tool, while it can be concluded that using the way of closer specification of crime problems in cyberspace is necessary to work also in the future, to create specific measures to fight the crime and other antisocial activities.

Conclusions

Social network and its tools provide options that are used in all areas of our lives. From a sociological perspective, the social network is a social structure, which consists of a system of social actors (individuals, organizations, etc.) and dynamic relations among actors (Wasserman, Faust, 1994). Prevention of crime and other antisocial activities have recently been inflected as an urgent need, and thus it is necessary to apply this need in a virtual environment, too. Userfocus as a prevention tool is an example of how to develop an efficient tool to optimally use the possibilities offered by social networks. It can reflect the real state of anti-social activities and also crush it. To apply the Userfocus and its techniques is needed to mention that its feasibility and applicability depends on many factors, which are based on the environment of social networks themselves. The success of this tool depends also on creativity and technological security of preventive authority, who should apply the Userfocus to social networking environment. Userfocus offers opportunities to be grasped and used for the benefit of preventing the anti-social activities, and the based on the techniques determining the Userfocus, effectively operate against such action. Implementation of Userfocus in an environment of social networks is a long process. The first step is to establish an authority responsible for searching the antisocial activity on social networks, while inferring also real consequences, not only in terms of prevention, using the Userfocus tool and techniques, but also in the form of direct intervention against disturbed social relations.

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AN EVALUATION OF KNOWLEDGE MANAGEMENT SYSTEM'S COMPONENTS AND ITS FINANCIAL AND NON-FINANCIAL IMPLICATIONS

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Received 11 August 2017; accepted 20 November 2017; published 29 December 2017.

Abstract. Knowledge Management is an inclusive process of gathering knowledge, processing it and then utilising it in order to improve firm productivity and seek solutions to crucial problems. This paper is based on the assessment of structural framework of a Knowledge Management System (KMS) and how these components influence the financial and non-financial aspects of an organisation. The study mainly focuses on the evaluating the influence of KMS on the overall performance of SMEs in Austria. The current study investigates previous researches and theories to build a comprehensive understanding of the topic. It also conducts a quantitative analysis to evaluate the relationships between Knowledge Management Capabilities, Processes, and Firm Performance. To get first-hand information related to knowledge management practices, 126 managers and senior employees from 72 Austrian SMEs are surveyed. According to the results, KM capabilities have a significant positive relationship with KM processes. Moreover, KM processes in the Austrian SMEs have a significant positive influence on financial and non-financial performance. The study recommends increased focus on KM practices for improved overall performance.

Keywords: Knowledge Management Systems, Knowledge Management Capabilities, Knowledge Management Processes, Financial Performance, Non-Financial Performance, T-Shaped Skills, Learning Organisation, Correlation, Regression Analysis

Reference to this paper should be made as follows: Luhn, A.; Aslanyan, S.; Leopoldseder, Ch.; Priess, P. 2017. An evaluation of knowledge management system's components and its financial and non-financial implications, *Entrepreneurship and Sustainability Issues* 5(2): 315-329. [http://doi.org/10.9770/jesi.2017.5.2\(11\)](http://doi.org/10.9770/jesi.2017.5.2(11))

JEL Classifications: G32, G41

Additional disciplines: information and communication

1. Introduction

Knowledge management is a well-structured procedure which includes retrieving knowledge from multiple sources and then processing this knowledge to extract useful information. This information is then utilised in order to improve the performance of a system and find innovative solutions to problems (Karagiannis and Reimer, 2005). Knowledge management also includes all the intentional and systematic methodologies applied for keeping the retrieved knowledge intact. The extensive evolution in the market has forced organisations to utilise their knowledge assets in order to win a competitive edge over other organisations (El-Said, 2015). Previous researches on knowledge management and its implementation have focused more on the factors that contribute

towards successful knowledge management. Most of the previous research work explores the influence of knowledge management on the performance and competitiveness of an organisation (Hansen, 1999; Zander & Kogut, 1995). However, there are very few research that focuses on assessment of the main components of a knowledge management system. The study of Lee and Choi (2003) proposed an integrated approach to evaluate knowledge management theories and identify the variables that are relevant to knowledge management system. Arora (2002) proposed that in order to assess the implications of a knowledge management system, it is very important to identify and evaluate all the components that are crucial for the success or failure of a KM system. This study focuses on the evaluation of knowledge management system's components and its financial and non-financial implications. In order to identify the core constructs of a KM system and understand the framework of a basic KM system, a literature review is included in the study, along with an empirical analysis. An important finding from the previous studies is utilised in order to set the direction of the current research study. The financial and non-financial implications of a knowledge management system are evaluated using statistical analysis. To assess the financial and non-financial implications of a KM system, a survey is designed for Small and Medium Enterprises (SMEs) in Austria which consists of all the important variables that are relevant to the topic of the current research. Responses from the participants are statistically modelled and analysed to generate important findings. The objective of the research study is to evaluate the main components of a KM system and assess their financial and non-financial implications in Small and Medium Enterprises in Austria. Therefore, the question under investigation is: *“What is the impact of Knowledge Management Systems on the financial and non-financial performance of Austrian Small and Medium Enterprises?”*

2. Knowledge Management

2.1. Knowledge Management System – a Concept

KMSs are not very popular among small and medium size entities because they are seen as costly and time-consuming mechanisms and entities do not realise its importance and usefulness yet. However, the implementation by large organisations has attracted other entities to the benefits and importance of KMS (Lee, & Hong 2002; Hislop, 2013). Therefore, the system is becoming popular and demanding with the passage of time. Knowledge management is the process through which companies increase the value of the gathered knowledge. There is often confusion between information management system and knowledge management system. The term “Information Management System” is generally referred to a software used to facilitate maintenance, retrieval, and transfer of information within the organisation. A Knowledge Information System (KIS) on the other hand is the system which helps the organisation to increase the potential of its intellectual capital (Armstrong & Krebs, 2002).

Many entities do not find it useful to develop KMS for managing knowledge, but David William in his article stresses that organisations must deliberately develop KMS so that the knowledge consumed can be used at maximum (William, 2016a). Many scholars and researchers have presented with a various list of components that compose KMS but following are the 7 proposed elements combined by the author David William in his article that is must have for an entity to develop knowledge management system:

Strategy	The first step is to make an effective strategy that identifies the opportunity or the problem, which can be used to improve the value or intellectual asset. It includes the structure of policies and regulations that are organised in a specific manner so that areas at risk or with potential could be identified.
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Participants	A strategy is effective only if it is correctly implemented in the targeted areas and to do so the required duties should be distributed among the participants, they may include: supervisors; owners; managers; achievers; analysts etc.
Source of the Knowledge	To assess the authenticity of the knowledge, it is important to identify the source where it came from. Intellect is useful only if it comes from a reliable source, and is sufficient to facilitate the purpose. It is considered more reliable if the source is external (and authentic) since the chances of manipulation are lesser that way.
Interface	The functionality of a KMS is affected by the style, techniques, and mode of the system. The interface includes technology, people and structure style. Easing the users is a key element in enabling them to their full potential (William, 2016a). The interface reflects the type of organisation and is relevant in adopting a mode of processes.
Functions	There are dozens of possible functions that a KMS can be used for. Although they may differ from entity to entity, and depend on the nature, type and structure of organisation there are some which are most likely present in every KM system (William, 2016a). Some of the most common functions are: The identification of the problem or opportunity; Selection of critical part of the knowledge; Data Mining; Effective delivery of the knowledge; Refinement for enhancement of intellect value; Protecting of the preserves information; Maintenance to keep the knowledge up to date; and Application of the knowledge.
Infrastructure	This component refers to the flow of the process. It is vital that every concerned person should have clear access to the knowledge, and each participant must be exposed to only the part of knowledge which is designed for his/her review. The purpose of an effective infrastructure is to make sure that each participant is focused on his part of duties in the KMS. It is crucial that organisation uses right tools for the right process to facilitate the enhancement of the value of knowledge.
Continuous Improvement	KMS is not a one-time tool is used as a never-ending cycle for the organisation. Therefore, it is necessary that organisations keep improving their knowledge management system, so that any change in the process or entity model may not surprise KMS (William, 2016a). Improvements should be made to better the strategy, process, people and technology of the system.

Source: William (2016a); Choi and Lee (2002); McGinnis and Huang (2007); Holtshouse (2013)

On the other hand, KMS is also commonly divided among three components:
 Capabilities – Covering the role of participants and continues improvement element.
 Processes – Include the sources, strategy, infrastructure, and interface of the system.

Performance – Consist of the functionality of the KMS (Lee & Lee, 2007).

2.2. Non-Financial Benefits of Knowledge Management System

2.2.1. Decision- Making

Decision making is a process which requires expertise, skills and sufficient knowledge organised in a meaningful order (Garfield, 2014). The primary function of KMS is to manage the information in such a way that the organisation can have maximum benefit from this intellect asset. The most likely usage of the outcome is the strategy or decision making. Managers, directors and top-level personnel rely on the available information for making strategic decisions. Therefore, it is necessary for them to know that the information they are basing their decisions is authentic, reliable, sufficient, and is fully understood before. Hence KMS assures all these and therefore facilitates decision-making capabilities to the organisation. Editor Lisa Quast has given the example of General Electric Inc. (an American conglomerate), who has put in place an additional committee Corporate Executive Council (CEC) as a form of knowledge management system (Quast, 2012).

2.2.2. Builds Learning Organisation

Author David Garvin believes that KMS is an important exercise for regular improvement. The need to learn more knowledge has enabled organisations to build a mindset that there is always the next step. This means that no matter how much an organisation has achieved, there is always room for improvement. The concept is basically applied to the employees of every level in the entity. Author has elaborated his logic by mentioning the US Army's After-Action Reviews (AARs), which are meant to take feedbacks from soldiers with the purpose of developing new techniques and resolving issues in the current ones. In this particular KMS system, each individual is enabled to observe his/her own weaknesses, assess their strengths and rate their performance. This is a good exercise for self-assessment which is of course reviewed by their seniors (Garvin, 2000; Liebowitz & Frank, 2016). Hence, KMS helps in building learning opportunities in organisations.

2.2.3. Stimulates Cultural Change and Innovation

KMS is a useful tool for designing, describing or changing the culture of an organisation (Corfield & Paton, 2016). If an entity allows a free flow of information, it may describe its structure as a casual organisation, allowing lower, mid and higher-level employees to coordinate with each other freely which may lead to innovations and change of ideas (Kane, 2014). The flow of knowledge or knowledge management is very important for any entity seeking a boost in its performance (King, Marks, 2008; Rajnoha et al., 2017). Making workplace as less stressful as possible through the creation of friendly and casual culture is a key to encouraging employees towards their jobs. The point is also covered in the notes of the author David Garvin, where he describes Change Acceleration Process (CAP) program as a successful attempt at creating a knowledge system to combine individuals for carving an innovative culture (Garvin, 2000); see also Ignatjeva et al. (2017).

2.3. Financial Benefits of Knowledge Management System

2.3.1. Less Chance of Manipulation in the Financial Records

An open environment with transparency is considered the ideal situation for the financial reporting. Organisations with unfair regulations and unnecessary restrictions give easy access to the top managerial personnel to manipulate the financials without a questioning authority. For example, if a chief financial officer (CFO) makes a mistake or deliberately acts against the interest of the company, he will very likely try to manipulate the financials in order to try and hide his mistakes or act of fraud (William, 2016b; Edvardsson & Durst, 2013; Belás et al., 2017; Paseková et al., 2017).

An effective KMS will probably highlight any such action, but if the boundaries in the organisation are too high with strict culture, it may be difficult for employees to challenge their superiors for their actions.

2.3.2. Better Financial Reporting

An effective KMS plays a key role in the constant flow of information without delays and fewer errors, since all the functions and relevant departments are integrated. The timely reporting is a crucial element of financial reporting system because a delay in sales or early recording of material transactions may cause disruptions in the reporting cycle making it difficult to justify to the external authorities (William, 2016b). The regular flow and constant checks enable smooth and timely financial reporting with fewer chances of errors.

2.3.3. Trust of Investors

Every investor appreciates transparency. KMs not only allow the internal individuals to access the information but also facilitate the external entities to get their desired information whenever they want. A proper working system with a constant flow of information results in timely response to investor's query; hence, results in increasing their confidence in companies (William, 2016b). Thereby, it can be affirmed that an effective KMS contributes to the elements necessary for the satisfaction of investors and other external parties (Like Tax authorities and auditors).

3. Methodology

3.1. Research Approach

The purpose of this research is to evaluate and assess the influence of KM processes and components on financial and non-financial performance aspects of Austrian SMEs. A quantitative research approach is adopted in this study, which appropriately addresses the research problem. Statistical methods and techniques are applied to process the data collected from SMEs.

A number of studies have already been conducted on the concept and implications of Knowledge Management. The purpose of research is identified on the basis of the exploration stage of the research. For early exploration, exploratory and descriptive purposes are appropriate. However, if the research is extending the findings of previous researches, the purpose of the research would be explanatory (Ivankova, Creswell & Stick, 2006). This particular study is explanatory in nature, as it is extending previous researches on KM and its implications from the perspective of Austrian SMEs.

3.2. Data Collection

The research adopts a correlation and a descriptive design in order to analyse the primary data collected from the Austrian SMEs. According to Bordens (2006), correlation is an appropriate design to identify the relationship between two or more research variables and analyse their overall effect.

The data collection method used in this study is a questionnaire survey. 72 Austrian SMEs were targeted and a questionnaire was circulated in these firms. The survey questions were answered by 126 employees and managers working in various departments.

3.3. Survey Measures

All the variables of the survey questionnaire are based on multiple items. The use of multiple items for measuring the influence of a variable tends to generate more precise and accurate findings. These items are also used in the evaluation process in order to improve the reliability and credibility of the measurement process. The constructs

are related to KM practices and processes implemented in an SME and their influence is observed on firm performance. A 5-point Likert scale is used to record responses of participants and relate these responses to the overall effect of KM on the organisation. Survey measurement on Likert-scale allows precise quantification of responses (Lee & Choi, 2003).

3.4. Survey Items

The survey questionnaire used in this research is adopted from the study of Lee and Lee (2007). It consists of items relevant to the KM system and its components. All the items are related to various aspects of the SME performance, which are represented in the form of research constructs/variables. The table below shows the variables used in the survey and multiple items on the basis of which these constructs are analysed (Table 1):

Table 1. Knowledge Management System Components

Variables		Items
Information Technology	IT Support	Information sharing via Intranet
		Knowledge map for knowledge source
		Use of Customer Relationship Management (CRM)
		Use of Data Warehouse
		IT support for information acquisition
Organisation Culture	Learning	Clubbing and community gatherings
		Contents of job training
		Encouragement to attend seminars etc.
		Informal individual development
		Formal training programs
Organisational Structure	Centralization	Making decisions without approval
		Supervisor's permission to act
		Need to refer others
		Making own decisions
		Acting without supervisor's consent
People	T-Shaped Skills	Knowing core knowledge
		Employees expert in their tasks
		Employees can explain their task
		Employees having accurate know-how

The processes of knowledge management are an inclusive procedure and consist of multiple sub-processes like accessing knowledge, retrieving it, utilizing it and finally integrate it in all organisational procedures. The study has divided the construct of knowledge management system into 8 items (processes), presented in the Table 2 below:

Table 2. Knowledge Management System Components

Construct	Items
Knowledge management processes	Accessing valuable knowledge
	Using knowledge that is accessible, in decisions
	Embedding knowledge in processes
	Representing knowledge in documents etc.
	Facilitating growth of knowledge
	Generating new knowledge
	Determining the knowledge assets' value
	Transferring existing knowledge

The scorecard of knowledge management is finally used to evaluate the financial and non-financial implications of a KM system on Austrian SMEs. The study uses cognitive determinants in order to evaluate the financial and non-financial performances of organisations. The financial and non-financial performance variables and the relevant items are listed in the Table 3 below:

Table 3. Performance items

Construct	Items
Financial Performance	Greater Economic value added
	Greater Net Profit
	Greater Market Share
	Greater Return on Investment
Non-Financial Performance	More customer retention
	More customer acquisition
	Greater customer satisfaction

3.5. Research Variables

There are three main constructs used in the research study: Capabilities, Processed and Performance.

3.5.1. Capabilities

A number of KM capabilities have been discussed in this study. The survey questionnaire addresses capabilities like information technology, organisation culture, organisational structure and people (Lee & Lee, 2007).

Knowledge is originated from people and propagates in an organisation through employees and managers and IT implementation. The penetration and utilization of knowledge depend on the organisation culture and structure.

3.5.2. Processes

The process of knowledge management is a complex procedure. It is based on various phases or sub-processes like accessing knowledge, retrieving it, utilizing it and finally integrating this knowledge in all organisational procedures.

3.5.3. Performance

The ability of an organisation to manage knowledge and utilize it for improving firm performance and problem-solving is reflected on the financial and non-financial performance of the organisation. The performance items in this research identify the financial and non-finical implications of a KM system implemented in SMEs.

3.6. Research Model

All the research variables and the relation between them are summarised in the research model presented below:

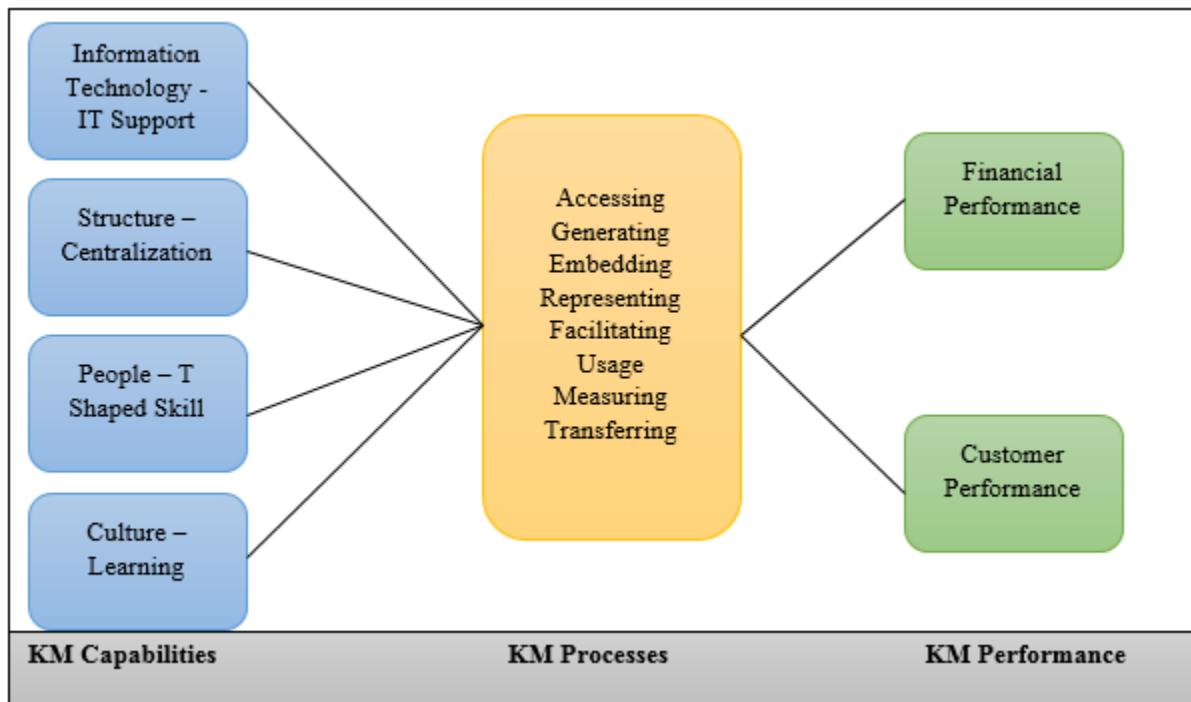


Figure 1. Research Model

4. Results and Analysis

The objective of this study is to examine the main components of a KM systems and assess their financial and non-financial implications in Small and Medium Enterprises in Austria. Before addressing the main research problem, descriptive analysis is conducted to explore the respondents' characteristics. Results reveal that majority of the respondents are working in the hospitality/tourism and wholesale/retail industry (21), followed by construction and engineering (18) (see Fig. 2).

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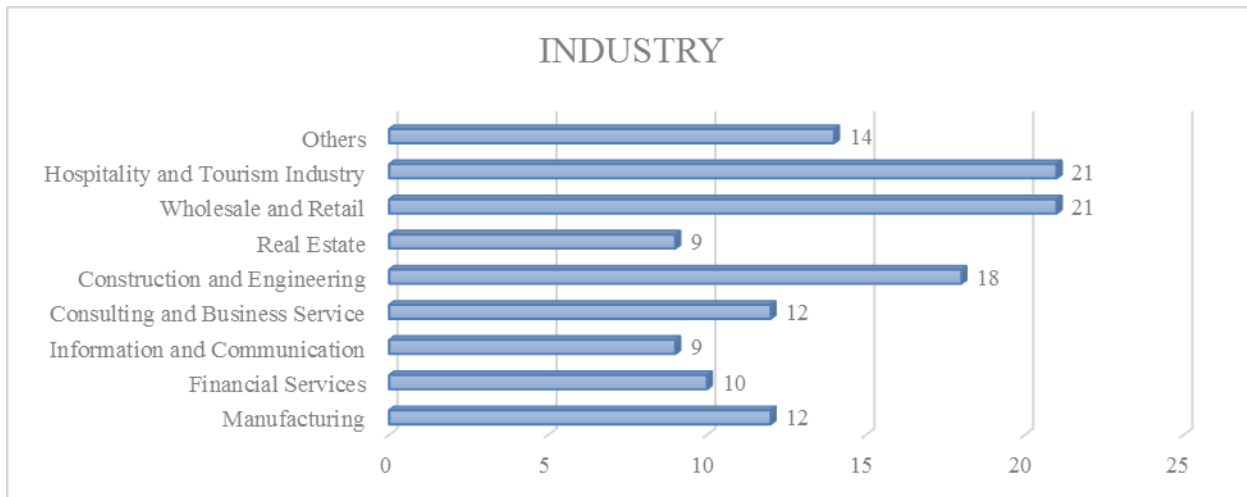


Figure 2. Respondents' Industry
Source: Author's own estimation

Moreover, the majority of the respondents are working in the accounting and finance departments in their organisations, which 19.8% of the total research participants. 16.7% of the managers/employees are working in personal management and training department, while 13.5% are part of the marketing department (Fig. 3).

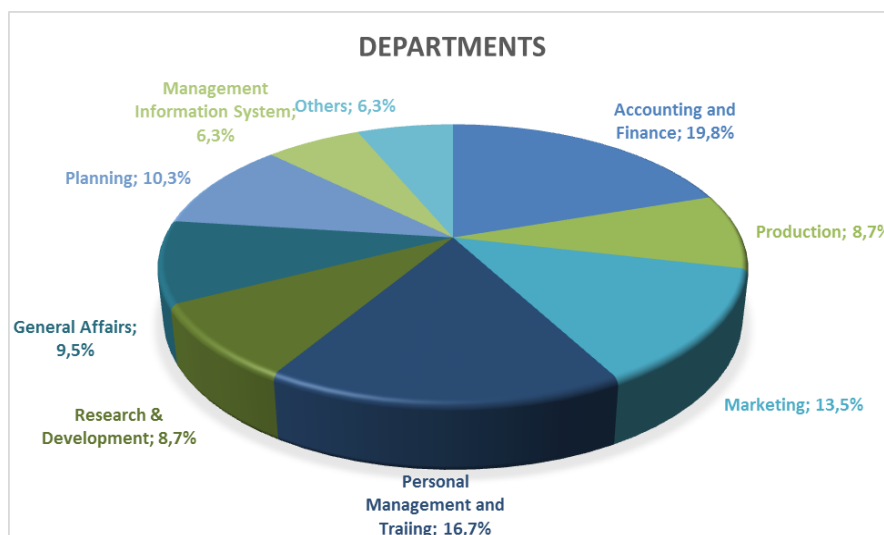


Figure 3. Respondents' Department
Source: Author's own estimation

Based on the data collected via questionnaire survey regarding KM Capabilities (information technology, organisational culture, organisational structure, and people), KM processes, and financial and non-financial performance, it is revealed that majority of the respondents perceive that their company employees have sufficient knowledge about their task and have the ability to explain their tasks to others (high t-shaped skills). The study found mixed results regarding the organisational structure of the companies, which suggests that the structure could either be centralised or decentralised. It is believed by the respondents that they have a learning organisation culture in their respective organisations. Moreover, they have sufficient IT support for information acquisition. In the context of KM processes, the majority agrees that their company stresses on generating new and accessing valuable knowledge. Their company also stresses on embedding knowledge in processes, products, and/or services. In addition, it is found that the companies focus on transferring existing knowledge to other parts of the organisation and stress on measuring the value of knowledge assets and the impact of knowledge management. It suggests that the selected Austrian SMEs have appropriate knowledge management processes.

The study has measured financial and non-financial implications through financial performance and customer satisfaction respectively. The internal consistency reliability of the research instrument is tested using Cronbach alpha statistic, which is found greater than the assumed threshold of 0.7. Moreover, the content validity of the questionnaire is measured through detailed analysis of previous KM practices. For determining the construct validity and summarising the observed variables (items), the techniques of principal component analysis (PCA) (factor analysis) is used. The KMO and Bartlett's test reveal that the sample is adequate ($KMO = 0.771$) and the data is appropriate for running factor analysis ($sig. < 0.001$). The test extracts 7 factors/components that explain 89.7% of the cumulative variance (Fig. 4)

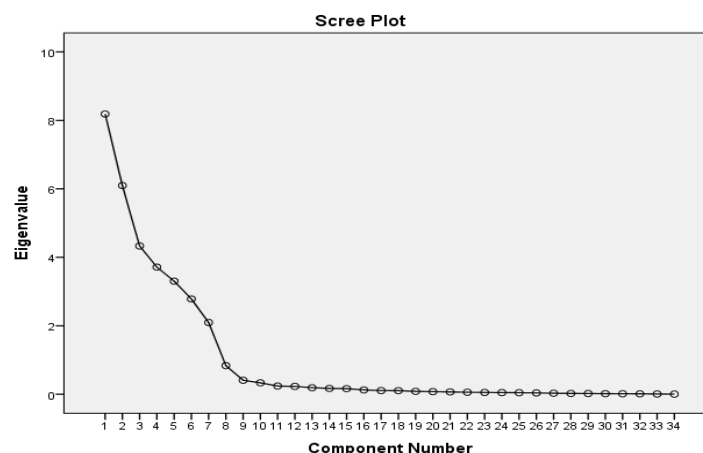


Figure 4. Scree Plot

Source: Author's own estimation

Using the PCA extraction method, and Varimax rotation method, the rotated component matrix is generated (see Table 3). The matrix shows the correlations between the variables and the estimated factors/components.

Table 3. Factor Analysis
Source: Author's own estimation

	Component						
	1	2	3	4	5	6	7
Our company stresses on generating new knowledge.	.982						
Our company stresses on accessing valuable knowledge from external sources.	.953						
Our company emphasizes on facilitating knowledge growth through culture and incentive.	.961						
Our company emphasizes on representing knowledge in documents, databases, and software.	.923						
Our company stresses on embedding knowledge in processes, products, and/or services.	.952						
Our company emphasizes on using accessible knowledge in decision making.	.952						
Our company focuses on transferring existing knowledge into other parts of the organization.	.949						
Our company stresses on measuring the value of knowledge assets and/or impact of knowledge Management	.883						
Our company employees can take action without a supervisor		.977					
Our company employees are encouraged to make their own decisions		.966					
Our company employees do not need to refer to someone else		.947					
Our company employees do not need to ask their supervisor before action		.955					
Our company employees can make decisions without approval		.968					
Our company provides various formal training programs for performance of duties			.968				
Our company provides opportunities for informal individual development other than formal training such as work assignment and job rotation			.971				
Our company encourages people to attend seminars, symposia, and so on.			.965				
Our company members are satisfied by the contents of job training or self-development programs			.932				
Our company provides various programs such as clubs and community gatherings			.948				
Our company employees can know their own know-how accurately.				.974			
Our company employees can explain their own tasks to others				.961			
Our company employees think that they are expert in their own tasks				.955			
Our company employees can know core knowledge needed in their own tasks.				.956			

Our company provides intranet for information sharing	
Our company provides IT support (e.g., groupware) for information acquisition	.955
Our company provides Data Warehouse or knowledge repository for knowledge acquisition	.950
Our company provides 'knowledge map' for knowledge source finding and accessing	.883
Our company provides CRM – Customer Relationship Management for customer information gathering	.944
Compared with key competitors, our company has a greater return on investment.	.919
Compared with key competitors, our company has a greater market share.	.895
Compared with key competitors, our company has a greater net profit.	.951
Compared with key competitors, our company has a greater economic value added.	.893
Compared with key competitors, our company has greater improvement in customer satisfaction.	.940
Compared with key competitors, our company has more creation of new customers.	.917
Compared with key competitors, our company has more retention of current customers.	.887

Table 4 extracts 7 latent variables, which include KM capabilities, KM processes, financial performance and non-financial performance. In order to assess the relationships between the constructs of KM capabilities, KM processes, financial and non-financial performance, the tools correlation and regression analysis are used.

Table 4. Pearson Correlation
Source: Author's own estimation

		Correlations				
		TS	C	LC	IS	KMP
T-Skills	Pearson Correlation	1	.254**	.306**	.236**	.289**
	Sig. (2-tailed)		.004	.001	.008	.001
	N	126	126	126	126	126
Centralization	Pearson Correlation	.254**	1	.409**	.184*	.451**
	Sig. (2-tailed)	.004		.000	.039	.000
	N	126	126	126	126	126
Learning Culture	Pearson Correlation	.306**	.409**	1	.344**	.701**
	Sig. (2-tailed)	.001	.000		.000	.000
	N	126	126	126	126	126
IT Support	Pearson Correlation	.236**	.184*	.344**	1	.598**
	Sig. (2-tailed)	.008	.039	.000		.000

	N	126	126	126	126	126
KM Processes	Pearson Correlation	.289**	.451**	.701**	.598**	1
	Sig. (2-tailed)	.001	.000	.000	.000	
	N	126	126	126	126	126
**. Correlation is significant at the 0.01 level (2-tailed).						
*. Correlation is significant at the 0.05 level (2-tailed).						

According to the table 4, each of the four KM capabilities is significantly correlated at 0.01 and 0.05 level with each other. Moreover, the KM capabilities have significant positive correlation with KM processes at 0.01 level. It suggests that a focus on IT, organisational structure, organisational culture, and people as KM capabilities in Austrian SMEs positively affects KM processes within the organisations.

The impact of KM processes is further examined on the financial and non-financial performance of Austrian SMEs using simple linear regression (see Table 5). The proposed regression models can be mathematically described as:

$$\begin{aligned} \text{FP} &= \alpha_1 + \beta_1 (\text{KMP}) \text{-----} (1) \\ \text{NFP} &= \alpha_2 + \beta_2 (\text{KMP}) \text{-----} (2) \end{aligned}$$

Where FP, NFP, and KMP represent, financial performance, non-financial performance, and knowledge management processes. Here, KMP is the independent variable or predictor, while FP and NFP are the dependent variables which are analysed in two separate regression equations. α is the constant term, whereas β is the coefficient which explains the rate of change in the dependent variable.

Table 5. Regression Analysis
Source: Author's own estimation

	Financial Performance			Non-Financial Performance		
	B	t	Sig.	B	t	Sig.
(Constant)	2.774	5.459	.000	3.213	7.699	.000
KM Processes	.296	2.392	.018	.223	2.191	.030

The table 4.3 reveals that at 0.05 level of significance the impact of KM processes (accessing valuable knowledge, using knowledge in decisions, embedding knowledge in processes, representing knowledge in documents, facilitating growth of knowledge, generating new knowledge, determining the knowledge assets' value and transferring existing knowledge) is statistically significant in explaining financial and non-financial performance. It may suggest that KM processes influence financial performance by enhancing return on investment, market share, net profit, and economic value added. Moreover, KM processes may impact non-financial performance by improving customer satisfaction, creating new customers, and retaining existing customers.

The proposed regression equations (1 and 2), based on the regression results, can be written as:

$$\text{FP} = 2.774 + 0.296 (\text{KMP})$$

$$\text{NFP} = 3.213 + 0.223 (\text{KMP})$$

Conclusion

The research study evaluated the main components of a KM systems and assessed their financial and non-financial implications in SMEs in Austria. It adopted a quantitative research methodology and used statistical tools to analyse the problem. The results showed that the Austrian SMEs have high KM capabilities in terms of t-shaped skills, learning organisational culture and IT support. They also have appropriate knowledge management processes. The correlation analysis revealed that the KM capabilities have significant positive correlation with KM processes in Austrian SMEs. Moreover, KM processes in the organisations have a significant positive influence on financial and non-financial performance.

These results of the study suggest that the SMEs in Austria need to focus more on practices and processes related to knowledge management, which can help them in improving their overall performance. However, at the same time, it is difficult to generalise the results of the study on the entire population of SMEs in Austria. Therefore, future research on the subject should increase the sample size in order to achieve more reliable results.

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THE IMPACT ON THE POPULATION ON THE SUSTAINABLE URBAN ECONOMIC DEVELOPMENT

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Received 25 August 2017; accepted 23 November 2017; published 29 December 2017.

Abstract. Today, attention is paid to urban sustainable development and a resident as of a sustainable urban economic development in the core and foundation and most problem is the migration of them. It's important to remember that the city is the socio-economic development and improvement of local promoter based resident. Given that both in Riga and in the whole country's population is shrinking, which is based on the migration problem. Riga is the largest and one of the economically richest municipalities and the capital of country in same time, it should serve as a model as a prop adjacent municipalities. It is important to remember and to follow Riga's sustainable development strategy according 2030 guidelines, which states that every neighborhood has equal opportunities to grow, develop and live, but is not currently being met. Given that the average active economically population is 62% of the employed population and 46% of the total population, which is critical in the city and surrounding sustainable development. Therefore, within the framework of the article it will be considered as a resident of the city affects urban sustainable economic development and will highlight the city of Riga overall economic performance and each residential area separately. The article is to determine what the impact of urban resident urban sustainable economic development is, and what the stumbling block of the population migration and low participation in urban development is, which is considered as one of the most important promoters of sustainability.

Keywords: urban environment, sustainable development, Riga, resident, economic development

Reference to this paper should be made as follows: Pavlova, I.; Šenfelde, M. 2017. The impact on the population on the sustainable urban economic development 5(2): 330-344. [http://doi.org/10.9770/jesi.2017.5.2\(12\)](http://doi.org/10.9770/jesi.2017.5.2(12))

JEL Classifications: R11, R58

1. Introduction

There is a lot attention paid to regional sustainable development facets in the contemporary scientific literature (e. g. Menshikov et al. 2017; Bilan et al. 2017; Zemlickiene et al. 2017; Tvaronavičienė, Razminienė 2017; Tvaronavičienė, Gatautis, R. 2017; Kendiukhov, Tvaronavičienė 2017; Štiglic 2017; Lincényi, Fabuš. 2017).

In this paper sustainable development Riga will be tackled. The following approach is adopted: it is assumed that one of the keys to the sustainable economic development of the Riga city is a Rigan and his/her awareness of affiliation to his/her living environment and the opportunities offered by it (Riga Development Program 2014-2020; Riga Sustainable Development Strategy till 2030). This is important because in the future it would improve

the situation in the city as a whole, reducing the demand for movement to other cities to receive services that are not available in his/her own city.

One of the main reasons for the migration of residents to the neighbouring cities of Riga is the well-organized environment and difference in apartment prices. Of course, every ambition can not be met and satisfied, but when analysing the characteristics of the city of Riga, it can be concluded that the inequality in the city is obvious. One person has the opportunity to develop and have a good rest in the locality of his own, while the other is deprived of this opportunity; then the question is why there is such an inequality. An example is Mezciems, where the number of pre-school educational establishments is smaller than in Skanste, where the number of population is 10 times smaller. Whereas, when researching cultural institutions in the neighbourhood, an incomprehensible spectacle appears; cultural institutions are not available in the larger localities of the city, but in Bukulti, which has 600 residents, there is a cultural center, but in Ziepniekkalns, which has 33 thousand residents, there is no cultural centre, the same spectacle also opens up in Purvciems. Brasa, where residents are three to four times fewer than in Purvciems and Ziepniekkalns, has four cultural institutions. Of course, within Riga you can go to nearby localities or the center, where there are almost a hundred of cultural institutions. However, in order the residents would have opportunity to develop and creatively improve in their locality, a cultural institution is often the place, where various events for children, adults and elderly people are organized, in order the resident could participate and feel comfortably in his/her locality and the city as a whole and he/she has the opportunity to attend some beautiful cultural and educational event and feel that he/she belongs to it. Further, in this research, the general characteristics of the city, the structure and characteristics of the population will be dealt with. The local government budget will be explored and analysed to determine the impact of the resident on the sustainable urban economic development.

2. Genetal characteristics of the city

Riga has 58 localities and each locality is different, each has its own history and story of its origin, for example, Plavnieki is a locality, where in the past there was only a meadow and developed agriculture, while Kengarags was “plunged” from the depths of the water. Therefore, the localities of the city are different and varied, because the history of their origins is also different and each locality has its own identity and character. The total area of Riga is 307.17 km² with population of 641 thousand (Main demographic indicators).

Riga, as the capital of the country and the largest city in the Baltics, plays an important role in the development of the state of Latvia, influenced both by it's the historical movement and the favourable geographical location. Undoubtedly, Riga must take on the organization of various national and international events, care for the welfare, health and education of the residents of Riga and Latvia, as well as contribute to the promotion of the national economy. Riga was founded in 1201, at that time there were no such administrative localities, only the central part of Riga, which is Old Riga and Citadele, was developed. In Riga at that time, there were only about 1 thousand residents. Historically, the surrounding areas were farmland, where manors and villages were located. Because of various military conflicts, life in the suburbs of Riga was unsafe and unpredictable. Riga was burned up many times (Bakule, Siksna 2009; Rubins 2004)

Since the year 1559, cases of burning up had been already repeated seven times, and in 1812, Riga was hurriedly burned up, because it was suspected that Napoleon would attack, but he chose a different direction and passed Riga. These historical facts also appear in the architectural building in the central part of the city, where wooden houses dominate. Riga was restored with the help of various architects and at various stages of government (Bakule, Siksna 2009).

During the elimination of war consequences, new residential houses were almost not built. Only in the late 1940s, the first houses for workers were built. Such block was formed in Riga. Given that Riga has the developed industry, the number of population rapidly increased every year and in the late 1950s the apartment issue was solved and massive city building was started (Kreituse et al. 2009).

As previously mentioned, one of the foundations of the sustainable economic development of the city is its resident. Unfortunately, in general, the statistics show negative trends, as the number of population in the city of Riga is decreasing. In 2017, the statistical indicators are more positive, as the number of population increased by more than 2 thousand people, but to reach indicators of 2007, a long way is still to go. (See Figure 1).

One of the keys to the sustainable economic development of the city is a Rigan and his/her awareness of affiliation to his/her living environment and the opportunities offered by it (Riga Development Program 2014-2020; Riga Sustainable Development Strategy till 2030). This is important because in the future it would improve the situation in the city as a whole, reducing the demand for movement to other cities to receive services that are not available in his/her own city.

One of the main reasons for the migration of residents to the neighbouring cities of Riga is the well-organized environment and difference in apartment prices. Of course, every ambition can not be met and satisfied, but when analysing the characteristics of the city of Riga, it can be concluded that the inequality in the city is obvious. One person has the opportunity to develop and have a good rest in the locality of his own, while the other is deprived of this opportunity; then the question is why there is such an inequality. An example is Mezciems, where the number of pre-school educational establishments is smaller than in Skanste, where the number of population is 10 times smaller. Whereas, when researching cultural institutions in the neighbourhood, an incomprehensible spectacle appears; cultural institutions are not available in the larger localities of the city, but in Bukulti, which has 600 residents, there is a cultural center, but in Ziepniekkalns, which has 33 thousand residents, there is no cultural centre, the same spectacle also opens up in Purvciems. Brasa, where residents are three to four times fewer than in Purvciems and Ziepniekkalns, has four cultural institutions. Of course, within Riga you can go to nearby localities or the center, where there are almost a hundred of cultural institutions. However, in order the residents would have opportunity to develop and creatively improve in their locality, a cultural institution is often the place, where various events for children, adults and elderly people are organized, in order the resident could participate and feel comfortably in his/her locality and the city as a whole and he/she has the opportunity to attend some beautiful cultural and educational event and feel that he/she belongs to it.

Further, in this research, the general characteristics of the city, the structure and characteristics of the population will be dealt with. The local government budget will be explored and analysed to determine the impact of the resident on the sustainable urban economic development.

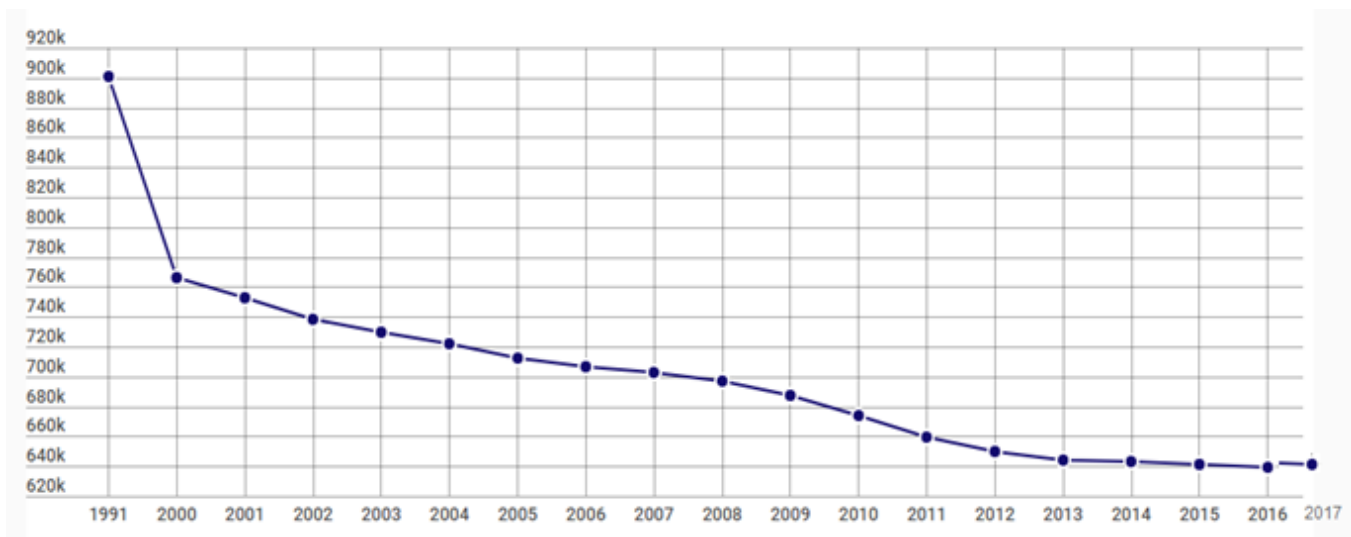


Figure. 1 The number of permanent residents in Riga
Source: Central Statistical Office

Contrary to the generally accepted belief that Riga deprives the regions of the most workable and active residents, it must be admitted that, unfortunately, the statistics show a slightly different picture, as it is shown in Figure 1, since 1991 the number of population in the capital has decreased. Riga has not succeeded in stabilizing the number of its permanent residents, as from 2000 until 2017 their number has decreased by 16, 3 % or from 766 thousand to not full 641 thousand. The same situation is abroad also. In Latvia, the number of population has decreased by 18% from 2000 until 2017, namely, from 2.38 to 1.95 million residents (Central Statistical Office). Looking at the neighbouring countries, the trend is different; in Tallinn, the number of population increased by 2%, but in Vilnius, such a sharp shrinking of population is not taking place, there the number of population has decreased by 1.5% and now it has 534 thousand of residents. The positive point is that Riga is still the largest city of the Baltic cities, and in 2017, the statistics show that in 2017, the number of population is increased compared to 2016 (Central Statistical Office; The population of the counties of Lithuania).

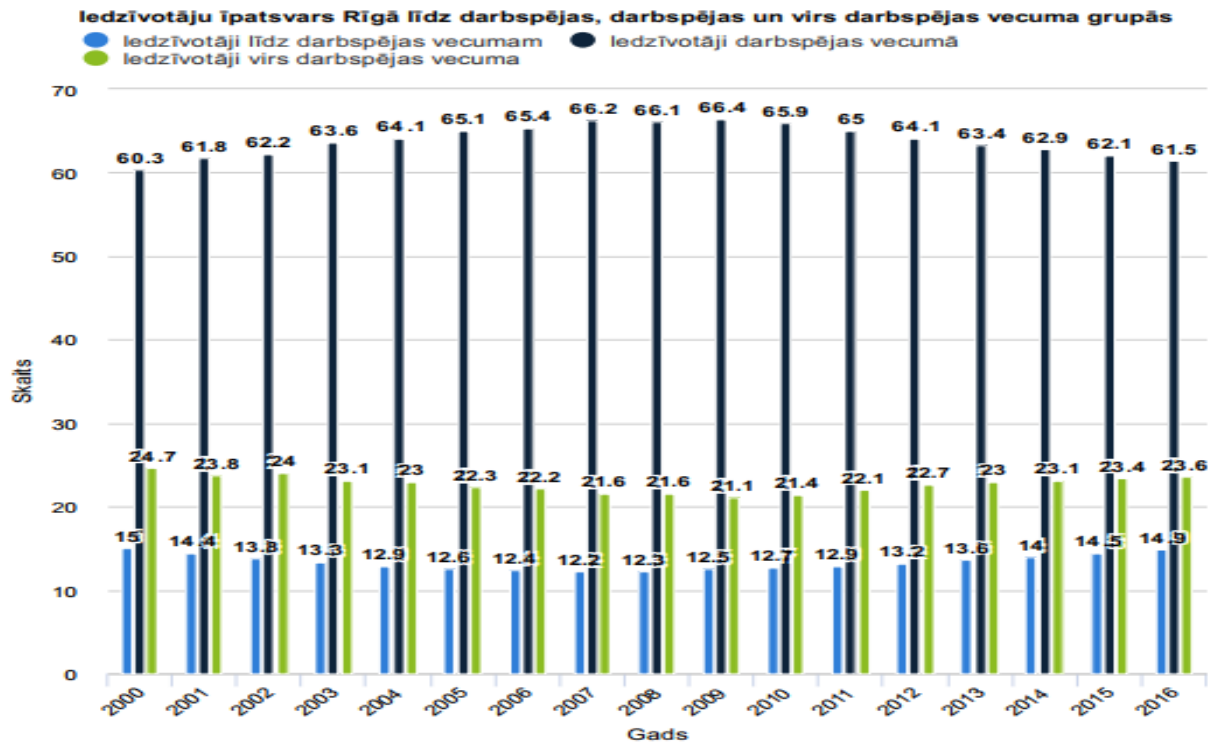


Figure. 2 Share of population in Riga
Source: Statistics about Riga

Figure 2 shows the structure of Riga population, where it is clearly shown that the city has a sufficient number of able-bodied population, which is an essential indicator for promoting the sustainable urban economic development. However, their number is still unstable and volatile, as it is shown both in Figure 1 and Figure 2. Despite the fact that the number of able-bodied population is high enough, unfortunately, the number of employed people is falling faster than the number of able-bodied population (See Figure 2 and Figure 3), which is an important indicator, since the basic income of the Riga City budget is made up of personal income tax, which consists of on average 62 % of the total revenues of the Riga City Municipality's budget.

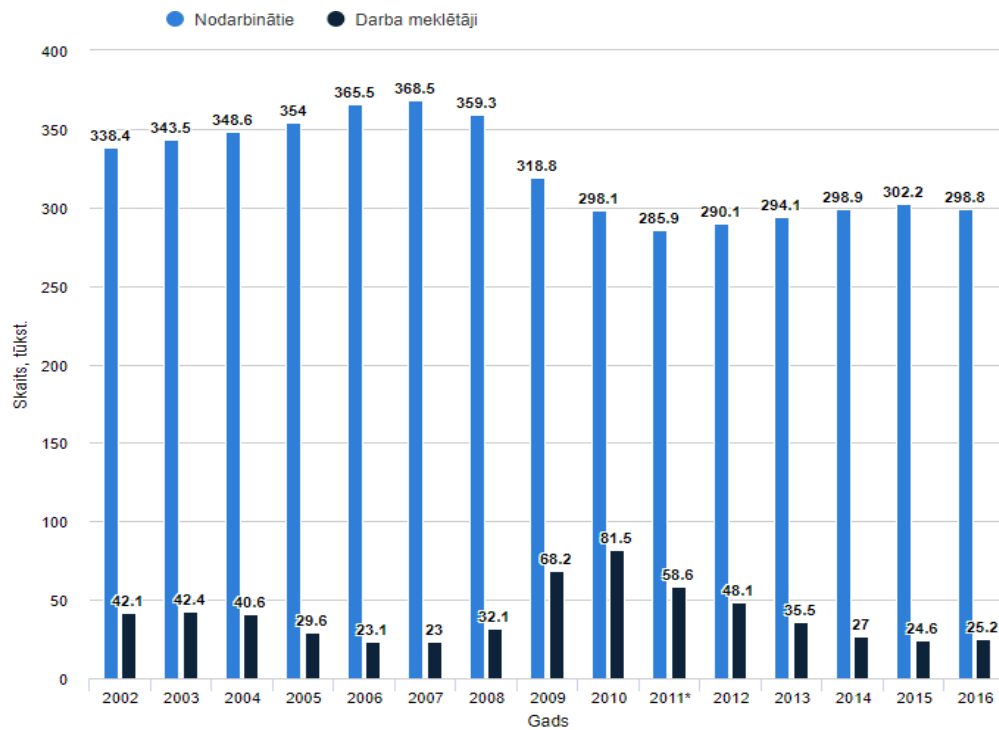


Figure 3. Job seekers and employed persons in Riga (thsd)

Source: Statistics about Riga

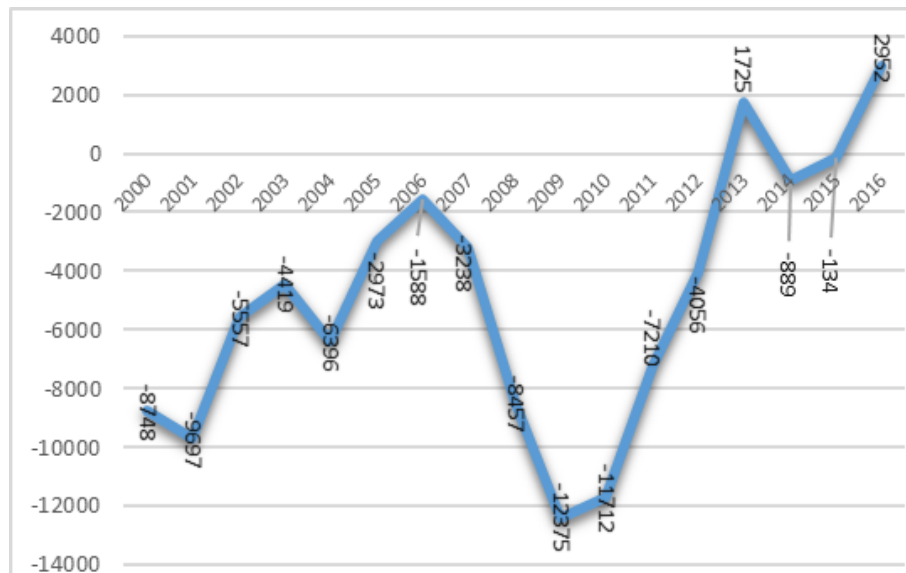


Figure. 4 Population migration balance in Riga

Source: Long-term migration of population in regions, republic cities and regions

One of the reasons for the migration of population is the lack of affiliation to their place of residence and lack of cooperation with the municipality, as well as the resident does not feel himself/herself as a cooperation partner in the development of his/her city, despite the fact that the resident is the core of the city development in the city planning documents.

One of the important factors of the city development is the quality of development of city planning documents and their compliance with the goals set. Therefore, it is vital for the growth of cities of Latvia to continue the development and implementation of strategic planning and management documents both for the cities of republic significance and regional cities, based on analysis of indicators characterizing the socio-economic and territorial development of the cities (Grizans, Vanags 2010).

When analysing both the population survey and the city planning documents, it is, unfortunately, concluded that upon developing the city planning documents, the residents' wishes are not taken into account and their opinion is not heard, which also appears in the absence of cooperation.

Within the framework of the research, the population's satisfaction with the city was viewed and the survey conducted by the SKDS (Market and Public Opinion Research Center) in 2014, which explicitly shows that residents of Riga enjoy public activities and are pleased to attend them, which is 69% of the respondents that also shows the need for cultural institutions. The survey also shows that the involvement of the population in the development and improvement of their locality has decreased by 50% (compared the survey conducted in 2014 to 2010). As well as the author of the research, in March 2015, conducted a survey of residents of the largest localities of the city of Riga (Ziepniekkalns, Plavnieki, Purvciems, Kengarags un Imanta), as a result of which it was established that the city development took place not complying with the city planning documents, because the residents were not provided with equal living conditions; it becomes apparent in such way that in Kengarags there is only one children's play area for nine courtyards. The mentioned situation in the management and planning of the city creates a sense of inequality in the residents. Consequently, it results in retroactive effect; the resident becomes abusive and does not want to participate in any activities related to the city development. All this also appears among the respondents and the sceptic attitudes of the residents towards the work of the local government and cooperation with it.

Not less important indicator is high prices of apartments in Riga, because, for example, in Ogre, Salaspils and Jurmala (Kauguri), apartment prices per square meter are lower by 30-50% than in Riga both in the new projects market and the standard-type apartment market (Real Estate Market Overview).

If the cooperation is not improved and a sense of responsibility and affiliation to their living environment is not created in the population, then in the long run, a large part of the living fund will be exposed to the risk of degradation. Such current model and rate of the city development is not sustainable, i.e. it is not comfortable to live in such environment for neither present nor future generations, as most of the city, with such a development, will become a brownfield, and "Ghetto" localities will grow in number. Therefore, one should take an example from European countries where the main principle of development is to make the living environment more attractive, but not forgetting the state of environment, which is essential, because it is necessary to maintain an aesthetically pleasing environment around the living area, in order to have a resident's desire to return to his/her locality. In order to be sustainable, one must be able to think innovatively, thus, it is necessary to create innovative ideas for the further development of the city by attracting and working together with the society.

Given that Riga consists of 58 districts and has several thousand residents in each locality with the total population of 641 thousand, the main goal of the city of Riga should be to increase their number and keep the stay of the existing residents in the city, therefore it is important to observe the factors indicated in Figure 5, then the resident will be affiliated and feel comfortable so as not to think about changing the place of residence.

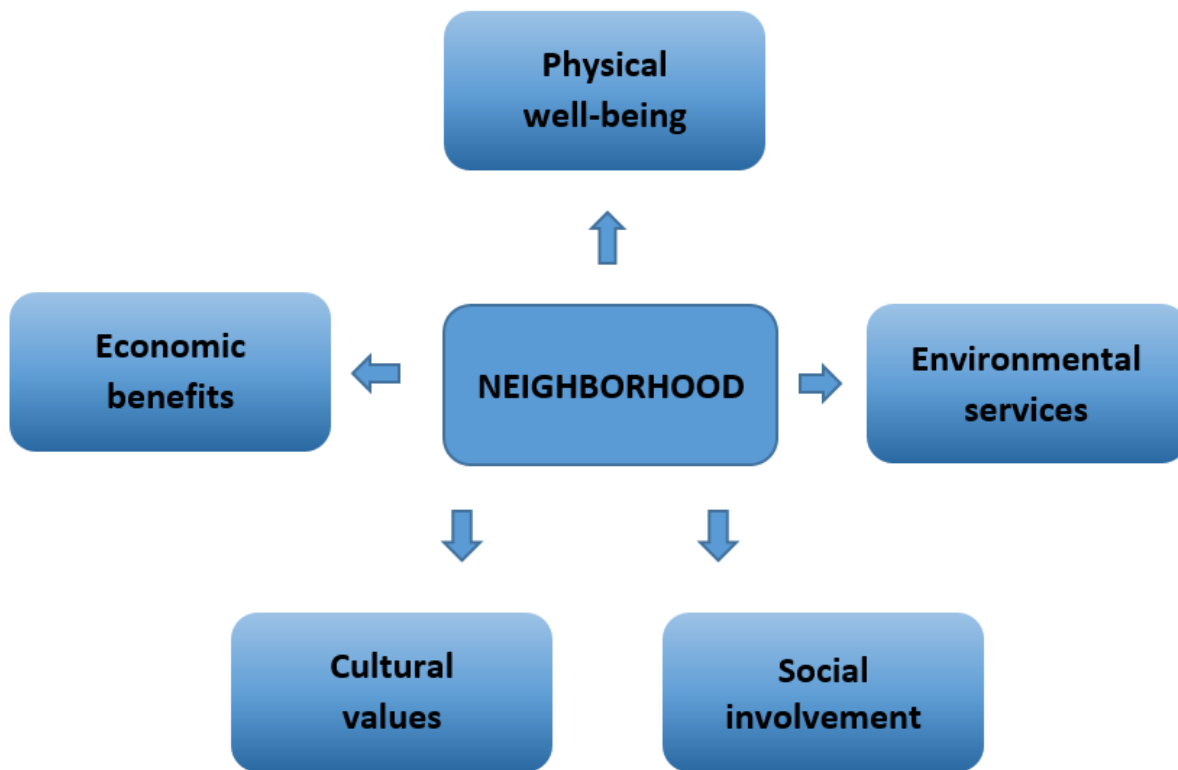


Figure 5. Contributions of a district to the city of Riga
Source: developed by authors

Given that the city consists of localities, then, as Figure 5 shows, the image of the city of Riga and, in particular, of localities is influenced by five important and interconnected factors:

1. Economic benefits mean that a well-organized infrastructure in the locality, i.e. kindergartens, polyclinics, hobby groups, and sports clubs, and other activities, should be located in the locality. Also, developing the living environment in the locality, desire for living accommodation increases, hence the interest of investors in investing their funds in its development grows, which would also raise market prices of real estates.
2. Cultural values – the opportunity to develop in a cultural way, to visit the events organized by own locality and the city, to be informed of activities in nearby localities and also the opportunity to participate and develop.
3. Social engagement – the opportunity to participate in social life in his/her locality. To participate in the adjustment, improvement of his/her place of residence, to cooperate with the Riga Municipality and to participate in public deliberations on the development of his/her locality.

4. Environmental services include the opportunity to enjoy your leisure time in an orderly environment, with persons being in the yard, exchanging views with the surrounding people and living in an orderly, safe and environmentally friendly environment.
5. Physical well-being includes free-to-use sports fields, cycling routes and various other activities to develop physically and mentally within the limits of your locality. Organization of various events for residents of the locality, bringing the locality closer together, and enhancing your affiliation to it.

Following all the five interconnected factors and all the four goals stipulated in the city development documents, which interact with each other and which are based on the sustainable urban economic development, and being based on the city's pillars: society, urban environment and economy, and considering Rigans (residents of the city) as the center of the pillars, the resident will feel comfortably and necessary and belonging to his/her place of residence, creating a desire to stay and live there. Figure 6 shows the real situation in inner courtyards of the localities of the city of Riga, which in no way express the interest of the local government in welfare of residents at their place of residence. This situation in the localities of the city of Riga is not the only one, there are many and more dramatic. The inner courtyards indicates in Figure 6 are in the largest localities of the city of Riga (Ziepniekkalns and Kengarags), the situation is dramatic.

The sustainable development is defined in a wide variety of ways, and its definition is dealt with very differently, because the process of sustainable development is topical throughout the lifetime of mankind and the concept is gaining in popularity. For the first time, the concept „sustainability” (Nachhaltigkeit) was used in 1713 in an article on the sustainable use of forests: “You can take from the forest as much as it can grow” (Hans Carl von Carlowitz, 1713).

It should be remembered that the city of Riga has also a social function and it can promote the communication and interaction among the people that will promote the emergence of new contacts that can form founding of new associations of population, which gives more motivation to fight for their desire to improve the environment at their place of residence, in order Rigans have the opportunity to spend their time comfortably that will also promote cultural functions, strengthening the resident's identity and sense of affiliation to his/her place of residence. It should be remembered that the localities serve as essential symbols for shaping the city's image and are important cultural heritage for the future generations, therefore their development needs to be given special attention and the principles and priorities of planning documents of the future city should be considered in order to make the written coincide with the done.



Figure 6. Inner courtyard of the city of Riga
Source: from the author's own archive

It must be admitted that a pleasant and safe locality is one of the most important factors for ensuring social welfare of the society. The pleasant surroundings give rise to a desire of people to preserve all that and continue to stay there.

Involvement of residents in forming the locality system, i.e. in the development of the city, is one of the instruments for developing and improving Riga urban environment. The municipality can implement and manage the sustainable urban environment development only if there are competent and Professional workers who are performing the basic work of urban development, because at the moment things seem to be chaotic, without a concrete plan and strategy and future outlook. Therefore, the active participation of residents in the work of local governments can both directly and positively influence the sustainable development of the city and indirectly, as when the residents feel more satisfied with the work of the local government and trust in it, there is a higher motivation to live and work in the particular area. Therefore, one should agree with the written that urban development in Latvia is possible not in a rivalry but in a partnership (Grizans; Vanags 2010).

The next part of the research will assess the impact of a resident on the sustainable urban economic development.

3. Assessment of the impact of a resident on the sustainable economic development

One of the main factors for the sustainable urban economic development is the number of population, which in Riga is large enough to compete and provide economic benefits to the Riga Municipality in the form of budget revenue. Also, not less important factor is the number of able-bodied residents, which at the moment on average is 63% of the total population of the city.

In the future, the Riga Municipality should look through how to preserve and maintain the youth's routine and stay in the agglomeration of Riga and not to migrate to foreign countries and other cities, and not only to set goals and objectives on paper, but also to reflect all this in reality in the labor market.

In 2016, the Ministry of Education and Science commissioned LLC "Excolo Latvia" to carry out a research on "The involvement of the Latvian youth in entrepreneurship". The research showed that the Riga City Council had launched several activities and projects for attracting young people to commence their own business and stay in the national labor market, for example, the City Development Department, in cooperation with JSC SWEDBANK, organized a grant program "Take-off", within which the young entrepreneurs of Riga (including majors) were entitled to receive financial support for the commencement or development of their business. It also participates in a grant program "Promotion of employment of the social exclusion risk groups in Riga", the project name is Take-off, the aim of which is to stimulate the development of new, innovative entrepreneurs and to promote the innovative development of existing enterprises in the administrative territory of Riga, where the second activity is promoting the employment of the social exclusion risk groups in Riga, the aim of which is to stimulate, launch or develop and implement the development of the sustainable development of societies and foundations or entrepreneurs in order to ensure employment opportunities, incl. creating new or improving existing jobs for target groups at risk of social exclusion (Latvian youth involvement in business).

As well as, the Department of Education, Culture and Sports of the Riga City Council organizes several events to support the involvement of young people in a number of entrepreneurial activities, such as entrepreneurial training for young people and youth groups "YES", whose aim is to strengthen the youth's NGO sector in Riga and contribute to the sustainability of organizations, to create a safe environment, in which young people are able to create their own jobs by monetizing ideas. The second activity is a project "My generation in the labor market" (URBACT II Program), the aim of which is to promote the employment of young people in a changing labor market, in particular by promoting entrepreneurship skills and attitudes (Latvian youth involvement in business).

The research shows that young people of Latvia at school age are very interested in entrepreneurship, but by age growing, this interest significantly diminishes and more interest is in being an entrepreneur/self-employed on their own, rather than creating larger entrepreneurship and employing others. Also, according to young people, the image and culture of entrepreneurship and its environment are, in general, not positive, as the image of enterprise is often associated with unfair business practices, the widespread image of public institutions as a threat to entrepreneurship as well as the low level of social capital in Latvia – distrust in others, fear of sharing ideas, lack of skills of working in a team, fear of failures (Latvian youth involvement in business).

The mentioned research shows that the Riga City's Municipality, in cooperation with the private sector, organizes activities for attracting young people to the development of entrepreneurship and integration into the labor market, but, unfortunately, the analysis of the research shows that young people feel insecure due to the situation of the tax and common business environment existing in our country. Therefore, this issue needs to be raised at the national level, which is currently indolent, because integration of young people into the labor market is problematic, as the desires do not coincide with the offer. This also shows the lack of cooperation in developing strategic documents of this kind.

Table 1 shows a common characteristics of the city of Riga, the indicators emphasize the importance of the city's resident both in the economic development of the city and in the sustainable urban development, as without the support of residents and professionalism of the municipality, the sustainable existence is not possible, therefore it is essential that there is cooperation between both parties, since one party gives resources, and the other party must be able to manage them effectively. Therefore, mutual trust and cooperation is important for the sustainable development of the city and state.

Table 1. Economic characterization of residents of Riga

Source: Residential district statistics, Residents and social processe, Statistics about Riga

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Population (thsd)	706,6	705,6	697,3	687,4	673,4	649,9	643,6	643,4	641	639,6
Working-age population (15-64 years old) (%)	66,2	66,1	66,4	65,9	65,0	64,1	63,4	62,9	62,1	61,5
Number of employed (thsd)	368,5	359,3	318,8	298,1	285,9	290,1	294,1	298,9	302,2	298,8
Personal income tax (milj.)	414,06	504,12	350,03	356,29	362,83	380,48	406,94	450,05	459,78	507,06

So, Table 1 shows that, despite of the fact that the number of population has decreased, the local government has considerably increased amount of personal income tax in the budget; these indicators also show an increase in income of the population. In 2016, an employed resident of the city pays 6193.7 euro into the Riga Municipality's budget from personal income tax. Also, the Table 1 clearly shows that as a result of the decrease in the number of population the number of able-bodied residents is decreasing, which shows that exactly able-bodied residents migrate from Riga, which brings economic contribution to the city of Riga. Today, in Riga, unemployment is 3.6%, which is lower compared to 2016 (5%) and shows that, nevertheless, the city of Riga is attractive its residents both economically and socially, because according to the data of the Central Statistics Bureau, the number of population in 2017 is at the same level as in 2015, but the number of population is still close to figures of 2007.

It must be admitted that, in general, the city of Riga is changing and urban planning is gradually taking place thoughtfully, but the "monologue" situation, and not the "dialogue" situation, is still felt, because cooperation is still of low capacity. Attending the conference on the future large-scale changes in the Skanste locality, the participation and activity of the population is low, the number of participants in the conference was small and,

during discussion, the lack of attention of planners to the shortcomings in territory development planning reasonably expressed by entrepreneurs and residents. This case also shows that it is not for nothing that Rigans have sceptical attitude to the ongoing system in Riga planning, because the residents believe that their opinions will not be taken into account.

Therefore, doubts arise about the Riga Municipality's understanding of the sustainability and economic growth of the city, as it is important to motivate the local patriotic spirit in the population, providing the residents with a qualitative, comfortable, pleasant and environmentally friendly living environment, in order to enable the resident to economically grow and develop instead of degrading himself/herself and degrading surrounding medium that is happening at the moment.

Conclusions

The resident of Riga is an important part of the city, which is also a fascinator of and participant in the sustainable economic development. Therefore, it is important to promote local patriotism in the population as well as cooperation with the local government, which will increase the trust and willingness of the resident to participate in the development of his/her living environment.

As a result of the research, it can be concluded that the city management lacks professional experience and skills to handle and efficiently manage existing resources, as the implemented does not coincide with the desires of the population and the overall image of the city.

It is important that the main pillar of the city's development is the opportunity for the residents to live in a qualitative living environment with a diverse and lively outdoor space, feel safe while staying and moving in the locality, have an advanced infrastructure and, of course, have a sense of affiliation to his/her locality and city. To feel needed for his/her city.

Good urban planning and management practices also show a level of welfare both in the population and the urban environment. A high quality living environment in an attractive locality is one of the main conditions for the sustainable development and labor force attraction to the city.

Given that the impact of the resident on the sustainable urban economic development is important, as his/her contribution to the city's municipality makes up 63% of the total budget revenue, it is important to save the residents in their city and attract new residents. In a developed city, a developed society.

Active participation of residents in the work of local governments can directly positively influence the development of the city, as well as indirectly – when residents feel more satisfied with the work of the local government and trust in it, there is a higher motivation to live and work in the particular territory. Therefore, it must be said that the development of cities in Latvia is possible not in a rivalry but in a partnership.

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EFFECTS OF CONTRACTOR AND EMPLOYER'S OBLIGATIONS IN BUY BACK

CONTRACTS: CASE STUDY OF OIL EXPORTING COUNTRY*

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Received 20 July 2017; accepted 28 October 2017; published 28 December 2017

Abstract. Buy back contracts are one of the variety of investment in oil industry in Iran. To put it another way, the main purpose of contracts such as buy back is to increase investment and attract more capital and foreign currency in the country. As it has been proved in economics and business sciences at international level, when investment is made in a country, it directly or indirectly bears positive impacts on all groups of people. The present research study aimed to examine the juridical status of one of the buy back deal sides under the name of contractor, who is supposed to invest and develop oil fields along with other related issues so that topics such as tax payment, insurance, workers, and civil responsibilities of contractors against employer would be more taken into consideration by contractors and more importantly, contractors could know about different insurance coverages and select their intended one and also abdicate any responsibility resulted from legal crimes from themselves by setting tax returns. This, in turn, helps them to do their business activities without any problem in the host country. Furthermore, employers also have some financial and non-financial obligations to contractors including preparing the required conditions for implementation of the deal substances. Knowing about these factors helps the two sides to sign a legal deal. Finally, the present study was an attempt to present a case study, which would raise the two sides' knowledge about their rights and sign the buy back contract according to predetermined specific legal regulation.

Keywords: Buy Back Contracts, investment, oil industry, contracts, Iran economic, case study

Reference to this paper should be made as follows: Ardalan, F.; Almasi, N. A.; Atasheneh, M. 2017. Effects of contractor and employer's obligations in buy back contracts: case study of oil exporting country, *Entrepreneurship and Sustainability Issues* 5(2): 345-356. [http://doi.org/10.9770/jesi.2017.5.2\(13\)](http://doi.org/10.9770/jesi.2017.5.2(13))

JEL Classifications: K12; F1, F14

Additional disciplines: law

1. Introduction

Energy availability is one the facet of energy security, driving force of sustainable economic regional developmet (e.g. Tvaronavičienė et al. 2017; Strielkowski et al. 2016; Melas et al. 2017).

* This research was supported Islamic Azad University, UAE Branch

Therefore legal environment in oil exporting countries inevitable obtain increasing importance for interested parties.

Iran has remarkable oil reservoirs in the world and it might be taken as one of the biggest oil tanks countries in the world.

According to an official statistics, Iran has 137.6 billion barrels of oil reserves and this has caused it to be the second-largest oil producer and exporter in the world (the first country is Saudi Arabia). Furthermore, after Russia which is regarded as the largest natural gas producer in the world, Iran has the second position in this term (Ghandi & Lin, 2011). Iran, as one of the main member countries of Oil Petroleum Explorer Countries (OPEC), has its economy largely on the basis of oil export revenues and it is, in essence, its main source of revenue. (Estelami 1999). However, due to a set of problems inside or outside of the country, the possibility of investment by both Iranian and non-Iranian persons and companies has considerably been decreased. On one hand, there are specific economic policies in Iranian constitution that are big hurdles against foreign investors and do not permit them to easily invest in different stages of discovery, development, or exploitation of oil and gas. This is largely due to the sovereignty issues present in the country's constitutions and petroleum rules (Ghandi & Lin 2011). On the other hand, there are some sanctions imposed by some powerful governments and countries on Iran that, in turn, prevents the two sides from having a mutual beneficial business.

Sanctions are mainly of two types: trade sanctions and financial ones. The former usually targets a country's import and export capabilities and cause embargoes on traded items and services (Pratt & Alizadeh 2017). The latter type of sanctions is mostly related to banks, financial institutions, and persons and tries to inhibit any kind of global fiscal trades (Andreasson 2008).

Recently, tougher sanctions have been imposed against Iran with the purpose stopping or reducing the progress of the country's nuclear program. These sanctions targeted a series of economic, scientific and technological, military and strategic actions. The most severe of them were banning any trade and interaction with Iran's Central Bank and also sanctions related to the country's oil trade. These sanctions largely aim to paralyze Iran's oil industry, as its main revenue, and also to reduce the important role of the Central Bank to be active in the selling of oil to the other countries of the world. These sanctions have been referred to as the toughest ones in the history (Sadeghi-Boroujerdi 2012).

The European Union (UN) also boycotted Iran and mostly focused on banks, trade and gas imports of Iran. Assets of persons and factories and organizations that made technology available to Iran were also seized (Pratt & Alizadeh 2017). The EU has also imposed sanctions on the Central Bank of Iran, its natural gas and metals, and has taken measures to make business trade between Europe and Iran more difficult (Moret 2015).

Many organizations are not willing to be involved in any interaction and trade with Iran due to many complicated barriers against them (for example, their need to gain specific certificates and licenses to sell exempted merchandise such as medicine. Other factors including baffling bureaucracy, long delays in payments also contribute to Iran's economic problems (Erdbrink 2012, Borger and Dehghan 2013). Cargo traffic has also been reported to reduce due to a set of factors such as limitations on Iranian ports and shipping companies such as insurance bans (Heydarian 2012; Moret 2015; Seeberg 2016). Furthermore, high transport costs and the use of middlemen to circumvent probable problems related to sanctions are also other problems that might discourage any company from interaction with the country.

The adoption of service contracts may also affect the ability of host governments to attract investment offered by international oil companies (Ghandi & Lin 2014). Buy-back service contracts are the basis of Iran's energy

policies, made by the National Iranian Oil Company (NIOC) (Ghandi & Lin 2014). These contracts offers tough constitutional rules that restrict foreign oil companies to be involved in the country oil and natural gas works (Ghandi & Lin 2011) They have also helped the NIOC to make use of the IOCs' technical and fiscal capabilities as the IOC has the responsibility of developing the field (Van Groenendaal & Mazraati 2006). Although Iran's service contracts are typically referred to as buy-back service contracts, their frameworks present three generations of service-type contracts in the country (Ghandi & Lin 2014).

Presenting some points concerning the judicial framework of buy back deals and also explaining their legal precepts at international and Iran level, the current study tried to make it possible for the two sides to reach agreement sooner. Furthermore, it helps them to reach unity in setting a deal without any opinion differences. Although any contract and deal depends on specific features and conditions, this study dealt with explaining general precepts of contracts in terms of rights, obligations, decisions, facilities and amenities, technology, and other related issues.

2. Impacts of Buy Back Contracts on Rights and Obligations of Contractor

The first buy-back service contract of Iran was signed on March 6, 1995 with Conoco Oil Company Alikhani, 2000) and after that, a set of other contracts were signed (Ghandi & Lin 2011). A service contract is an almost long time framework governing the interrelationship of a host government and international oil companies (IOCs) in which the IOCs explore oil or natural gas fields for the host government for already determined money. Almost in all of the cases the host government does not permit the IOCs to have any control on the extracted or subsoil or sub-surface resources (Ghandi & Lin 2011).

The term "contractor" refers to a company - or foreign companies - that signs a deal with National Iranian Oil Company(NIOC) and is supposed to invest, develop the oil fields, develop amenities, etc. in Iran oil upstream section, and national Iranian oil company, as the representative of oil ministry of Iran, is known as the employer of this deal. In the first article of oil rule approved on October, 1st, 1987, the term "contract" has been explained as: "contract means obligations made between oil ministry and an operational unit or any real or legal person who takes the responsibility of doing some parts of oil operations in line with Iranian's rules". In continuation, article 3 also states that: "any determination and assignment of the right of ownership and sovereignty of oil amenities and sources belongs to the Islamic government that, according to this rule, should be done by oil ministry".

Buy-back service contract is typically referred to as a contract between the National Iranian Oil Company and an International Oil Company (IOC) by which the IOC is committed to develop an oil or natural gas field and also to deliver the field to the NIOC when production starts.(Ghandi & Lin 2011)

3. Contractor's Rights and Obligations

At first, the rights and obligations of contractor and then those of the employer would be studied.

3.1. Impact of Buy Back Contracts on Contractor's Rights

This section deals with the most important fiscal rights effective in contractor's deal:

Receiving Remuneration

After contractor does all its obligations and NIOC also approves this, the contractor is qualified to receive its remuneration and all costs and invest benefit. The IOC's yearly repayment rates are in accordance with special amounts of the production of the field and an agreed-on rate of return. Remuneration is extra payments for the IOC's services such as carrying on engineering, procurement and construction actions as well as financing the

project and technology transfer (Ghandi & Lin 2011) In Iranian buy-back service contracts, Repayment of the project investment along with fiscal costs, remuneration, management fees and benefits are done in a limited time by specific installments based on the income resulted from selling of up to 60 percent of oil and gas produced from the fields developed (Dehkordi, Hamedani 2014). As receiving remuneration is among the contractor's rights, its payment is also among the employer's duties. The amount of repayment is determined at the time of signing the contract and only in cases that the amount of operation and work agreed in the master development plan is increased or decreased; the amount of remuneration might also be increased or decreased accordingly. On the other hand, repayment is on the basis of part of borrowings repaid in by the NIOC and its estimations are in line with an already agreed on fixed oil price and money equivalent of a portion of the produced crude oil for the IOC. Although the contractor might always expect to receive all oil costs and the agreed payment, the contractor's profit is not fixed.

Costs Compensation

As it was above-mentioned, repayment of all costs spent by the contractor should be done after the beginning of exploitation from maximumly 60 percent of produced oil from the same project. All capital and non-capital costs and also bank, operational, and consultation costs that have been spent by the contractor during the completion of the project and also payments that the contractor spends for income tax should be returned to the contractor during the remaining time of depreciation. Furthermore, all the costs that the contractor pays after beginning of primary production from the first phase of the contract area should be returned to the contractor based on a usual method without any bank cost usually three months after paying the costs. The tax and tolls costs paid by the contractor out of Iran are not included in this repayment by Iran. As it was already pointed out, repayment of all costs should be done only by selling a specific amount (60 %) of oil from the same source by Iranian oil company.

Investment benefit

In addition to remuneration and contracting costs, the investment benefit should also be paid to the contractor. The rate of fiscal facilities benefit is determined in line with the rate acceptable for central bank of the country for other financial facilities (Dehkordi, Hamedani 2014). In each period, any amount of oil costs that is not paid is transferred to next period and in this case, the benefit rate is based on London Inter Bank Offer Rate (LIBOR) along with a higher percentage that is considered for the belated sections of costs. Therefore, it might be stated that the whole income of the contractor involves the repayment of all costs to the pre-determined limit along with compensation money and costs of fiscal supply during the period of loan depreciation. Hence, the contractor can ensure that all oil costs and compensation money are repaid in line with day value. It was often thought that the benefit rate of buy back contracts is fixed. But it is not necessarily this as the repayment of contractor's commission for the purpose of keeping a fixed benefit rate is not eternally set; but, all repayments are done based on day pecuniary conditions and only remuneration is determined at the time of contracting. Therefore, the rate of invest return is not predictable in these types of contracts.

Suitable Reward

According to one precept of buy-back service contracts, when production on the fields of the contract begins, the NIOC takes over the operation of the field (Van Groenendaal & Mazraati 2006) meaning that besides ownership rights of the produced crude, and in sharp contrast to production sharing agreements, the NIOC is the operator of the developed fields in the buy-back framework.(Ghandi & Lin 2011) In other words, Unlike the production sharing contracts in which foreign contractor considers itself as a partner in the field and its resulted productions and as a result, has more motivation to reach the highest possible economic rate by using advanced technology, technical knowledge, skills, amenities, machineries, and raw materials, in buy back contracts, the main preoccupation and concern of the contractor is reaching a specific rate of product in line with the contract. Thus, in these types of contracts, the contractor has no motivation to make use of advanced technology for further production or reducing costs. As a consequence, to motivate contractors in these contracts, other strategies such as

determining reward payment or prize have been specified. To put it another way, there is always a condition stipulated in the contracts that " if the contractor does its duties correctly and appropriately and the amount of capital costs expenditures do not exceed the capital cost ceiling (CCC), three months earlier than the repayment of costs is finished, contractor and N.I.O.C will adjust the reward and remuneration amount in a way that the investment the rate of return does not exceed x percent for example, 14 %" (Dehkordi, Hamedani 2014). Thus, if capital cost expenditures are less than that specified in the contract, reward will be awarded to the contractor. However, if in contrast, the capital cost expenditures go beyond the pre-determined amount in the contract, this extra cost is not paid by the national Iranian oil company.

Security Right

One of the rights that each investor (foreign or Iranian) should have is full security especially economically and financially. Security in the country is among the most important and influential factors in attraction of foreign investment. When an investor does not see his investment safe and sure, never risks as he is looking for benefit and therefore, never invests in a risky country with no or less security. The concept of security is wide and involves different economic, life, political, and other security aspects. A foreign investor in a buy back contract is supposed to keep all his amenities, machineries, factories, internal and foreign workers, etc. to the end of projects and their delivery to national Iranian oil company. Health and appropriate keeping of them is depended on security that is among the first human rights. Accordingly, from among duties of oil ministry that has also been stipulated in oil rule of 1987, article 10 is "providing a good and safe condition and environment to encourage and attract efficient committed and expert elements".

3.2. Impact of Buy Back Contracts on Contractor's Obligations

After dealing with the rights of contractors, this section touches on their obligations.

Observing the Employer Country Rules

Contractors are supposed to follow and obey all rules of Iran (as the employer country) from beginning of their operations in projects to the end of projects and delivering them. This obligation has been stipulated in article 120 of work rule approved in 1989: "Alien persons cannot work in Iran unless they have visa with specific work right and also receive related work license based on pertinent rules and regulations". Article 124 of the same rule also states that "work license is issued or renewed or extended for one year maximumly". In order to be in accordance with Iranian rules, contractors are obliged to establish an office in Iran whose related explanations are discussed in the following sections.

Observing International Standards

From among other duties of contractors is regarding international standards in all their operation stages (Dehkordi, Hamedani 2014). According to Iran's buy-back service contracts, the host government gives no control on extracted or subsoil or sub-surface resources to the IOCs (International Oil Company). In other words, service contracts do not have a profit sharing mechanism (Ghandi & Lin 2011) So, Contractors usually try to make use of non-standard strategies and methods to finish the projects sooner and this is, in fact, one of defects of buy back contracts in comparison with participation in production ones. Furthermore, since national Iranian oil company has the responsibility of supervising and managing all actions of contractors, they should consider this important point carefully. To do this, contractors should use all their facilities and amenities based on international standards so that the costs related to projects do not exceed what is mentioned in contracts and even become less than it. This observation of international standards should be done by contractors in all stages of the projects. As an example, contractors should do their best to take care of environment and not to damage the area and oil fields. It goes without saying that as more advanced international standards are used, the field would have longer life time and more productivity.

Using Internal Forces

NIOC, as a governmental company, is responsible for meeting the purposes of Iranian government economically and non-economically. An important non-economic purpose that NIOC follows is to keep a high employment proportion of Iranian nations (Ghandi & Lin 2011). Therefore, in Iran's buy-back service contract, the contractors are obliged to prefer Iranian citizens to non-Iranian ones in their employment for different sections of projects and make use of foreign forces only when there is no qualified Iranian force. Foreign writers and researchers regard this as one of the articles of the Iranian model of buy-back contract. One of the important responsibilities of the oil ministry is preparing and equipping the needed work force and this is accomplished only by cooperation and participation of Iranian and foreign forces and using foreign experiences. In article 10 of the oil rule approved in 1987 it has been stipulated that "oil ministry is obliged to work for bringing up and equipping the needed work force and accessing advanced technology and also developing in different related fields of studies and taking appropriate measures to increase the knowledge and information level of experts and employees. Thus, one of the required ways and effective measures is the contractor's use of Iranian forces and equipping them with modern knowledge and skill. Maximum use of internal forces' technical and administrative capabilities is an effective way to prevent any transfer of foreign currency from the country.

Training and Transferring Technology and Guaranteeing Efficiency

It appears that Iran's interest in buy-back service contracts could be accounted for by the requirement for international oil companies' capital. To put it another way, besides the requirement for IOC's capital, the cooperation of the IOC's helps the government to make use of its know-how that, in turn, might consist of project management in different aspects such as how the capital is invested (Ghandi & Lin 2011).

As a consequence, in Iran's buy-back service contracts, contractors are obliged to make use of Iranian forces as much as possible. In line with this, they are supposed not only to employ internal forces in their projects, but also, train them and transfer the needed technologies to Iran. Unfortunately, in most of the contracts that are signed between Iranian officials and foreign sides (in all cases including oil and non-oil ones), it is the product that is transferred to the country and not related technologies. Due to a set of factors such as shortage of investment in the country, lack of required skills, shortage of technical knowledge and facilities (technology) for discovery, one of the national Iranian oil company's preoccupations has always been transferring suitable technical knowledge and also training and equipping internal forces by foreign contractors. There is no exact statistics about how the company has achieved such a purpose. In articles 1 and 10 of the oil rule approved in 1987, issues such as training and preparing the required work force, developing technology, and elevating industrial and technical knowledge have been predicted. However, unlike the oil rule approved in 1974, the strategies and methods for achieving these purposes have not been explained that, in turn, indicates the retrogressive movement of the rule maker.

Fiscal Supply of Projects

Any current cost, tax, tolls, and social security and income tax costs should be paid by foreign contractors and the national Iranian oil company repays these costs to them later. The project finance is a contract according to which a bank or commercial institution or a foreign oil company pays a loan to the oil field owner country for a specific operation but has no control on the type of spending and at the same time, has no commitment for achieving the operation and just receives the main amount of the loan along with its benefit rate from the guaranteeing government or bank.

Iran's buy-back service contracts typically lack Iran's Central Bank guarantee on repayments to IOCs. This is a feature of Iran's second type of buy-back service contract compared to the first version (Shiravi & Ebrahimi, 2006). According to an official statistics issued by the International Energy Agency IEA, there is a salient increase in the world oil demands from the present level of 84.6 million barrels each day to 105.2 million barrels each day in 2030 (International Energy Agency 2009). This requirement, in turn, needs remarkable investment in oil production and transport infrastructure. Moreover, most of these investments and development would be in OPEC countries. OPEC's enhancing portion of production enhances the significance of comprehending production

decisions and OPEC countries' energy policies (Ghandi & Lin 2011). In the fourth program of economic, social, and cultural development, in article 14, section (a) it has been stated that "to increase the capacity of production and keep and elevate the portion of Iran in OPEC production and also to encourage and support attraction of foreign investment and sources in upstream activities of gas and oil, the national Iran oil company is given this permission to act for signing discovery and development of oil fields contracts with foreign companies". Additionally, in the budget rule of 2006, the permission of signing finance contracts and also turning these contracts into buy back ones was given. However, the important point is that in the buy back contracts, national Iranian oil company, as the employer side of the contracts, does not take any commitment and responsibility and the foreign contractor should finance all related costs of projects from the beginning to the end of the operation from international organizations and institutions and as it was already mentioned, guaranteeing these loans is also on contractors' shoulders. The contractor should prepare and pay all oil costs during the discovery or development operations and these costs include all invest, non-invest, operational, and fiscal costs and after the completion of the project, these costs would be repaid to the contractors by N.I.O.C.

Tax Commitments and Work Obligations (Legal)

This issue is explained and discussed under to paragraphs:

A) As it was already stated, at the beginning, all costs including non-investment ones such as tax, social security, etc. are to be paid by contractors and at the end of the work, these costs are repaid by the employer. Thus, it should be examined how tax is paid by contractors in terms of Iranian rules. As we know, there are two types of tax: one is tax on benefit and income and the other is income tax that includes all employees and personnel working in the contractor company in Iran. The latter type is received from the personnel themselves based on Iranian tax public regulations. Note 20 of article 105 of direct tax rule (amendment approved 2001/02/27) states that "foreign real persons are to pay tax for 25% of all their obtained income including exploitation of capital in Iran, activities that are done directly by themselves or indirectly by their related representatives and companies or income they might obtain by transferring their rights to others, transferring technical knowledge, and also technical training and helps". However, as it was already mentioned, according to Iran's model of buy back contracts, all costs including tax ones should be paid by contractors at the beginning of projects. Therefore, it might be stated that contractor's tax is paid either directly by national Iranian oil company or they themselves pay them. Those contractors who prepare and purchase all or some of needed pieces and facilities inside the country, are exempted from paying tax to the extent of their purchase (note 2 of article 106 of direct tax rule, amendment 2001).

B) Observing Work Law Rules; One point that contractors are obliged to follow is different working obligations stipulated in related rules and regulations for foreign contractors. As an example, article 120 of work rule states that "alien persons cannot work in Iran unless firstly, they have visa with specific work right and secondly, they receive work license according to related rules". It has also been mentioned in article 124 of the same rule that "work license is issued or extended only for one year maximumly". Therefore, contractors should notice this rule for their foreign workers and employees. Furthermore, contractors are responsible for receiving permission of stay and work for their foreign personnel. Some foreign analysts know this as one limitation of foreign investment in Iran.

In article 20 of encouraging and supporting foreign investors rule (approved in 2002), it has been mentioned that "related executive organizations are supposed to act as to interactive commitments for visa, stay permission, work license, and employment license for foreign managers and experts.

Establishing Representative Office in Employer Country

In 1998, a single article was approved in Islamic Consultative Assembly under the name of "Permission rule of establishing foreign branch or representative" according to which "foreign companies that are legal companies in their registry place are allowed to establish a branch or representative office in line with the country regulations and rules". The note of executive regulation of the rule, on suggestion of ministry of economics, would be approved by ministers' cabinet and in cooperation with other pertinent organizations. Article 2 of the regulation

approved in 1999 states that "the branch of foreign companies is under the management of main company and achieves the purposes and actions of the main company in the country and therefore, the responsibility of the branch is with the main company". All companies that are formed and established in buy back contracts are no exception to this rule. Contractors who are obliged to obey all Iran's rules is supposed to follow this rule as well by establishing a branch and doing all related activities by this office.

Keeping Accounting Reports

Since national Iran oil company has the right of inspecting, accounting, approving, and confirming all spent costs of projects, contractors are obliged to prepare and keep all costs notes and accounts based on commonly accepted accounting methods and examining these accounts by national Iran oil company is possible only by establishing an office.

Offering Report to Employer

Contractors are obliged to report to the employer (national Iran oil company) concerning all activities that they do especially those related to costs, documents, and accounting deeds. As with accounting, it should be pointed out that announcement of costs, credits, and accounts along with their related documents should be offered to the employer in annual or three-month tables. The employer has the right of appointing its own accountants or Iranian and foreign accountants for examining all related documents, costs, invoices, and deeds of the contractor. It also has the right to have full access to invoices, documents, reports, and any other dependent contractors within working hours.

Completing Tax Return and Tax Acknowledgement

As it was already explained, according to note 2 of article 105 of direct tax act approved in 2001, foreign companies are to pay a tax for about 25 percent of their total income. Therefore, contractors are obliged to fill in tax returns and pay their related tax and this is done by their representative office established in the country. However, as it was already mentioned, national Iran oil company would repay these costs at the end of projects.

Responsibility Insurance

Contractors are obliged to insure their personnel, facilities, and tools based on Iran's rules. None of the contract sides is responsible for any direct or indirect damage of the other side. Thus, contractors should insure all his personnel and tools and machineries appropriately and time of the insurance is to the end of projects and their delivery to national Iran oil company.

4. Impacts of Buy Back Contracts on Employer's Rights and Commitments

This section deals with rights and commitments of the employer (national Iran oil company) in buy back contracts.

4.1 Impacts of Buy Back Contracts on Employer's Rights

Rights of national Iran oil company, as the employer of buy back contracts, are divided into two fiscal and non-fiscal parts.

Fiscal Rights

Fiscal rights refer to rights that have fiscal and economic values and might be changed into money. Right of contract annulment, obligation right, and right of asking for damage compensation are among the employer's fiscal rights that are to be examined here. In the case where a buy back contractor does not do his duties, national Iran oil company has the right of contract annulment. However, as we know, a set of rights and duties are made for each of the sides of contract and when each of the sides breaches his own obligations, the other side might ask

for annulment. As with buy back contracts, as the duties of contractors are by far more than those of the employers and contractors are more likely to breach the commitments, the right of annulment in the employer's section is discussed.

Right of Commitment Performing

In internal Iranian rights, when a committed person does not achieve his obligations, at first, is forced to do commitments and in case of preventing from doing commitments again, the other side of the contract has the right of asking for annulment. This applies for buy back contracts as well. To put it another way, when one of the sides (contractor or employer) prevents from doing his obligations, the other side has annulment right. That is why, as it was already mentioned, when one side does not do his commitments (often contractor side as he has many obligations to do) and this lack of commitment achievement continues after the determined deadline, the annulment right is made for the other side. This deadline is, in fact, a kind of compulsion for the side to do his duties in the specified deadline (usually 90 days in Iran) and after this time, if he does not do his duties again, the right of annulment is created for other side.

Right of Asking for Damage Compensation

This right does not belong merely to employer. Rather, contractors also might ask for such a right when the employer ignores obligations. As an example, if contractors do not use the required standards for implementation of projects and this leads to damages to the employer, contractors are certainly responsible for compensation of damages. It should, however, be mentioned that when any damage is made for the other side as a result of ignoring the contract and no implementation and compensation guarantee has been predicted in the contract, the culpable side might be obliged to compensate damages according to The rule named as justification rule. In this case, any side that asks for damage compensation, should prove his damage. In other words, three elements are necessary for any realization of responsibility: damage, commitment of damaging action, and causative relationship between action and damage. Thus, if the employer claims damage, should ask for compensation by raising a civil responsibility based on above-mentioned conditions and the same point applies for contractors. Another point to mention is that contractors usually insure themselves for any responsibility against the employer and this is, in fact, a preventive measure against damage.

Non-Fiscal Rights

Non-fiscal rights refer to those rights that cannot be changed into money even if they have fiscal effects but these fiscal effects are not basic and original.

Inspection and Supervision Right

Employer has the right of inspection and supervision in coordination with the other side during the project stages. National Iran oil company usually keep the right of inspection for itself in all contracts with contractors. Therefore, the company can inspect different stages of projects such as studying and examining vibrations, excavations, etc. Contractors are committed to offer the related tables and information to the employer's side.

Right of Insurance Coverage Selection

From among other non-fiscal rights that are typically predicted in Iran's buy back contracts is that of selecting insurance coverage for contractors. It was already explained that one of their duties are to put in priority employing Iranian employees and training them.

Right of Supervising Employees' Training

Another non-fiscal right is that of supervising trainings that are given to Iranian employees by contractors so that the employer might ensure about the quality of trainings.

4.2. Impact of Buy Back Contracts, Employer's Obligations

This section deals with the employer's obligations (national Iran oil company) against contractors. These obligations are also divided into fiscal and non-fiscal ones.

Fiscal Obligations

The most important financial obligations of N.I.O.C. as the employer side of buy back contracts are:

Payment of Costs to Contractors

As it was already explained, at the beginning of the project of developing oil fields, all related costs of projects to the end of them are on contractors' shoulders. However, after the projects are delivered to N.I.O.C., the company is obliged to repay all these costs to contractors.

Export Obligations

As it was stated, the employer is committed to pay all capital, non-capital, remuneration, and benefit costs of contractors in monthly installments from productions of the same project and as it was several times mentioned, money payment has no place in buy back contracts. Rather, to 60 percent of produced gas or oil from the same project is usually paid to the contractor according to a long-term contract. Therefore, the company is supposed to guarantee this payment to the contractor side.

Non-Fiscal Commitments

To achieve intended purposes in on time beginning of projects and implementation of contract, the employer has a set of non-fiscal commitments as well as fiscal ones against the contractor side including preparing necessary conditions for the work. Furthermore, the employer is supposed to provide other conditions and factors such as land, water, road, etc. for implementing development operations; and also related technical information and authorizations, related customs authorizations for entering and exiting required facilities and machineries.

Conclusions

What might be concluded from the present research study is that the contract side companies that attend Iran for discovery and development of oil fields projects become familiar with framework of buy back contracts in Iran and might become familiar with their obligations including using human forces and their training and also insurance rules of the country. By knowing about these rules and standards, they would be able to do their work in the country more appropriately and without any legal problem.

Acknowledgement

We should thank Islamic Azad University, UAE Branch for their support regarding the present research. I do really appreciate their cooperation

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**ENTREPRENEURSHIP ECOSYSTEM FACETS: THE EUROPEAN MIGRANT CRISIS AND PUBLIC
OPINION IN SLOVAKIA**

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Received 18 May 2017; accepted 26 September 2017; published 29 December 2017

Abstract. The research study offers an analysis of the current Slovak public opinion on the issue of migration in the context of the current refugee crisis, while also offering prevailing opinions, attitudes, preferences and values of the Slovaks to the possible arrival of asylum seekers in Slovakia. The study also provides the Slovak citizens' opinions on possible solutions to the refugee crisis. From realized analysis public opinion of the citizens has emerged with serious stance on the issue of migration. It should be noted that a similar approach is also seen in other countries of the Visegrad Group. We think that improving public opinion on citizens' attitudes regarding migration would demand the politicians an educating campaign not only in Slovakia but across the whole European Union. The European Commission may need to promote multicultural education.

Keywords: entrepreneurship ecosystem, European migrant crisis, refugee, Slovak Republic, research, public opinion

Reference to this paper should be made as follows: Lincényi, M. 2017. Entrepreneurship ecosystem facets: the European migrant crisis and public opinion in Slovakia, *Entrepreneurship and Sustainability Issues* 5(2): 357-367. [http://doi.org/10.9770/jesi.2017.5.2\(14\)](http://doi.org/10.9770/jesi.2017.5.2(14))

JEL Classifications: N44, O15, Y80,

Additional disciplines political sciences; sociology; information and communication;

1. Introduction

Since 2013, the European migration and asylum regime has entered a phase of crisis, which reveals the deep interdependencies between its different components (including intra-EU mobility) and the unbalanced nature of its normative foundations. This original structural fragility had not fundamentally compromised the overall functioning of the regime until two major exogenous factors (the economic crisis, with its asymmetrical impact on the eurozone, and the wave of political instability and conflicts on the southern shore of the Mediterranean) brought its intrinsic limits to the point of rupture (Pastore, Henry, 2016, 44-57).

In 2015, over one million refugees and migrants arrived in Europe, laying bare the limitations of the EU's common border control and burden-sharing systems. „It explains how unilateral, national-level responses have made the EU as a whole particularly susceptible to a unique brand of coercive bargaining that relies on the

threat (or actual generation) of mass population movements as a non-military instrument of state-level coercion“ (Greenhill, Kelly 2016, 317-332).

The number of refugees and migrants arriving by sea in Europe is on the rise. According to UNHCR, more than one million refugees and migrants arrived in Europe by sea in 2015, whereas more than 3700 people lost their lives while trying to reach the European shores. As a response to the migration crisis, the EU has adopted a number of policies as proposed by the European Commission in the Ten point Action Plan on Migration and the European Agenda on Migration. This was followed by adoption of the second implementation package of the Agenda and initiation of EU-Turkey Joint Action Plan on migration management (Ineli-Ciger, Meltem, 2016, 1-33).

We address the Mediterranean borders as they really are at the current moment: interconnected, delocalized, much more extensive than defined by law as "the European frontier". They constitute a "pressure cooker", exacerbated by the effects of police controls in transit countries like Morocco, Libya and Turkey. *„This border Regime extends to the European territory contains through the 400 immigration detention centres and the monitors of foreigners settling in Europe. The overwhelming borderland regime calling into question the validity of the ethical and political principles that led to the construction of the European Union“* (Suarez-Navaz, Liliana, 2015, 265-276)

Although migration was not at first among the Barcelona Process priorities, this mechanism regulated it in an indirect way. The Process was supposed to reduce emigration from the Mediterranean countries through their development, which had to create a wide range of opportunities for their population. „These events also showed the failure of the EU migration policy in the region since illegal migration is still growing. Today it is essential for the European Union to analyse the shortcomings of the Barcelona Process and reform its policy towards the Mediterranean region“ (Pogorelskaya, Anastasia, 2016, 103-107)

Margarita Urda and Svetlana Shevelyova (2016, p. 22) discuss some pending issues related to migration in terms of ensuring national security of the countries involved in international integration processes; it is emphasized that security challenges are closely related with the formation and implementation of migration policy. *„The preconditions of forced and illegal migration types are identified together with their influence on the security state in different spheres of social life. It is shown that intensification of migration processes may have a very good economic effect and can be justified economically and politically“*. (Margarita, Shevelyova, 2016, 22) „It has been determined that money transfer remittance of migrants, which also affects one of the basic macroeconomic indices, such as gross domestic product, has a considerable impact on sustainable economic development of both states“ (Grinko, 2016, 27).

2. Methodology

The main objective of the research is to analyze the current Slovak public opinion on the issue of the European migrant crisis.

One of the secondary research objectives is to analyze opinions, attitudes, preferences, values of the Slovaks in the face of the possible arrival of refugees in Slovakia.

Another secondary objective is to analyze opinions of the Slovaks to come up with a possible solution of the European migrant crisis.

In determining the methodology of research, we have set the following research questions with which we continue to work:

Research question no. 1: What is the attitude of citizens of the Slovak Republic to the possible arrival of asylum seekers in the Slovak Republic in connection with the migration crisis?

We anticipate the concerns of citizens of the Slovak Republic about the possible arrival of asylum seekers and on the ground that Slovakia is a conservative country where significant national and Christian principles, and the Slovaks have a lot of experience with migrants. As it has been clear from research studies that was implemented by the International Organization for Migration (IOM) in Bratislava within the project Migration in the Slovak Republic to the EU (2004 - 2008), foreigners living in Slovakia have perceived stereotype attitudes towards them which are based on rigid and hardly changing prejudices against otherness. Compared with their counterparts from other EU countries citizens of Slovakia is relatively little experience with foreigners and is also very low level of knowledge about groups of foreigners living in Slovakia. (Vašečka, 2009, 105-106) It should also be said that the attitude of the Slovaks to the possible arrival of asylum seekers in Slovakia certainly influenced the politicians who have done on this subject campaign in parliamentary elections in 2016. On the other hand, some entrepreneurs and other managers could welcome migrants from a new workforce perspective. According to the authors Grenčíková, Španková and Habánik (2017, 81-89), labour force is beginning to be a serious problem for the economy of the Slovak Republic and Czech Republic.

Research question no. 2: How should the EU deal with the issue of migration, concerning the Slovaks?

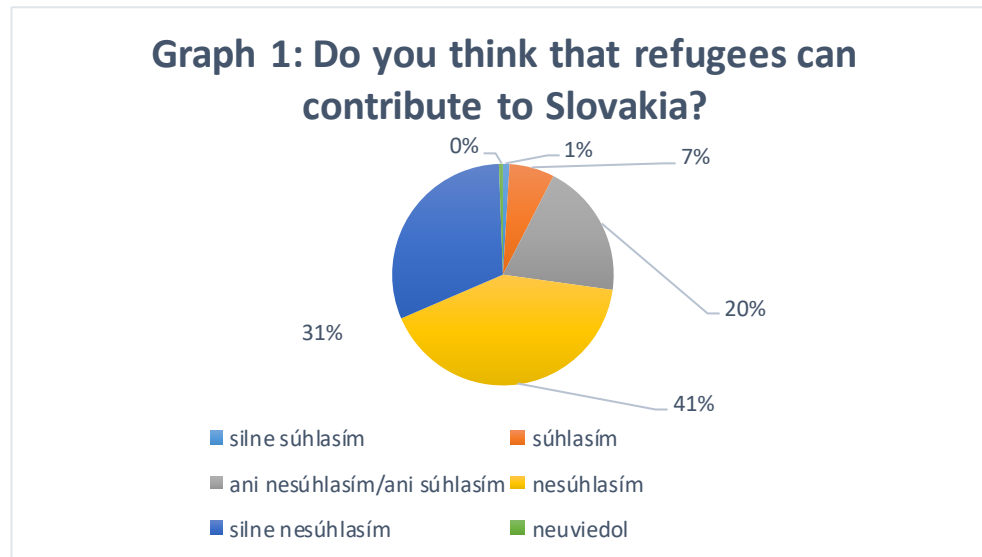
We think that Slovaks will prefer such solutions the European Union to the issue of migration that is not their individual concern.

The research survey was conducted in the fourth quarter 2015 The sample of respondents in 1033, which was representative of the population in terms of gender, age and region. The research sample consisted of 492 men and 541 women.

For data collection questionnaire was used as the main research method. Administered questionnaire was provided by 100 interviewers trained and experienced personnel in the field, and had a 100 percent return. The questionnaire consisted of 17 closed, open, semi-closed and items that provide options for quantitative and qualitative processing. In the case of closed items were used three types of questions: dichotomous offer simple choice and a multiple selection. Questionnaire method was also combined with the method Likert scale. (Gavora et al., 2010)

3. Results and Discussion

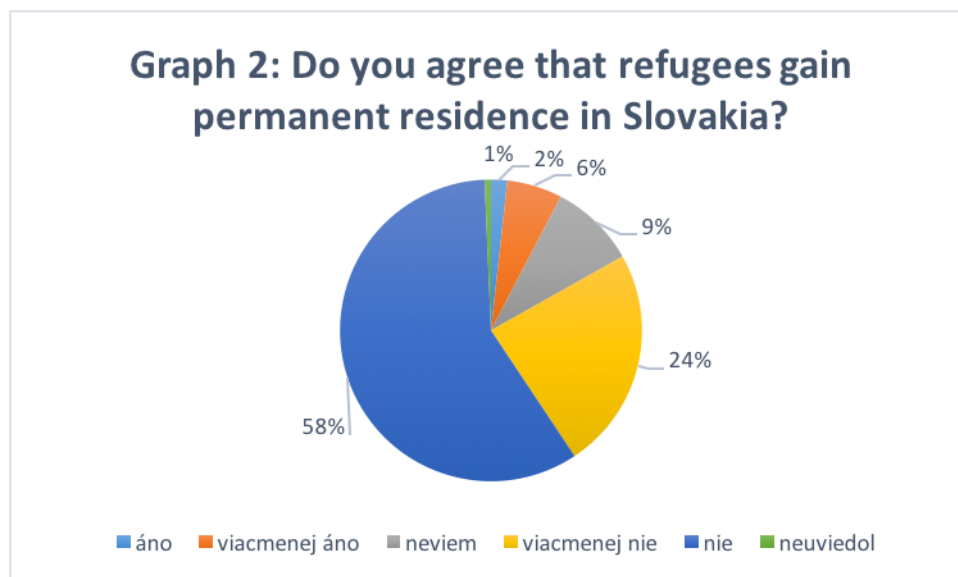
Only 7.6% of all respondents believe that refugees can contribute to Slovakia. In contrast, only 75.5% of respondents were concerned that the arrival of asylum seekers in Slovakia may increase crime. More Graph 1.



Graph 1.

Source: Own processing of field research documents

Most Slovaks polled 82.55% disagree with the fact that refugees gain permanent residence in Slovakia. Up to 76.5% of all respondents are in fact concerned that refugees are unable to comply with Slovak traditions and norms. More Graph 2.

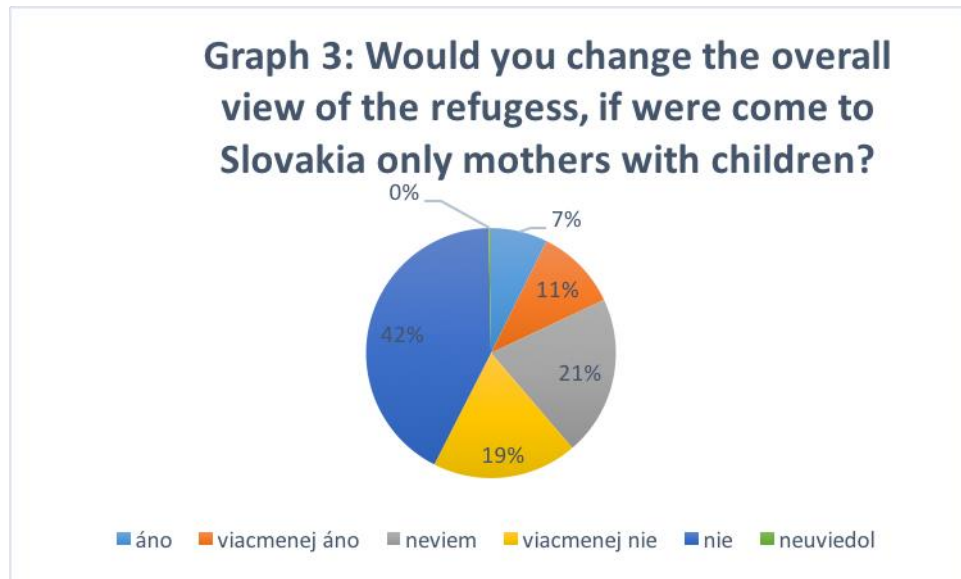


Graph 2.

Source: Own processing of field research documents

Slovaks, however, were not willing to accept some of the habits of migrants (80.3% of respondents) that asylum seekers raised with their arrival in Slovakia. Almost half of respondents would be unemployed refugees in their

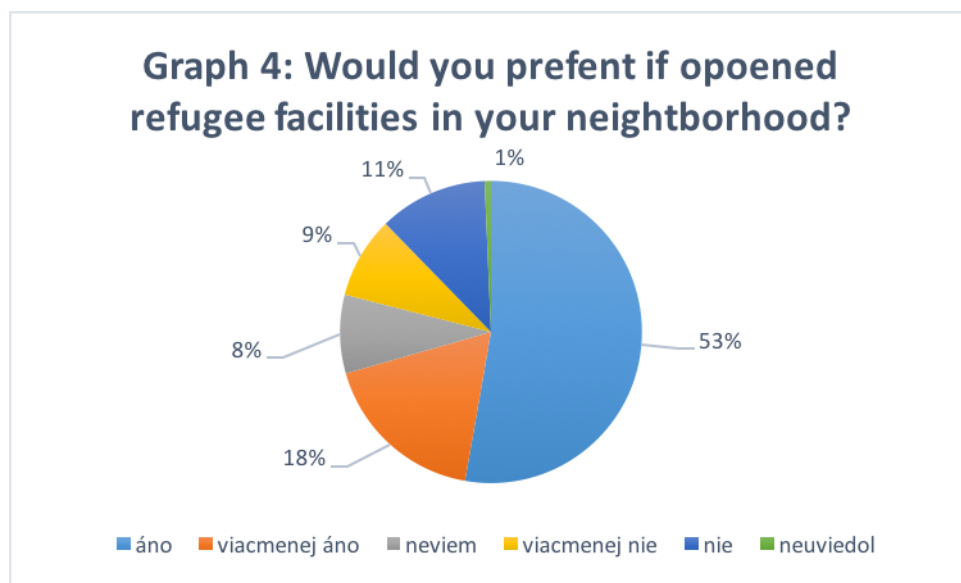
companies, while 22.6% of those questioned can imagine it, and the remaining respondents to this question could not answer. In contrast, more than half of those surveyed would be willing to change their minds if it happens that mothers came with their children to Slovakia. (53%) More Graph 3.



Graph 3.

Source: Own processing of field research documents

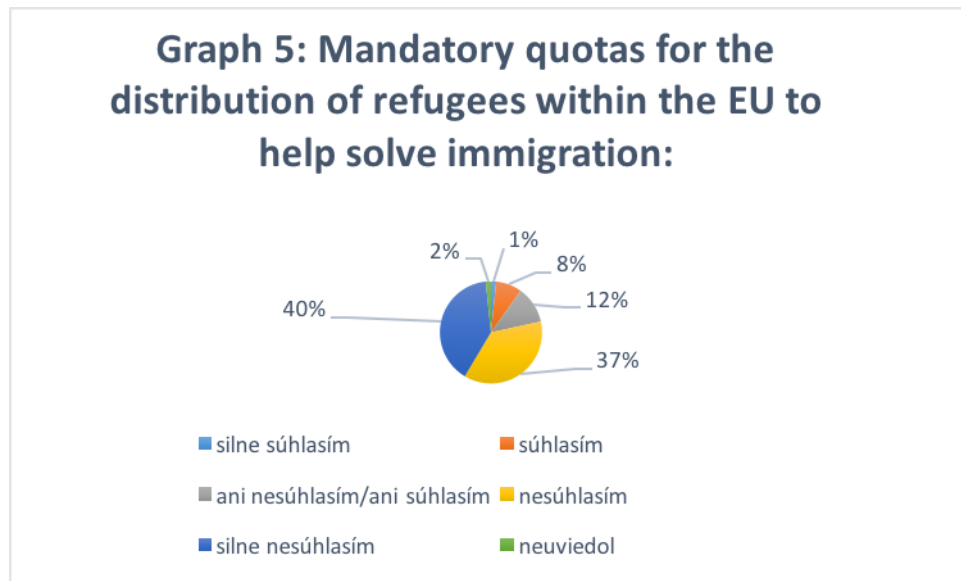
Slovaks would not want to live next to the asylum seeker. Most respondents (70.6%) would be impeded if they were in their area opened refugee facilities, and only 88.2% of those questioned did not wish to see mosques flourishing in their city. More graph 4.



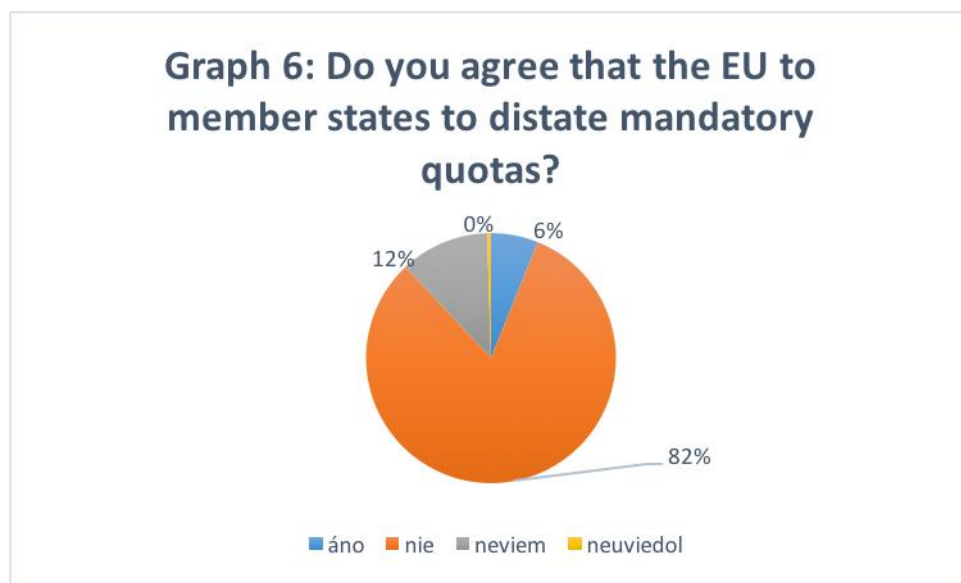
Graph 4.

Source: Own processing of field research documents.

Up to 76.8% of all respondents think that mandatory quotas for the distribution of refugees in the EU do not help resolve the situation with immigration. Moreover, according to 81.9% of respondents at all it is not right for the EU to dictate to Member States refugee quota. The most effective solution refugee crisis is to fight against its causes, namely wars and terror in Syria and Iraq. This argument has been supported by 63.3% of respondents. Up to 67% of those surveyed considered the correct decision by the Government of Robert Fico, the Slovak Republic will respect the quota and an action before the European Court of Justice in Luxembourg against the Council of the European Union. More graph 5-8.

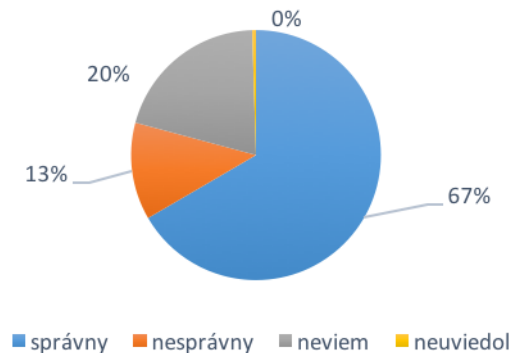


Graph 5.
Source: Own processing of field research documents.



Graph 6.
Source: Own processing of field research documents.

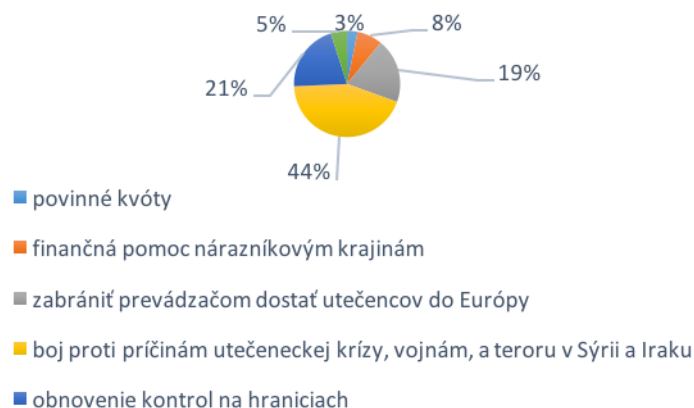
Graph 7: Government R. Fico decision, the Slovak republic will not respect quotas and bring a court action, consider:



Graph 7.

Source: Own processing of field research documents.

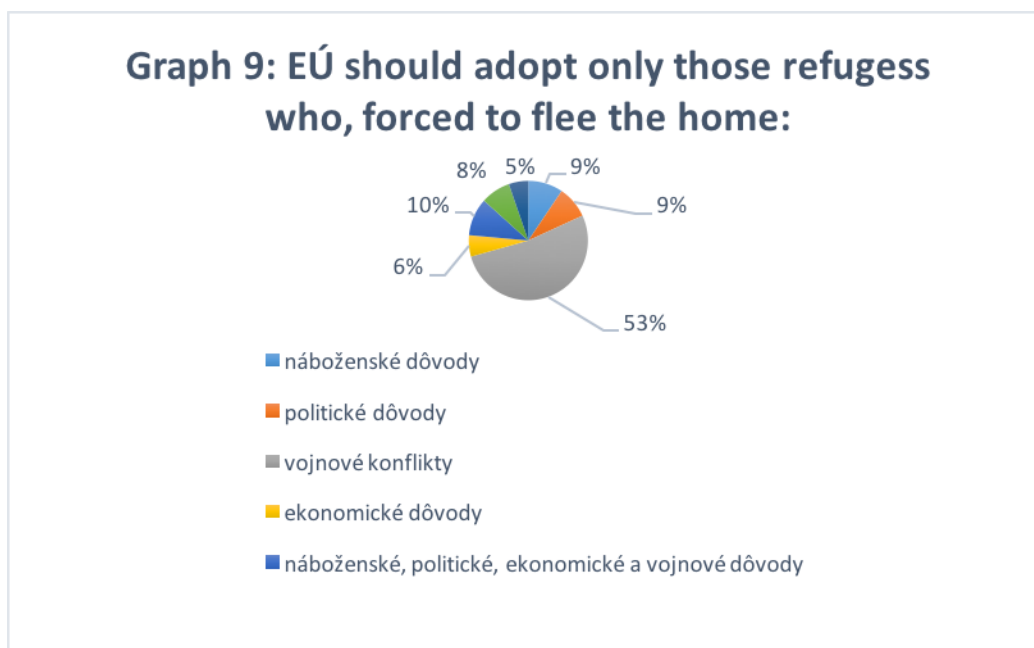
Graph 8: What measure (s) would be most effective in addressing the refugee crisis?



Graph 8.

Source: Own processing of field research documents.

The European Union should take particular those migrants who, forced to flee the home armed conflicts. They think that 61.3% of respondents in the survey. Only 11% of the respondents agree with the adoption of asylum seekers in the case of religion, 10.2% for political reasons, and only 6.8% for economic reasons. Others have said quite the adoption of migrants, respectively, have not decided to answer. More Graph 9.



Graph 9.

Source: Own processing of field research documents.

In the first research question, we assumed the concerns of citizens of the Slovak Republic about the possible arrival of asylum seekers and on the ground that Slovakia is a conservative country where significant national and Christian principles, and the Slovaks have a lot of experience with migrants. This argument is confirmed by eight of the nine studied questions in the questionnaire. Migrants as interviewed by the Slovaks were not important, but rather a burden because they would not be willing to respect local traditions and standards and contribute to increase crime. Slovaks who were interviewed disagree in various ways with the refugees obtaining permanent residence in Slovakia upon arrival, they would live next to the migrant, however, they would not employ the migrants at work and would not want to be close to them or allow them to grow mosques. Slovak citizens would also not be willing to accept some of the habits of migrants that asylum seekers would introduce upon their arrival in Slovakia. On the other hand, it is interesting that the Slovaks would be willing to change their minds on the issue of migration if only mothers come with their children to Slovakia.

In the second research question we observed that the Slovaks will prefer such solutions that the European Union introduces to the issue of migration if the solutions are beyond their individual concern. The interviewed Slovak citizens do not agree with mandatory quotas for the distribution of refugees in the EU as well as the dictation of these quotas upon their states, the EU Member States, while not respecting these quotas believe finding solutions to the issue is correct. They think that migration policy should be able to limit those asylum seekers who, were being forced to flee their homes due to armed conflicts. According to the interviewed respondents the most effective solution to the refugee crisis would be possible by finding the cause, which is the combination of wars and terror in Syria.

We think that the critical attitude of the Slovaks towards the European Union's solutions is also related to the Euroscepticism and the negative moods that rise in the European Union from the economic crisis. (Fabus 2012) and the subsequent decline in confidence in the European Union (Zsuzsanna, Mura 2014), which is confirmed by Eurobarometer surveys in several Member States.

Similar results of research studies have also been typical to other polls. Public opinion poll on public attitudes towards refugees 2Muse Agency Initiative Call for humanity pro bono have confirmed a slight majority against refugees that there was bias and little has been done by the government. To the question "Do you agree that Slovakia adopted refugees and could thus become their new home country?" The response was "no" by 56% of the population, the portion that agreed with the adoption was (18%) and those who withheld to express their opinion were (26%). As indicated in the survey, which took place from 09.09 to 12/09/2015 in Slovakia on a representative sample of the population 15+ (representatives in terms of gender, education, age, size and region of residence), most of the concerns (60%) can be summed up under the category Aggregates security and cultural maladjustment. It should also be noted that fears about asylum seekers in Slovakia apply to the Visegrad Group countries and the politicians need to explain to the citizens this unpopular topic.

Conclusions

The completed analysis shows cautious attitude of citizens towards the issue of migration. We think that the concerns of citizens compounded negative posts in the media, as well as some politicians utilized the issue for their advantage during the election campaign in the parliamentary elections in 2016, who, instead of responsibly explaining the problem of migration to the negative statements made it a tool for election campaign.

We believe that to improve public opinion on the issue of migration would help awareness campaign in the mass media with the help of using marketing communication. Of course, this marketing campaign should be carried out not only in Slovakia, but throughout the European Union under the coordination of the European Commission. (See marketing campaign Polakevičová 2016; Szabo 2016; Machová, Huszárik, Toth 2016).

Several experts also highlight the importance of multicultural education in the case of increasing the tolerance of citizens to asylum policy (Dopita, Staněk 2007; Medved'ová 2008; Janas 2015).

The study does not claim of bringing comprehensive insight into the analysis of Slovak public opinion on the issue of migration. However, the topic that has been covered above offers some insights and treatment options. First of all, it will be very interesting to analyze public opinion on the issue of migration with regard to the Slovaks after some time now during the Slovak Presidency of the Council of Europe, respectively, after the actual year of feasibility study. Additionally, it would be interesting to carry out in-depth interviews with selected citizens about the causes of fear of the refugee crisis among others.

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PECULIARITIES OF CYBER SECURITY MANAGEMENT IN THE PROCESS OF INTERNET VOTING IMPLEMENTATION

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Received 20 August 2017; accepted 14 November 2017; published 29 December 2017

Abstract. The modern world could not be imagined without the information and communications technology. Today's society, its life and social relations are deeply influenced by the virtual space, and that stands as a reason why the world's Information Technology specialists and representatives of various branches of science have been focusing on solving the problems in the sphere of cyber security. Software and technological solutions used in reorganization of the activity of private sector nowadays are widely used in the public sector as well. By using technologies, countries put their effort into involving their citizens into the process of governance and direct participation in various political processes inside the state itself, and one of the most widespread tools to motivate the citizen-to-state political participation and resident's direct interaction in political processes is internet voting. Authors of scientific literature investigate how cybersecurity management is being comprehended and analyzed in technological, legal, management, economical, human resource management and other aspects; how cyber security is analyzed in the context of services provided by institutions of public administration; which means of cyber security management are essential, in order to speed up the processes of establishing e-voting systems. In this article the authors investigate the theoretical aspects of cyber security management in internet voting, analyze the global experience in the sphere of cyber security management implementation with the help of already established e-voting systems, evaluate the properties of cyber security management in the process of implementation of internet voting in Lithuania, as well as present audience with an in-depth analysis of the opinion of the local population, cyber security and voting system specialists, concerning the matters and possibilities of establishing internet voting in Lithuania. The authors also propose a cyber security management model, which could be used in the process of implementation (both preparation and establishment) of the internet voting system in Lithuania.

Keywords: internet voting, e-voting, cyber security, cyber security management, cyber security model

Reference to this paper should be made as follows: Limba T.; Agafonov K.; Paukštė L.; Damkus M.; Plėta T., 2017. Peculiarities of cyber security management in the process of internet voting implementation, *Entrepreneurship and Sustainability Issues* 5(2): 368-402. [http://doi.org/10.9770/jesi.2017.5.2\(15\)](http://doi.org/10.9770/jesi.2017.5.2(15))

JEL Classifications: D72, D80, H83

Additional disciplines: information and communication; informatics

1. Introduction

Approximately 50 countries (for example, Switzerland, the United States, Canada, Kazakhstan and others) in the world allow their citizens to vote via the internet, but undoubtedly Estonia is the country that could be named as

the leader in e-voting, being the first country to launch internet voting (Vegas, Barrat, 2017; Shahandasht, 2017). Most states allow the usage of e-voting systems only in local (municipalities) elections, meanwhile internet voting is available in all types of elections in Estonia since 2005. However, internet voting has not been critically acclaimed everywhere. The successfully functioning e-voting system of the Netherlands was banned in 2007 due to the vast amounts of cyber attacks. Germany and Norway have both shut down their e-voting systems, claiming the system failed to meet expectations and assure the privacy of the voting process, as well as meeting the appropriate security standards. The topic of internet voting in Lithuania has been very relevant in the past decade and is known for being the center of heated discussions before every upcoming election. There were five law bill packages concerning the possibilities of voting in elections and referendums that were debated in the committees of Parliament of the Republic of Lithuania. Today, when attacks targeting individuals and against corporations, banks or state sectors occur, precaution measures against these types of cyber attacks are becoming a strategic aim of numerous countries. Internet voting is a very specific and important expression of democracy, and it is crucial for this expression to be protected from both, inner and outer dangers. A successful cyber attack against a process as important to a country as elections, can not only be the reason for the election to be declared invalid, but can also discredit the country and destroy its citizens' trust in the state. This article will analyze the whole process of internet elections in the context of cyber security. The aim of this article is to investigate the properties of cyber security management, analyze the cyber security of certain e-voting systems and to present a model of cyber security management, which could be applied and used for internet voting.

2. Theoretical aspects of cyber security management in elections conducted via Internet

Issues with the definition of Cyber security in Lithuania. Modern life and organization management could not be imagined without information technology and internet access, and the influence of internet over everyday life and global economics has not ceased to grow (Limba, Plėta, Agafonov, Damkus, 2017; Štītīlis, 2013). Today, our daily life, fundamental rights, social interactions and economies depend on information and communication technology working seamlessly. The phenomenal expansion of cyber space has brought the unprecedented development of economics and increasing number of new opportunities. However, that also conditioned the appearance of new risks (Erbschloe, 2017). The 2013 cyber security strategy of the European Union states, that 'Cybersecurity incidents, be it intentional or accidental, are increasing at an alarming pace' and both scientists and experts of cyber security stated, that cyber security incidents can affect the supply of services, essential for the society (providing water, electricity, healthcare, mobile network etc.) and damage the critical infrastructure (Fuschi, Tvaronavičienė, 2013; Limba et al., 2017). Modern technologies and the global cyber space have created unprecedented conditions to commit crimes remotely on the separate parts the world, as long as they have the access to the internet; and both - private users and entire governments are exposed to risks in the cyberspace (Štītīlis, 2013; Kohnke et al., 2016; Owen et al., 2017; Antonucci, 2017).

The definition of cyber security in Lithuania was often confused with the definitions of electronic data security, data security, safety of networks and information and security of data systems. Also, cyber security is defined differently in various laws and legal bills of the Republic of Lithuania: for example in the resolution of 'development of electronic data safety (cyber security) 2011-2019 programme' and 2012 Republic of Lithuania Minister's of Internal Affairs order on 'Affirmation of State's data resource concordance to electronic data safety (cyber security) requirement internal supervision', the definition of electronic data security and cyber security is though of as the same thing, while in the 2013 electronic data security requirement schedule, affirmed by the Government of the Republic of Lithuania, *electronic data security* is defined as assurance of confidentiality, integrity and accessibility of electronic data.

This problem was solved by the Cyber security law issued on 2014 December 11, which specifically defines the concept of cyber security as 'the whole of legal, data transmission, organizational and technical means, meant to avoid, discover, analyst and react to incidents, as to reconstruct the functioning of customary electronic

connection networks, data systems or industrial processes in case such incidents take place. It is worth noting, that scientists, when talking about the development of cyber security, mention not only the main groups of electronic data security (normative, administrative, procedural and programme-technical) (Kiškis, 2006) and dimensions of data security (strategical, human factor and technological) (Jastiuginas (2011), but also emphasize the essential integration of the governing aspect into the process of assurance of cyber security (Limba et al., 2017).

Cyber security management principles and e-voting. The Committee of Ministers of the Europe Council endorsed the Recommendation (2004) 11 of the Committee of Ministers of the Member States on the legal, operational and technical standards for e-voting at the 898th Ministerial Meeting on 30th of September, 2004. In regards to the relatively low turnout of voters in the Member States and noting that some Member States have already implemented or are planning to use electronic voting, the Committee encourages Member States to take into account the development of new information and communication technologies in their democratic practices. The recommendation emphasizes the need to maintain the principles of democratic elections and referendums when electronic voting systems are being implemented. Voters must be guaranteed universal suffrage, equal elections, free elections and secrecy of ballot (Recommendations Report to the Legislative Assembly of British Columbia, 2014; Goldsmith, 2017), and the electronic voting system must be designed to give the voters the possibility to vote with an *empty ballot* (Limba, Agafonov, 2012).

It should be noted that in order to organize electronic elections it is necessary to implement:

1. *Procedural e-voting security measures*: familiarize voters with electronic voting system and its operating principles; provide with the possibility to test and understand how to use e-voting system; provide initial, as well as periodic testing of the system; know the principles and function of the hardware and software used in the electronic voting system; develop the voting system in a way which allows the recalculation of the results of voting if it is necessary; ensure the security and reliability of the e-voting system and provide voters with alternative voting options;
2. *Organizational standards*: make adjustments to legislations in order to establish the legality of the use of electronic voting systems; create voter register and keep it up to date; provide mechanisms that allow voters to vote only once (only one vote must be recorded in the election results); ensure that information on electronic voting will be disseminated through various communication channels; present voting options for the voters following the principle of impartiality; strictly avoid affecting voters choice in electronic voting system; electronic voting bulletin must contain only information related to the voting; clarify that the vote casted through the Internet is calculated as an equivalent vote with the same value as the vote casted through ordinary ballot in the polling district; the electronic voting system should be configured in a way which does not provide the voter with the evidence of the choice in ballot; in case of violation of the integrity of the system, electronic voting results must be announces as ineligible;
3. *Technical measures*: ensure that e-voting software and services are public and easily accessible; include voters in the process of developing electronic voting systems, in particular into the testing of simplicity of the system; analyze the interoperability of the e-voting system with the technologies already used by the voters;
4. *Security procedures*: authenticity, availability and integrity of registers containing data of voters and candidates must be guaranteed; it is necessary to ensure that voters receive an authentic electronic ballot; sufficient measures should be employed to ensure that the e-voting system is protected from the effects that could change (influence) elections results; ensure that information on the voters decision is destroyed immediately after the voting has taken place and the results of the election are recognized as valid; restrict the voters from connecting to the e-voting system after the elections are over; ensure the integrity of the received data; perform the counting process and, if necessary, repeat it.

Cyber security issues related to Internet voting. Internet voting system is not only a technical but also a social entity that is created, supported and used by people and groups. These groups may make mistakes or try to abuse

the voting system for their own purposes. The ability to vote remotely provides with a possibility to attack the voting system from anywhere in the world using non-administrative, but information resources (Ramonaitė et al. 2008). Successful attacks against internet voting systems may lead to public mistrust in voting systems or influence the deployment and usage of these systems in the internet voting process. Therefore, it is extremely important to analyze all possible threats that could arise in regards to the internet voting system, identify potential parties and attack mechanisms (Limba, Agafonov, 2012).

Vulnerability of personal device. Personal computer, mobile phone or other device used by the voter is the least secure link in the chain of internet voting. Personal computers are most often poorly maintained and not protected from cyber threats. However, they will be used by voters to reach the internet voting system servers during the internet voting. Those devices cannot be controlled by the elections committee and election committee is unable to influence voters to draw attention to these issues (Elections BC, 2011; Wohlin C. et al., 2012).

Potential intruders are constantly scanning the Internet for vulnerable targets. Researchers have noticed that computers in internet cafes or public libraries are most insecure (Jefferson, 2004). They may contain spyware or vulnerable programs (Dykstra, 2017). Voters may encounter same risks at their workplace – operating systems and browsers may be vulnerable to malware that can be downloaded by voters or other users accessing the same devices (computers) due to negligence or lack of awareness. A malicious program, operating on the voters device, can change the choice of the voter during the internet voting period without the voters knowledge or consent. Voter needs to have the access to a trusted and secure device to participate in internet voting, as this is only option to reliably check what choice was made and received by internet voting system. However, this situation is problematic as it allows voters to have a solid proof of their choice and fuel corruption. If the malicious counterfeiting occurs before the ballot is sent (on users machine), representatives of the administration may not be able to distinguish between the incident and the users mistake (Elections BC, 2011).

Also, it is also possible that the voter may try to manipulate the use of the internet voting system: vote more than once and try to sell the proof of choice. Malicious behavior may also be anticipated – intentions to damage the voting system, influence or change the election result, create doubts and damage credibility of the election results.

To summarize, it can be stated that the security of voter's personal device is one of the biggest issues connected with the internet voting system. Personal computers are not well maintained and not protected against malware attacks and other vulnerabilities, while public resources like computers in the internet cafes or public libraries are even more insecure.

Analysis of the internal vulnerabilities of internet voting systems. Šttilis (2011) describes the internal threats to the system as *authorized users of the information system (or former ones) who unexpectedly caused damage to the organization*. Limba and Agafonov (2012) categorized internal users into three groups:

- *Users of internet voting systems* usually create minor problems; incidents are not complex often caused not by the technical violation of the system, but mostly through non-technical vulnerabilities (organizational policies, etc.). The main purpose of such criminals is usually financial gain, but not the damage to the organization (Šttilis, 2011). Internet voting systems sometimes could be at risk due to negligence or lack of competence by users;
- *Administrators of the internet voting systems* can be very dangerous for the system and cause the excessive damage due to the exclusive access rights. They can try to abuse the electronic voting system and civil servants to execute the attacks. Šttilis (2011) observes that the most common motive for these employees is the revenge, and less often – financial gain. In order to defend against the actions of unauthorized system administrators, there is a need for rules which limit the ability of system administrators to elevate their own privileges – this would require the approval of other administrators (Association for Computing Machinery, 2006);

- *Civil servants.* Some vulnerabilities of internet voting system relate to the civil servants who are not directly involved in internet voting system administration, but have access to a voting system (managers, project supervisors and etc.). These individuals can participate in or even manage the internal attacks on voting system. Most common motive for this group of people may be the financial gain (Limba, Agafonov, 2012).

In order to protect against internal users of the system, the system must ensure that no person, using their privileges or permissions, could undermine the secrecy of electronic votes. All votes (ballots) must be encrypted in a way, which ensures on a technical level that a single person is unable to decrypt them. The private key of the election committee, used to decrypt collected ballots, could be split into several parts and entrusted to different individuals or authorities (administrators, auditors, etc.). Only after putting together all parts of the key it would be possible to create the possibility to decode the ballots (Recommendations Report to the Legislative Assembly of British Columbia, 2014).

Analysis of the external vulnerabilities of internet voting systems. Voters can participate in the internet voting from anywhere in the world if they are able to use internet. This makes voting much more accessible and convenient for the voter. However, this also makes internet voting more vulnerable to threats of the global electronic environment which can emerge from anywhere in the world. Cybercriminals may disrupt or even takeover internet voting systems. Electronic crimes are committed by various parties: students, terrorists, members of criminal groups, etc. The goals of these groups may vary, but usually they attack systems for personal financial gain or political purposes (Štītīlis, 2011):

- *Hackers.* This group is characterized by excellent knowledge of computer applications, networking processes and weaknesses of computers. Most often, hackers are computer fanatics who are looking for weaknesses in computer software or hardware, just from boredom or to demonstrate their abilities (Štītīlis, 2011). Ramonaitė and others (2008) argue that internet voting systems can become a new entertainment or a good challenge for the hackers;
- *Typical criminals.* Criminal groups and individual criminals, in order to get financial profit are moving their *business* into the electronic space (Štītīlis, 2011). Internet voting systems may be interesting for them because the private data stored inside the voting systems. Typical criminals could also include vote buyers, who are looking for ways to safely buy votes online;
- *Hacktivists* are members of groups which try to achieve their goals through the abuse of computers and computer networks. Their activities usually are protests or civil disobedience. To achieve these goals, hacktivists tend to target websites, steal and disclose confidential information, carry out DDoS attacks etc. (Hampson, 2012). Hacktivists may try to compromise internet voting systems, interfere with the work of the system or disclose confidential information stored in the voting system;
- *Foreign intelligence services* carry out their missions. In addition to gathering of information, foreign intelligence services are also seeking to influence the decisions of state institutions and influence the public opinion (Who, how and why are spying in Lithuania, 2014). Servers of internet voting systems can be attacked to show the influence of a particular country or to create public chaos. Depending on the goal, intruders may not try to conceal the unauthorized intrusion into the internet voting system. If the goal is to influence the outcome of the election, foreign intelligence could try to falsify the results of the internet voting during election in order to choose the most suitable political party or candidate. In this case, efforts would be kept secret (suspicion could be fueled only by an unusually high level of support for a certain political party or candidate). At last, foreign services could try to compromise the internet voting system in order to undermine the authority of the state itself and reduce the level of public trust (Ramonaitė, 2008; Limba, Agafonov, 2012).

It can be concluded that the biggest threat to internet voting system is the foreign intelligence services as they are well organized and have a high financial, technical and intellectual capabilities. There are also considerable risks from caused by hackers, who are moderately organized and the lack of financial resources is supported by a common goal. Typical criminals could try to abuse internet voting systems for financial gain, but it is likely that good protection may persuade them to not take risk. It is possible that unknown hackers could try to attack internet voting systems in order to show off their skills.

Possible attacks of internet voting system. There are numerous ways in which cyber attackers could try to break into the internet voting system (Halderman, 2017), disrupt its work, violate the integrity of votes or simply compromise internet voting. Limba and Agafonov (2012) stated that it's unlikely that individual user systems (PCs) will be an attractive target for cyber-attacks, but practice shows that this is one of the main targets for attack.

Internet-based attacks could be divided into three main groups:

1. *Attack against the environment of the voter* could be based on a low level of the security of personal equipment and social engineering. The most commonly used attack techniques are:
 - *Man in the middle* is a frequent attack in cyberspace, when the attacker interrupts communication between clients or client-server systems. Violation of the integrity of communication allows the attacker to control the flow of information. This attack may violate the voters' privacy and disclose the voting information. The attacker can also use this attack to deprive the voter of his right to vote by not allowing the vote to reach the internet voting system. In order to avoid this attack, it is necessary to ensure a secure connection throughout the entire internet voting process. Another way to deal with it is to check whether the voters vote has been counted. The fact of a large number of voters who connected to the voting server, but did not vote, would create suspicions of a man in the middle attack and could force the election to be recognized as invalid. The same attack could take place during the registration phase (Jefferson, 2004);
 - *Viruses*. Hackers could prevent internet voting by creating a virus that destroys the systems. An example of this could be the CIH (Chernobyl) virus, which was created to gently slip into the user's computer and remain dormant until a certain date. On a certain date it starts working and destroys the system. A similar virus could be created to work on the period of elections, damaging personal computers (Middleton, 2017) of voters and preventing them from voting. Of course, voters may try to find other computers, but this would complicate internet voting and create chaos;
 - *Spoofing attack* is a method of imitation of a legitimate message or resource which is being offered to a voter (through email or other means of communication). The voter may think that he is voting on the official website of the internet voting system. The fraudulent internet voting website may look and visually function as an official site, but does not connect to the system. During this attack, the attacker also receives voters identification data, which can later be used to connect to the real internet voting website. The attacker can use e-mail to send a web link to the voter and lure him to a malicious webpage or use this method to install the Trojan horse on the voters computer;
 - *Trojan Horse* is a destructive program that is often presents itself as a useful software, but secretly runs malicious functions which may violate the confidentiality and integrity of the data on the system of a user. This can result in user losing his login information, access to the system or imitated voting;
 - *Pharming attack* can redirect traffic from one website to another. This can be done by changing the settings of the voters computer or by exploiting domain name server (DNS). Attack on DNS may also be called DNS poisoning, when attacker falsifies DNS records and redirects voter to a specially prepared fake internet voting website. The voter, following the instructions on the website (which looks like an official one) casts a vote that is not being counted (and may also lose his credentials);
 - *Attack against the website*. A dangerous hybrid attack which could be accomplished by inserting a malicious code into a specially selected website. For example, an attacker who is an opponent of the other

candidate sets a trap on his website. This way, every visitor, who visits the website, loses the technical possibility to vote using the internet voting website. Such attack could take away several hundreds or even thousands of votes from the candidate and that might be enough to lose the elections (Jefferson, 2004).

2. *Attack during the ballot casting.* When the voter confirms the choice in a ballot, the ballot travels to the internet voting server. Data sent through open channels may be subject to change by third parties (integrity violation), stolen or disclosed (confidentiality violation). Therefore, it is necessary to ensure a secure connection between the voter and the internet voting system using secure protocols (e.g. TLS). The data, sent by the voter, should be encrypted with a secure encryption algorithm (Recommendations Report to the Legislative Assembly of British Columbia 2014).
3. *Attacks against the electronic voting system.* It may appear that only technical attacks against electronic voting systems are relevant, but the abuse of social engineering is also an issue that can cause problems for the system. The following list indicates the attacks which are most dangerous for the internet voting systems:
 - *Denial of Service (DoS) and Distributed Denial of Service (DdoS) attacks.* The purpose of these attacks is to create conditions that do not allow legitimate users (voters) to reach the resources of the internet voting system (attacks against availability of information). Exhausting resources on the internet voting server (ddos against physical infrastructure, software or communication protocols) may render the system unavailable thereby compromise the internet voting process. This type of attack may be accidentally caused by legitimate system users if the system is technically weak and was not estimated to handle a high number of connections from users. Such accidental DDoS attack has happened in 2011 (Census of Inhabitants in Lithuania) when a large amount of users logged into the census system simultaneously;
 - *Zero-day attacks* are based on security vulnerabilities in applications or operating systems which are not known to the producer of the software. Traditional security measures like antivirus or firewall are unable to detect or prevent these types of attacks. Zero-day attack is classified as highly advanced and can be used as an entry point to the system;
 - *Social engineering attacks.* This type of attacks can not only trick voters into using fake websites, but also organize campaigns “against the internet voting” or scare people by suggesting that the internet voting is unsafe, which could lead to public losing trust in internet voting system (Limba, Agafonov, 2012). These ideas can be supported by other propaganda campaigns (publishing the fake internet voting results before the end of the elections or publically publish a fake list of voters). A similar situation occurred in Lithuania in 2015 when a fake list of conscripts was published earlier than the real one.

Cyber security management in Lithuania. According to Urmanavičiūtė physical, technical (logical) and administrative control measures are used in order to protect the information. Cyber security law (adopted in Lithuania in 2014) defines cyber security as a body of legal, information dissemination, organizational and technical measures which are intended to prevent, detect, analyze and respond to cyber incidents. The following are tools for managing cyber security in Lithuania:

- *Legal measures:* The main legal acts of the Republic of Lithuania that regulate the principles of cyber security assurance and management are the Cyber Security law (2014), Resolution of Government of the Republic of Lithuania On the Approval of the Program of Electronic Information Security (Cybersecurity) Development in 2011-2019 (2011), General Lithuanian Police Commissioner order On Approval of the Description of the Information Required for Cybercrime Investigations, Possessing, Police Instructions and Cybersecurity Investigation Procedures. According to the description of the general safety requirements for electronic information approved by the Government of the Republic of Lithuania, a description of the guidelines for the content of security documents and a description of the guidelines for the classification of state information systems, registers and other information systems and the

determination of the importance of electronic information, each information system administrator must prepare and get approval from the Ministry of the Interior for these documents:

- Instructions for regulation of system security;
 - Rules for safe electronic information management;
 - Continuity plan for information system;
 - User administration rules for information system.
- *Information dissemination measures:* One of the most important elements of the organization management is the ability to correctly communicate and to understand the value of the information received and its significance for the effectiveness of the organization's activities (Virbalienė, 2011). Legal documents do not establish a list to clearly determine if the information is a secret of the company or institution. Different subjects may consider very different information to be important. Therefore, organizations must have their own internal documents and lists of confidential data, also create rules and procedures for storage and administration of this data. According to the law on State and Service of Secrets of the Republic of Lithuania (1999), classified information is marked by the significance, potential damage that would be incurred by the state, its institutions or persons if this information should be lost or disclosed to persons without the right to know it. The law also sets out the principles that must be observed when working with classified information:
 - Information must be classified and declassified in accordance with the principles of legality, reasonableness and timeliness;
 - The classification of the information is established and the level of protection assigned to such information must be proportional to the importance of the classified information and the amount of damage that would occur from the unlawful disclosure or loss of such information;
 - Classified information must be trusted while strictly following the *need to know* principle. This principle says that classified information may only be entrusted with appropriate work permits or access to classified information held by persons who, in the course of their duties, are required to have access to classified information. A person may be entrusted only with classified information that is required for the performance of his duties.
 - *Organizational measures:* Security measures may prove to be useless, unless all the employees of the organization contribute to the protection of the information. Personnel protection covers a wide range of organizational measures. Information security training increases the awareness of employees on what and why needs to be protected, what are the threats and vulnerabilities (Ministry of Internal Affairs of the Republic of Lithuania, 2005). The Center for Internet Security (2015) emphasizes that human factor has a significant impact on all system design, application, operation, usage and monitoring functions. The Association for Computing Machinery (2006) states that authorized users of the system need to know how to protect their passwords and to protect themselves against social engineering attacks. Therefore, it is very important to assess the specific skills and knowledge of a particular group and to develop a training plan that needs to be continuously updated to include the latest threats (Center for Internet Security 2015). The recommendations issued by the Ministry of the Interior on the protection of information (2005) refer to the determination of responsibilities and personnel protection measures. It also defines the internal organization rules and procedures that govern the organization's information security policies, procedures and instructions. The procedures define how to safely use the systems or behave in certain situations: creating and changing passwords, accessing the office outside of office hours etc. Resolution of the Government of the Republic of Lithuania (2013) focuses on the secure exchange, updating, introduction and destruction of electronic information; software and hardware replacement and upgrade; information system changes management. The Association for Computing Machinery (2006) states that it is necessary to ensure that the rights to administrate the system of internet voting system or its parts (servers) must be strictly controlled and granted only to those employees who are required to complete the specified tasks. Administrators should

not be able to elevate their privileges – this should require permission from another administrator. The rules may have an exception for an emergency, when the permission of is not required. Center for Internet Security (2015) notices that attackers may try to detect and exploit legal accounts (ex-employees, testers, attendees) that have not been deactivated and have retained their rights. Therefore, systemwide accounts must be monitored on a regular basis. It is important to ensure that all accounts have an expiration period, as well as the activation linked to the termination of the employment contract. Response to incidents and their management plans must be prepared in advance. After the incident occurs, it is too late to develop the necessary procedures, data collection, record keeping and other processes that could help coping with the situation during the incident. Chaotic response can help attackers capture more data and cause more damage, therefore it is essential to prepare incident response procedures. It is necessary to define phases of incident management, assign specialists who will make take the decisions and take the responsibility for them.

- *Technical measures:* Technical measures are divided into hardware (access control systems, firewalls, video cameras), software (protects computer systems against malicious programs and viruses, provides access to important data only to authorized system users and eliminates software vulnerabilities) and mechanical (locks, doors, groves, etc.) (Ministry of Internal Affairs of the Republic of Lithuania, 2005). Different solutions are developed to protect network resources from external factors and to ensure the control of user access to the system resources. Most popular of them are:
 - *802.1x standart.* Network access is controlled by verifying user identities in accordance with the 802.1x standard, which provides access control and the ability to check user profiles on the RADIUS server and grant them access rights from different places on the network (Urbanavičiūtė, 2010);
 - *DMZ.* Demilitarized zone is an access control tool that ensures the security of public servers. Public service or proxy servers (that act as an intermediary and establish two-step connections between remote users and enterprise servers to which the external users are connecting also help protect against attacks from outside) may be located in DMZ. Center for Internet Security (2015) emphasizes that, in order to increase security, DMZ systems should be allowed to communicate with the intranet only through applications on proxy servers or firewall applications;
 - *PKI.* Public Key Infrastructure is a set of hardware, software, specialists and procedures used to store, create, manage, provide, update, delete certificates using public key cryptography. Public Key Infrastructure can facilitate and speed up the exchange of information by changing paper based methods (Repečka, 2007);
 - *IDS.* Intrusion Detection System is a device that monitors traffic on the network and detects an attack-like traffic. They can act on the basis of signatures, behavioral analysis and other mechanisms. IDS controls and analyzes user and system performance, checks system configuration and vulnerabilities, evaluates system and data integrity (SANS Institute InfoSec Reading Room, 2001);
 - *WAF.* Web Application Firewall - software that checks the flow of data for a web-based application. WAF's solution helps with blocking attacks against Web server vulnerabilities, protects sensitive information from unauthorized disclosure and control access to it (Center for Internet Security 2015);
 - *SSL and TLS protocols* are commonly used to ensure secure communication (Repečka, 2007):
 - *SSL protocol* uses symmetric and asymmetric encryption methods. During the communication session between the client and the server symmetric session key is set at the beginning of the session, which is created by the client browser and encrypted with the public key of the server. Since asymmetric encryption has been implemented in this step, only the server can decrypt the session key with its own private key. Both the client and the server station already have an identical symmetric session key and can begin to securely interchange data. However, the usage

of SSL protocol is prohibited due to the vulnerabilities found back in 2014 (SSL 3.0 is vulnerable to POODLE attacks). The new version of the secure protocol (TLS 1.2) is currently recommended;

- *TLS* only performs the identification of the server and the client remains unidentified, but in case of internet voting, it is important to voter to identify with whom he is communicating. There is also a higher-level scheme called mutual authentication, but it requires a well developed PKI. The operation of the TLS is based on three steps:

- direct connection based on algorithm;
- transfer of public key and validation of the certificate;
- encryption using the symmetric key.

In conclusion, it can be said that in order to prevent, detect, analyze and respond to cyber incidents, a comprehensive set of legal, information dissemination, organizational and technical measures is needed. According to the legislation of the Republic of Lithuania, it is necessary to ensure secure communication and dissemination of information and to adopt the documents regulating the organization's information security policy, procedures and instructions. Technical security measures should be adopted in order to protect network resources from external factors and ensure the control of users' access to resources and secure communications.

3. Analysis of global experience of implementing cybersecurity management in internet voting systems

Scytl internet voting model. *Scytl* is one of the largest organizations in the world offering various voting systems (traditional voting, phone voting, electronic voting machines and internet voting). The organization claims that its products cover over 87% of the voting systems used in the world and that the online voting system proposed by it is extremely reliable. *Scytl* is constantly looking for new technologies and techniques to ensure even greater security of electronic ballots. Technologies such as public key infrastructure, cryptography, have been approved by twelve countries and have been successfully used. *Scytl*'s internet voting system was studied by independent experts who found that the technology used in system is accurate and reliable (Shah, 2013).

According to the *Scytl* voting model (see Figure 1), the encrypted votes are signed with the voter's electronic certificate and sent to the internet voting storage server. After the verification of the voters eligibility, voting server stores the ballot. At the end of the voting period all encrypted ballots are transferred to the ballots mixing server. Ballots are mixed and decoded and the results of the voting are counted.

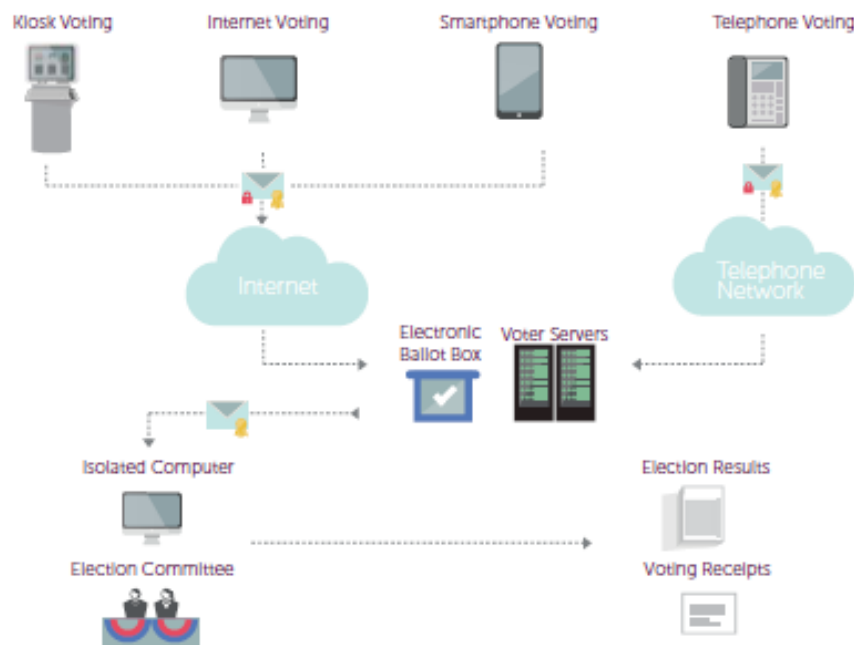


Fig. 1. *ScytI* principle internet voting scheme

Source: ScytI.com, 2017

In the *ScytI* model, voting system is provided is with personal and confidential voters data during the voter registration process. For the security reasons, this information is distributed to different internet voting system servers. The internet voting system requires authentication each time from anyone who attempts to obtain this data. These procedures ensure that personal data is provided only to an authorized user. *ScytI* company uses different voter identification techniques that can differ according to requirements of the different countries of the world. *ScytI*'s cryptographic technologies and algorithms are easily compatible with Google, Android, Blackberry and Apple IOS operating systems and provide the same level of security as a cryptographic techniques used in standard personal computers. The *ScytI* voting system securely encrypts voting ballot on user's voting device before ballot is signed and only then sends it to the servers of electronic voting system.

Voters who voted on the Internet voting system get a confirmation voucher with a unique number that enables the voter to check whether his or her voice has successfully traveled to an electronic voting system and has been counted. With this unique code it is impossible to restore voice content and this measure could prevent the sale of voice during the elections. Additional measures that could prevent voice selling is an ability of voter to vote through internet voting system as many times as he wants – only the last vote will be counted. Voters also have the opportunity to vote with empty ballot and put his choice on internet voting system.

The encryption technology used in *ScytI* voting system provides the confidentiality and integrity of the voters' ballot. Ballots are encrypted before they are sent to electronic ballot boxes and only the election board can decrypt them. At the end of the election, ballots are transferred to a safe environment, mixed and decoded before counting procedure begins, thereby guaranteeing anonymity of voters (Puiggali, 2014).

The *ScytI* internet voting system has an ability to check ballots before, during and after the election. Election audit teams have the opportunity to check whether the electronic ballot server contains only the eligible voters' ballots (Puiggali, 2014).

Audit system in *Scytl* internet voting system is integrated with the security information and notification of violations management system. This solution ensures that all data in system is properly processed and that security of this data is analyzed. Continuous scan of vulnerabilities ensures that system has a real-time opportunity to block security breaches even before they cause damage to the voting system (Scytl, 2015). *Scytl* has patented the technology of *static record* that protects system records from unauthorized change, also the encryption of those records ensures system integrity.

Cybernetica internet voting model. The *Cybernetica* organization develops various software, conducts researches and implements theoretical and practical security solutions. The company is ISO 9001: 2008 and ISO 14001: 2004 certified. *Cybernetica* has participated in several projects developed by the Estonian Government such as the Estonian National Identity Card (ID) and the creation of an internet voting system (cyber.ee). The *Cybernetica* internet voting system is used only by Estonia.

Before the beginning of each election in Estonia the election committee publishes sets of internet voting system applications (applications for Windows, Linux, Mac OS) that can be downloaded from the <https://valimised.ee> web page. Voter downloads the voting application and enters the identification key which is used to verify his identity. A secure connection (TSL) used for data transfer confirms the identity of the server using an encryption certificate. The server confirms the voter's eligibility (using voter's public key) and returns voter to the list of candidates. The voter can mark his choice and enter the signature key. For the voter registration the ballot forwarding server is used. It is a publicly accessible server that accepts an HTTPS connection from a voter's software and verifies the voter's eligibility. Ballot forwarding server acts as a subsystem for mediation with a ballot storage server that could not be reached from internet (Springall et al., 2014).

In *Cybernetica* internet voting model the identity of the voter is determined using a personal identity card with an integrated electronic signature. Each card has two keys: a user identification key and a signature key each of them has separate PIN code.

Another possibility for a voter to confirm his or her identity is to use the mobile signature (Mobile ID). The voter accesses internet voting web page www.valimised.ee using his computer, downloads and installs special internet voting application. When Mobile Signature Authentication Code (PIN1) is entered an SMS message with a control code is sent to the voter. After the identification voter can reach the list of candidates according to the voter's place of residence (list is displayed on the voter's device). The voter makes a choice and after entering the private key (PIN2) receives a control code via SMS message, which, after entering, signs the ballot. After that voter gets the popup message which indicates that the voter's ballot has been counted (Springall et al., 2014). The mobile signature allows the voter only to identify himself, but there is currently no possibility to use a mobile phone as a voting device. The computer with internet connection is required to participate in internet voting process in Estonia. For these reasons this method is not so popular in Estonia although the state encourages its use (Estonia.eu, 2015; Clarke, 2017).

Cybernetica internet voting system used in Estonia uses public key infrastructure to create a *double envelope* analogue that is used for postal voting (see Fig. 2.). The voter's vote is encrypted before being sent to the electronic ballot box using election committee's public key. An encrypted vote could be considered as an internal anonymous envelope as it is in the case of mail voting. The voter, who signs encrypted vote with electronic signature, adds his identification data to the outer envelope (Ramonaitė et al., 2008; University of Tartu, 2015). The outer envelope (digital signature) identifies the identity of the voter and the secret "voice" is stored in the inner envelope (public key encryption). When the voter's eligibility is confirmed, the signature is removed leaving only an anonymous encrypted vote that is transferred to separate ballot storage server (Springall et al., 2014).

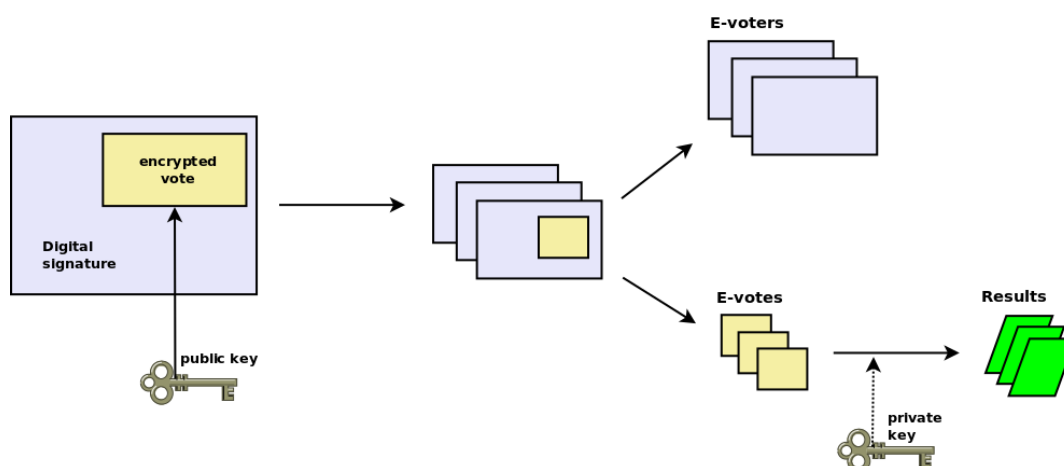


Fig. 2. Technical solution for internet voting in Estonia
Source: University of Tartu, 2015.

In order to avoid the possibility of selling votes, internet voting system allows voter to vote as many times as he wants, but only the last vote is counted. Internet voting system informs user that he has already voted, but it does not display how many times. If the voter is voting on the election day using the traditional voting method, the internet voting ballot is canceled (Springall et al., 2014).

Encrypted and signed ballot is sent to the server and linked to an unpredictable unique tag, and returned to the voter in the form of the QR code. The user can verify that his voice has been correctly recorded using the smartphone's application. The gadget scans the voter's QR code and contacts the voting system server, which returns the encrypted voice (but not the signature) and a list of potential candidates. The gadget, using a unique tag, encrypts the simulated vote for each potential candidate and compares the result with the encrypted voice sent from the internet voting server. If there is a match, the application displays the appropriate candidate.

Opponents of Estonian Internet voting say that this voice check method gives voters the opportunity to sell their voice because proof of voting content is proven. However, the election organizers reject the complains as, in their opinion, buyers can learn the content anyway (without voting control), as voting takes place in an uncontrolled environment. This mechanism simply gives the voter more clarity, and, moreover, vote can be verified only for a very limited time (University of Tartu, 2015).

Internet voting system server stores signed and encrypted ballots during the online voting period. Internet voting ballot storage server, after receiving a ballot from the ballot forwarding server uses certified external protocol to verify the voter's digital signature and confirms that the ballot is formed correctly. After the depersonalization of the votes, the election committee officials record all valid encrypted voices on the DVD and transfer them to the vote counting server. Vote counting server processes encrypted votes and re-checks signatures, afterwards, removes any canceled or invalid voices. The counting server is connected to a device that has the private key of the election committee for voice decryption. Election committee officials exports decrypted votes and record them on a DVD. The results are compared with the number of votes cast during the internet voting period and published. The counting server is not connected to the network, it is used only at the final stage of the election. Officials use the DVD to copy encrypted voices (with their digital signatures removed) (Springall et al., 2014).

During the internet voting *Cybernetica* voting system use authentication server to monitor system processes. This server is an internal authentication and monitoring platform that track events and collects statistics from the ballot

forwarding server and voice counting server. The server applications and technical design aren't described publically. Employees can connect to this server using remote connection.

After the internet voting is finished (4 days before the elections in the traditional voting poles), the list of internet voters is sent to the elections committee, which marks persons who has already voted in the voter lists. Traditional voting in the constituency is still a priority. A voter who has already voted on the internet may come to vote on the day of elections in voting pole. In this case the internet voting ballot will be erased (Estonia.eu, 2015).

According to the findings of the independent security expert teams from the United States (2014), United Kingdom and Finland have studied the security of the internet voting system in Estonia and publically announced the results of the researches, which have been a source of great clout. These results state that *it is possible to counterfeit the voting results on the election committee servers, by breaking into the computers used to prepare the system code, before installing it into vote counting servers*. Scientists have demonstrated exploitation of systems vulnerabilities in their lab. Experts from the Estonian National Election Committee replied that the researchers did not find any new attack vectors that has not be foreseen in the internet voting system design, and that expert-submitted attack techniques can not be effectively managed to change the results of the elections. It was also noted that the election committee has strong protection and automatic mechanisms that are able to detect attacks against the internet voting systems or attempts to falsify election results, while the errors in the online web site estoniaevoting.org do not reveal any technical details about the alleged vulnerabilities of the internet voting system (University of Tartu 2015).

Geneva solution internet voting model. The Swiss government launched internet voting project in 2000. There was a very high number of referendums in the country, so the Internet voting had to increase voter turnout and possibility to participate in the elections. The implementation of the system was also encouraged by the high level of internet penetration. Present, Swiss citizens are allowed to vote using internet voting system only in the European Union and in the Wassenaar countries.

In order to be included as a voter living abroad, it is necessary for the citizen to register their place of residence in the Swiss consular offices and renew the registration every four years (Barrat, Gildsmith, Turner, 2012).

Before every election, the Geneva canton residents receive a letter with a one-time voter card containing a voter identification number valid for a certain period of time. This card stores the citizen's (voters) number and PIN code (Geneva State Chancellery, 2010). The voters in the internet voting system confirm their identity by using this card and entering their birth date and place of birth (Parliamentary Research Department of the Parliament of the Republic of Lithuania, 2015). To secure voters connection (access) to the internet voting server an HTTPS communication session using SSL connection is created.

The internet voting website becomes publicly accessible after the electronic ballot box stamping-up procedure. To vote online, the voter connects to the <https://www.evot-e.ch/ge> website and enters the voter card number received by mail. By pressing *acquaint* button, the voter confirms that he has acquainted with the actual legal information appearing on the screen (causing liability for election law violations) (Barrat, Gildsmith, Turner, 2012). Vote recording begins on the voter's computer after the voter marks his decision. Later, a secure communication channel is used to send the ballot to the electronic ballot box, decode the ballot and verify the voter's eligibility and the integrity of data of the voting ballot. The system sends a confirmation to the voter with a unique code known only to the internet voting system and the voter himself. Then the voter must confirm identity by entering birth date, password from the voter card and the place of birth. This data is not available in publicly accessible registers. The place of birth is also indicated on the Swiss citizen's identity cards and citizens passports. The voting server verifies the voter's data, whether the voter has not yet voted and after that record the voice. Finally, the internet voting server sends a confirmation to the voter that his voice has been counted.

Geneva solution internet voting model use asymmetric encryption method to encrypt votes. Public and private election committee keys used for this encryption are generated before the election. Before sending a ballot to the voting server it is additionally encrypted with a symmetric key (the secret code which is taken from the voter's card). This dual ballot encryption increases the security of the ballot. In addition, the internet voting system server uses the hash function to check whether the ballot has not been changed during transition or after it was received.

The *Geneva solution* internet voting system has one voter list for all three voting methods: voting via the Internet, postal voting and traditional voting polls voting. This option prevents the possibility to participate in elections more than once. The internet voting allows to vote only one time, without the ability to change your ballot later. The citizens who voted on the internet could not to vote in other ways (by post or in traditional voting polls (Parliamentary Research Department of the Parliament of the Republic of Lithuania, 2015). This solution creates situation in which it is difficult to ensure that citizen voted on a voluntary basis, also the possibility that one family member can vote for others exists. According to the election committee during the internet voting process this problem is solved by asking a private question that only the voter can answer. Election committee also calls 2% of internet voters to make sure they voted for themselves without any pressure from anyone (Geneva State Chancellery, 2010).

Internet voting ballots are counted during a formal meeting of the competent authority, it contains representatives of different political parties. Election committee's computer with special application is used to collect all election committee employees' passwords which are needed to generate private election key that will be used to decrypt and count voting ballots. (Geneva State Chancellery, 2010).

The *Geneva solution* internet voting model process is shown in Figure 3. The voter connects to the online voting system by downloading and installing voting application on his device. This application automatically adds a Java script to the web browser that ensures secure communication between the voter and the internet voting system. This creates a controlled environment. A connection to an internet voting system using the SSL protocol is initiated. Data flow is checked by the firewall. The internet voting system has a web server that manages queries in voter database, which is monitored by the elections committee. There is also a unique code generator that generates voter ID numbers and a cryptographic generator that generates cryptographic keys. The *Geneva solution* voting model does not cover the whole voting process - only the first part: voter registration, identification and formation of a voter's ballot.

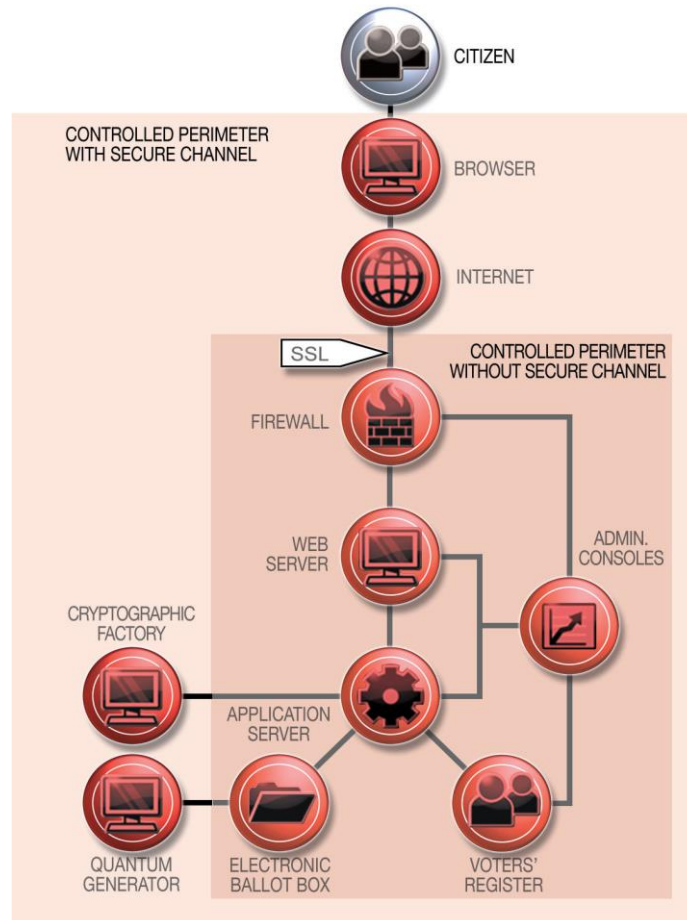


Fig. 3. The Geneva solution internet voting process
Source: Geneva State Chancellery, 2010

Comparative analysis of internet voting models. In this comparative analysis aspects of internet voting process of the different internet voting models are compared.

The voter registration methodology differs in the analyzed models. In the *Scytl* and *Cybernetica* models, voters registers on the internet voting day by joining the election website. Meanwhile, the *Geneva solution* internet voting model requires voter to register their place of residence in Swiss consular offices and are asked to renew registration every four years. The *Scytl* voting model enables voters to register and vote on devices with Google, Android, Blackberry and Apple IOS, while others allow voting only by usage of the personal computer.

The most sophisticated *voter recognition technique* is applied by *Scytl*, which declares that any method of voter identification could be adopted to the *Scytl* voting system. In the *Cybernetica* model, the identity of the voter is determined using a personal identity card and the government of Estonia encourages the use of a mobile signature. The *Geneve solution* voting model uses data from the card received by a voter for a special election and entering confidential data known only by voters: date and place of birth.

Voting and voice counting mechanisms and methodology. All analyzed internet voting models use public key

infrastructure to ensure voice secrecy by creating a double-envelope analogue that is used for postal voting. Only *Scytl* offers the ability to vote on devices with Google, Android, Blackberry and Apple IOS, while other voting models allow only the use of personal computer.

Scytl and *Cybernetica* models allow the voter to vote online as many times as needed counting only the last vote. This possibility reduces the probability of a bribe. *Geneva solution* model allows a voter to vote only once. In addition, the *Geneva solution* model users, after having voted online, lose the right to participate in postal voting or in traditional voting at the voting pole.

The *Scytl* model gives the voter possibility to check his voice and ensure that it was counted as expected. In this way, without submitting the content of the ballot, it's possible to make sure that the voice is recorded correctly. *Cybernetica model* sends a unique QR code to the voter. Citizens using smartphones can check that voice has been correctly recorded. The *Geneva solution* model does not provide voice verification feature.

The methodology for counting votes in the analyzed online voting models is very similar. After the election, electronic votes are firstly de-personalized and then recorded on a DVD or other media and transferred to a safe environment where they are decrypted using the election committees private key and counted.

Specifics of internet voting models audit. The *Scytl* internet voting system can be checked before, during and after the election. Election audit system is integrated with the management of security information and infringement reports. In the ongoing scan of vulnerabilities, the system has a real opportunity to block security breaches even before they cause damage to the system. The *Cybernetica* model uses an authentication server to monitor the internet voting process, which is an internal platform for tracking events and collecting statistics from the voice forwarding server and voice counting server.

In summary it can be stated that all the internet voting models are very different. All of them are united by the use of the *double envelope* technology to ensure the secrecy of votes. According to the authors *Geneva solution* model is unacceptable for the implementation in Lithuania internet voting due to insufficient security in determining the identity of the voter. The voter's card sent by mail may be stolen, and the date and place of birth of the voter is not classified as confident information in Lithuania. *Scytl* and *Cybernetica* models are much safer in this perspective. It is hard to decide which of the two models is better for Lithuania: *Scytl* which provides wider options for the voter when choosing a voting device or *Cybernetica*, whose vote checking method is criticized for potentially disclosing the content of the vote.

4. Evaluation of the characteristics of cybersecurity management during the implementation of Internet voting in Lithuania

Research methodology: Semi-structured expert interview method was chosen for the qualitative research. The survey was conducted by interviewing experts from two fields as currently there are no experts on cybersecurity management in Lithuania. Experts on Internet voting and cybersecurity were interviewed by the authors using two different questionnaires. Experts on Internet voting were asked about the security issues during connected with internet voting, while cybersecurity experts were questioned how to deal with cyber security issues that can occur during the usage or implementation of the internet voting systems. Six internet voting and six cybersecurity experts were interviewed during the survey.

Number of experts was based on the methodological assumptions presented in the classic testing theory, which states that the reliability of aggregated solutions and the number of decision-makers (in this case - experts) are associated through a rapidly decreasing nonlinear relationship. According to Baležentis and Žalimaitė, the group

of 7 experts is sufficient for a qualitative research, and the accuracy of the assessment is sufficiently precise. As the number of informants continues to increase, the accuracy of the assessment is increasing very slightly; therefore, it can be assumed that the reliability of the survey is sufficient (Baležentis, Žalimaitė, 2011).

The purpose of this survey: to clarify the issues of cybersecurity in connection with the internet voting and to provide with the possible solutions in accordance with the problems identified. *Survey tasks:* identify problems regarding the internet voting in Lithuania; discuss separate stages of the Internet-based voting system while keeping in mind the cyber security issues; find out what is the expert opinion on the possible security issues and security solutions to solve them; find out the point of view of cyber security experts on the most problematic aspects of the cybersecurity management in internet voting.

Issues of Internet voting. Three of the four internet voting experts participating in the survey indicated that the internet voting system is not legitimized in Lithuania largely due to the "lack of political will". A number of legislative amendments were prepared to validate the voting during the elections of the President and the Parliament of the Republic of Lithuania, municipal council or European Parliament, but all of them were rejected by the Parliament of the Republic of Lithuania. Other experts argued that the biggest problem with online elections is the lack of clarity: the amendments proposed to the Parliament on the possibility of voting online in the elections and referendums essentially will not restrict the voters from doing that through traditional means and will meet all the voting principles and requirements of the law; the electorate will be able to vote online several times, but only the last vote received from the voter will be counted. However, the whole internet voting process is not clearly defined to this day. Experts argued that before setting up the online voting (internet voting), it should be completely clear what type of system will be implemented and used during the internet voting process in Lithuania. Experts also recommended that the law should be clearer to identify and detail the principle features of the system, ensure a clear division of responsibilities between the institutions involved in the voting process and provide external control mechanisms to ensure competent and independent quality inspections during the process. According to a few experts, it seems that the internet voting is used by politicians in the advertising campaign, but it is not enough to initiate changes of laws to implement internet voting in Lithuania – it is necessary to carry out a lot of "technical" work too. It was noted, that risk analysis of the internet voting system in Lithuania is not carried out until now, but it is strictly mandatory to coordinate the tolerance of risks with the electorate of Lithuania.

While summarizing the answers of the experts to the first part of the questioner, it can be assumed that Internet elections in Lithuania are not legitimized due to four main reasons: lack of political will by the members of the Parliament; there is no consensus on how the Internet voting system should look like; no risk assessment carried out and tolerable risk levels are not defined; insufficient involvement of the society in the implementation of Internet voting processes. There is a lack of public information on the Internet voting topic (discussions, conferences).

The possibilities of using existing internet voting models in Lithuania. Experts emphasized that it is undoubtedly important that the internet voting should be integrated into the entire voting system of Lithuania as an integral part. This is a prerequisite for the creation of a well-functioning, uninterruptable election process. The opinions of experts on internet voting also differed due to the possible models of the internet voting in Lithuania. Only one expert confidently suggested using *Scytl* model in Lithuania. The expert highlighted the benefits of the *Scytl* internet voting model: it is possible to install different voter identification tools and it can be easily integrated into devices using Google, Android, Blackberry and Apple operating systems providing the same level of security as a personal computer. Other experts, however, spoke more cautiously about the *Scytl* model. One of the experts distinguished *Cybernetica* voting model as the most suitable for Lithuania. In Estonia *Cybernetica* model was suitable due to the well-developed electronic signature infrastructure. Meanwhile in Lithuania, while the majority of citizens have the electronic signature on a personal identity card, but rarely use this option. The remaining

experts were unable to tell which model of the internet voting would be best to use for the elections in Lithuania. Experts emphasized that in development of the model of the Lithuanian internet voting system it is necessary to clearly identify requirements that are compatible with the laws of the Republic of Lithuania and the specifics of the public administration system.

To summarize, it can be stated that internet voting experts do not agree on the particular internet voting model that should be selected and used in the context of internet voting in Lithuania. Experts suggested using either *Scytl* or *Cybernetica* model. It was also believed that Lithuania, using global practice, could develop its own model of internet voting which could be adapted to the specifics of the Lithuanian legal framework and public administration specifics.

Security problems of Internet voting. One of the most important conditions for conducting internet voting is to ensure that only eligible Lithuanian citizens can vote using the internet voting system and that the person could be clearly identified. One of the experts said that the internet voting is very similar to the pre-voting (postal voting using two envelopes principle): the voting pole opens the external envelope, finds the identity of voter and verifies that the voter has voted. It is also checked whether the voters belongs to the voting area and that voter did it only once. When everything is checked, the election committee marks voters list and indicates that the voter has voted. The inner envelope with the voting ballot is put into the ballot box with the other envelopes. All of these principles must remain during the internet voting and it can be achieved through cryptographic measures. All interviewed internet voting experts have unanimously opposed the use of the online banking system for the voter identification for the internet voting system in Lithuania. One expert stressed that confidentiality in the bank is understood as the protection of information from third parties. Meanwhile, the bank knows and sees all the steps of its customers. The secrecy principle of the voting is based on the fact that the system does not know how the voters voted. Voting system just could identify the fact that voter has voted, but it cannot identify for which candidate or party. According to the expert, this is a *significantly higher level of system secrecy*. Experts also mentioned that the identity of the voter in the Lithuanian internet voting could be determined using an electronic signature or a mobile signature. The opinion of experts on the possibility of using a personal ID card for identification was split: three experts said that this project failed in Lithuania, but did not deny that it was a safe way to both identify and vote; meanwhile, other experts said that it is essential to provide the wider variety of choice of identification measures for internet voters and it is most important that it has to be safe and reliable.

As a problematic issue, experts identified the voters' ability to test their choice (the possibility to receive voting confirmation). This option is mentioned in the amendments. One expert noted that the *Scytl* internet voting model is currently using the best voice verification method. The voter can take a few steps to verify if his voice has been counted and counted as intended. Other experts mentioned the checking method used in the Estonian internet voting model, but this model has been criticized for the release of vote content, which creates the possibility to buy voices. One expert feared that internet voting would create additional opportunities to buy/sell votes. Meanwhile other experts have stated that the criminal purchase of votes in Lithuania has been noticed a few times, while the possibility of voter to vote many times through the internet and later traditionally at the voting pole would cause the decrease in the bribing the voters.

In summary it can be concluded that there are five main problematic points of the internet voting: the registration of the voter; identification of the person in cyber space; possibility for the voter to check his voice; additional opportunity to bribe voters and issues of internet voting audit.

Internet voting cybersecurity management issues: cybersecurity experts (participating in the survey), after being asked about the cybersecurity management issues in the internet voting organization and implementation process, unanimously emphasized that currently it is not possible to ensure the security of voters device used for internet voting without compromising voters privacy. Experts noted that frequently citizens may use some *pirated*

software on a personal computer or not have a supported antivirus program which can update its virus databases from the official source. Some expert, working with cyber security issues, mentioned the naivety of users when the use of pirated antivirus programs is providing them with a false sense of security (outdated software, not up to date definitions, possibly malicious cracks used). In solving the problem of an unsecure voter device (personal computer), several experts suggested together with internet voting program to install a Java script that would block other applications during the internet voting process. However, experts warned that this could violate voters' privacy. Experts have published recommendations for the voter that should be followed during the voting over Internet: web page address should be typed manually (clicking on link could lead to phishing websites using *social engineering*); ensure that encrypted HTTPS connection is used during the communication with a server; verify that the site security certificate exists and is still valid. Experts mentioned that a cyber attack could also be expected while the voter is communicating with the internet voting system. All experts recommended the use of a secure encrypted communication channel to guarantee the confidentiality and integrity of the data transferred between voters computer and internet voting system.

According to cybersecurity experts, absolute security exists only theoretically - even in the most protected systems, there is always a possibility of an error and intrusion - this possibility cannot be eliminated. Therefore, before the internet voting system is implemented and used, a comprehensive risk analysis (risk assessment, probability of occurrence, damage, possible resources, risk reduction, etc.) and a tolerable risk assessment are required.

In conclusion, it can be stated that at present, without violation of personal privacy, there are no technical possibilities to ensure the safety of a voter's device - only recommendations to secure the device can be made (but the voter has to follow them). Secure communication between the voter and the internet voting system can be ensured using a secure encrypted connection (TLS). Cybersecurity experts also recommend the use of all possible technical, organizational and legal measures to protect internet voting system.

5. Dynamic analysis of public opinion on the possibility to implement Internet voting in Lithuania.

Two identic studies were carried out to evaluate the public opinion, as well as the support or disapproval towards the implementation of electronic voting systems in Lithuania (the first research was conducted in 2007, second in 2017).

Research methodology: research was carried out using a questionnaire consisting of twenty questions. The target sample size must be at least 384 respondents. As the population continues to grow, the number of respondents varies considerably, so it can be assumed that the reliability of the study is satisfactory. In 2007, 419 respondents were interviewed, and in 2017 researchers addressed 436 respondents, while the reciprocity of the questionnaire was 63 and 54 percent respectively.

Results of the study: As it was mentioned, 419 and 436 respondents were interviewed during the study. The distribution of respondents (by age) is presented in Chart 1.

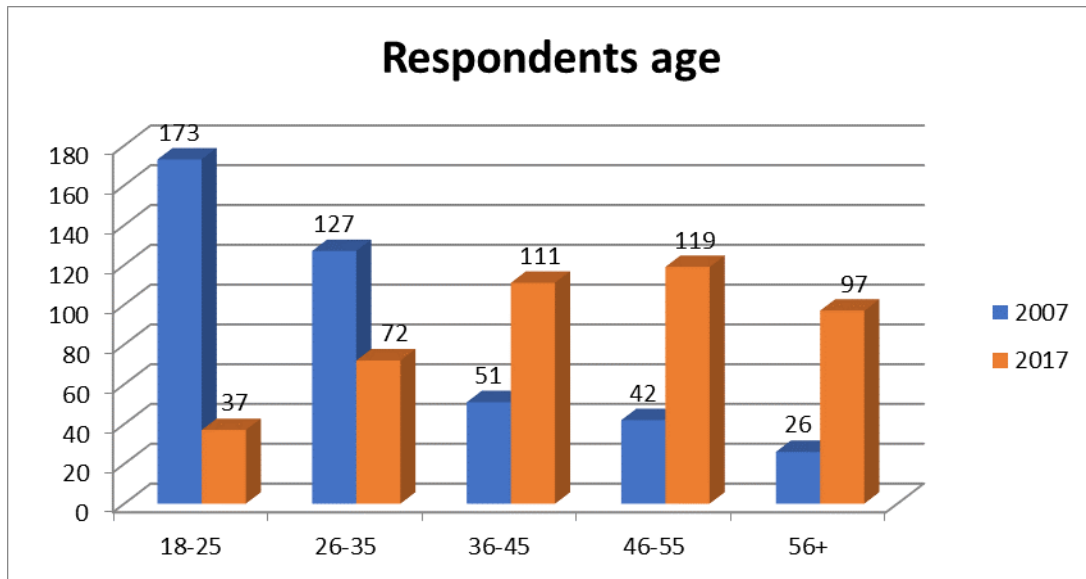


Chart 1. Distribution of respondents by age.
Source: Compiled by authors.

The distribution of respondents by gender is presented in Chart 2.

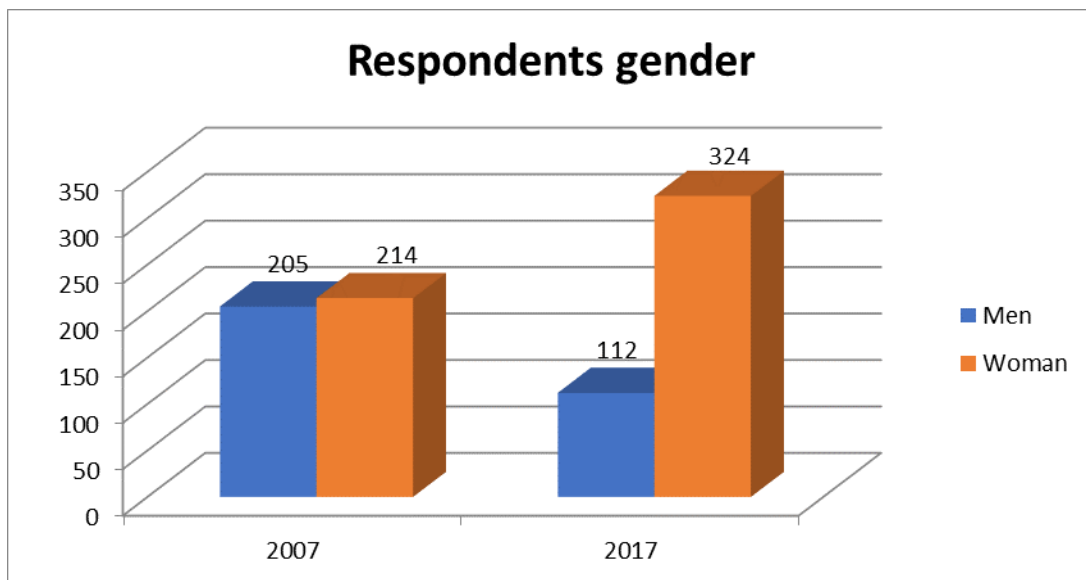


Chart 2. Distribution of respondents by gender.
Source: Compiled by authors.

The distribution of respondents according to their place of residence is presented in Chart 3.

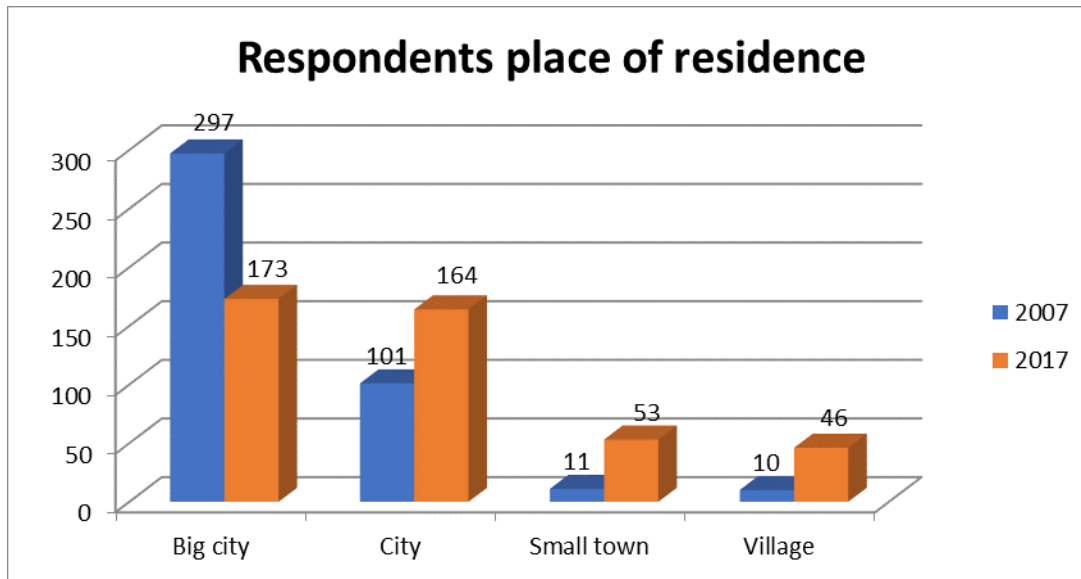


Chart 3. Distribution of respondents according to their place of residence.
Source: Compiled by authors.

Distribution of respondents by education is presented in Chart 4.

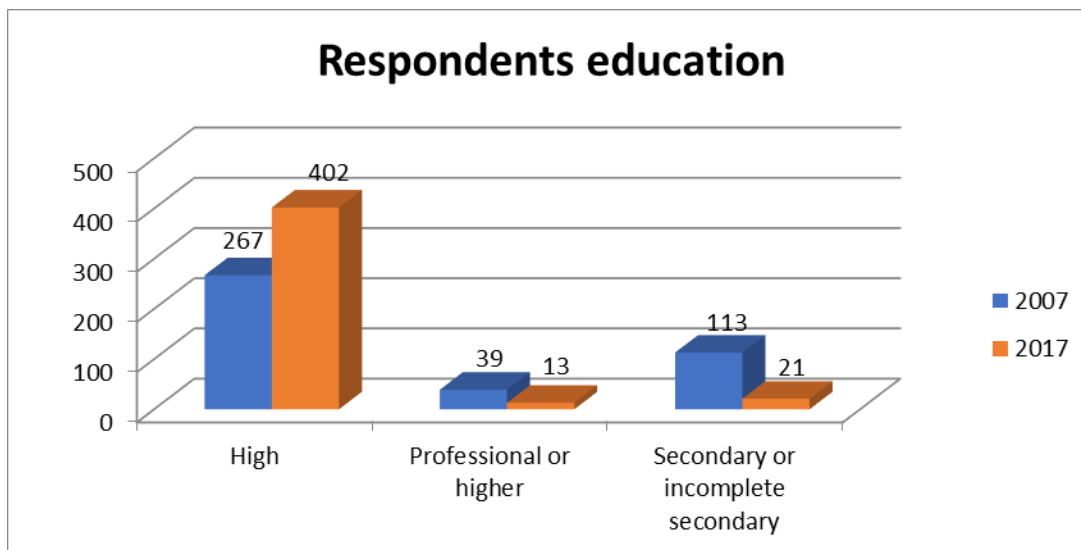


Chart 4. Distribution of respondents by education.
Source: Compiled by authors.

The distribution of respondents according to their occupation is presented in Chart 5.

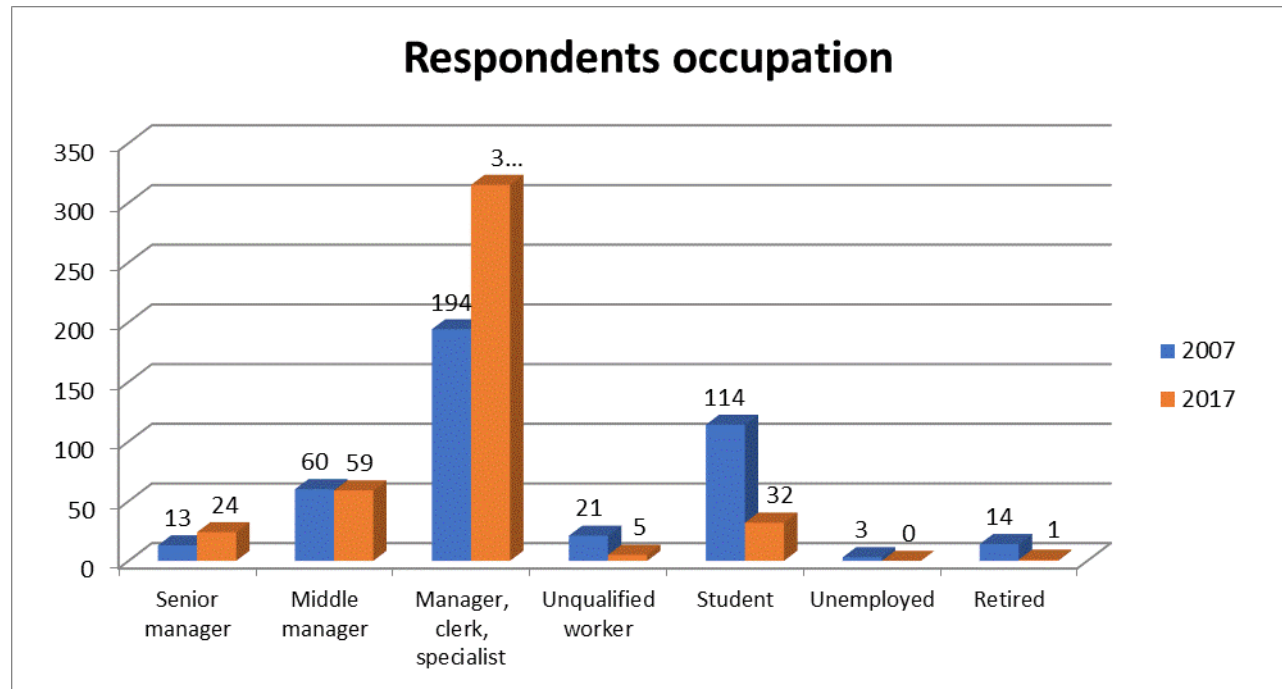


Chart 5. Distribution of respondents according to their occupation.
Source: Compiled by authors.

The distribution of respondents by income is presented in Chart 6.

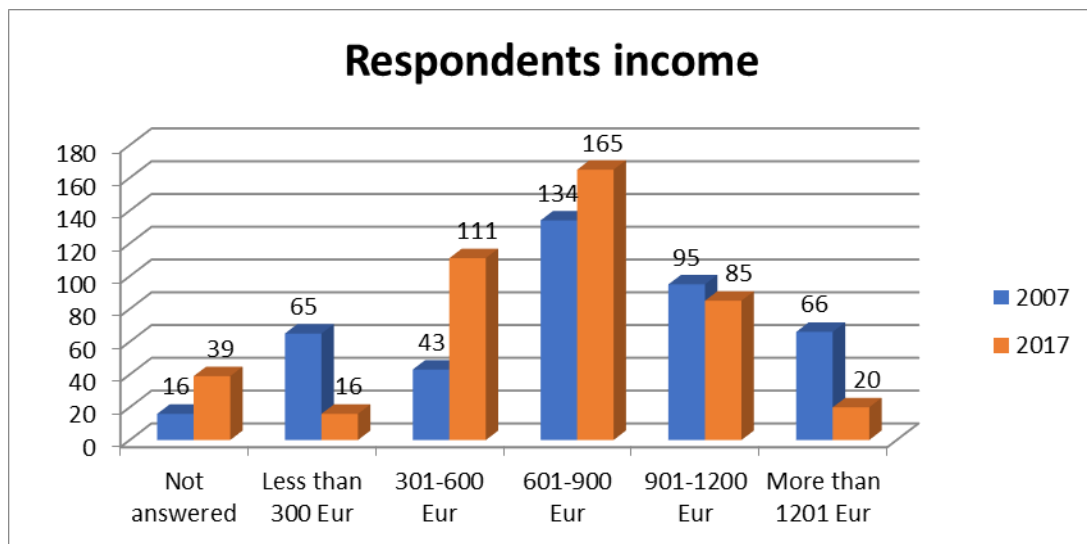


Chart 6. Distribution of respondents by income.
Source: Compiled by authors.

The distribution of answers of respondents according to the distance from their home to voting pole is presented in Chart 7.

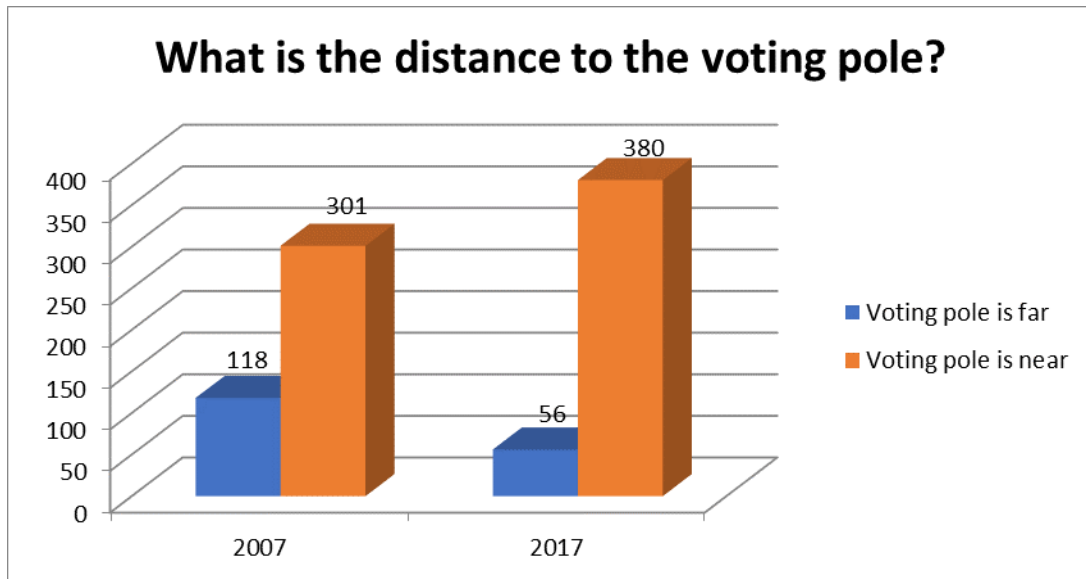


Chart 7. Distribution of respondents answers about distance from their home to voting pole.
Source: Compiled by authors

The distribution of answers of respondents based on their participation in elections is presented in Chart 8. It can be argued that respondents are participating in the elections more actively.

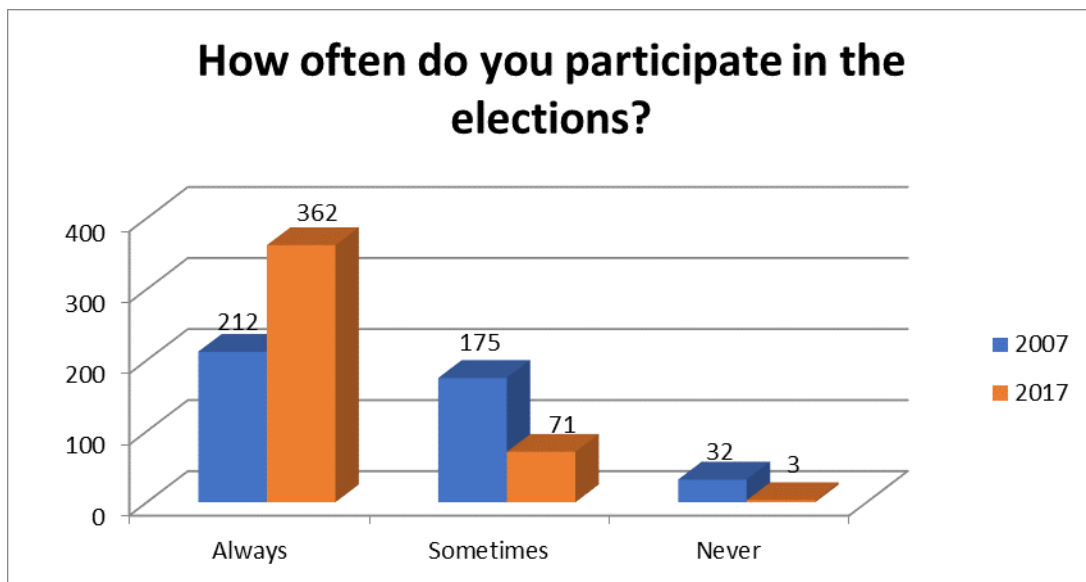


Chart 8. Distribution of respondents answers about their participation in elections.
Source: Compiled by authors

The distribution of answers of respondents based on non-participation in elections is presented in Chart 9. It can be stated that respondents began to favor candidates in the elections more favorably, but the inadequacy of candidates is still the main reason that encourages residents to refuse to participate in the elections. Only the respondents who answered the previous question “sometimes” or “never” were evaluated.

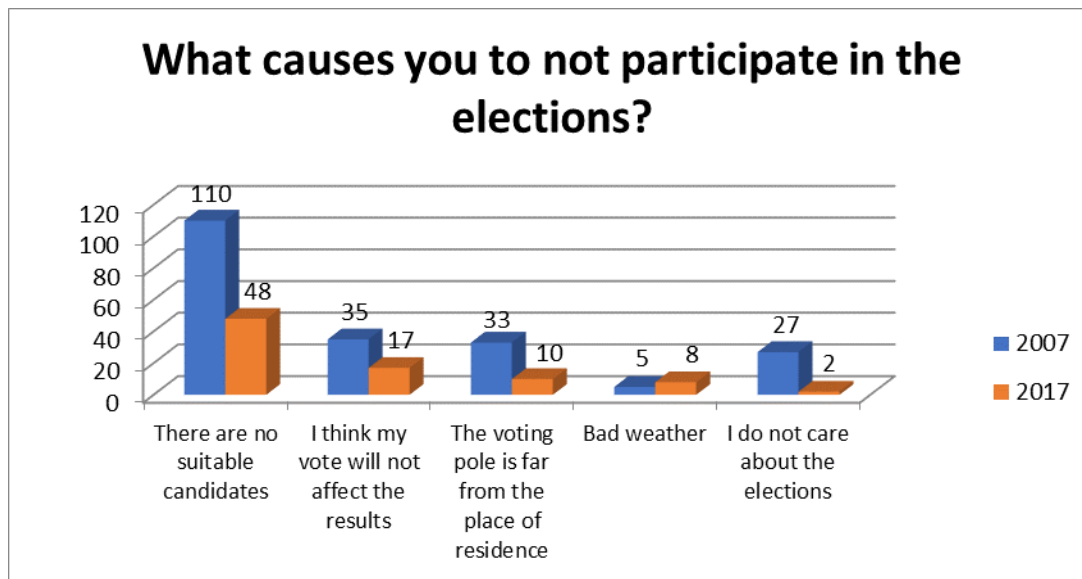


Chart 9. Distribution of respondents answers about non-participation in elections.
Source: Compiled by authors

The opinion of respondents on internet and traditional elections is presented in Chart 10. It can be noted that in the surveys conducted in 2007 and 2017, respondents considered internet voting more attractive than the traditional method of voting.

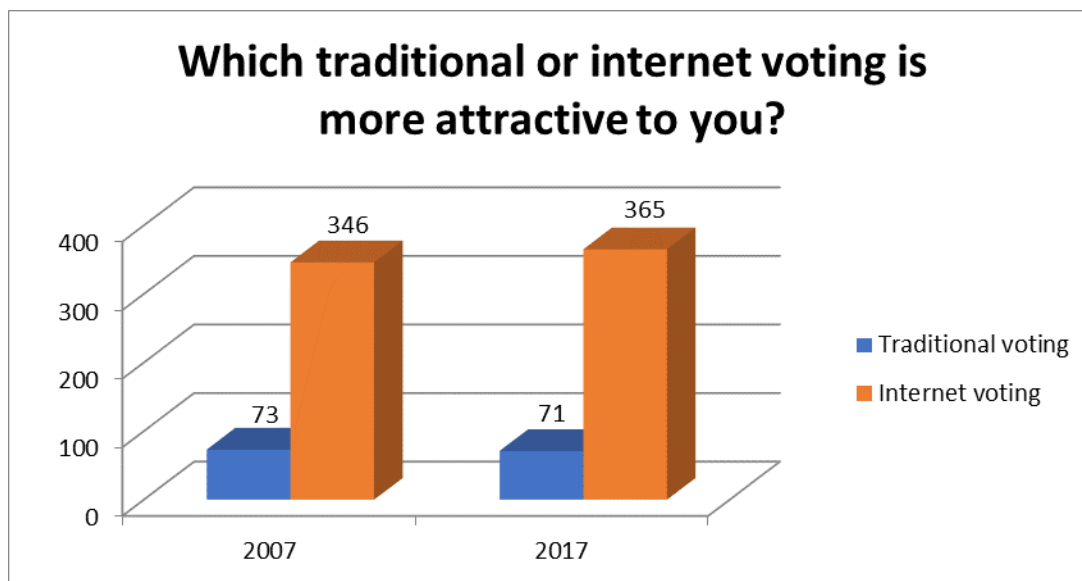


Chart 10. The respondents' opinion about internet and traditional voting.
Source: Compiled by authors

The distribution of answers of respondents based on the use of identification tools in the electoral process is presented in Chart 11. It can be noted that most respondents considered the identification by using electronic banking as the priority. It can also be noted that there was a drop in respondents consent to the use of personal identification cards with electronic signature, as well as the desire to use an additional identifier. There is a slight increase in the possibility to use mobile signatures, but it is not as obvious as the increase in the number of supporters of the use of the banking system's as the identification tool.

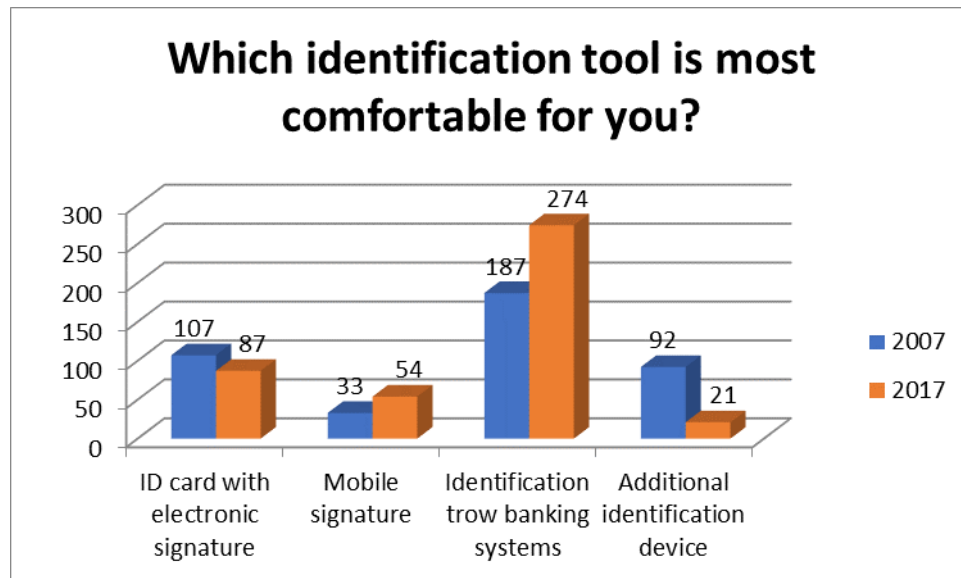


Chart 11. Distribution of respondents' responses about the use of identification tools in the electoral process.
Source: Compiled by authors

The respondents opinion on the impact of internet voting on voter turnout is presented in Chart 12. Most respondents believe that the implementation of internet voting would fundamentally change voter turnout during the elections and encourage them to take part in them.

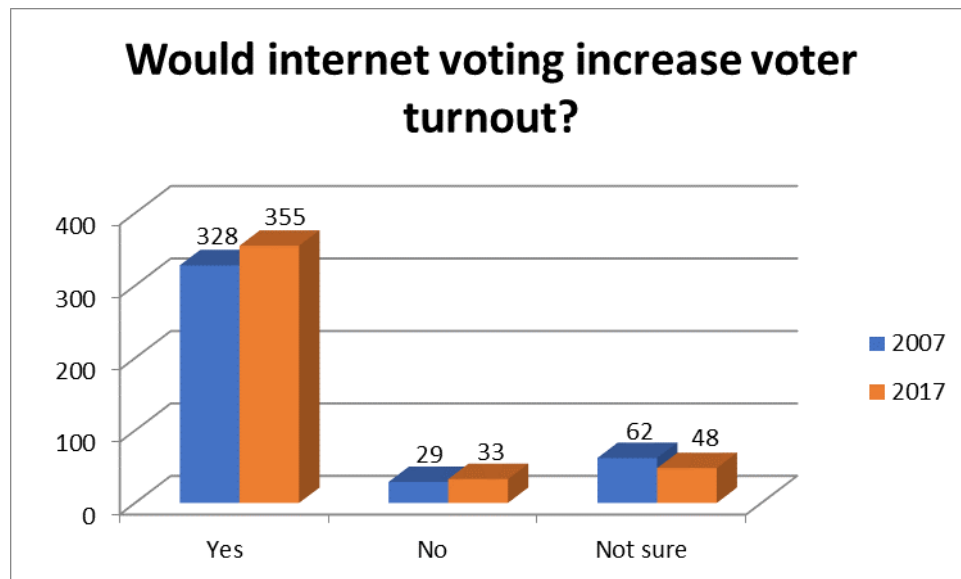


Chart 12. Respondents' opinion on the impact of internet voting on voter turnout.
Source: Compiled by authors

The distribution of answers based on the use of internet voting systems when living or working abroad are presented in Chart 13. During the surveys, respondents positively assessed the possibilities to use the internet voting system if they lived or worked abroad. It can be argued that the number of respondents, evaluating more positively has grown in 2017 and the number of people who have not known or disliked the idea of using such system has decreased.

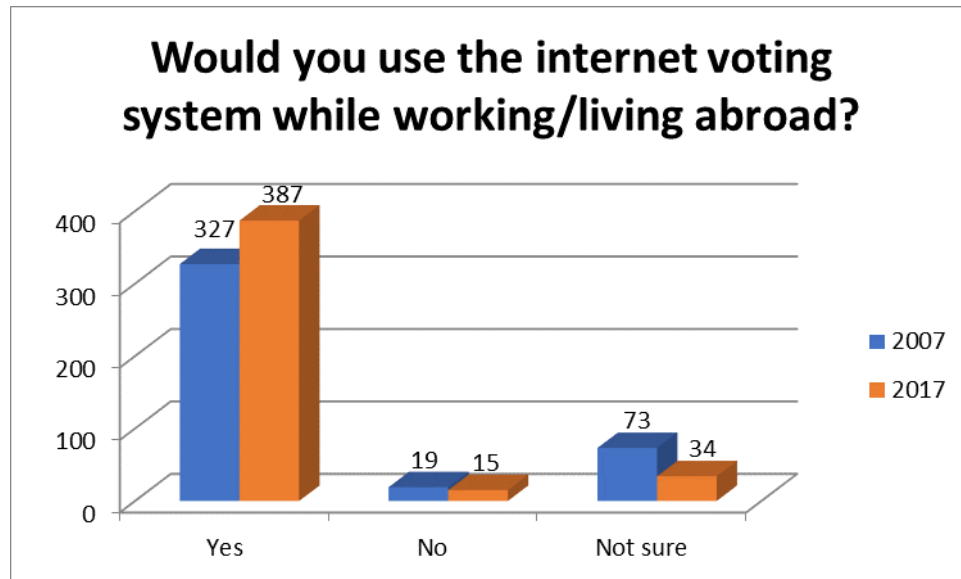


Chart 13. Respondents' answers on the use of internet voting systems when living or working abroad.
Source: Compiled by authors

In the course of the survey, respondents were also asked questions about traditional and internet voting systems:

- Question 1: Are you satisfied with the current voting system?
- Question 2: How do you rate the internet voting system?
- Question 3: Would internet voting boost your electoral performance?
- Question 4: Would you support capability to vote in any voting pole?
- Question 5: Would you support the roll-out of the internet voting end before traditional voting begins?
- Question 6: Would you support the fact that once person have voted online, there would be a possibility to change his or her choice during the voting in a voting pole?
- Question 7: Do you agree with the statement that electronic voting may positively affect voting transparency?

The summary of answers is presented in Chart 14. As it can be seen, respondents began to favor existing traditional voting system, but the internet voting system also received a more favorable assessment from respondents. Respondents also noted that they favored the emergence of an internet election system and believes that this system would encourage them to participate in the elections more actively. It was also noticed that respondents welcome the possibility of casting their vote in any voting pole, and also agree that electronic election service would begin and end before the election process in the voting poles. Answering the question about the possibility of changing the will expressed during the internet voting, respondents, as in 2007, evaluated this possibility negatively.

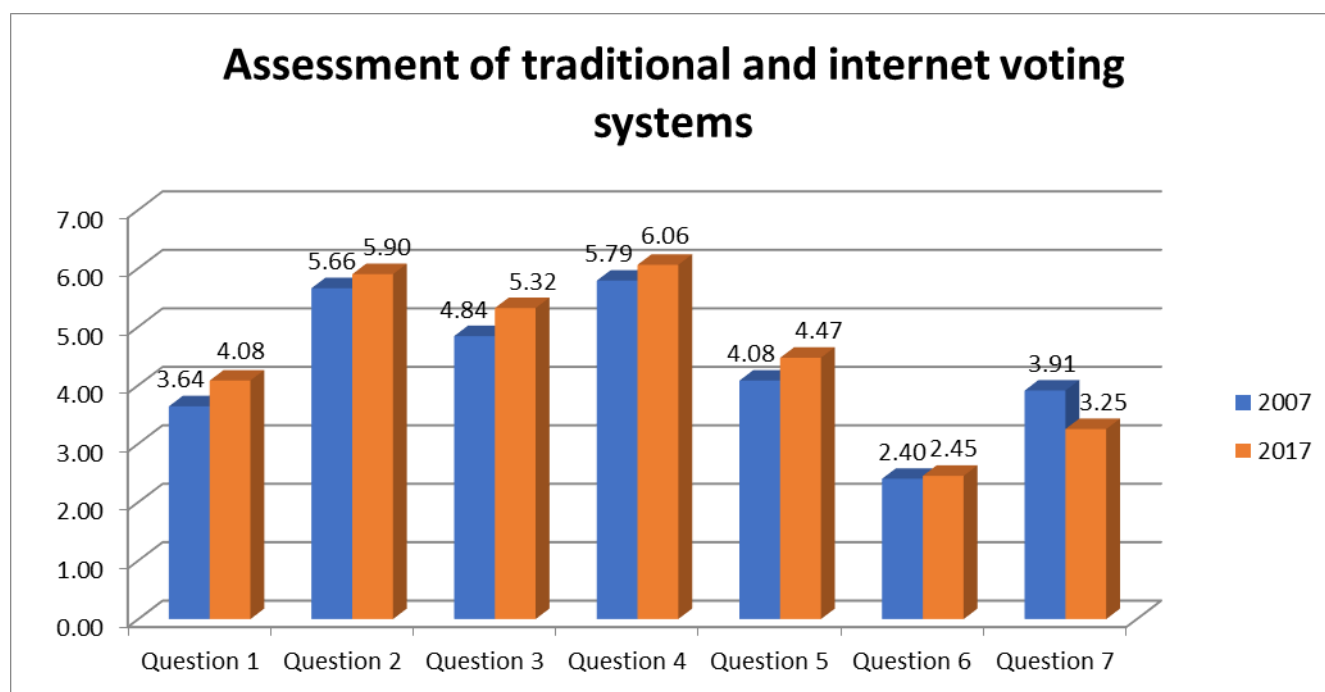


Chart 14. Assessment of traditional and internet voting systems.

Source: Compiled by authors

To sum up, it can be said that the public is beginning to see the internet voting as a more favorable choice than in 2007, although this favor is not yet very clear. It should be noted that the residents of Lithuania do not consider that it would negatively influence the transparency of the voting (internet vote security), and the statements of politicians and political parties, that citizens do not understand the security mechanisms used in the internet voting process and therefore are not prepared for the introduction of this technology, are not well motivated. Respondents also believe that the emergence of internet voting will help solve the problems of active participation in the country's political processes. Most respondents believe that the implementation of internet voting would fundamentally change turnout of voters during the elections and encourage them to take part in them.

6. Proposed cyber security model for the Lithuanian internet voting

The process modeling methodology was chosen for the development of the internet voting cyber security management model. Activity-oriented approach is chosen for the development of the model, focusing on the activities of the process and the relationships between them. Other elements of the process are not defined or analyzed in the context of process activities.

The purpose of the simulation is to create a cyber security model for managing of internet voting system. Modeling tasks:

- Create internet voting system infrastructure;
- Draw a logical internet voting scheme;
- Integrate cyber security management tools into the final model.

Before the analysis of the internet voting cyber security management model it is assumed that the devices of users, participating in the voting system, has a legitimate, regularly updated operating system with legal and

proprietary software supported by the manufacturer. The device is securely configured, with an updated antivirus program installed and etc.

According to the proposed internet voting cyber security management model (see Fig. 4), voters connect to the internet voting systems webpage using secure (TLS) connection using its own equipment and own internet connection or connection which could be provided by public libraries or other trustworthy places where an internet-capable device can be used. The voter downloads the application used for internet voting and installs it onto the device that will be used for voting (computes, phone or etc.). By using a mobile signature or other secure electronic signature voter confirms his identity and registers to the internet voting system.

Internet voting system, for security reasons, communicates with an external (unsafe) environment only through the demilitarized zone (DMZ). All communications initialized only from the inside of the network. In other words, it's not possible to directly connect to the internet voting system from the outside. The DMZ has a firewall software that allows only the default size and type queries and monitors the whole traffic. During the DDoS attack, the firewall application blocks and filters attacker's connections allowing legitimate user to connect to the system. The communication server periodically sends queries to the DMZ zone. When the voter sends a registration request, the communication server receives it and verifies the voter's eligibility (according to the voter's public key). According to the voting district to which voter belongs (place of residence), an electronic ballot is sent to the voter. If the voter is voting using the internet voting system for the second time, the internet voting system shall remove the previous vote from the ballots storage server and send him a new electronic ballot.

After the voter fills electronic voting ballot internet voting application encrypt it with an election committee public key (inner envelope) and voter signs encrypted ballot with his private key (external envelope), ensuring that the ballot belongs to that exact voter. Then voting ballot is transferred to internet voting system using encrypted communication channel.

Ballot travels into the DMZ zone. Electronic ballots storage server periodically sends queries to the DMZ zone server and transfers encrypted and signed ballots to the ballot storage also sends information to the voter database, marking the voter as one who has already participated in the internet voting. A voucher with a unique QR code (valid for 30 minutes) is sent to the voter to create the possibility for a voter to check if his choice has been correctly transferred and recorded on the ballot storage server.

Encrypted ballot is saved on a ballot storage server until the end of the traditional voting in voting polls. After closing the voting polls, voter identities are removed from the encrypted ballots (the inner envelope is removed from the outer envelope). Election committee audit team is monitoring the process of ballots depersonalization. After that, encrypted ballots are recorded on a DVD and transferred to a secure environment where the ballots will be decrypted and counted. Election audit follows the process of decoding and counting votes and after the end of counting the results are published.

All communications between the voter and the internet voting system during the voting processes is organized using a secure encrypted TLS connection. Internet voting system must be tested and certified before it is going to be used in elections. In order to ensure the security of the voting system from external and internal threats, a security policy that includes technical, organizational and legal security measures must be developed. While implementing the Resolution of the Government of the Republic of Lithuania (No. 716 of 24 July 2013) on general requirements for the security of electronic information, safety regulations, rules for the safe management of electronic information, information system continuity management plan and the rules for the administration of the information system must be prepared and approved.

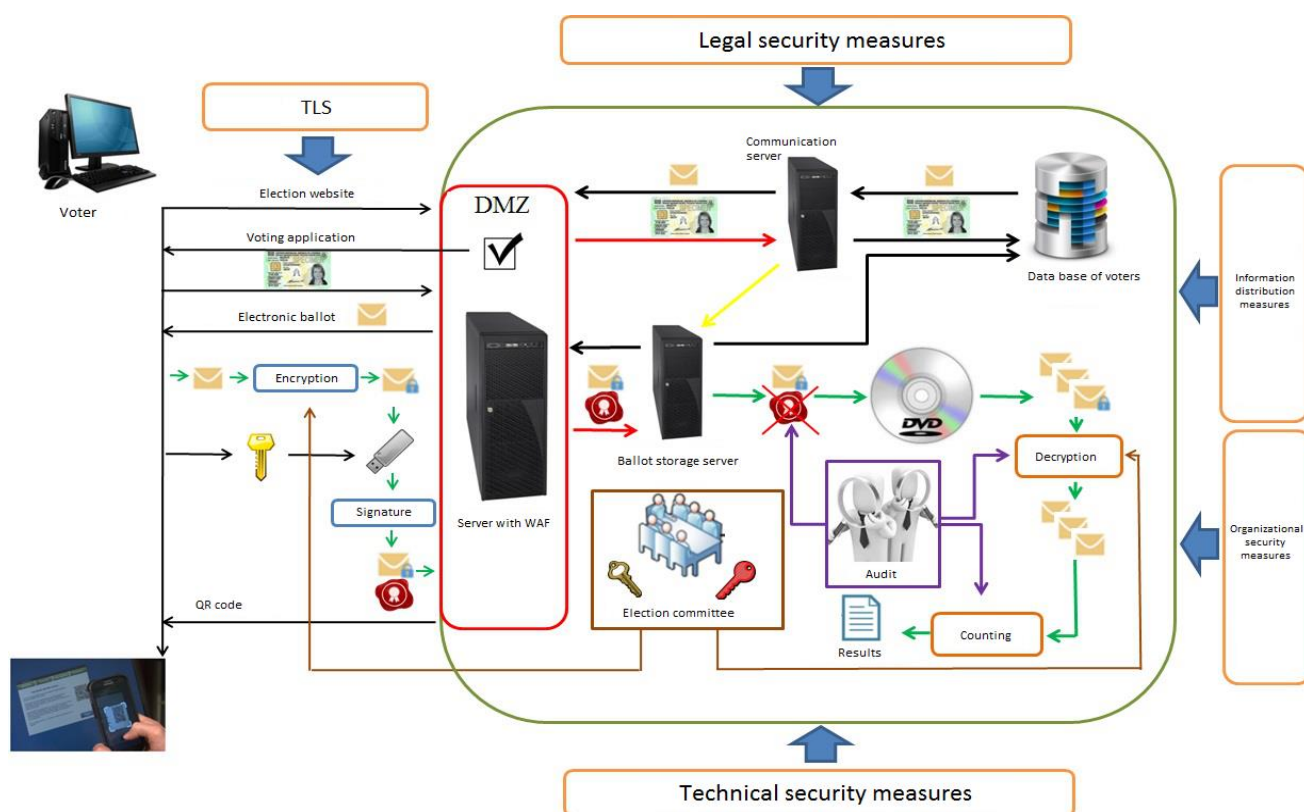


Fig. 4. Internet voting cybersecurity management model
Source: Compiled by authors

Possibilities and development perspectives of the Internet voting model. Created internet voting cyber security management model is based on good theoretical and practical examples: *Scytl* that is used in France, United Kingdom, Norway, Austria etc. and *Cybernetica* which is successfully operating in Estonia and “*Geneva solution*” internet voting models. The issues of Internet voting model have been discussed with internet voting experts and cybersecurity experts who have made recommendations on the cyber security management model. During the development of the model authors took into consideration specifics of public administration and the legal regulation in Lithuania: legal acts regulating the security of electronic information and cyber security in Lithuania, laws of the Parliament and Presidential elections, municipal councils and elections to the European Parliament, referendum law and five amendments to these laws, allowing the possibility to use the internet voting systems during the elections were analyzed. Therefore, it can be argued that represented internet voting cyber security management model could be used to conduct internet voting not only in Lithuania, but also, considering the similar legal regulation on cyber security and internet voting, in other Member States of the European Union.

Concept of Internet voting during the Elections and Referendums was agreed upon in Lithuania in 2006. Government of the Republic of Lithuania approved Internet Voting Implementation Program in 2007; it was designed to create and implement an internet voting system. Nowadays this Concept is morally obsolete and the Program has not yet been implemented. The perspective of the Internet cyber security management model represented by the authors in Lithuania is limited by the fact that currently internet elections are not legitimated, i.e. there are no laws regulating the possibility to use internet voting systems during the elections of the

Parliament, President, European Parliament, municipal councils and voting in referendums. However, if the amendments to the aforementioned electoral laws were to be adopted, the model could be applied in the internet voting in Lithuania.

The internet voting cyber security management model is very similar to the *Scytl* and *Cybernetica* models: models are united by the same phases of the internet voting process (registration, identity verification, ballot encryption, vote confirmation, voice counting and storage, deletion, decryption and counting procedures). Author's proposed model, like *Scytl*, uses the same identification methodology. Ballot encryption takes place using the public key infrastructure methodology by creating a double-envelope analogue (used by *Scytl* and *Cybernetica*); voice counting technology is the same as for the *Cybernetica* internet voting model (usage of QR code).

The analysis of *Scytl* and *Cybernetica* voting models involved only the internet voting process, providing the secure communication between the voter and the voting system. Publicly available sources do not provide any information about the technological aspects of cyber security management in these internet voting systems. Internet voting cyber security management model includes the entire range of legal, technical and organizational security measures. These measures and instructions should help preventing, detecting, analyzing and responding to incidents while also providing the system recovery after the incident or attack.

The strength of the proposed internet voting cyber security management model is that it has benefited from global good practices and takes into account the views and recommendations of internet voting and cyber security experts. The model does not specify the methods and methodologies used during the internet voting process stages, which would make the perception of the model more difficult. However, it can be broken down into scenarios according to the stages of the internet voting process, which could indicate the methods proposed for certain stages. Depending on the aspects of public administration internet voting cyber security management model can be adopted by other EU Member States with similar legislations.

Conclusions

After reviewing the opinions described in the scientific literature, it can be stated that internet voting should be subjected to the requirements of traditional voting and all principles of democratic elections and referendums, also cyber security management, information dissemination, organizational and technical measures must be retained. The whole range of these tools should help protect against the internal (administrators, other system users and civil servants) and external (foreign intelligence services, software, typical criminals, and hackers) intruders during all stages of the internet voting process.

Currently period authorities of Lithuanian government institutions are only declaring their intention to legitimize internet voting. However, the peculiarities of the legal regulation of the Republic of Lithuania, the amendments to electoral laws and the global opinion on cyber security allows us to expect that the situation is going to change shortly and legal acts will be adopted to allow the possibility to use the internet voting in election processes, as well as development of the internet voting system.

The survey on the possibility of implementing internet voting in Lithuania has shown the attitude of the population towards this *problem*. It is noticeable that in the last decade the opinion of the Lithuanian population on the possibility of internet voting has changed slightly and this opportunity is viewed by Lithuanians as a positive thing. Further changes in the opinion of the population can be encouraged through the implementation of programs (campaigns) for the promotion of internet voting as well as through the explanation of the peculiarities of the structure and functioning of the newly introduced voting system for the population. It should be noted that the residents of Lithuania do not consider that it would negatively influence the transparency of the voting

(internet vote security), and the statements of politicians and political parties, that citizens do not understand the security mechanisms used in the internet voting process and therefore are not prepared for the introduction of this technology, are not well motivated. Survey respondents also believe that the implementation of internet voting will help solve the problems of participation in the country's political processes. Most respondents believe that the implementation of internet voting would fundamentally change voter turnout during elections and encourage them to take part in the elections.

Despite the absence of technical barriers (without violating personal privacy, there is currently no way to secure the voter during the internet voting process), legitimization of internet voting could not be done because of the lack of political will. There is currently no consensus on what the model for internet voting should look like. So far risk assessment has not been carried out and tolerated risk has not been identified. The lack of trust of citizens towards the online voting system is based on the insufficient society involvement in the implementation processes of internet voting.

The internet voting model, which should be implemented in Lithuania, should unite methods and technologies that are used in *Scytl* and *Cybernetica* internet voting models. Proposed internet voting cyber security management model was developed using the best features of *Scytl* and *Cybernetica* models, taking into account the views and recommendations of internet voting and cybersecurity experts. The model was developed in accordance with the existing specifics of public administration and the legal regulation in Lithuania. The internet voting cyber security management model could be used to implement internet voting not only in Lithuania but also in other EU Member States with similar legislation base.

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