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Faculty of National Economy
Department of Finance

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PAPERS

THE ISSUE OF PROPERTY TAXATION ON THE EXAMPLE OF THE TAX ON IMMOVABLE PROPERTY

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ABSTRACT

The generally accepted economic theory considers land, labour and capital the essential production factors. The first named factor - land - is de facto the only one which is determined from the view of its layout and cannot be extensively expanded. At the same time, land creates the basis for the income from land, or a building on it, and therefore the major part of the property tax base. Despite these facts, there are only few analytical-synthesis studies about its taxation (in comparison with the factor of labour and capital). The aim of this paper is to clarify some of the characteristics and peculiarities of property taxation on the example of the tax on immovable property mainly on the basis of descriptive methods and to concretize this issue by means of comparison and deduction in selected EU countries.

Keywords: Property Taxation, Land, Tax on Immovable Property, European Union

JEL codes: H20, H22, B10

1 Introduction

The standard economic theory understands land as one of the three primary sources (in addition to labour and capital) which is rare, limited and is used for locating production and business activities, infrastructure, houses and living space for the population.

In the period of feudalism and the beginning of capitalism, the theory of land economics played an important role in the research of contemporary economists (land issues in economic theories also [6]). Probably the biggest importance was attributed to agricultural land by physiocrats, the most famous representative of whom was François Quesnay (the pivotal work from 1758). Physiocrats were of the opinion that all the origin of wealth comes from agriculture and the cultivation of land, they professed the so-called tax monism which suggests the existence of only one tax - the tax on land annuities (see [5]) which, in the modern times, can be understood even as the real estate tax. Adam Smith extended the theory of agrarian reform to classification of land according to its productivity, defined the monopoly profit, and in terms of quality, he placed agricultural activity at a higher level than production activity [16]. We can conclude this quite a short list of economists giving land and its taxation a major role with Thomas Malthus (1815) who, devoted to his theory of unbearable growth of

population, described the declining agricultural yields, the scarcity of land, and the differential rent [9].

The current economic research tends to underestimate the importance of land, agriculture, and also property taxes. For example, in the famous book *The Economics of Taxation* [7], there are four pages devoted to this topic.

In the context of the above, there is an interesting fact about the frequency of incidence of scientific treatises concerning taxes as a whole, and papers on the issue of property taxes based on the taxes on land. In the past five years (2010-2014), a total of 58 “tax” papers was published in impacted economic magazines in the Czech Republic and Slovakia, out of which only 3 texts on the issue of land taxation.

The aim of the paper is therefore to point out some of the important attributes of property taxation, to indicate other possible areas of research in the field of property taxes, and demonstrate this issue on data and indicators of selected countries.

2 Literature Review

From the macroeconomic point of view, property taxes make up an additional revenue entry of public budgets [15] and the ease of their choice is a significant advantage (high control, very low possibility of tax evasion, stable yields [19]).

Last but not least, we need to be aware that land as the primary factor of production is not taxed only as such, but products of the soil can also be subject to a tax (as reported by [3]) and this whole area has been in the centre of state interferences in advanced economies (in further detail see [14]).

Property taxes belong according to the international methodology [12] to the group 4000. In the Czech Republic, in addition to Vehicle Excise Duty which does not relate to land, there are other property taxes which are based on land (land or buildings located on them) - an immovable property tax, and a tax on acquisition of immovable property (the inheritance tax and gift tax were abolished). These taxes are not harmonised within the European Union [18], and therefore their presence in the tax systems of the member states, the very structure of the tax and its rates are left in the powers of national governments (see [13]). In practice, it is possible to find both unit property taxes and ad valorem taxes (the impact difference between the unit tax and taxes ad valorem in detail in [1] or [17], as well as a place in the system of public budgets where the revenues of such taxes go [11]).

3 Data and Methodology

Most of the population converts a part of their income into property. Therefore it is possible to collect other direct taxes in the economy - property taxes. These taxes may be imposed both on the part of the property (state variable) and the net value of the asset or the asset increment (flow variable). Property taxes are usually imposed under the first rule, i.e. they particularly affect land and buildings, then motor vehicles or other movable property.

To illustrate the theoretical knowledge within the application level, all member states of the European Union (hereinafter referred to as EU-28) were used. For the subsequent analysis, the data was obtained primarily from official sources of the European Commission and Eurostat (from a publication by [4] in particular), the prestigious institution International Bureau of Fiscal Documentation (a publication by [13] in particular) and the authors' own sources.

Apart from the method of analytical description, generally theoretical methods of reasoning, comparison, and (for the conclusions of the research) synthesis were used. Out of the methods of mathematical statistics, the authors used a multivariate correlation analysis in which the examined dependencies were detected by the quadratic polynomial trend line.

The authors worked with three research assumptions: (i) there is a dependency (of direct proportion type) between the share of property taxes revenue and the total tax revenues, and a share of real estate tax revenues and overall tax revenues, (ii) there is a dependency (of direct proportion type) between the share of property taxes revenue and total tax revenue, and tax revenue of municipalities and the total tax revenues, and (iii) there is a dependency (of direct proportion type) between the share of real estate tax revenues and the total tax revenues, and tax revenues of municipalities and the total tax revenues. These assumptions (hypotheses) were chosen from the rational expectation that, in most EU-28 countries, real estate taxes represent the most important income entry of all property taxes, and that the property tax revenues are in most cases directed to the budget of municipalities.

In order to enlarge explanatory clearness and achieve the research aim, the commonly used indicators of partial tax quotas (which relate to gross domestic product) were not used, but the indicators relating to total tax revenues were used instead.

All data and calculated indicators relate to 1. 1. 2014 because of the absence of more recent data.

4 Results and Discussion

Similar to the corporate tax, the theoretical justification for the taxation of property does not virtually exist; if the asset was created in the form of savings from income which has already been taxed, this means at least a double taxation. Currently, the income is gained in most cases in the form of money which can be measured more easily than the property. If you define the taxable income in a way that it also includes all forms of its increment, then the additional taxation of the property is not needed. In addition, there is a fairly easy integration of the property tax into the income tax (e.g. [8]). If the property provides its holder a certain revenue, the property tax will be the equivalent of the income tax on revenues of the property, according to the equations (1) and (2).

The property asset P creates an annual yield which is equivalent to a certain percentage of the value of this property (i). If a tax is imposed on this yield, its absolute amount will be the same (assuming zero inflation) as a given percentage of the original value of the asset:

$$Y = I \cdot P \rightarrow P = Y/i \quad (1)$$

If both the income tax (T_Y) and property tax (T_P) are introduced, the following applies:

$$T_P \cdot P = Y/I \rightarrow T_Y \cdot Y \rightarrow T_P = I \cdot T_Y \quad (2)$$

Many economists, however, still recognize the merits of property taxes. Main reasons they mention are the possibility to additionally tax the property created from incomes which forestalled the income taxation, the ease of tax collection, and the possibility to mitigate property inequalities. If we generally assume greater wealth of higher income group of tax payers, this tax will be progressive even when the tax rate is proportional, and it will correspond to the vertical fairness.

4.1 Types of property taxes in the European Union

Table 1 illustrates the situation in the field of property taxes in countries of the EU-28. Apart from Malta, where the classic property taxes are not collected, there are property taxes in all the remaining member states of EU-28.

Table 1 Property taxes in member states of the European Union

	Real Estate Tax	Net Wealth Tax	Inheritance Tax	Gift Tax
Austria*)	YES	NO	NO	NO
Belgium	NO	NO	YES	YES
Bulgaria	YES	NO	YES	YES
Croatia	YES	NO	YES	YES
Cyprus	YES	NO	NO	NO
Czech Republic	YES	NO	NO	NO
Denmark**)	YES	NO	YES	YES
Estonia***)	YES	NO	NO	NO
Finland	YES	NO	YES	YES
France	YES	YES	YES	YES
Germany	YES	NO	YES	YES
Greece	YES	NO	YES	YES
Hungary	YES	NO	YES	YES
Ireland	YES	NO	YES	YES
Italy	YES	NO	YES	YES
Latvia	YES	NO	NO	NO
Lithuania	YES	NO	YES	YES
Luxembourg	YES	NO	YES	YES
Malta	NO	NO	NO	NO
Netherlands	YES	NO	YES	YES
Poland	YES	NO	YES	YES
Portugal	YES	NO	YES	YES
Romania	YES	NO	NO	NO
Slovak Republic	YES	NO	NO	NO
Slovenia	YES	NO	YES	YES
Spain	YES	YES	YES	YES
Sweden	YES	NO	NO	NO
United Kingdom	YES	NO	YES	YES

*) The effectiveness of the inheritance and gift taxes was suspended by the decision of the Constitutional Court of the Republic of Austria.

***) Firstly, the estate tax on all testator/testatrix's assets is collected, and secondly, the inheritance tax is collected from each individual heir/heirress on his/her share.

****) The inheritance tax and gift tax are included in income taxes.

Source: [4] + author's own research.

It is clear from the list that the vast majority of EU-28 countries collects regular property taxes in the form of real estate taxes, only two states impose in addition to the regular tax also a tax on net wealth (France and Spain).

4.2 Tested research assumptions

Table 2 shows the significance of revenues from property taxes from the perspective of their share in the total tax revenues, and also revenues of municipal budgets compared to total tax revenues.

Table 2 Indicators of property taxes and municipal budgets compared to total tax revenues

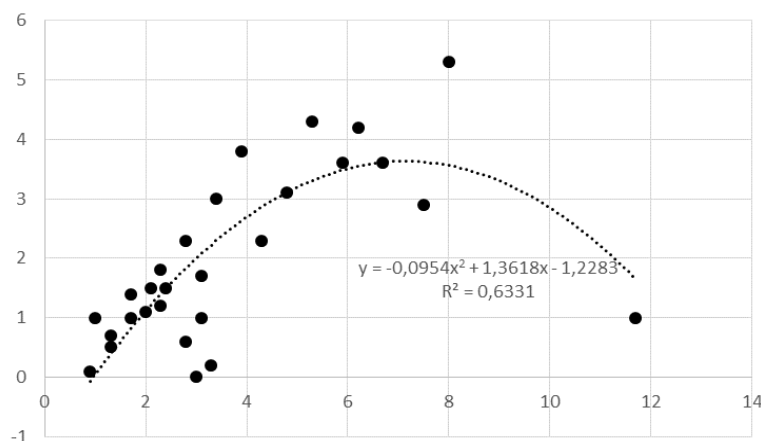
	Taxes on Property as % of Total Taxation	Taxes on Immovable Property as % of Total Taxation	Tax received by local Government as % of total Taxation
Austria	1.3	0.5	12.1
Belgium	7.5	2.9	4.9
Bulgaria	2.0	1.1	3.0
Croatia	0.9	0.1	12.0
Cyprus	2.1	1.5	1.3
Czech Republic	1.3	0.7	13.8
Denmark	5.3	4.3	26.9
Estonia	1.0	1.0	13.1
Finland	2.8	0.6	22.8
France	8.0	5.3	12.6
Germany	2.3	1.2	7.9
Greece	6.2	4.2	0.7
Hungary	3.1	1.0	6.3
Ireland	4.8	3.1	3.3
Italy	5.9	3.6	15.7
Latvia	3.4	3.0	19.3
Lithuania	1.7	1.0	9.6
Luxembourg	3.3	0.2	4.0
Malta	3.0	0.0	0.0
Netherlands	3.1	1.7	3.8

Poland	3.9	3.8	12.7
Portugal	4.3	2.3	6.7
Romania	2.8	2.3	3.6
Slovak Republic	2.4	1.5	10.5
Slovenia	1.7	1.4	11.1
Spain	6.7	3.6	9.9
Sweden	2.3	1.8	34.9
United Kingdom	11.7	1.0	4.8

Source: [4] + author's own research.

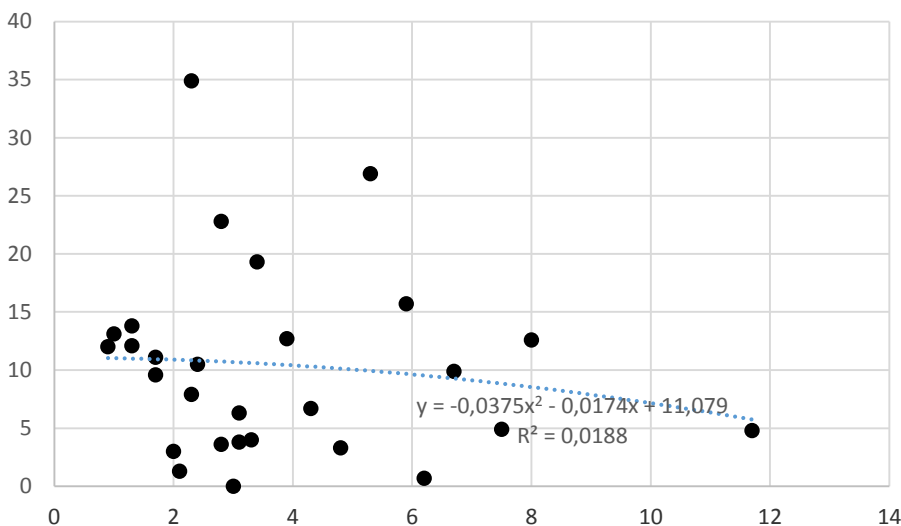
The values in Table 2 were subject to the correlation analysis, the results of which are shown in Figures 1 to 3.

Figure 1 The level of dependence between the ratio of property tax revenues and the total tax revenues, and the ratio of real estate tax revenues and the total tax revenues.



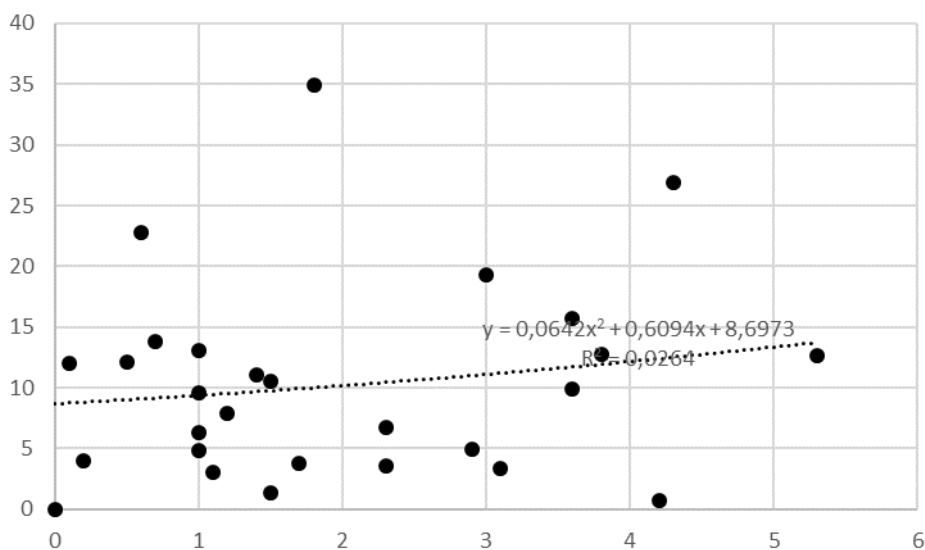
Source: Author's own research.

Figure 2 The level of dependence between the ratio of property tax revenues and the total tax revenues, and the ratio of tax revenues of municipalities and the total tax revenues.



Source: Author's own research.

Figure 3 The level of dependence between the ratio of real estate tax revenues and the total tax revenues, and the ratio of tax revenues of municipalities and the total tax revenues.



Source: Author's own research.

Analyzing coefficient of determination, that shows the proportion of total variation of outcomes explained by the model, we can see the higher values in figure 1 (0.6331). There are no substantial values in figure 2 and 3 (only 0.188 in case of the share of property tax revenue in total tax revenues and tax revenues of municipalities in total tax revenues and 0.0264 in case of the share of revenue on immovable property taxes in total tax revenues and tax revenues of municipalities in total tax revenues). We can say about dependence between the share of revenue on immovable property taxes in total tax revenues and tax revenues of municipalities in total tax revenues.

The performed two-level correlation analysis shows that the research assumption (i) really exists. The interpretation of this result therefore confirms that the real estate taxes form as to the importance the biggest part of all property taxes and also the total property tax revenue derives from real estate tax revenues. The research assumptions (ii) and (iii) have not been confirmed. The interpretation says that the total revenues of municipalities do not depend either on property taxes revenues as a whole or the real estate tax revenues.

4.3 Discussion

Property taxes (generally taxes on wealth or narrowed real estate taxes or land taxes) can have in some theoretical papers [2] also a different meaning than in the sense of obtaining a tax revenue. These taxes can also serve as a tool of redistribution of intergenerational property transfer or as an effort to influence the taxpayer to manage land or immovable property in general more efficiently.

Regarding practical economic policy, property taxes can be also used, for example, for the purposes of improving the quality of the environment. For example in the Czech Republic, the Ministry of the Environment proposed in year 2008 to implement additional environmental component of the property tax as a part of the so-called environmental tax reform [10]. For the purposes of motivation of households for replacement of their old and more polluting heating systems, the proposal included additional environmental component of the property tax, where the tax rate was based on both technical and environmental parameters

of such heating system, which is an integral part of the property. However, this environmental component of the property tax finally was not approved by the government, mainly because of anticipated strong social impacts.

The authors are aware of limitations to their research. It is clear that the examined issue could be extended to a research of microeconomic environment including the amount of property taxes in standardized households or their share in the expenses of the taxpayer (e.g. in relation to multiples of the average wage, in relation to the type of land and real estate, in relation to the location).

5 Conclusions

The taxation of land and real estate stands rather in the background in current economic research, even though it offers quite a lot of possibilities for research.

Property taxes, the real estate taxes in particular are an integral part of the tax-payment system of developed countries, it is practised in 27 states out of the EU-28 member states.

The research question 'to what extent does the real estate tax determine the revenue of all property taxes' is possible to be answered with a conclusion that it constitutes a significant part of these taxes. Considering the research question 'how significant are the property tax revenues for municipal budgets', it is possible to state that their role is not decisive, and that the municipality revenues primarily consist of shared taxes. This conclusion can be the relevant information for agents of public policy.

The conducted research also confirmed high autonomy of EU-28 member states in structuring and setting the amount of both the land taxes (real estate) and the property taxes in general. This fact can be also the impetus for further research in the field of property taxes both at the theoretical level and at the level of application surveys.

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RELATIONSHIP BETWEEN FOREIGN DIRECT INVESTMENT AND ECONOMIC DEVELOPMENT IN BALTIC COUNTRIES

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ABSTRACT

During recent years much more attention is paid to the flow of foreign direct investment and its influence upon country's economy. Developing countries generally seek to attract as high as possible foreign direct investment flows, but the effect of these investments to the financial system of the countries and their economies is not always measured. Various studies are conducted to determine the influence of foreign direct investments to certain countries, but finding studies investigating foreign direct investment effect on the Baltic Countries economies is complicated. That is why it is important and useful to evaluate and compare how foreign direct investments affect the economic development in the Baltic countries – countries having similar economies. Paper analyzes not only the correlation relationship between the mentioned factors, but evaluates that foreign direct investment impact on gross domestic product amount of the country can occur with a certain lag. Methods used in the paper are: logical comparative and generalization methods, systematic literature analysis, correlation analysis and Granger causality test.

Keywords: Baltic countries, economic development, foreign direct investment, gross domestic product

JEL codes: O1, O4

1 Introduction

Foreign direct investment (FDI) in many countries is seen as an important strategic element in the development of the country. That is why the attraction of FDI is envisaged as one of the main objectives of economic policy and the pursued objectives. Most countries in the world prefer receiving as high as possible FDI flows, because these investments bring benefits to countries' economies. It should be emphasized that in order to get the full benefits of FDI, the country should have a favourable business environment that encourages not only domestic but also foreign investment [1]. If the country does not create a suitable business environment for foreign investors, it may not receive benefits from these investments or even have a negative impact to the countries' economies. FDI relationship with GDP is widely examined subject in the scientific literature. Hailu [2], Ozturk [3], Imoughele & Ismaila [4] and others scientists researchers revealed that FDI does not always cause the positive influence to the development of the country, that is why it is important to evaluate and measure the impact of these investments to the Baltic countries economic development – their gross domestic product amount. The main aim of this paper is to evaluate the relationship between FDI and GDP in the Baltic countries, determine the linear relationship between them and to estimate possible

FDI and GDP relationship with a lag, because these indicators sometimes do not change at the same time.

2 Literature Review

European Commission defined FDI as an international investment within the balance of payment accounts. Direct investment enterprises are those in which direct investor owns ten or more percentage of the ordinary shares or voting rights, or the equivalent [5]. The World Bank defines FDI as net inflows of investment, which acquired the long-term management interest (10% or more of the voting rights) in an enterprise operating in a country different from that of the investor [6].

In scientific literature there could be found different opinions about FDI impact to countries' economies. According to Moraru [7] FDI has positive influence not only to country gross domestic product (GDP), but also on the economic growth of the country, improving overall productivity and more efficient use of resources. FDI also contributes to the increase of employment over the business development and further development. Kuliaviene and Solnyskiniene [8] argues that FDI is often considered as one of the most important factors of economic development. FDI influence on Lithuania's economic growth was analysed before by Garsviene and Rupliene [9]. The examination of Lithuania FDI to GDP per capita impact, showed a strong linear relationship between these indicators, although in different industries, the effects are different, but in all economic activities there was found statistically significant relationship. Ekanayake and Ledgerwood [10] studied the impact of FDI in developing countries in different regions (Asia, Africa, Latin America and the Caribbean). Their studies have shown that FDI positively affect economic growth in developing countries in all regions. It should be emphasized that according to Kokko [11] studies, FDI impact on developing countries is likely to be similar as the effect in developed countries, but possibly in smaller size and less important.

However, some researches showed that FDI not always causes the positive impact on economic development in particular countries. Ozturk [3] studies showed that FDI could have a negative impact on the country economic growth. In some countries FDI negatively affects the country's economic growth, while in other countries FDI does not affect or very weakly reacts with the country's economic growth. Hailu [2] also argues that FDI can cause negative effects to the country's growth prospects. Countries' governments should also consciously improve the business environment that FDI could contribute a positive influence on country's economic growth [4].

FDI can bring many benefits to the country, but the main benefit could be defined as gross domestic product growth, which leads to other benefits emergence. However the countries adopting foreign investments should consider the potential negative impact of these investments, try to orientate these investments properly and get all the benefits from them.

3 Data and Methodology

Data for the research of GDP volumes were used from Eurostat database [12]. Data of FDI stocks amount for 2000-2014 years were used from Lithuania Official Statistics Portal [13], Latvia Statistical Database [14] and Bank of Estonia [15] databases. All the analyzed data are quarterly. The paper examines the relationship between FDI and GDP, but does not examine the others factors impact to GDP or FDI amount. The analyzed period covers 2000-2014 first quarter, because the data of seasonally adjusted GDP are provided only until 2014 first quarter. Determining the relationship between FDI and GDP, the correlation coefficients were

calculated and their significance was tested. One of the correlation coefficient is a Pearson correlation coefficient which evaluates strength of the linear relationship and is calculated by the following formula [16]:

$$r_{xy} = \frac{\overline{xy} - \bar{x}\bar{y}}{S_x S_y} \quad (1)$$

where: \overline{xy} - the average of two variables multiplication;

\bar{x}, \bar{y} - respective variable average;

S_x, S_y - respective variable standard deviation.

However, in the scientific literature it can be found that sometimes the foreign direct investment impact on countries GDP indicator occurs not immediately, but with the lag. In order to determine this lag, different authors [17], [18], [19] used Granger causality test. This indicates which variable is determined by another variable and shows whether the lag between that exists. In this test the statistical Eviews program performs a regression analysis:

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \dots + \alpha_i y_{t-i} + \beta_1 x_{t-1} + \dots + \beta_i x_{t-i} + \epsilon_t \quad (2)$$

$$x_t = \alpha_0 + \alpha_1 x_{t-1} + \dots + \alpha_i x_{t-i} + \beta_1 y_{t-1} + \dots + \beta_i y_{t-i} + u_t$$

Calculated and found statistical significance F Wald statistics is a general hypothesis of:

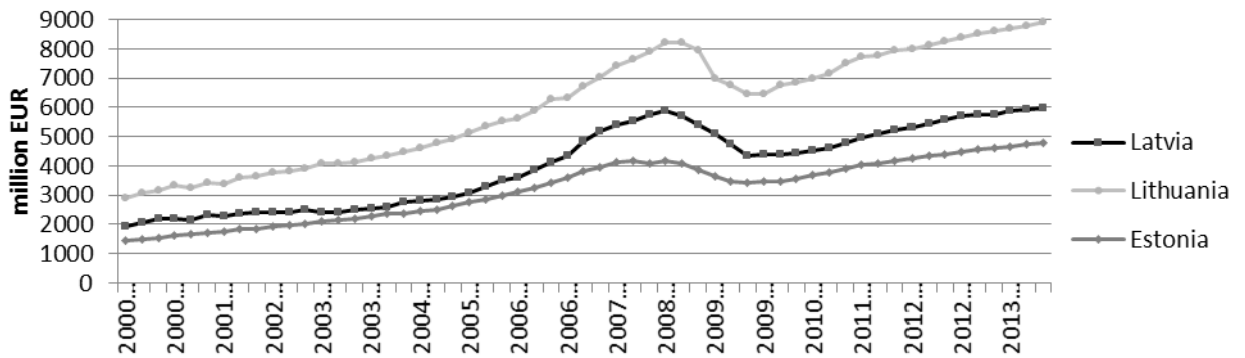
$$\beta_1 = \beta_2 = \dots = \beta_i = 0 \quad (3)$$

The first regression null hypothesis is that X does not Granger cause y variation and the second regression is that the Y does not Granger cause X variation. Granger causality test is one of the time-series models, and data used to it should be stationary. Stationary can be checked by a number of criteria, but in this case the selected criterion is Dickey-Fuller GLS test. When calculating this criterion statistical program performs ADF test and submits its results. The analysis used 0.05 confidence level. The research methods used in this paper are: granger causality test, correlation analysis, systematic literature analysis, logical comparative and generalization methods.

4 Results of FDI and economic development analysis

The country's economic development, its economic situation and tendencies reveals the GDP indicator, which is most commonly used indicator in the analysis with FDI [4], [7], [8], [10]. Figure 1 presents the nominal GDP percent changes in the Baltic countries during 2000-2014 years. In the analyzed GDP data the seasonal influence is eliminated and it is estimated by number of working days, the GDP is at current prices.

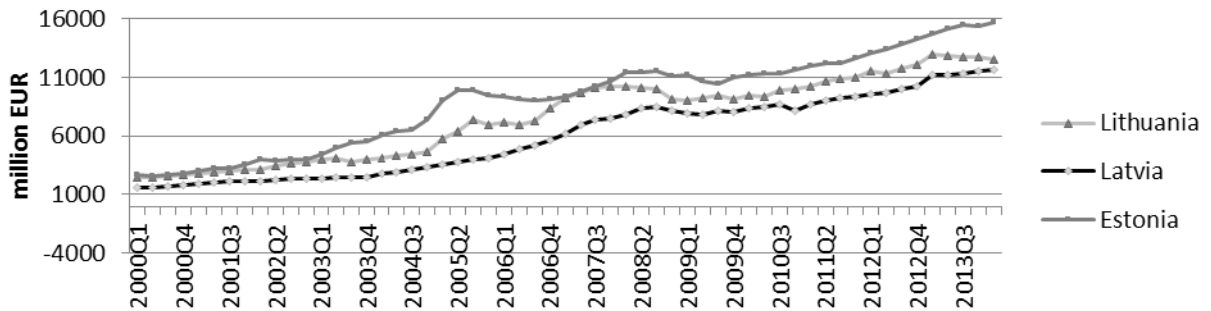
Figure 1 GDP volumes in the Baltic countries for 2000-2014 years, million EUR



Source: based on [12] data

GDP indicator had a tendency to grow during the entire analyzed period, with the exception of 2008-2009 years, when its decline was recorded in all Baltic countries. Economic crisis mostly has affected Latvian GDP amount, comparing 2008 year to 2010 year data, GDP in Latvia fell by 23.55 percent, when in Estonia 15.02 percent and in Lithuania only 14.22 percent. After the economic downturn Lithuania managed to recover first, comparing the volume of GDP in the first quarter of 2010 with the fourth quarter of 2009, GDP volume has increased by 5.17 per cent., when in Latvia respectively only 0.98 percent. Figure 2 illustrates FDI amounts in the Baltic countries during analyzed period of 2000-2014 years.

Figure 2 FDI stocks volumes in Baltic countries in 2000-2014, million EUR



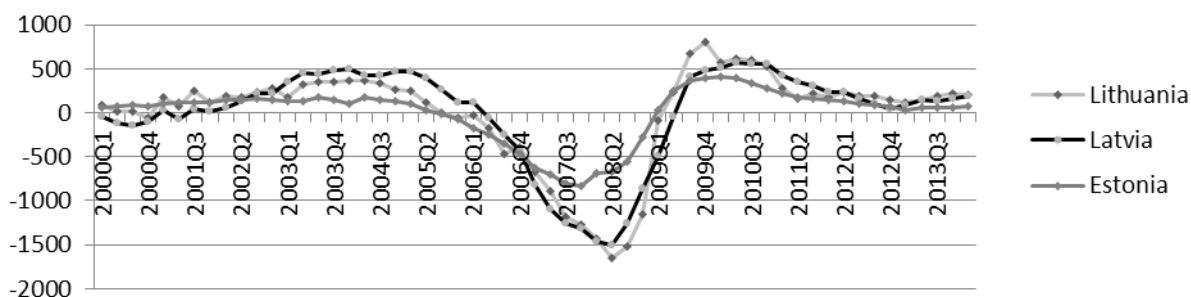
Source: based on [13], [14], [15] data

During the entire analyzed period FDI stock amounts had a tendency to grow in all Baltic countries. From figure 2 it can be seen that in 2005-2006 FDI volumes decreased in Lithuania and Estonia, while in Latvia it continued to grow. During economic crisis in 2008 years FDI decreases were recorded in all Baltic countries. The decreases of FDI volumes may be associated with the uncertain economic situation around the world, causing foreign investors to reduce their investments. Estonia from Baltic countries managed to attract the biggest volumes of FDI, while Latvia attracted lowest volume of FDI during the entire analyzed period. It may be associated not only with the country's economic situation, but regulation barriers, facilitates doing business, regulation quality and rule of law, which is estimated by Global Opportunity Index. Global Opportunity Index ranks 136 world's countries and focuses on the main determinants of FDI. By 2015 year Global Opportunity Index ranking Estonia from the Baltic countries was in the best 12 place, Latvia was in 29 place and Lithuania in 37 [20]. Of course, there are others factors which lead to better attraction of FDI, but these main determinants are also very important.

From the Figure 1 and 2, it can be seen that GDP and FDI time series contain linear trends that make time series data not stationary. Stationary condition is required by Granger

causality method, so linear trend was removed for all GDP and FDI time series, in order to obtain stationary data (Figure 3 and 4).

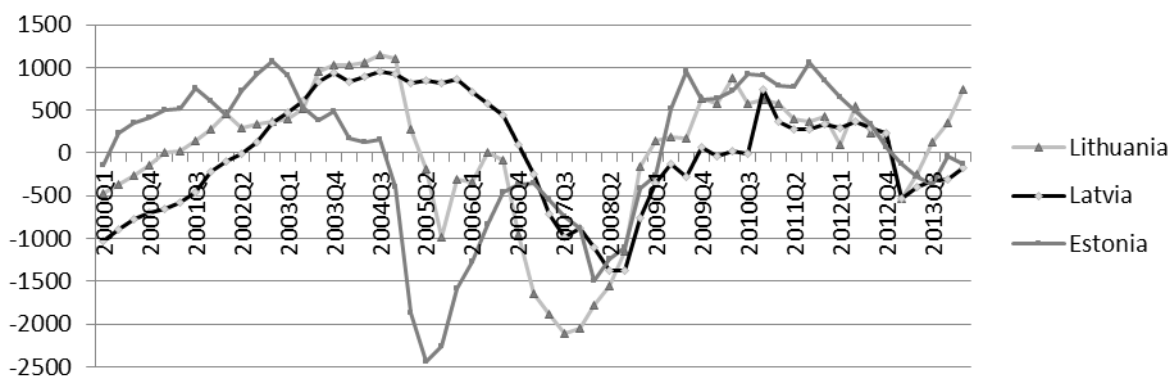
Figure 3 GDP data with removed linear trend in Baltic countries



Source: Authors calculation

Trend was removed by applying linear model using least-squares method and subtracting modeled data from original. Linear trend is also not the factor of interest which can be influenced by other factors.

Figure 4 FDI data with removed linear trend in Baltic countries



Source: Authors calculation

As it can be seen from Figure 3 and 4, transformed data should be more stationary and should also show more accurate relationships between FDI and GDP. Therefore, further analysis is performed using depicted transformed data.

In order to determine the linear relationship between country GDP and FDI and the relationship strength, the correlation analysis was used. Table 1 shows the calculated linear correlation coefficients between the Baltic countries GDP amount and FDI volumes.

Table 1 The linear correlation between FDI and economies (GDP) in Baltic countries

Country	Correlation coefficient	t_{observed}	t_{critical}
Lithuania	0.834	11.203	
Latvia	0.731	7.953	2.000
Estonia	0.600	5.558	

Source: Authors calculation

Calculated correlation coefficients showed that in Lithuania and Latvia between GDP and FDI strong positive dependencies exist, because correlation coefficients were greater than 0.7.

In Estonia between mentioned variables exist medium positive strength, because coefficient was greater than 0.5. All correlation coefficients are significant, because their $t_{observed} > t_{critical}$.

In scientific literature it is argued that between GDP and FDI the lag exists and these variables do not change at the same time. Correlation coefficient also does not indicate which variable is independent and which depends on the other factor changes. In order to evaluate mentioned aspects and according to other researches studies Granger causality test was selected. The stationary of data was checked by Dickey-Fuller test using the transformed GDI and FDI data which are shown in Figure 3 and 4. Stationary test results are presented in Table 2.

Table 2 Stationary test results by Dickey-Fuller test with transformed GDP and FDI data

Null Hypothesis: X has a unit root	GDP		FDI	
	t-Statistic	Probability	t-Statistic	Probability
Lithuania	-2.321	0.0242	-1.976	0.0533
Latvia	-2.936	0.0049	-1.148	-
Estonia	-2.973	0.0044	-2.577	0.0128

Source: Authors calculation

Estonia GDP and FDI calculated probabilities are less than 0.05, which means that null hypothesis should be rejected and these data are stationary. In Lithuania case calculated GDP probability was also less than 0.05, but FDI probability was greater, which means that FDI data are stationary with higher than 5 percent confidence level, but it also can be considered as stationary. It appeared that Latvia FDI data are not stationary and the data of FDI and GDP volumes were calculated as the 1st order differences. With new data the Dickey-Fuller stationary test was performed, which results are presented in Table 3.

Table 3 Stationary test results by Dickey-Fuller test with 1st order differences data

Null Hypothesis: X has a unit root	GDP		FDI	
	t-Statistic	Probability	t-Statistic	Probability
Latvia	-2.713551	0.0089	-5.715279	0.0000

Source: Authors calculation

The calculated probabilities are less than 0.05 and null hypothesis is rejected, which means that now Latvia GDP and FDI data are stationary and Granger causality test could be performed. Performing the Granger causality test in all the cases, x is identified as appropriate country GDP, and Y is FDI. Obtained Granger method results, where delays (lags) number is 1 (a quarter) are illustrated in Table 4.

Table 4 Granger causality test results between FDI and GDP in Baltic countries with 1 number of lags

Null Hypothesis	Lithuania		Estonia		Latvia	
	F-Statistic	Probability	F-Statistic	Probability	F-Statistic	Probability
X does not Granger Cause Y	0.035	0.8515	0.326	0.5703	17.278	0.0001
Y does not Granger Cause X	17.397	0.0001	0.567	0.4547	0.402	0.5289

Source: Authors calculation

One calculated probability in Lithuania was less than 0.05, which shows that the null hypothesis should be rejected and with 1 period of lag FDI changes affect the amount of Lithuania GDP, but the GDP changes do not affect the amount of FDI. In Estonia case, both probabilities were higher than 0.05 and null hypothesis should be adopted. The relationship between GDP and FDI in Latvia was confirmed, its probability is less than 0.05 and null hypothesis should be rejected. Therefore the GDP affects FDI amount in Latvia with one period lag, which means that the GDP changes affect the volume of FDI the next quarter in Latvia. The obtained results when number of lag from 1 period is changed to 2 periods (half-year) are shown in Table 5.

Table 5 Granger causality test results between FDI and GDP in Baltic countries with 2 numbers of lags

Null Hypothesis	Lithuania		Estonia		Latvia	
	F-Statistic	Probability	F-Statistic	Probability	F-Statistic	Probability
X does not Granger Cause Y	1.663	0.2000	2.447	0.0969	7.846	0.0011
Y does not Granger Cause X	8.236	0.0008	0.582	0.5626	0.313	0.7329

Source: Authors calculation

Calculated probabilities showed very similar results as it was with one number of lag. With 2 periods of lags FDI changes affect the amount of Lithuania GDP and GDP changes affect the volume of FDI in Latvia. All others calculated probabilities were higher than 0.05, which means that null hypothesis should be adopted and there is no relationship between FDI and GDI with two periods of lags.

5 Conclusions

One of the main benefits of FDI attraction can be identified as gross domestic product growth, which has been proved by different authors' researches. But in some countries FDI could cause the negative impact on country economic development or have no influence on it. So it

is important to evaluate the FDI impact on countries' economies, properly orientate these investments and try to get all advantages of FDI attraction.

In all Baltic countries FDI and GDP indicators had a tendency to grow during all analysed 2000-2014 first quarter period, but economic crisis affected both GDP and FDI amounts in all Baltic countries. Correlation analysis revealed that between GDP and FDI in Lithuania and Latvia strong positive linear relationships exist, while in Estonia respectively medium positive correlation was found.

Ganger causality test results showed that with one and two periods of lags FDI changes affect the amount of Lithuania GDP and GDP changes affect the volume of FDI in Latvia. This indicates that Latvia's economic growth causes the growth of FDI amount, which can also be stated as positive aspect. In Estonia with one and two periods of lags there was not found the relationships between FDI and GDP amounts. Summarizing in Lithuania and Latvia FDI has a strong positive influence on economic development, suggesting that these countries' governments and entrepreneurs should try to increase attractiveness of foreign investors. While Estonia should focus on country business environment, the distribution of FDI, because Estonia manage to attract the highest amounts of FDI, but it gets the smallest positive influence on country's economic development and positive influence does not occur after a quarter or half-year lag.

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SCIENTIFIC APPROACHES ANALYSIS TO DETERMINE THE SHADOW ECONOMY'S NATURE

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ABSTRACT

One of the major challenges facing the scientists is to develop an integrated system of views on the nature of shadow economic phenomena. The purpose of this article is to study the existing scientific approaches to define the conception of “shadow economy” and to develop a clear and applicable in practice universal definition, capturing the essence of this phenomenon. Based survey-monographic methods on this article, the scientific approaches to define the shadow economy, are classified into thematic groups. The content of the shadow economy concept and its components are analyzed; author combines various titles of this phenomenon in one system in order to avoid confusion. The result of the research is the author’s definition of the shadow economy, according to which it is such a sector of economic activity, the processes and results of which are deliberately distorted (including hidden) for the purpose of profit earning.

Keywords: the shadow economy, the informal economy, the non-observed economy, the criminal economy, the national accounts system

JEL codes: O17, E26, E01

1 Introduction

The shadow economy is a complex subject of researches. At the same time, the study of this phenomenon is important for understanding of its impact on the “usual” economic processes, such as formation and distribution of income and property, trade, investment and economic growth in general. The shadow economy volume of one country according to various estimates [50, p. 58; 57, p. 109; 51, p. 320 etc.] comprises 20-80%. Thus it is impossible to explain such differences in rates only by imperfection of the assessment methodology.

In fact, the methodological inconsistency stems from terminological differences in determining definitions of notions, in selection of activities to be included into the shadow economy. In this regard, it is possible to actively promulgate the necessity to eradicate the shadow economy, however, to include various phenomena into the concept.

The shadow economy is an inherent phenomenon in every society. The results of historical researches [26, p. 115; 54, p. 89; 62, p. 205 etc.] shows that it existed at all the periods of society development and at all the stages of social reproduction.

Attention of the researchers to the problems associated with existence of the shadow economies was paid only in late 60's and early 70-s of the XX century. The studies began with more detailed attention to the economic peculiarities of different developing countries. The empiric studies done by experts of the World Bank and the International Labor Organization should be considered as the first steps towards this direction. Keith. Hart, British sociologist involved in the study of economic activities in urban slums of the Republic of Ghana, was the first to introduce the definition of the "informal sector" into scientific terminology [31, p. 134]. One of the first scientific works in the field of shadow economic studies was the article "The Subterranean Economy" published in 1977 by American economist Guttman P.M. [30, p. 33], in which the author proves the inadmissibility to neglect the unrecorded economic activity. The study titled «The other path: the invisible revolution in the Third World» [18] published by the economist from Peru - H. De Soto in 1990 was equally popular among experts interested in issues of the shadow economy.

The first international conference on the shadow economy was held in 1983 in the city of Bielefeld [63]. Approximately forty reports relating to the issues of the shadow economy in a variety of economic systems were presented at the event.

The next step was the Conference of European Statisticians on informal and hidden economies, which was held in Geneva in 1991. The first special guidance was published using the material of the conference of it with respect to the shadow economy statistics in the countries for which a market economy is typical. In 1992 and 1993 several conferences and seminars devoted to the monitoring and evaluation of the informal sector of the economy took place.

The questions on assessment of the shadow economy volumes were discussed at the joint meeting of the UNECE, OECD and Eurostat on the national accounts, held in May 1996 [65]. A special working group is formed in the Eurostat to study issues of the shadow economy.

Despite the efforts of the international community, today there is no single generally accepted universal concept of the shadow economy. Typically, a variety of positions is determined by the presence of existing differences in the nature of applied and theoretical problems revealed by the authors, as well as in the chosen methodology and research methodology.

Based on the above, the study of the concept of the "shadow economy" is relevant and important problem of the economics.

2 Materials, methods and organization of research

In this study it is important to consider the key methodological approaches to the definition of the "shadow economy".

The study of 120 definitions of the shadow economy was carried out on the basis of a survey and monographic, historical, logical, analytical, comparative methods of scientific knowledge.

At the organizational stage of the study it was suggested that understanding the nature of shadow economy phenomenon has the most significant differences depending on the chosen approach: theoretical or operational. Theoretical approach [40; 4; 1 et al.] is distributed to a lesser degree and presents the shadow economy as an economic category, reflecting a complex set of economic relations.

The most of the studies [55; 43, 8, and others.] are drawn towards the operational approach that defines the shadow economy by measuring it through actions. Such an approach is used in the solution course of statistical, applied problems, in formulation of recommendations on improving of the legislation and adjustments to the ongoing socio-economic policies.

Usually, from the methodology standpoints the most significant differences to the shadow economy aspects study are observed from the viewpoint of social, economic, legal and cybernetic approaches. The wide source base has identified many more concepts.

3 Results and discussion

Only the names for “out of state” economic field and its individual sectors in the contemporary scientific literature, counts several dozens: informal [42, p. 15], underground [67, p. 23], black market [27, p. 19], subterranean [64, p. 38], unfair [19, p. 29], and so on.

The list of specific inherent instruments in economic approach [2; 9; 14 et al.] includes:

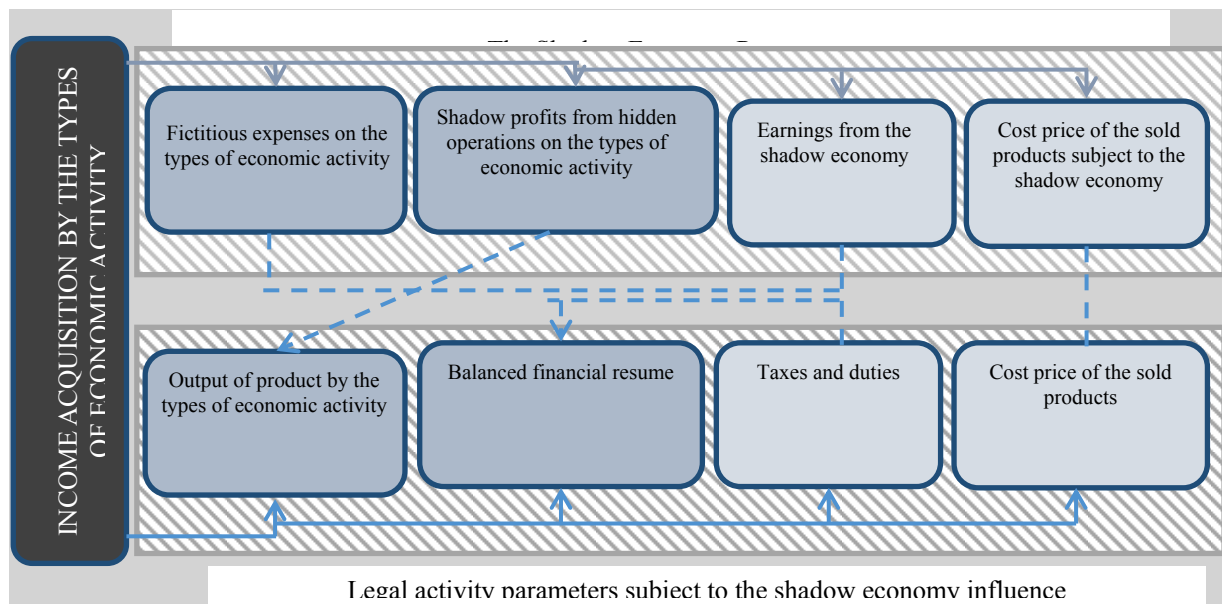
- study of the influence exerted by the shadow economy on the effectiveness degree of pursued economic policy, the use and allocation of available economic resources,
- development of reliable methods for its objective evaluation and measurement,

Institutional level in the researches undertaken by economists [13; 53; 38 et al.] is concentrated on the study of social and economic institutions of the shadow economy, and, above all, on the system of formal and informal rules of conduct, the sanctioned mechanisms and the laws of their development. Therefore, in our opinion, it can be attributed not strictly to the economic but to the social-economic approach.

The shadow economy is examined not only within institutional approach, but also at the macro- and micro levels, as well as in the global overview. The level global economy is a vast field for studies [25; 35; 32 et al.] of the international shadow relations (for example, drug trafficking, prostitution, laundering of criminally obtained funds).

The macro-level provides an analysis [28, p. 195; 70, p. 109] of the shadow economic activities in terms of its impact to production, economy pattern, distribution, redistribution procedure and consumption of gross domestic product, the employment rates, inflation, economic growth and other macroeconomic processes (Figure 1).

Figure 1 Performance of formal and informal economic activities



Source: Compiled by the article author.

Micro-level is the field of study [12; 46; 47 et al.] of economic behavior and decision-making options by business enterprises, the subjects of the shadow economy, the study of particular illegal markets.

From the point of view of sociological concepts [29; 48; 66 et al.] of the shadow economy this sphere is considered within cooperation certain social groups that differ in the shadow institutions system in their position, the motivation of economic behavior of subjects in some important situations.

On the basis of the cyber concept [73; 17; 59 et al.], the shadow economy is considered to be a self-regulated and self-controlled systems. A set of effective economic and mathematical models of management and forecasting of the shadow economy and regularity of its development vectors and options involving its interaction with the formal sectoris developed.

From the point of view of legal concepts [37; 21; 15 et al.] manifestation the shadow economy is usually considered as a special field of deviant (including criminal) behavior. The key focus is paid to the study of number of socially dangerous formats of economic activity, crime prevention methods and ways of their prevention by legal means (criminally-legal and criminological control).

The consumer concept is of considerable interest used by some authors [16; 60] that limits the scope of the shadow economy by illegal consumer market.

The shadow economy is limited by the labor concept [45; 22; 44 et al.] by unreported and unregulated employment.

Both concepts have proved their effectiveness in the study of shadow phenomena within the frames of the economically backward countries, but are narrow enough to study the market economy conditions.

The concept of the Dutch economist J. Breman to define the shadow economy as based on the identification of the shadow economy effects and the shadow business [11, p. 219]. The

concept under consideration, in accordance with the criterion of subjects of the shadow economic relations can be singled out as the enterprising (contract).

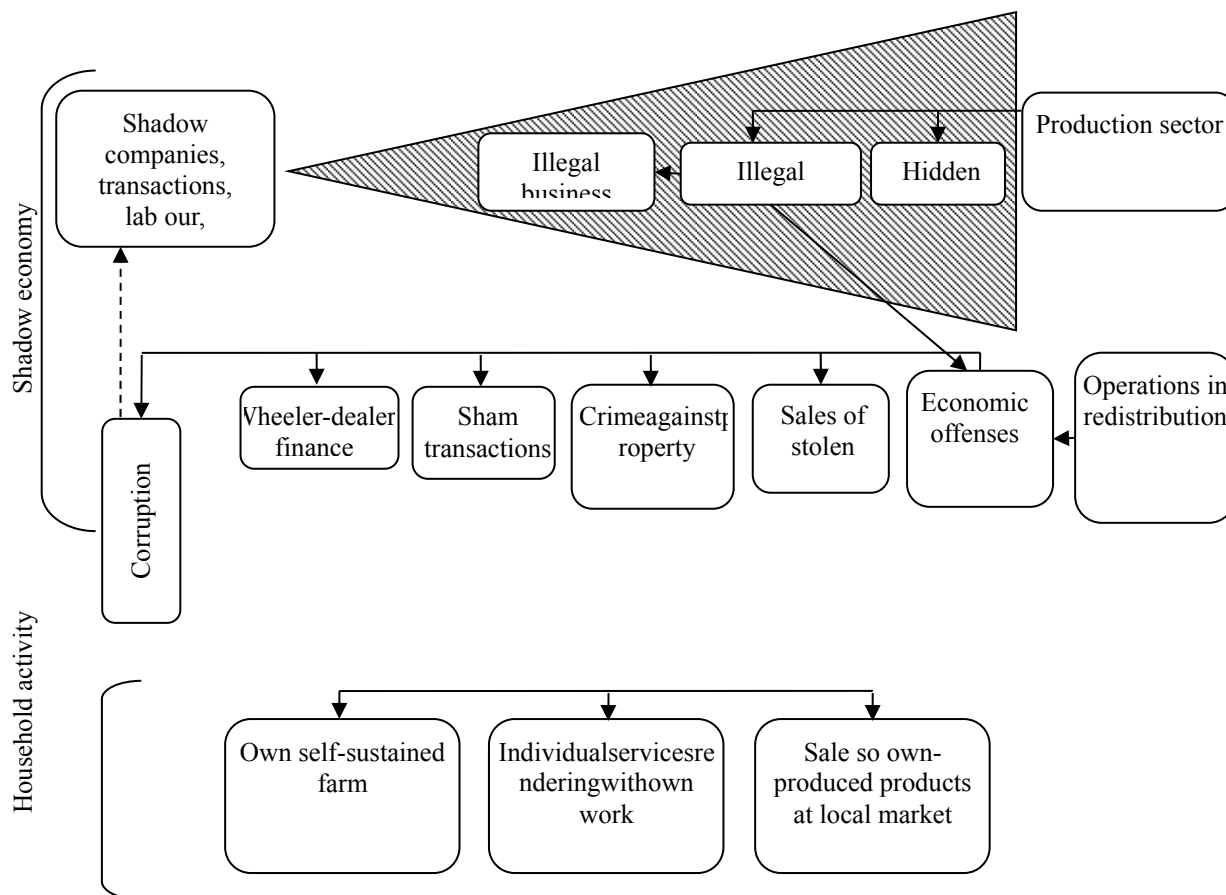
Today the concept of transactions, unregistered by the state or a transactional concept [72; 69; 68 et al.] is widespread. In comparison with the previous position, the understanding of the transaction as the primary unit of the whole sphere of shadow economic activity significantly expands the understanding of the shadow economy, since a contract in the business concept is only a private case of the transaction, where coordination of the will of a few (two or more) entities are required.

The operating concept offers to use the concept of a shadow economic operation as a primary element of the shadow economy. Though this approach is presented in the literature [5; 20; 56 et al.], but not consistently carried out, as quite often the economic operation is actually identified with a transaction. But the concept of operation, as shown by the vocabulary analysis [10, p. 309; 24, p. 459; 6, p. 209] is much broader than the concept of transaction and may contain any of the economically significant actions in order to obtain the shadow revenues (for example, the implementation of illegal operations in the accounting field).

One of the varieties of business concept of the shadow economy is the concept of a business enterprise, which is used for different kinds of criminal forms of economic activity. Its main feature is the examination of the shadow economy phenomenon as a system of criminal business enterprises. This concept is developed on the basis of methodology of economics (example - the theory of firm by the Nobel Prize winner R. H. Coase [52]) and jurisprudence (in order to ensure control of organized crime in the United States the concept of the business criminal enterprise is developed [33, p. 10]).

As a result of main approaches analysis to understand such phenomena as the shadow economy, it is important to note the lack of the authors' attention to the study of its causation - determination. This implies the meaningless use of different titles, while all the manifestations of the studied activity could be classified. This will allow using each term in accordance with its purpose (Figure 2).

Figure 2 Types of non-observed economic activities in their relationship



Source: Compiled by the author

We did not include the domestic (informal) economy in this scheme into the shadow economic activities. It should be noted that the researchers [3; 39; 41 etc.] are unanimous: the level of harm caused by exercising subjects is minimal. Our opinion in this respect is more categorical: domestic economy does not cause any harm, but on the contrary is stabilizing. In the aspect of macroeconomic consequences, the home economics brings positive impulse to support the most vulnerable and socially unprotected segments of the people. In addition, it is the basis of creativity and culture development (agriculture and craft), the income is considered as a side effect, which indicates demand of the economic entity's creation. The only exception is the shadow activity in which the household is only a cover.

It should be noted that unlike many investigators [7; 61; 34 et al.], we believe that the activities not included in the statistics due to shortcomings in statistical surveys should not be included into the shadow economy definition. This is due, firstly, to the fact that we do not include home (informal) economy into the shadow one. Second, unintended actions of economic entity, caused a real understatement of income, is a mistake, but not a shadow economic activities. Third, the initiatives of an economic entity for the statistical treatment similar in practice do not meet obstacles in the accounting bodies (for example, in the absence of this type of activity according to classification the most similar in nature activities is selected). Thus, a bona fide business entity has always a possibility of open economic activity. Excretion of it into the "shadow" is carried out only by intention to understate the real incomes or the production of illicit goods and services.

Corresponding to mechanisms taken into account to ensure the coordination of individual sectors and the shadow economy spheres, one can allocate mechanisms:

- a) activities excretion into the “shadow”;
- b) informal relations;
- c) power-forced.

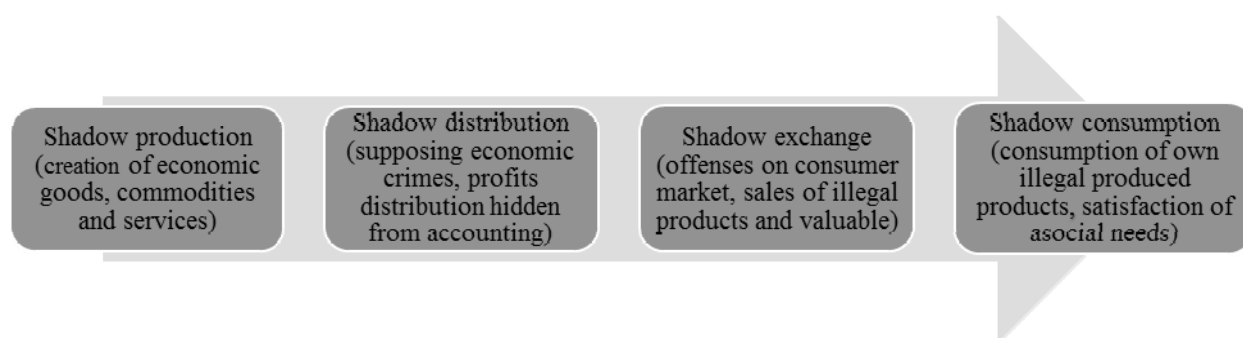
If the analysis of activity extraction “into the shadow” as an integral part of the shadow economy remains as a general rule [49, p. 59; 23, p. 105; 36, p. 98], then the informal relations in the shadow economy mechanism usually remain unnoticed. The presence of the power-enforcement mechanism in the shadow economy is recognized by only a few researchers [58, p. 320; 71, p. 109].

Consistent with the nature of the result, you can talk about the shadow economic activity:

- Productive, bringing a real contribution in the production of gross domestic product,
- Redistribution, unrelated to the real development of various economic benefits, but redistributing the property and income.

Based on the current stages of the reproductive cycle, we can identify a similar informal activity (Figure 3).

Figure 3 Stages of the reproduction cycle of shadow economic activity



Source: Compiled by the author

The most of the concepts discussed above the interpretation of shadow economy definition means the economic activity inclusion into its composition in all phases of the reproductive cycle. The exception is a statistical concept that considers the shadow economy as a productive sector, participating in the GDP creation.

4 Conclusions

These concepts are constructive in dealing with a number of specific research tasks, but not considered as a basis for full-scale and extremely precise formulation of a universal definition of the shadow economy phenomenon, which cover at the present time almost all categories and types of economic resources and markets. The approaches proposed in the scientific literature to word the shadow economy definition significantly vary depending on the elementary object of the shadow economic activities elected by the researchers. Among the most constructive may be mentioned such as: transaction, contract, economic (production) relations, institution, operation, business enterprise, quantity and other parameters that reflect the existence of shadow economic activity.

Based on the investigated essential features of the shadow economy, allocated in the researchers' approaches of different directions, as well as on the analysis of the universal causes and foundations of its existence, we can formulate a definition of the "shadow economy" term. But first, we note a number of significant improvements and additions based on the theoretical uncertainty and economic reality.

Firstly, the society does not control not only a certain percentage of inventory of goods, services, money and valuables, but also many other economic benefits. Such an important element of any economic activity as entrepreneurial skills is not mentioned in the economic science as one of the shadow economy components; in the absence of them it is impossible to achieve positive economic results. At the same time among the "shadow businesses" (representatives of the shadow economy) entrepreneurial skills are usually pronounced and increasingly acquire criminal forms or forms not provided for in the criminal law, but causing considerable (and / or socially significant) economic damage to public.

Second, the shadow economy uses not only public property, but also its own, earlier illegally obtained capital. And with the increase of ranges and rates of property and capital accumulation acquired by criminal means, ever increasing the range and scope of the shadow economy, the share of gross domestic shadow product.

Third, the main goal of any shadow business is getting windfall profits (excess profits). The latter should be understood as the profit in two or more times higher than average rates of return available on this official market of goods (services), as well as profits arising in the field of illicit goods and services (in this case, the profit is zero on the official market, so it will be super-profits in the shadow market). In other words, the shadow economy exists and can exist only under conditions in which it is possible to obtain windfall profits.

Fourth, all the shadow economy in its activities and entrepreneurs enriched due to it cannot do without the state's services, which creates a request for corruption. At the same time the shadow economy does not come in economic relations with the state acting as a business entity (does not pay taxes, duties, does not comply with the regulatory requirements for activities and so on). In this sense, there are exclusively economic relations of subjects of shadow activity with officials about the distribution of shadow incomes received for rendered "services" of corrupt officials.

Fifth, in the shadow economy phenomenon itself there is a contradiction: on the one hand - this is the beginning of some specific criminal activity, on the other - a set of absolutely real economic processes, avoiding of which is currently difficult or impossible to meet the existing needs of the population to the fullest. It should be noted that in its second side, the shadow economy is just delaying the solution of hidden social problems, as they cease to be "on the agenda".

Based on the above the shadow economy definition can be represented as quite simple and clear, it is important for research, evaluation and minimization of it. The scale of the shadow economy as a whole, are subject to the general state of the economy, as well as the society ability to ensure control of production, distribution, consumption and sharing of economic benefits and create conditions for the entrepreneurial skills application.

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THE SLOVAK BEER INDUSTRY AFTER THE ENTRY INTO THE EUROPEAN UNION

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ABSTRACT

At the present time over 90% of the Slovak beer market is dominated by two multinational giants and three smaller breweries. The Slovak beer market is significantly influenced by the dominance of the two largest companies, which are in addition foreign owned. The following paper is concerned with the issue of increasing the excise duty on beer and its consequences for consumption of the studied product and the aim is to demonstrate the tax burden in relation to domestic producers and beer consumption in the domestic market. Data on consumption and the evolution of excise duty rates were compared ex post and conclusions were drawn using an analysis of economic indicators and the time period considered is the 16 years from 1999 to 2014.

Keywords: rates of excise duty of beer; beer consumption; elasticity; optimal taxation

JEL codes: F15, G18, H20, H25

1 Theoretical approaches to excise duties on consumption

The precursors of the current duties on consumption were excise duties. Historically indirect taxes had a natural character whose aim was to obtain money from the profits of traders so that the monarch could finance wars. [2] The end result was however that the traders passed these taxes onto the consumer. As the economy gradually started to move from one based on agriculture, trade and artisans to one based on money, so increased the importance of taxes as the main source of income to the state budget. [11]

The era of liberalisation brought with it a minimisation of state intervention and a restriction of the task of taxation to the covering of expenditures connected with defence, internal security and law enforcement. [10] England was in the 17th century a pioneer in the introduction of excise duties, where they gradually introduced duties on goods, commodities of daily use such as salt, sugar and butter as well as taxes on income, paid by people who had income from agriculture, industry, interest and dividends, as well as from pension income and the income of self-employed and unskilled workers. With time the importance of excise duties increased and in the 19th and 20th centuries these went off in two directions. The first was aimed at taxes on turnover (taxes on the transfer of goods) and the second to the development of excise duties as selective taxes on particular types of products. Gradually these were split into tax duties on separate individual products, whereby products of daily consumption were gradually excluded.

The era of classical economics brought with it many economists, in particular Adam Smith, David Ricardo and not least John Stuart Mill. An important conclusion is that the overall consumption of the lower classes, measured both in value and quantity, is higher than that of the middle and upper classes, i.e. taxation has a greater effect on the lower classes. [7] Taxes on the raw materials needed for the production of fermented drinks and alcohol produce a bigger tax take in comparison with other taxes on consumption, whereby such taxes to a large

extent impact on the lower classes. [9] The taxation of alcoholic drinks, as luxury goods, has a greater impact on the lower classes. The main reason was that fermented drinks were free of tax as was distillation of alcohol for private use. So the upper classes who were in the position where they could afford to produce their own alcohol were able to consume it at tax free prices. The lower classes thus paid a higher price for the same good. In connection with this fact Adam Smith came up with the thought, that a reduction of the excise duty rate on malt would bring in more tax than would an increase. The main reason was the tax exemption for home-produced alcohol for own consumption and also the fact that in the bigger breweries there was a greater probability of tax evasion. [5]

Currently general consumption taxes are seen as selective taxes from the sale or use of particular goods or services, for example alcohol or petrol. During the time period considered Governments relied on the take from such taxes, given that amongst the OECD countries such taxes contribute on average 12% of total income. [1] Apart from the fact that consumption taxes produce necessary income, they also represent a means by which externalities can be managed and those can be taxed who profit from Government expenditures. There are four motives justifying the very existence of consumption taxes. First they provide income to the state budget, secondly they control externalities, which pollute the environment, thirdly they permit the application of the principle of tax utility (consumption taxes should be designed to bear on those who gain benefit from the state, which finances such benefits from particular consumption taxes, e.g. taxes on petrol which go towards financing road repairs) and lastly they can levy a tax on those goods which damage health, such as tobacco and abusive use of alcohol, where there is a risk of over-consumption, if no tax was levied on them. [8]

2 The history of beer brewing in the territory of Slovakia

The history of beer brewing in the territory of Slovakia is almost as old as in the case of neighbouring countries and reaches back to the turn of the 10th and 11th centuries. The first brewing guild was set up in 1450 in Bardejov and by the 17th century beer was brewed in every larger town. In the 1990's there were 15 breweries in Slovakia.

The Slovak beer industry underwent a number of significant changes in its history. The free movement of goods, that followed the entry of Slovakia into the European Union in 2004, had the effect of reducing each year beer production with the result that the negative trade balance in respect of beer increased. Following the split of Czechoslovakia into Slovakia and the Czech Republic on 1 January 1993, a customs union was implemented between the two separate states, that resulted in a negative trade balance for Slovak beer from 5 to 7 million Euros. However, as a result of the rapid decrease in the number of Slovak breweries and the resulting decrease in production and the export of beer to the Czech Republic, the negative trade balance rapidly increased to reach 32.363 million Euros in 2014. From 1995 to 1998 new domestic as well as foreign investors entered the beer brewing industry. The difference between the tax rate for low-alcohol and other beer was reduced. The record for beer production, 4.8m hectolitres was recorded in 2002. At that time Slovakia was in 10th position as regards beer consumption per head of population. This increasing trend in beer production came to a halt half way through 2003. Twice that year the rate of tax on beer was increased. The first increase occurred on 1 January 2003 when the basis for taxation was changed¹ and

¹ Law No. 391/2002 which amended and added to Law No. 310/1993 relating to excise duties on beer in accordance with later regulations

then on 1 August 2003 when the rates of tax on beer were increased². This double blow during a single year was extreme and out of proportion. The second half of 2003 constituted the start of a long-term recession in Slovak beer brewing. Whereas beer sales in the first half of 2003 were still 1% higher than in the same period of 2002, in the last five months of 2003 from August to December a fall of 12% was registered compared with the same period in 2002. Over the whole year sales in 2003 were down 4.1% compared with 2002. As a result of the tax increases as well as the opening up of the market and entry into the EU seven Slovak breweries were shut down with a loss of 5,000 jobs. During the period from 2008 to 2010 employment in the beer industry fell by 21%. [4]

At the present time over 90% of the Slovak beer market is dominated by two multinational giants and three smaller breweries. The Slovak beer market is significantly influenced by the dominance of the two largest companies, which are in addition foreign owned. The number one producer, Heineken Slovakia, owned by the world number three Heineken International, has a 45% share and the number two Pivovar Topvar, which belongs to the world number two SABMiller, has a 28% share. The two companies, amongst whose brands are “Zlatý Bažant”, “Corgoň”, “Kelt”, “Martiner” and “Gemer”, and respectively “Topvar”, “Šariš” and “Smädny Mních”, make up almost three quarters of the total market. The third largest brewer is also the oldest, Pivovar Steiger (with brands “Steiger”, “Stein”, “Grošák”, “Sitňan”), whose majority owner is the British firm Endemit with the Czech company PMS having a minority holding. [3]

The three companies mentioned, together with the Banskobystrický Pivovar (brands: “Urpiner” and “Kaprál”) and the Bytča brewery Popper owned by Slovak entrepreneurs complete the five dominant players. It is important, though, that up to 85% of the raw materials used by the top three players (Heineken, Topvar, Steiger), come from Slovakia. The global companies brought in investment to update the industry, as well as technical innovation, new management styles and company cultures. In 2009 the Association of small independent breweries in Slovakia was set up, which at the present time represents more than 40 small breweries (with an annual production of less than 200,000 hectolitres) with a market share in Slovakia of 5%. Slovak breweries are traditional employers in particular in regions with high levels of unemployment (Hurbanovo, Šariš, Banská Bystrica, Vyhne, Bytča). Increased demand for beer leads to increases in production and this helps the economy in the area of employment, with the sector in total providing about 17,600 jobs. About 1,700 people work in the breweries themselves, and the supply sector, indirectly employs a further 3,800 people (Table 1). Of these most work in the agricultural sector as well as in beer-related media and marketing (due to the fact that the brewing industry is an important sponsor of Slovak sport and sporting events). The most significant contribution to employment is however provided by the outlets for the product, public houses, restaurants, shops, etc.

Table 1. Indirect employment thanks to the beer industry in 2012

Sector	Number of jobs
Agriculture	1,409
Ancillary work	72
Packaging	201
Equipment and other industrial activities	95

² Law No. 242/2003 which amended Law No. 310/1993 relating to excise duties on beer in accordance with later regulations

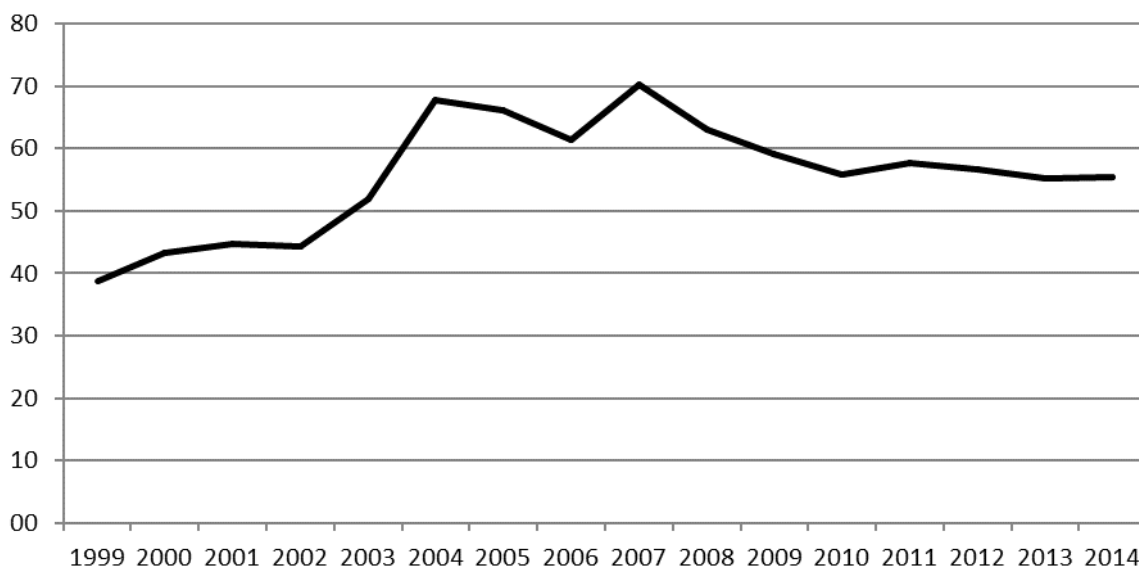
Transport and storage	614
Media and marketing	1,183
Services and other	261
Total	3,800

Source: The Contribution made by Beer to the European Economy Full Report – December 2013 A report commissioned by The Brewers of Europe and conducted by Ernst & Young Tax Advisors and Regioplan Policy Research. Amsterdam.

3 Data and Methodology

A steady reduction in beer production in Slovakia began in 2004. In that year Slovakia produced 4,243,182 hectolitres of beer, whereas in 2014 Slovak beer production had fallen to 2,857,424 hectolitres of beer for a tax take of 55.4m €. The free movement of beer across national borders occasioned by entry to the EU resulted in beer imports. [12] Whilst in 2004 there was a negative trade balance of 8,946,100 €, by 2014 this had increased to 37,558,950 €. This is also a result of stagnation in exports and a countervailing increase in imports from the Czech Republic and from previously non-traditional beer exporting countries, especially Poland and Hungary. Despite all the above, and the increases in the tax rates the contribution from beer to the state budget over the long term is falling or at the least stagnant. Figure 1 indicates the years when there was a change in the tax rate on beer. The double increase in the tax rates on beer in 2003 had as a result an increase in the contribution to the state budget, but only in the first year after their introduction. The falling trend was halted in 2007, but in the following year the contribution from the tax on beer again fell. [6]

Figure 1. Development of the contribution to the state budget from the tax on beer in the years 1999 to 2014 in € millions



Source: Own calculations based on data from the Financial Directorate of the SR

The production and consumption of beer affects the state budget not only via excise taxes, but also through income tax and value added tax (VAT). Thanks to all taxes and social security contributions the total income in 2012 from the beer industry was on the level of 229m Euros, which represents 1.83% of the total income to the state budget. The trend shown may be the result of:

- saving by consumers – a too high proportion of Slovaks have low incomes and have to consider carefully how they spend them;
- the possibility of substitution by other types of alcoholic drinks, such as spirits and wine;
- the high excise duty rate on beer;
- changes of life style – which lead to consuming drinks with a low alcohol content;
- severe penalties for those who drive under the influence of alcohol;
- pressure from imports of similar products from abroad – this also depends on the activities of the food chains and the margins they negotiate from suppliers and those applicable on sales.

4 Conclusions

Excise duties are levied only on specific items of consumption and therefore do not have to ensure a steady income for financing public expenditure. They are rather aimed at supporting social and market aims with the help of a better allocation of resources. They were introduced primarily in order to increase income for the state, but they are also seen as key methods of influence people's behaviour. The main principal is that rational and informed individuals make decisions on what to consume and what not to, but external costs (physical, psychical or financial) should be included in the price, given that not everybody is perfectly informed and rational. Since consumers react with regard to prices elastically, the take from consumer taxes falls. This motivates the government to constrain the possibility of substitution with the aim of reducing offer price elasticity.

Rates of excise duty, which are based on consumer expenditure, do not increase as consumption increases in the way that rates of income tax increase as income increases. Expenditure taxes are regressive because such taxes take a greater part of the income of the poor than the wealthy and thus pose a greater tax burden for the poor. This means that the distributional effect of consumption taxes is directly proportional to the price elasticity of supply for goods and services.

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POSSIBILITIES OF BUSINESS RISK REDUCTION IN INSURANCE THROUGH SYSTEMATIC USE OF THE SOCIAL MEDIA AND BUSINESS INTELLIGENCE TOOLS

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ABSTRACT

The paper evaluates gradual expansion of the social media use in the German insurance industry. Their deliberate implementation based on a systematic strategy and use of advanced software tools for evaluation of data from two-ways communication with actual and potential customers over the social media internet platforms may bring specific risks and opportunities in this conservative industry. Therefore, authors emphasize the systematic implementation of social media as well as social media and Business Intelligence tools for business risk reduction in insurance companies.

Keywords: insurance market, social media, risk management, Business Intelligence

JEL codes: G220, M310

1 Introduction

Social media (SM) denote digital technologies that allow users to interact with each other and to provide media content for individual use or within a community [1, p.11]¹. "Social Media is a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content"[2, p. 15]. Social media include various web services such as:

- social networks (e.g. Facebook, Twitter, Google+)
- media platforms (e.g. YouTube, WordPress, Flickr)
- business networks (e.g. Xing, LinkedIn)
- recommendation platforms (e.g. Yelp, WhoFinance).

Social networks have spread rapidly. 47 % of the German enterprises use SM. Another 15% have specific plans on their use [3]². The most typical forms of the SM use are: company presence in the social networks (86%) and presence on the internet video platforms (28%, especially the big companies)³. The most important drivers of these activities are marketing, promotion, advertising and PR in companies. Nearly 75% of corporate SM users consider SM

¹ Users can create in social media content without web design or programming and share them with others.

² The level of implementation and use of SM in small in medium-size businesses is about the same. The most extensive use of the SM is in the trade (52%), the least level of use is in the industry and construction.

³ Company blogs are used by 28% of respondents followed by micro-blog communication (25%) of the companies using the SM.

as a promotion support tool (in trade more than 85%), 72% use SM in marketing and 60% in the PR activities. The most important objectives of the use of SM are"[3, p.5]:

- (1) increase of brand or company awareness (82%) for companies of all sizes and industries, in service industry companies it accounts for nearly 90%,
- (2) acquisition of new customers (72%),
- (3) building up customer relationships (68%), and
- (4) only 15% plan to expand their portfolio of products and services in collaboration with customers via SM.

2 Integration of social media in marketing communication in financial sector

The German insurance industry occupies leading positions in international business context. Germany recorded the highest trade surplus in the world worth \$285 billion in 2014 [4]. Germany is the leading location of reinsurers in the world. It accounts for about 30% of global reinsurance premiums. Providing employment to about half a million people, the insurance industry is one of the most important economic sectors in Germany⁴. The survey of Keylens Research Center shows that SM are the least important in the sector of financial services in Germany [5, p. 10]. Only 10% of banking and 11% of insurance institutions consider the SM of importance. Nearly 45% of banks and 42% of insurers evaluate it as marginal or not important at all. Approximately 50% of the insurance companies have no social media strategy [6]. In practice there is a large discrepancy between the strategic importance and the realizable social media results. Only a few German insurance companies have passed through a digital learning in this context. Therefore, many of them do not use the potential of the monetization of social media yet currently.

In order to provide guidance on SM implementation in organizations and evaluate its maturity level SM various maturity models have been developed and used, e.g. [7], [8], [9], [10]. Maturity models describe the main stages of organization's evolution faced with a given problem. They enable to assess its status quo based on criteria used within a framework of development stages and set out an improvement plan to progress to a superior stage, thus they serve as valuable tools of strategy evaluation. A systematic overview of maturity models would go beyond the purpose and scope of this publication. The following maturity model focused on the stages of the professionalization of SM [8] helps evaluate level of development of SM in an organization:

Stage 1 Listening through the use of SM monitoring applications: The activities and statements of customers in SM platforms are observed and analysed.

Stage 2 Creating SM presence: in order to increase the level of awareness for public relations and advertising purposes, e.g. setting up a Facebook fan page, Twitter account or YouTube channel.

Stage 3 Building a community: having succeed in involving active supporters and influencers in the own community (user forums, user support communities) on SM platforms it becomes possible to make use of the creative and innovation potential of customers for improvement of products and business processes thus opening up new potential of ROI increase. This necessitates community management with specific challenges for organization.⁵

⁴ German insurers provide insurance cover about 460 million insurance contracts. The insurance industry also has an important role for the economy as a whole as a long-term oriented institutional investor with an investment portfolio of approximately 1,400 billion euros (GDV 2014).

⁵ Community Management comprises methods and activities related to concept, structure, operation, guidance and optimization of virtual communities and their adjustment to the virtual space. Available at: <http://www.bvcm.org/2010/05/veroeffentlichung-der-offiziellen-definition-community-management>

Stage 4 Integration of SM in business processes: consequent inclusion of SM in company business processes, where feasible as well as involvement of customers in research and development enables to use their innovation and creative potential in enrichment of product development with crowdsourcing and open innovation. Customers may partially take over control of specific business processes, e.g. sales function may utilize the information generated by customers via SM within the Social Customer Relationship Management or customer support service may be fostered and improved through customer involvement, e.g. via Customers-Help-Customers forums or Self-service platforms.

Stage 5 Transformation into a socially integrated company: The transformation into a socially integrated enterprise dissolves traditional corporate boundaries. Both customers and employees are equally integrated within the model of socially integrated enterprise. The idea of the Enterprise 2.0 is characterized by the digitally networked enterprise with an open and authentic internal and external communication exchanges and mobile action of employees.

According to [8] a prerequisite for the professionalization of SM use lays in acceptance of power of consumer opinions in SM, thus new conditions for communication by management of organization. The maximization of shareholder value is no longer in focus, instead it is superseded by the maximum customer benefit with an employee participation. Therefore, the combination of SM in internal and external communication, companies can lead to fully mature professionalization. This maturity model is easy to understand and use, however, it is based on theoretical assumptions, and it requires justification based on research data.

This raises the question of maturity stage of German insurance companies evaluated by means of a maturity model. The survey on the SM in insurance in [6], among other, dealt with the following question: How would you classify your business in the digital transformation process? 44 % of respondents evaluated their status as the fourth stage, i.e. integration of SM in their business processes. About 22% responded to be in the third stage, i.e. in the process of building its own community. 17% assessed themselves to be at the level two, i.e. creation of SM presence, and 6% were at the levels zero (no plans on own SM activities) or one (use of SM monitoring applications). The highest stage five, i.e. transformation into a socially integrated companies achieved only 6% of respondents [11]. This online survey could work with the data from 18 insurance companies, so its results were not representative, they only indicated the tendency to various potential benefits in the insurance sector that are yet to be achieved. Only through the transformation stages stated in the maturity model may insurance companies attain maturity levels allowing user participation. This optimization of business models can be achieved through product innovations (Friendsurance), extension of customer power (e.g. Service-Communities) or even via disruptive innovations of business model. The development of some other industries shows that companies have been using these approaches already. Six, Starbucks and Dell take on the opinions and wishes of customers and implement them as far as possible also [11, p. 85-88]. So that the customers are trigger of development. This has changed marketing in a dramatic way from traditional company marketing and sales to "Marketing with friends" [12].

3 Social Media and Risk Management

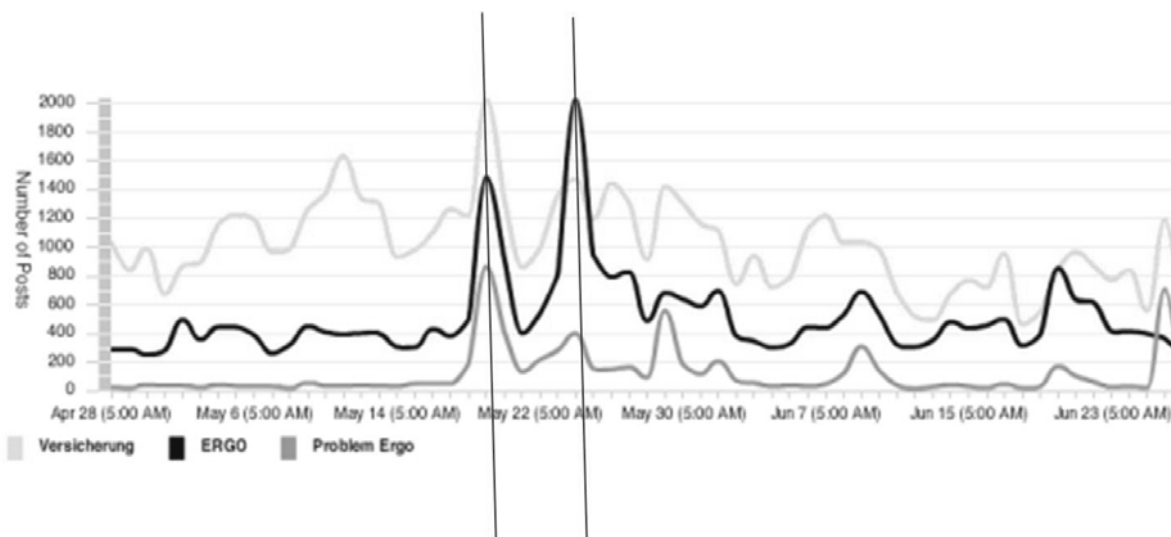
Social media is a powerful tool to interact and engage with customers, in marketing, customer support, customer engagement, and internal collaboration however, it can also expose companies to new types of risk in areas like brand reputation, employee productivity, and malware. SM as such can be a risk, or it can strengthen traditional risks. In the study of the independent consulting company Altimeter Group nearly two-thirds of the surveyed US companies reported that they saw in the Social Media "considerable or huge risk in terms of

the reputation of their brand"[13]. Yet 60% of companies either never trained their employees about their corporate SM policies or they did so only upon hiring them. Moreover, 43% of companies had less than one employee responsible for managing SM risks. The following four largest risks perpetuated by SM were found in this 2012 survey:

1. Damage to brand reputation. 66% of 52 companies surveyed told that SM represented a significant or critical risk to the reputation of the organization. Damage to brand reputation can result in a loss of trust or credibility of the organization.
2. Releasing confidential information. Companies are constantly concerned about the leakage of confidential information, from earning indications to changes in key staff. 32% of 52 companies surveyed told that SM were either a critical or a significant risk to releasing confidential information.
3. Legal, regulatory, and compliance violations. While the government works with private industry to reformulate its regulations around SM, companies in highly regulated industries want to engage and, at the same time, not violate any laws or regulations. 30% of 52 companies surveyed indicated that the legal, regulatory, and compliance risks from SM were critical or significant, while another 25% rated the risk as moderate.
4. Identity theft or hijacking. Organizational identities hijacked on SM platforms are becoming more common, including setting up fake Facebook pages or Twitter feeds and providing false information or acting otherwise maliciously. Brand hijacking and traditional identity theft fears led 25% of 52 companies surveyed to say that this risk was critical or significant.

While it takes years to build up a good reputation and to develop a strong brand, in some situations it may take a very short time to seriously jeopardize or even destroy it as shown in the recent problems of ERGO or Debeka insurance companies. The following short case study illustrates how a “shitstorm”⁶ is able to destroy the reputation.

Figure 1 “Shitstorm” and online reputation crisis of Ergo insurance



Source: [11, p. 208]

⁶ “Shitstorm” is a storm of indignation in a discussion on SM platforms partly accompanied with insulting remarks. Its distinguishing feature is that discussion participants produce large number of subjective criticism in a short period of time (original discussion topic as well as aggressive, abusive, threatening or attacking statements about companies, institutions, and individuals in public. It refers mainly to blog posts or comments on Twitter and Facebook.

Causes of the crisis of the Ergo insurance⁷ were reported by all German media. The crisis started with a sex party in Budapest, incorrectly calculated pension (Riester) contracts and faulty life insurance contracts. In May 2011, it was published in the newspaper Handelsblatt that in 2007 the HMI (sales organization of Ergo) had used invitation for a sex trip to Budapest as incentive for hundred best sales people and top managers [14]. The Ergo-crisis was intensively discussed online and brought about a “shitstorm” against the company. The history of this crisis is represented in the Figure 1 below based on the analysis of SM monitoring with the tool Radian 6 from Salesforce. At the peak day of the “shitstorm” (22 May 2011) there were identified about 2,000 postings about Ergo disseminated through online media and social networks such as Facebook, Twitter and YouTube. The content and form of postings ranged from aggression to vulgarity. It demonstrated the shift in the balance of power between companies and customers due to the SM impact.

The Ergo “shitstorm” was a real big risk to reputation of this insurance company. As a consequence of it, many insurance companies have associated the SM use with fears. However, such fears may be eliminated through education, training and open communication.

Safeguarding brand reputation, protection of information and intellectual property, and mitigation of adverse legal actions requires from organizations to be more proactive in managing SM risk. Setting up an effective SM risk management process [13] in an organization means to focus on:

- 1) identification of types of SM risks;
- 2) assessment and prioritization of those risks against limited resources;
- 3) mitigation and management those risks to reduce their impact on the organization; and
- 4) evaluation of emerging risk against mitigation efforts.

4 Opportunities and Risks of Social Media in the Insurance Branch

In spite of statistical figures stated above, many German insurers are active in SM. The most favoured SM networks are Facebook, Twitter, YouTube and XING, with Facebook being the most preferred communication channel. Facebook has been predominantly used for customer relationships, Twitter for press relationships and XING for employee search. SM have changed the business massively. Through SM the behaviour of customers has changed significantly, they are encouraged to share information online with other interested persons using interactive tools. Well informed, demanding and critical customers tend to take more part in the marketing communications and expect more personalized service. Therefore, it is essential for insurance companies to improve their professional presence in SM networks. The strategy considerations of the insurers should not only analyze the SM risks against their chances in brand promotion or customer increase, but also take preventive measures, e.g. in their reputation management.

Many German insurance companies have feared a reputational risk and a “shitstorm” since this incident. It appears that the SM risks are dominant in the insurance branch, so the low relevance of SM and reserved attitudes of German insurers to them are not surprising. Probably, the root of the problem is to make a convincing cost/benefit case for the competent managers and then reflect it in the company strategy. For risk management are particularly important: SM policy, SM monitoring and SM compliance. In addition, the professional social

⁷ The ERGO Insurance Group is an international insurance group. It is one of the largest insurance companies in Germany with offices in 30 countries. www.ergo.de.

media handling ensures a company against risks from, through a SM strategy with security measures such as monitoring, compliance and policy. The communication should be open minded, focused on values, transparent und not advertising. If insurance companies use SM profiles, they can start building a proactive reputation with a blog and sharing postings on Facebook, Twitter and YouTube.

Today's customers expect that the brand they do business with will be on SM and will be contactable via the most prominent SM platforms such as Twitter, Facebook or YouTube. Handling grievances in a professional and considerate manner is critical to achieve a successful resolution for both parties: customer and company. This two-way communication increases opportunities to connect with customers and prospects, but also increases risk, especially if corporate regulators are already announcing compliance requirements and guidelines on SM use. In addition, the viral effects with word-of-mouth are very interesting for the finance branch. This increases the range of marketing activities and the company saves advertising budget [14]. This is an important impact for finance companies in a low involvement market.

The SM use in finance sector should comply with the regulations of the Federal Office of Supervision of Financial Services⁸ in terms of handling of data and protection of privacy. A fundamental question is, whether employees, social media manager, marketing department and the SM agency are aware of these guidelines? Most SM activities come from a marketing perspective, without considering risk management at all. At the same time, heads of departments need to share responsibility for managing risk and train staff on how to do this in their day-to-day jobs.

SM risks may fall under five main areas of business risk: operational, regulatory, information security, reputational and financial. Some risks may have impact on one or more categories. [15, p. 23]. Hence, it is necessary to weigh the opportunities against the risks of SM implementation and use in insurance sector (Table 1):

Table 1 Opportunities and risks of Social Media in insurance companies

Risk type	Specific risks	Specific opportunities
Operational/ Market risk	<p>1 Violation of company rules with subsequent loss of control, Copyright violations, Lack of employee competence, Leakage of confidential information, Monitoring employees on SM</p> <p>2 „Ownership” issue over the content of employee postings on LinkedIn, Facebook, Twitter, etc.</p> <p>3 Wrong” communication due to denial of employees, lack of social media competence, insufficient capacity of resources needed or other resource issues</p>	<p>1 Creation of a new communication channel, Personalization of communication, Customer interaction support</p> <p>2 Management of brand/company image, Increase of brand awareness, Building employee and customer loyalty</p> <p>3 Acquisition of new customers, Targeting new leads/customers Building relationships with (younger) customers, More or better (after-sales) service, Boost in sales support</p>

⁸Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin)

	4 Ignoring of innovation impulses in customer interaction, Brand theft	4 Fostering innovation, 5 Recruiting new employees, Building relationships with multipliers ⁹
Regulatory/ Legal risk	1 Violation of applicable laws, regulations and terms of use: data privacy and protection, standards on advertisements and endorsements (consumer protection), Conflicts between regulatory measures in the EU and US, etc. 2 Legislation on data retention and archiving. 3 Disparaging comments, defamation, harassment and intentional infliction of emotional harm 4 Risk of using third party as SM service provider 5 Premature ad unauthorized financial disclosures of public-companies - time and person that made official information public	1 Optimization of business processes and cost advantages
Information security risk	1 Underestimation of security risks on SM websites in organization 2 Cyber-crime: activities of hackers and spammers on SM platforms: unauthorized information gathering, phishing, fraud and spamming, malware risk 3 Constant modifications due to development of SM platforms	1 Pressure to define and approve the right permissions, approvals, access, data classifications and collaboration processes before starting a SM implementation 2 Precautions on SM risks in organization: SM security policy of organization Employee awareness and training in SM security policy, Use of anti-virus and anti-spyware applications on SM websites whenever possible
Reputational risk	1 Lack of SM governance: Inappropriate statements of employees, management responses to online criticisms in discussions out the brand or company.	1 Creation of „company face“, Higher confidence towards the company 2 Management of discussion in the company communication channels

⁹ Multipliers or influencers - specific key individuals that have influence over potential buyers, e.g. potential buyers themselves, retailers or journalists, academics, professional analysts or advisors. Influencer marketing focuses marketing activities upon the influencers rather than on the target market.

	2 Fake SM accounts	3 Insights "behind the scenes"
	3 Company reputation damage due to "shitstorm"	
Financial risk	1 Effects of SM on stock markets, i.e. on share prices of organization 2 Unclear ROI of regular SM use in organization, Cost of SM implementation and presence 3 Remediation efforts (after IT outage or hacking), Leakage of confidential information	1 Financial benefits of opportunities utilized in the operational field

Source: [15] [16] and own research

5 Solutions to Risk Management

Possible solutions to risk management in financial institutions and other companies may fall in the categories described in the Table 2 below. They are strengthened by the latest developments in the Business Intelligence (BI) technology. BI technologies provide current, historical and predictive views of internally structured data for products and departments by establishing more effective decision-making and strategic operational insights through functions like online analytical processing, reporting, predictive analytics, data/text mining, benchmarking and business performance management.¹⁰ BI tools range from Data Visualization tools, Big Data tools, BI Dashboards, Predictive Analytics and Corporate Performance Management up to Social Business Intelligence (SBI) tools¹¹.

Table 2 Key Groups of Social Media Risk Management Tools

Group of tools	Overview	Tools
Social Media Monitoring and Listening Platforms	Used by organizations to listen to what their customers are saying in the social web. In SM risk management, they are focused toward listening for risk-indicating statements from customers and leakage of internal information by partners and employees	Simple tools, like Google alerts and Facebook searches. More advanced listening tools, like Salesforce Radian6, Brandwatch, Synthesio, Crimson Hexagon. Full-on analytics packages, like SAS or Oracle Social Engagement and Monitoring Cloud Service

¹⁰ <https://www.techopedia.com/definition/345/business-intelligence-bi>

¹¹ <https://www.trustradius.com/bi>

Social Media Management Tools	<p>Used by organisations to organize, manage, and automate their SM workflow, including publishing. In SM risk management, some of these same tools can also be used to manage and control what information is released by the organization, e.g. for scanning outgoing corporate social messaging and flagging inappropriate content or content in violation of corporate guidelines.</p> <p>Important for companies operating in a highly regulated environment.</p>	<p>Broad set of tools, like Hootsuite, Buffer, IFTTT, SocialOoms, Social Flow, SproutSocial, Actiance, Awareness, Expion, Hearsay Social, Inc., Sprinklr, and others</p>
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Social Media Compliance Tools	<p>Used to assist organizations to comply with either internal policies and/or external regulatory requirements. They enable activities such as archiving of SM activity, auditing SM activity, and monitoring employee social activity</p>	<p>Tools include RegEd Arkovi, Actiance, Smarsh, Hootsuite, Gremln, Jive, Kronovia, Social iQ Networks, and others</p>
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Sources: adjusted [15, p.21], [13], [17], [18]

SBI combines the traditional roles of BI software (building reports, dashboards, score cards, etc.), to track overall performance and shine a light on key performance indicators. SBI then applies these results to analyze and deliver insights from monitoring of SM networking, monitoring and analytics into a dashboard interface that offers clearer insights, which can lead to better ROI. The most noticeable feature of SBI is that it invites customer input and feedback at early points in the process rather than after a product is released.¹² The top ten players in the global Social BI market are: IBM, Oracle, SAP, SAS Institute, Adobe Systems, Attensity Group, Beewolve, Clarabridge, Crinson Hexagon, evolve24.¹³ Insurance companies should use SM monitoring for crises, forecasting or as a precaution measure and Business Intelligence for increasing the ROI.

6 Conclusions

With SM monitoring and BI tools based on the SM strategy insurance companies are able not only to develop new opportunities for company business but also reduce the SM risks efficiently. SM monitoring and BI allow an assessment of a company's capability and

¹²<https://www.techopedia.com/definition/26752/social-business-intelligence-social-bi>

¹³<http://www.technavio.com/blog/top-18-social-business-intelligence-software-companies>

readiness to be able to move to the next level of maturity in the deployment of digital business innovation and transformation. There may occur blocks, which may be cultural, managerial, operational, or related to security or regulations. Nevertheless, this process offers a benchmarking capability whereby organizations can compare their maturity stage with their peers (if a sufficient number of participants in each sector have completed an assessment). The SM Monitoring Maturity Model is used to research those answers within a consistent framework, and it provides the basis for improvement. Recommendations for action are the following:

1. Adopt a clear SM strategy that specifies the requirements and culture of the business.
2. Employee training in SM is critical to ensure that SM is an asset for an organization, and ensuring everyone is vigilant but collaborative about getting it right.
3. Carry out a regular annual SM check to quantify exposures and provide recommendations on how to best address various identified risks.
4. Utilize issues-based monitoring, in particular when market-sensitive announcements are being made.
5. Consider implementation of appropriate monitoring during a crisis or as a precaution against occurrence of unexpected issues or incidents.
6. Include SM within your reporting framework – beyond marketing. A diagnostic report can also identify what measures need to be in place regarding your SM exposure and risk.

Ultimately, regardless all procedures put in place, it is necessary to keep vigilant and create a corporate culture where everyone in organization understands how to protect business brand and his/her own personal brand.

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RATING OF INNOVATION PERFORMANCE AND COMPETITIVENESS OF THE VISEGRAD FOUR IN COMPARISON WITH THE EU MEMBER STATES

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ABSTRACT

The importance of innovation activities consists especially in the development of future competitiveness and improvement of efficiency of economy in given country. The goal of our paper is to provide a general overview of innovation development in the Visegrad Four countries (Slovak Republic, Czech Republic, Poland, Hungary) when compared to the member states of the European Union (EU-28). The introductory part of the paper deals with the basic indicator of measurement of the innovation performance and competitiveness within the European Union. The analytical part focuses on the rating of innovation performance of the Visegrad Four countries and their competitiveness based on an eight-dimensional classification of the main aspects, or categories of the innovation process. The second part of our research will subsequently deal with the global index of competitiveness of individual countries when compared to the EU.

Keywords: Innovation, Competitiveness, European Union, Countries of V4 - Slovak Republic, Poland, Czech Republic, Hungary

JEL codes: O3, O30

1 Introduction

In today's time of strong globalization driven by the force of business development, economic development and growth of the overall economy of all countries, innovation activity is active not only due to the increase of competitiveness of companies in the local and global business environment, but also due to securing sustainability and development of the economy of the states. However, the innovation performance level of individual countries varies substantially, which results except for other also from the continuous persistence of regional disparities throughout the world, including the European Union. An essential feature of innovations is the realization of a new added value of a product, a technology or a service in the market.

The term innovation is connected with the name of the Austrian and American economist J. A. Schumpeter (1889-1950), who has focused during his active time on the analysis of business conditions, under which the business is interested in or can perform so called new combinations of developmental changes. He described especially these new combinations of the developmental changes with the term "innovation", while he understood innovation as the application of these changes in the practical activity of the enterprise. [11]

History of the increased support of innovation enterprising in the European Union reaches back into the 1980's. Despite the fact that the belief that research, development and innovations are internally mutually dependent activities was dominating at this time, during the period from 1983 to 1994 programs for innovations support and programs for research and

development support have been carried out independently. [6] Individual countries found out and acknowledged very quickly that science and innovations can significantly contribute to the national productivity, profit and economic growth. Especially because of this reasons the governments together with key institutions began to establish their general approach and strategy for the support of innovations. [2] The breakthrough in the history of the European Union happened with the special summit in Lisbon (2000). The adopted Lisbon Strategy places emphasis, except for other, on the creation of a European space of research and innovation and for the creation of a favorable environment for the basic development of innovative enterprises, especially the small and medium sized. [6] The current strategy of the EU growth is Europe 2020, which builds on the experience gained during the application of the previous strategy, while it uses its positives and solves those problems, which emerged during its realization. The new strategy talks of new type of growth (intelligent, sustainable and inclusive), which is reached especially through the improvement of the (life-long) education and the level of workers' skills, stimulation of research and innovations, higher rate of intelligent networks usage and the development of a digital economy, modernization of the industry and support of higher efficiency when using resources and energies. [3]

2 Literature Review

In recent years the European Union is devoting significant efforts to the support of innovation and innovative enterprising, since innovation and knowledge is becoming the decisive source of wealth in a major way. However, there are several definitions of innovation. Based on the Green Book of innovation, which was published by the European Committee in 1995, under the term innovation one can understand the renewing and increasing the assortment of products and services and relevant markets, the creation of new production methods, supply and distribution and introduction of changes in management, work organization and work conditions and know-how of the work force. [4] The OECD Oslo Manual (2005) defines innovation as a set of scientific, technological, organizational, financial and commercial procedures, which lead or should lead to the realization of new or improved technological products or means. [9] The Oslo Manual is a set of instructions for the creation of internationally comparable indicators of innovations, which differentiates four types of innovations, namely innovations of the product, the process, organizational and marketing innovations. Currently the works are focused especially on the successful management of innovations in the enterprise. [1]

In recent years competitiveness is also one of the frequently used terms and its definition is also not yet unified. One of the competitiveness definitions says that it is the capability of the country to sell own products and services in given market, while the term competitiveness includes e.g. also the overall business environment of the country, physical and knowledge infrastructure as well as labor market indicators or the regulation of financial markets and products and services markets. [7] Based on another definition the macroeconomic competitiveness expresses the capacity of the economy to create, use and sell outputs in global competition so that the welfare of the population would continually grow relative to other economies. [12] The World Economic Forum (WEF, 2013) defines competitiveness of a country as a grouping of institutions, policies and factors, which together define and determine the productivity of the country, i.e. more competitive economies are the ones, which grow faster and more effectively than other over time.

3 Data and Methodology

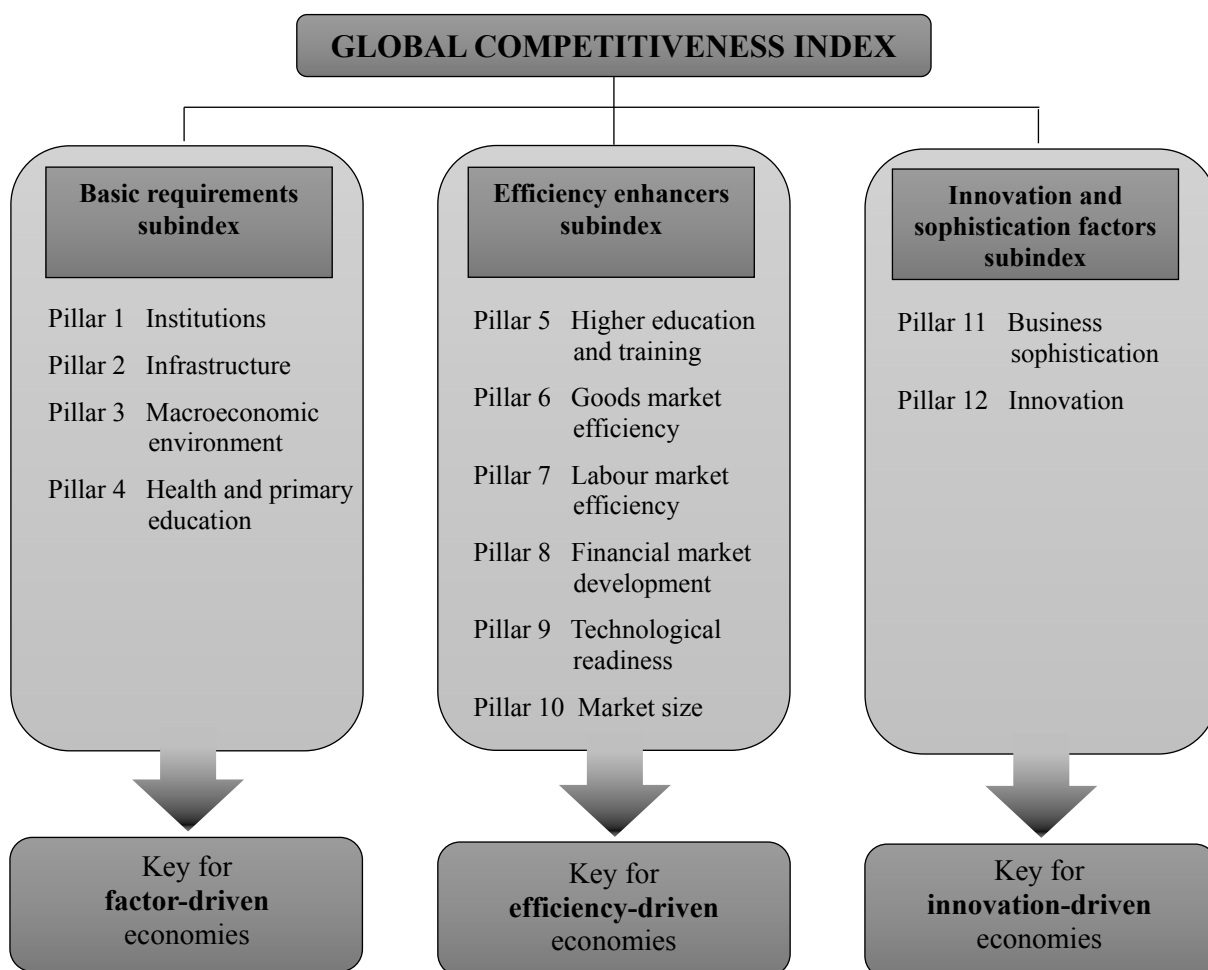
For writing of this paper secondary data was used in the form of annual reports, surveys and statistical data collected and processed by international institutions dealing with the evaluation of innovation performance and competitiveness of individual countries. The data of the World Economic Forum and the European Committee was used for writing of this paper, which are the best ones at collecting the Eurostat and OECD data. The paper focuses on the current period 2014 – 2015. For the processing of the data general theoretical methods of data processing were subsequently used like abstraction, analysis, synthesis, deduction and from the special methods statistical methods and comparison in time and space were used.

As part of the analytical part of our paper, we will assess the innovation performance and competitiveness of the Visegrad Four countries using the **Summary Innovation Index (SII) and the Global Competitiveness Index (GCI)**. The Summary Innovation Index was created within the European Union because of the need to unify the fulfillment of the Lisbon Strategy goals and subsequently its successor the Europa 2020 strategy, while the European Innovation Summary (EIS) is being annually amended with new indicators with the goal to better capture the complex nature of the innovative processes. Specifically, in 2015 the index contained 25 indicators divided into eight categories and three general areas, while it calculated SII based on summarization of measured innovation indicators. The Summary Innovation Index, which expresses the innovation performance of given country can range from 0 to 1, while the smaller the SII value, the higher the innovation performance. Based on the reached value of the Summary Innovation Index the countries are divided in four groups [5], specifically:

- *innovation leaders* (innovation performance is at least 20 % above the EU average),
- *innovation followers* (innovation performance is between -10 % and +20 % of the EU average),
- *moderate innovators* (innovation performance is between -50 % and -10 % of the EU average),
- *weaker innovators*, so called catching-up countries (innovation performance is more than 50 % below the EU average).

The Global Competitiveness Index (GCI) discusses the perspectives of a country how to reach a sustainable economic growth in the medium term. The value of the index itself is divided into three groups with respect to their importance for individual countries, based on the economic development stages (Figure 1). The Competitiveness Index assesses e.g. the quality of public institutions, government policies, size of the market as well as other factors, which determines the level of productivity in given country. Basic measures in these areas are therefore necessary to remove exceptionally unfavorable situation in individual countries and increase their competitiveness. [10]

Figure 1 The Global Competitiveness Index framework



Source: [10]. Own figure.

4 Results and Discussion

Within the European Union the innovation performance of the member states is analyzed by the European Commission in the publication Innovation Union Scoreboard. Based on Figure 1 we can see that the average innovation performance in EU-28 for 2014 was 0,555. We have divided the member states based on the achieved SII values into four groups:

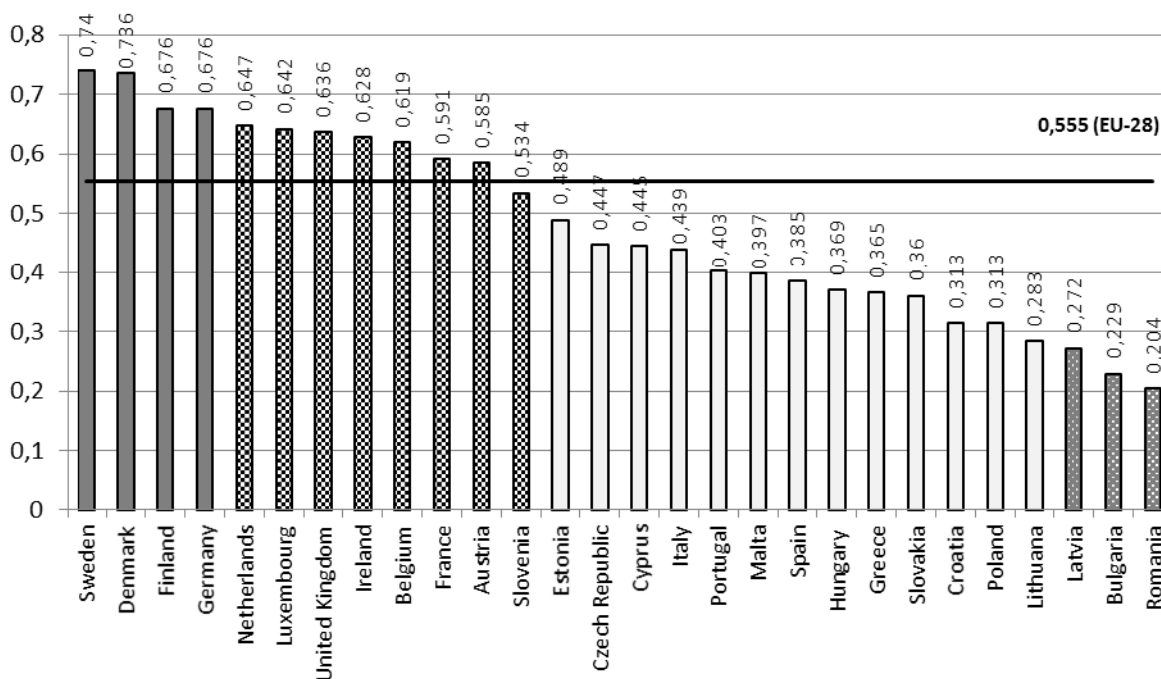
- the **innovation leaders** include Sweden, Denmark, Finland and Germany (just like in last year), which reach the Summary Innovation Index value in the range 0,676 to 0,74 and when compared to the average value of the EU their innovation performance is 21,80-33,33 % above the average¹.
- the **innovation followers** include Holland, Luxemburg, Great Britain, Ireland, Belgium, France, Austria and Slovenia, while the Summary Innovation Index of these countries oscillates around the EU average value (+16,58 % and -3,78 %).²

¹ In 2013 the innovation performance value of the leaders was in the range 23.47-35.38 % above the EU-28 average.

² Except for the present ones the innovation followers included also Estonia and Cyprus, while the values of the Summary Innovation Index oscillated around the EU-28 average value in the range +17.15 % to -9.57 %.

- **moderate innovators** are countries with SII values in the range 0,283 to 0,489, namely Estonia, *Czech Republic*, Cyprus, Italy, Portugal, Malta, Spain, *Hungary*, Greece, *Slovakia*, Croatia, *Poland* a Lithuania.³
- Latvia, Bulgaria and Romania are **catching-up countries**, or weaker innovators, while the Summary Innovation Index value of these countries is more than 50 % below the EU-28 average (-50,99 % to -63,24 %).⁴

Figure 2 EU Member States' innovation performance (2014)



Source: [5]. Own figure.

The European Union is using an eight-dimensional classification for the rating of the innovation performance of the countries, the goal of which is to capture the main aspects, or categories of the innovation process. In the following figure we can see achieved values of the V4 countries in the area of these aspects. In 2014 the V4 countries we recording a lower value in almost all the dimensions. However what is positive, that except for Hungary all countries were reaching a very good innovation performance in the area of human resources, and the Slovak Republic was reaching the relatively better value than the EU in this area. The human resources development is assessed in three based groups, while the first group is made of new graduates of the doctor's study, where the SR (2.4) is high above the EU average (1.8).⁵ In case of observing population with completed tertiary education, Poland (40.5) and Hungary (31.9) are found above the Europe average (36.9), the Czech Republic and Slovakia reached similar values (CZ 26.7 and SK 26.9) however below the EU average. The observed countries are doing best in the case of ratio of young people with higher secondary education. The

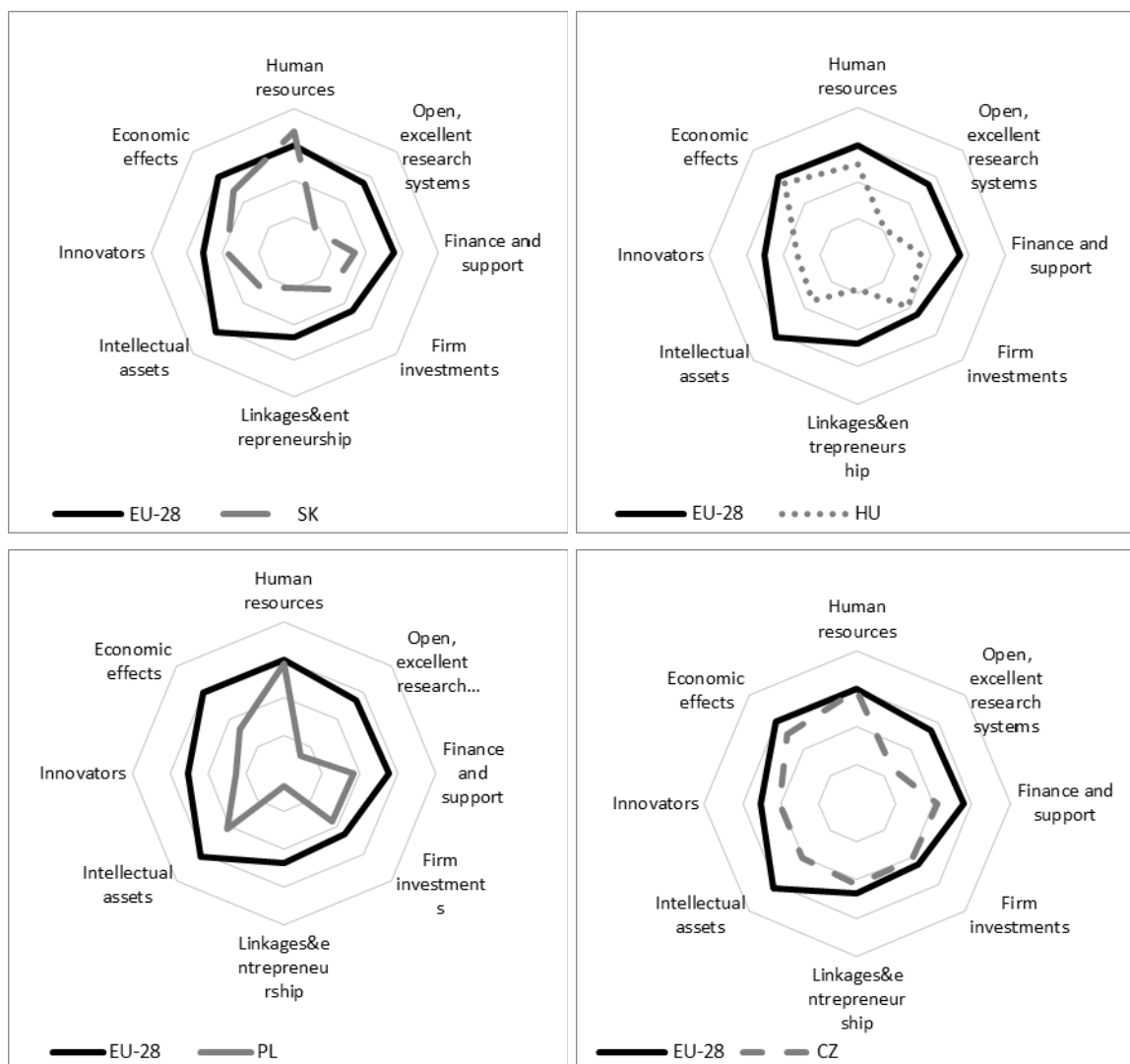
³ In 2013 the moderate innovators were countries with the SII values in the range 0.279 to 0.443, specifically Italy, Czech Republic, Spain, Portugal, Greece, Hungary, Slovakia, Malta, Croatia, Lithuania and Poland.

⁴ To only change from 2013 occurred in the order of the countries. In the last year Romania had the best results out of the listed three countries with the SII value of 0.237, followed by Latvia (0.221) and Bulgaria (0.188).

⁵ The Czech Republic is just below the EU average (1.7), while Hungary (0.9) and Poland (0.6) have weaker values.

percentage of young people ages 20-24 with complete secondary education is 91% in case of Slovakia 90.9% in case of the Czech Republic, 89.7% in case of Poland and 83.3% in case of Hungary, while the value of this indicator as it the level of 81% in case of EU-28. This fact can be assessed very positively, because the availability of highly skilled and educated people is one of the most important innovation controllers. However other dimensions are equally important. The distribution of individual values in the V4 states varies. On average the best values are reached by the Czech Republic, but as we can see below, all countries are significantly below the average in the area of intellectual property. This dimension focuses on achieved results in the area of know-how success. On the other hand we are lacking also opened, state of the art and attractive research systems and low levels were also reached by the countries in the area of business and cooperation.

Figure 4 Innovation performance of Member States' V4 (2014)

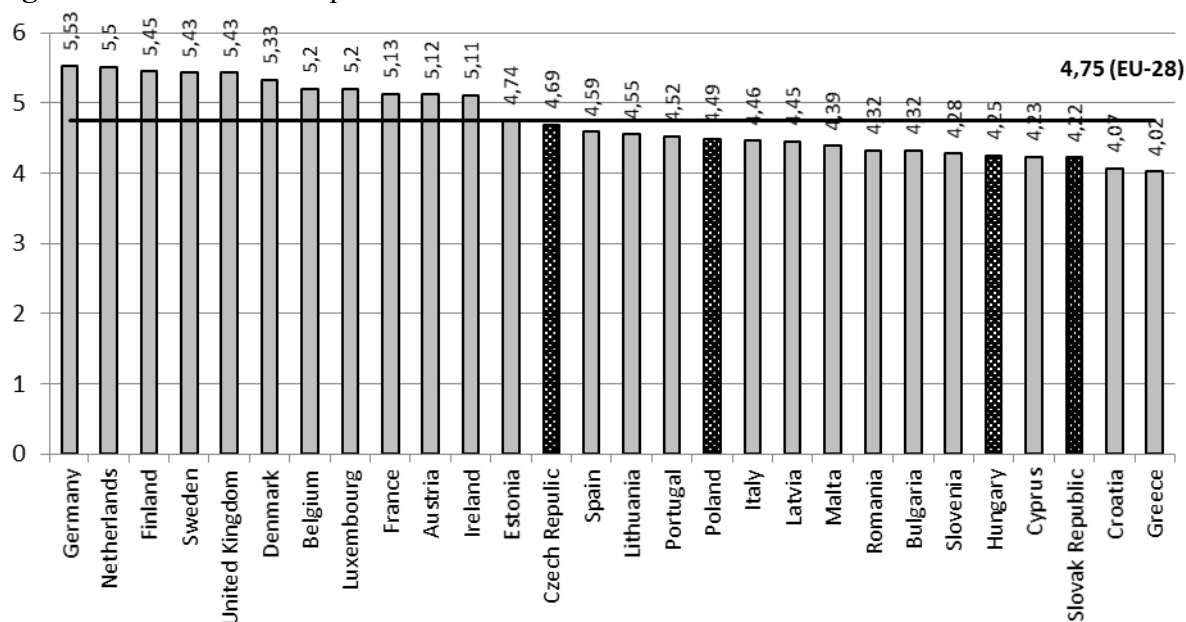


Source: [5]. Own figure.

In 2015-2016 the World Economic Forum included in the competitiveness rating 140 countries around the world, while also this time European economies are dominating the top ten countries. Switzerland is at the top of the competitiveness list for the seventh consecutive year. Singapore maintained its second position and USA defended their third place from last

year. The top ten countries also include Germany, Holland, Japan, Hong Kong, Finland, Sweden and Great Britain. In another section of our paper we focus on the European Union countries, with special focus on the V4 countries. Based on Figure 4 we can see that all V4 countries are below the EU-28 average (4.75), however the Czech Republic continues its growth (again moved from the 37th position to the 31st position of all the countries) and it is the leader among the V4 countries. Poland improved its position year on year (from 4.48 to 4.49 thus improving its position by 2 places and reached the 41st position). Hungary erased its improvement from last year and its current GCI is 4.25 (in the last year it was 4.28). It reached 63rd position this year and it deteriorated by 3 positions. Despite the fact the overall Slovakia got in the first half of the competitiveness list of the observed 140 countries and current results confirmed the positive trend in the SR⁶ (it is on the 67th position as opposed to last year when it reached the 75th position), our country has the worst results among the V4 and the situation is similar also in the EU. Only Croatia and Greece have worse results.

Figure 4 The Global Competitiveness Index 2015-2016 of Member States' V4



Source: [10]. Own figure.

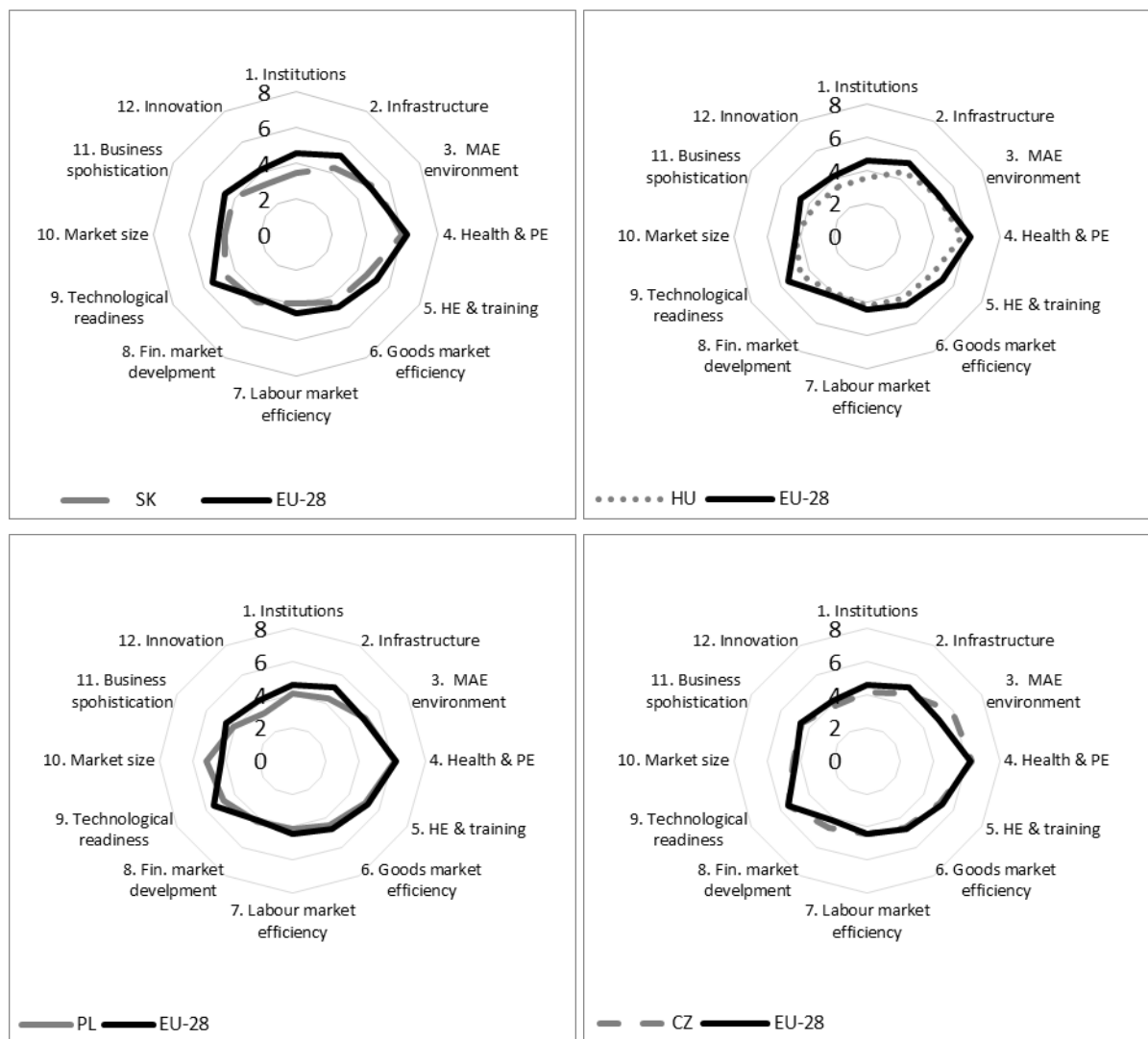
The global competitiveness index indicators can be divided into three groups (see Figure 1), specifically to basic requirements, efficiency accelerators and factors of sophistication and innovation. The basic requirements, which include factors like the institutional framework, infrastructure, macro economy, population health and based education show better values in all of the Union countries (the EU-28 average is 5.24). The second group – efficiency accelerators – the World Economic Forum assesses factors like higher education and trainings, market efficiency and technological readiness. Based on the EU data (4.72) this group is on average in the next to last position. The last position is occupied by the group assessing the sophistication of enterprise processes and innovation (sophistication and innovation factors – EU-28 average is 4.39). Based on the assessment of these three groups

⁶ According to the manager of the Business Association of Slovakia (BAS) the reasons from improving the overall rating of Slovakia can include e.g. shortening the time needed to start a business, or government support of new technologies through the digitalization of the public administration, which is welcomed by the entrepreneurs. In the enterprise sector the competitiveness of Slovakia is strengthened by the companies improving the quality of their production processes and introducing innovation. The respondents of the survey welcomed also the progress in infrastructure construction, however on the other hand the perception of corruption worsened according to them. [8].

we came to the conclusion that allow V4 countries are among the countries, the competitiveness of which depends on their capability to increase the efficiency of using the production factors and the capability to improve enterprise processes. [1]

Using Figure 5 we have specified which GCI indicators affect the competitiveness of Poland, Hungary, Slovakia and the Czech Republic the most when compared to the EU. Based on the available statistical data, in case of the European union the best result is reached by the Health and primary education pillar, followed by the Technological readiness pillar, which demonstrates the openness of the countries to foreign investors, which brings in the new technology.

Figure 5 The Global Competitiveness Index 2015-2016 of Member States' V4 (according to Pillars of GCI)



Source: [10]. Own figure.

In comparison to the EU achieved results, Slovakia recorded in 2015-2016 a negative situation in the area of the institutional framework (are defined by the legal and administrative framework), in the area of innovation financing, which is confirmed by significant lagging of our country behind the EU average from the support of science and research point of view and in the end in the area of technological readiness (the capacity of the economy to establish new technologies and know-how). Hungary and Poland are in a similar situation. In the case of the

Czech Republic, it has the best results of the V4 countries, and in case of the five indicators it reached better values than the EU average. However what can be assessed as positive is that our country reached values above the EU average in the area of macroeconomic stability, (which is important in attracting direct foreign investments), as well as the assessment of the financial market sophistication. Poland has above the average levels in the area of macroeconomic stability, assessment of the financial market sophistication and in the area of the market size (includes the openness of the economy, which is an important factor of competitiveness). Hungary is the only country, which is below the EU average in 11 indicators (it is exactly at the EU level in market size assessment).

5 Conclusions

Turbulent development and the globalization process itself affects almost all areas of the world economy. It is being confirmed that the necessary part of progress of each national economy in this development is improving its competitiveness and thus support of own viability and international acceptance. In recent years innovations are considered an important source of competitiveness, which represent one of the important sources of economic growth. Not only do they help the European countries to remain competitive in the global economy, but they also help to create new jobs and improve the quality of life of the EU citizens. The basic issue of lack of innovation development in majority of the countries is the non-existence of a system of institutions, policies and tools focused on the society and for support of innovation (eventually insufficient cooperation of public and private sector) on one hand and lack of financial resources on the other.

As part of our paper we have assessed the innovation performance level of the V4 countries based on the EU innovation policy tool to the Innovation Union Scoreboard. The analysis of 25 indicators divided into eight groups showed that based on the score of the summary innovation index all V4 states fall into the third performance group of moderate innovators, with a below the average innovation performance. The highest performance within the V4 is reached by the Czech Republic, which is in the 14th position of the innovation performance rating of the EU-28. The lowest innovation performance is manifested by Poland, which is followed only by Lithuania, Latvia, Bulgaria and Romania. Subsequently we have assessed the development of the competitiveness of individual V4 countries when compared to EU-28 based on GCI. We have determined that the factors, which prohibit the growth of competitiveness of the V4 countries the most, considered by the World Economic Forum include especially the institutional environment of the country and below the average innovation potential.

In general the V4 countries in an effort to improve their competitiveness as well as support the development of a knowledge-based economy should increase their overall expenses for research and development, support companies and projects in creating innovation, create conditions for applied research by establishing research and development centers, or eventually apply programs of state support and public procurement in the area of new technologies and innovations.

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INITIAL AUDIT FEE DISCOUNT – THEORY AND REALITY

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ABSTRACT

The aim of the paper is to review the academic literature in relation to the initial audit fee discounting. The theoretical arguments in favour of its existence span from the transaction costs for the clients, initial costs on the part of auditor, information asymmetry to the audit fee stickiness. The discounts have been documented using the empirical archival research for some countries and periods. We trace the main arguments for the existence of the initial discounts in the relevant academic literature and also present the overview of their evidence in empirical research.

Keywords: auditing, audit fee model, initial discounts, low-balling

JEL codes: C58, D21, M42

1 Introduction

External auditing is the important part of financial reporting. The role of auditors is to provide a true and fair view of the financial statements of a given company and thereby offer assurance to investors and shareholders. Thus, a properly functioning audit market is the significant prerequisite of the healthy and transparent capital market. In this context the change of the external auditor and initial discounting are important phenomena. In the past the practice of initial discounting raised questions related to the audit quality and auditor independence.

The topic of the auditor change in itself is of interest for both the practitioners and academics. Academic research has covered several aspects related to auditor switching – auditor choice (Beattie and Fearnley, 1995 [1]; Landsman et al. 2009 [21]; Ettredge et al. 2011 [13]) audit opinion (Chow and Rice, 1982 [5]; Citron and Taffler, 1992 [6]; Krishnan, 1994 [20]), financial distress (Schwartz and Menon, 1985 [25]; Citron and Taffler, 1992 [6]; Hudaib and Cooke, 2005 [19]) and the initial discounting (DeAngelo, 1981 [11]). As one would expect, these areas are often inter-related.

The relationship between the audit fee and auditor change is complex. There is rich and bi-directional relationship between the audit pricing and the auditor changes. Clients often switch auditors or at least consider the auditor change because of high audit fee or simply because they expect a decrease in audit fee (Bedigfield and Loeb, 1974 [2]; Beattie and Fearnley, 1995 [1]; Competition Commission, 2012 [8]). It is then understandable that the auditors may offer the initial price discount in order to satisfy the client's wish for lower audit fee and to secure the contract. However, the clients' expectations of lower audit fee may not be the only reason for the existence of the discount. Another reason may be the competition among auditors. It was argued that in the competitive environment the audit firms offer

discounts in order to secure ownership over the future quasi-rents (DeAngelo, 1981 [11]). Others argue that the new auditors offer lower audit fees simply because they do not have enough information about the auditee and the real client-specific costs associated with the audit (Coate and Loeb, 1997 [7]), thus leading to the initial loss and the so-called winner's curse scenario. Yet others argue that the brand-name auditors offer lower initial fees in order to let the client experience the higher quality audit services if the uncertainty about the quality prevails (Carson et al., 2012 [4]). From a different perspective, the regulators expressed concerns that offering the audit fee significantly below the production costs may lower the audit quality and at the same time the future economic interests in the client may undermine the auditor's independence. Namely, in such situation the auditor may be reluctant to reveal potential accounting issues thus risking termination of the relationship. Hence the question of the initial price discount of audit engagement has attracted considerable attention.

The paper is structured as follows. The second section describes the theoretical explanations for the existence of the initial audit fee discount. The third section reviews the empirical studies from Australian, US and UK audit markets that are related to the initial discount. The last section concludes the paper.

2 Theoretical explanations of the reasons for existence of the initial discounts

The academic community has approached the explanation of the initial fee discount using a range of analytical theoretical models. In one of the first studies DeAngelo (1981) [11] argues that the initial price discount is 'a competitive response to the expectation of future quasi-rents to incumbent auditors'. The important moment in her argumentation is the point that these quasi-rents are the consequence of the existence of technological advantages to incumbents and the transaction costs. The technological advantages mean that the incumbent already went through the necessary start-up procedures (client-specific costs) when conducting the audit for the first time. The transaction costs refer to the costs incurred to the client when changing its auditor. The existence of the quasi-rents has two effects: firstly in competitive environment it leads to the low-balling because the other auditors want to gain the property rights to the quasi-rents and are bidding for the contract and will lower the price for the initial audit until the difference between the actual costs of the initial audit and the offered price is equal to the net present value of the quasi-rents. Since the net present value of the quasi-rents is positive, the initial price has to be lower than actual costs and hence the lowballing occurs. The second consequence of the existence of the quasi-rents lowers the optimal level of auditor independence. But, as DeAngelo (1981) [11] argues, the low-balling does not adversely impact the auditor independence in future periods since the initial discount represent the sunk costs. This line of reasoning suggests that the initial discounts are to be offered universally if the three conditions are fulfilled – there are significant start-up costs, there are significant contracting costs, and the auditing environment is competitive. Maggie and Tseng (1990) [22] further elaborated DeAngelo's model and studied the conditions under which the auditor is willing to compromise his or her independence. Important for the purpose of the paper is the fact that the auditor breaks even if the initial discount is equal to the net present value of what they call the value of incumbency¹.

¹ Actually, there is an interesting point in their analysis related to the recent debate on the mandatory auditor rotation in European Union and in UK. Namely, Magee and Tseng (1990) assume that the life of the company is limited. The practical implication of this detail is the opportunistic pricing of the audit in the last period when the incumbent can charge higher price. Little did they know then, it is exactly what has been empirically observed in Italy where the auditor rotation is mandatory since 1975.

On the other hand, Coate and Loeb (1997) [7] provide an alternative theoretic explanation for the existence of the initial price discount – information asymmetry. Namely, the successor auditor does not know the information that the previous auditor had accumulated about the client. Hence, in the bidding of the initial price the potential auditor is willing to bid a lower price than actual costs, reflecting solely the information common to all auditors and not its private component known only to the incumbent.

The third potential source of the initial discount, albeit only for subset of the auditor changes is linked to the experience good theory (Craswell and Francis, 1999 [9]; Carson et al., 2012 [4]). According to the theory the brand name auditors offer the initial discounts to the clients that were not audited by auditor of the same type before, in order to let them experience the quality of their audit services. The auditee, once convinced of the superior quality of the new auditor, will willingly pay the brand-name premium later. Such discount is offered in situations where the uncertainty about the quality prevails.

Finally De Villiers et al. (2014) [10] propose that for some companies the reason why the initial discount is observed is the fact that the audit prices are sticky and the changes in audit fee fundamentals do not translate immediately into changes in audit fee levels. It takes longer for the downward changes of audit fee determinants to materialize in the audit fees. However, if the company changes its auditor, the audit fee adjusts immediately and as the authors argue, this leads one to observe the fee-cutting behaviour. However, this hypothesis is consistent only with the short-cutting, i.e. the permanent decrease of the audit fee, usually under the level of audit costs, thus undermining the audit quality. This explanation contradicts to the empirical observations of research studies that examined the recovery patterns of audit fees after the auditor change. We are not aware of a study that would document the persistent discounting outside the five-year window. On the contrary, the studies support the notion that the discounting is only temporary phenomenon.

3 Initial audit fee discount in empirical literature

Before we proceed to the evidence of initial discounts in the empirical studies, let us make firstly clear distinction between the price-cutting behaviour and the low-balling. The price-cutting means the offering the initial discounts without explicit consideration of the relationship between the audit fee and the audit costs. On the other hand, the low-balling refers to the setting the initial audit fee under the level of auditor's costs. Even though it is low-balling that may lead potentially to auditor compromising his or her independence and undermine the audit quality and hence it is against the public interest, it is not easy to measure it in reality. Namely, in order to evaluate the extent of low-balling directly, the researcher would have to know the private information about the billing rates, staff hours or realization rates of a given auditor. But this information is seldom available to researchers. Thus the only thing the researcher may observe is the audit fee and all one can do is to compare the actual audit fee for the period when the change occurred either with the previous year, the following year or the predicted fee for the company with the similar characteristics. Sometimes the terms price-cutting (or initial discounting, which means the same thing) and low-balling are used interchangeably, but we do not agree with this practice. In theory, if we include the opportunity costs among the auditor's cost, there may be certain logic in it, but then the whole issue about the independence loses its ground.

Another interesting moment to consider when evaluating the results of empirical studies on testing the initial audit fee discounts is the modelling approach. The most common approach is to model the initial audit fee discount as a time-invariant dummy variable in the audit fee model where the dependent variable is in the form of logarithm. The advantage of this

approach is the interpretation of the estimated coefficient for this variable.² However, this approach has its opponents. For example Pong and Whittington (1994) [24] argue that such model is too restrictive in that it assumes the multiplicative functional form. They suggest using the model with dependent variable in levels and using the interactions to capture possible non-linearity. Yet another approach was used in Huang et al. (2009) [18] when performing the sensitivity analysis – they used the audit fee model in changes. The experimental variable, however, was not differenced.

An alternative approach is to use what we call the counter-factual evidence. Such technique is usually used in the event studies. Here, firstly the audit fee model is estimated using only the companies that did not switch their auditor. As the second step, the initial discount is calculated as a difference between the actual audit fee of the company that changed its auditor and the predicted fee using the estimated coefficients from the estimated model and the company's characteristics. The obtained number is transformed to percentages to facilitate the easy interpretation. The advantage of this approach is the fact that instead of one number (estimated coefficient of binary explanatory variable modelling the auditor change) for all the switchers a company-year specific quantity is calculated for each case of auditor change. The downside of this approach is the skewed distribution of the percentages after the transformation with occurrence of outliers. The usual remedy is one-sided winsorization.

Now let us finally proceed to the reviewing the empirical literature. The noteworthy feature of the literature is the fact that the empirical evidence of the initial price-cutting behaviour in relation to the audit market is mixed and country- and time-specific. In what follows we review the empirical studies from the Australian, US and UK audit markets.

In the Australian market, neither Francis (1984) [14] nor Butterworth and Houghton (1995) [3] found evidence for the discounting behaviour. On the other hand, Craswell and Francis (1999) [9] documented initial discounts only for upgrades from non-Big 8 to Big 8 auditors.

In contrast, the studies from the US audit market report substantial price-cutting behaviour. Simon and Francis (1988) [26] found an average discount of 24% for initial year and 15% for the two following years. Ettredge and Greenberg (1990) [12], having examined a similar time period, found an average discount of 24%. Turpen (1990) [27] reported discounts of 19% and 15% for the first and the following year. Ghosh and Lustgarten (2006) [15] researched the extent of initial fee discounts separately for oligopolistic and atomistic segments of audit market. In accord with their expectation they found that the new clients of small audit firms pay, in the initial year, on average a 24% smaller audit fee, whereas the clients of Big 4 firms gained only 4% less. Ghosh and Pawlewitz (2009) [16] studied the initial discounts before and after the implementation of SOX³ and found the 22% price-cutting before and 11% in the post-SOX period. After the disaggregation of the data to small and large auditors, they found that while in the pre-SOX period both types of auditors offered the discount, after the SOX implementation the discounting continued only in the small audit firms market. However, the authors warned against generalizing these results because of the small sample size. Huang et al. (2009) [18] analysed the initial audit fee discounts in post-SOX era. Their results showed that the new clients of the Big 4 auditors enjoyed a substantial initial audit fee discount in 2001 (24%), however, the discount gradually disappeared during the researched period and changed into an audit fee premium of 16% in 2006, instead. In the non-Big 4 group the results

² In case of dummy explanatory variable and the dependent variable in logarithm, the effect of changing the value of dummy variable from zero to one is equal to $\exp(a) - 1$, where a is the estimated coefficient. If this number is multiplied by 100, it may be interpreted as a percentage change in audit fee as a result of changing the value of the corresponding dummy variable from zero to one.

³ The Sarbanes–Oxley Act of 2002

were not consistent in terms of the existence of initial audit fee discounts – the model in levels gave different results than the one estimated in differences.

There are few studies examining the existence of initial audit fee discount in UK audit market. Pong and Whittington (1994) [24] was the first study to study the extent of initial price discount in UK. Using a sample of the largest companies in the period 1981-1988 they documented statistically significant price-cutting behaviour only in the segment of small auditors. Gregory and Collier (1996) [17] examined the initial fee discount along with the subsequent price recovery using a sample of 399 out of the 500 UK largest listed companies and their financial statements for 1991. The study found that the companies that changed their auditor within last three-year period enjoyed on average audit fee 22.4% smaller. If the change was lateral, i.e. within the Big 6 group, the discount was 20.2%, if the client was a newcomer to Big 6 clients' group, the discount was 35.6%. However, these discounts did not persist over the three-year window. Recently Peel (2013) [23] explored the extent of initial fee discounting of eight largest audit firms. The sample comprised private and public companies. The author found substantial discounts in the case of listed companies. The private companies, on the other hand, did not benefit from the initial discounting. Moreover, large clients switching to another Big 4 auditor were enjoying the substantial discounts, as well. The firms with former Big 4 auditor switching to Mid 4 group were getting smaller discounts. Since the discounts disappeared in the following year, the author argued the evidence was consistent with competitive pricing in the Big 4 sector. Moreover, the small clients were not enjoying discounts if they were upgrading their auditor, i.e. entering the higher quality group. In a way the price-cutting structure found by the study differs to that found by previous studies.

4 Conclusions

In the paper we reviewed the academic literature studying the theoretical and empirical aspects of initial audit fee discounting. Even though the offering the initial price discounts is not unique to audit market but it is widespread practice across many other markets, it attracted a lot of attention because it is perceived as negative phenomenon potentially threatening the independence of auditors and undermine the audit quality.

From the viewpoint of theory, DeAngelo (1981) [11] in a way defended the practice and argued it is natural response to the existence of quasi-rents in the competitive environment. At the same time she showed that the quasi-rents existed because on one hand if the client changes auditor, it incurs the transaction costs if the audit firm performs the initial audit it faces increased set-up costs. Maggie and Tseng (1990) [22] analytically extended DeAngelo's model and showed that the initial discounts are equal to the present value of the gains associated with the performing the audit in the future. Coate and Loeb (1997) [7] argued the reason for the initial discounts lied in the information asymmetry. Another possible explanation for subset of the audits is the experience good theory. Finally, De Villiers et al. (2014) [10] proposed that the initial discounting existed because of the downward stickiness of audit fees.

The empirical evidence of the initial price-cutting behaviour in relation to the audit market is mixed and country- and time-specific. In Australia the discounting was observed only very rarely. On the other hand, in US audit market there was documented widespread and significant discounting, however, the extent decreased after the enactment of SOX. In UK, the empirical studies on initial discounting are rare, but the extent of initial discounting is quite large, particularly for the listed companies.

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SIZE, STRUCTURE AND FINANCIAL EFFICIENCY OF CEE'S BANKING SECTORS

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ABSTRACT

This paper carries out a comparative analysis of the banking sectors of the Central and Eastern European countries against the banking sectors of developed countries. In the analysis indicators describing the size, structure and financial efficiency of European banking sectors were used. The cluster analysis methods were also applied, enabling the classification of the European banking sector in respect to all adopted indicators. The results clearly indicate large differences in the size, structure and financial condition between the banking sectors of countries with developed economies and their counterparts in CEE countries.

Keywords: banking, efficiency, size, analysis

JEL codes: G1

1 Introduction

In financial sciences comparative analysis of banking sectors play an important role. They allow to gain knowledge about the position of given sector against other banking sector in respect of the pace of development or effectiveness. Comparative analysis of banking sectors facilitate the evaluation of integration processes in the European banking sector. The conclusions of the comparative analysis may also serve as a basis for actions taken by the supervisory institutions.

The purpose of this paper is to conduct multidimensional comparative analysis of European banking sectors, taking into account indicators describing: size of the banking sectors, pace of their development, their structure and financial condition. Such goal requires preparation of appropriate indicators that enable the evaluation of aforementioned aspects and the choice of proper statistical method which, in turn, enables aggregation and synthetic evaluation.

The first part of the article reviews the literature on given subject and the results of comparative research of European banking sectors, with an emphasis on banking sectors of CEE countries. The second part of the article presents the research methodology and the complex analysis of banking sectors of CEE countries against the banking sectors of the so-called "old" EU countries. This analysis covers the period between 2008 and 2014, because the authors wanted to capture changes resulting from the global financial crisis.

2 Literature Review

International comparative analyses can refer to comparison of banks from different countries or banking sectors. They are carried out by academic centers, central banks, think tanks,

consulting companies and commercial banks. They differ mainly in terms of complexity. Hence it is possible to distinguish different types of research: complex, sectional and focused on selected aspect (eg. profitability of banking sectors). Other important research trend are analyses concentrating on evaluating the influence of various factors on the condition and structure of European banking sectors.

Cyclical analyses of European Central Bank play an important role in the comparative analyses of banking sectors.

Broad comparative research, including EU-27, Japan and USA, was conducted by Bijlsma, Gijsbert, Zwart [1]. The authors of this research applied 27 indicators (including the ones describing the importance of banks in financial intermediation, size of banking sectors and structure of banking sectors). The result of the research show that the fundamental differences between CEE countries and “old” EU countries result from different size of banking sector and different openness to foreign capital [1].

Complex comparative analyses of banking sectors of CEE countries usually cover the evaluation of banking sectors level of development, using indicators of bank assets, loans or deposits in relation to GDP, growth rate, financial stability of banks and their financial performance [2], [3], [4].

The second area are comparative research focused on selected aspect. This type of analyses are important part of research on financial performance of banking sectors [5], [6]. In this approach, apart from the typical comparative research, analyses of factors determining banks profitability can also be distinguished. The review of research on financial performance of banking sector show, that the main instruments used in such analyses are indicators of profitability of banking sectors (ROE, ROA) and indicators illustrating costs level in relation to income.

Analyses of influence of foreign capital inflow and financial liberalization on development and financial results of banking sectors in countries undergoing systemic transformation are also an important area of research on the European banking sector's efficiency. Andries and Caparu conducted a research, which proves that liberalization has a positive influence on cost-effectiveness of banks [7].

The global financial crisis caused the evolution of new trend in comparative research after 2008, which covered the analyses of influence of the crisis on banking sectors in individual EU countries.

The development of new technologies caused the emergence of comparative research regarding internet banking [8].

Comparative research of banking sectors are also conducted in the aspect of the level of competition and concentration ratio [9].

Comparative research require multidimensional evaluation of banking sectors and inclusion of several or more indicators at the same time. In this kind of situation, multidimensional comparative analysis methods (cluster analysis in particular) are considered as useful instruments. Comparative analysis of Eurozone's banking sector, using cluster analysis, was conducted by Knotek [10], who took into account macroeconomic indicators and measures describing banking sector. From among the cluster analysis techniques he chose Ward's method. The author analyzed banking sectors of Eurozone countries in two years: 2002 and 2012. The results show, that in 2012 countries seriously threatened with insolvency (Italy, Portugal, Ireland, Spain and Greece) formed a homogenous class [9].

In terms of this paper's goal it is reasonable to recall the analysis conducted by Sorensen and Gutierrez published in 2006 in ECB's working paper [11]. In this research the authors applied cluster analysis techniques, including smoothing analysis, in order to evaluate main patterns and trends in the Eurozone's banking sector, with respect to the homogeneity degree of the Member States. The results of the research show, that Western and Central European Countries (such as Germany, France, Belgium and to a certain degree also Netherlands, Austria and Italy) tend to group together, while Spain, Portugal and Greece usually form a separate cluster. Ireland and Finland also form an individual cluster, however they are closer to the Western and Southern European cluster.

3 Data and Methodology

Complex evaluation of CEE countries banking sectors against their counterparts in the "old"EU requires:

- determining the evaluation criteria of banking sectors,
- selection of indicators to evaluate the banking sectors,
- choosing appropriate method for aggregation and synthetic presentation of the analyzed problem.

In the approach presented by the authors of the paper, comprehensive comparative analysis of the banking sector includes the following criteria:

- size of the banking sector,
- role of the banking sector in the economy,
- banking sector's structure,
- banking sector's financial efficiency condition.

In the multidimensional comparative research choosing indicators plays an important role, as it usually determines the research results. Indicators chosen for this research, describing individual criteria are substantively important and frequently used in other comparative analyses, whereas the data used for calculating the values of these indicators are available to the public and are of high quality.

To analyze the size of individual banking sectors the authors used the indicator showing the relation of the assets of particular banking sector to total assets of the European banking sector.

To measure the role of the banking sector in the economy the authors used the indicator of assets value of individual banking sector to GDP. This indicator is frequently used in comparative analyses, however it is not always interpreted correctly. Treating this indicator as a stimulant can lead to false conclusions. Too high value of this relation increase the risk coming from the banking sector for the whole economy and public finances, which was clearly showed by the example of Ireland, when it turned out that the problems of banking sector are too serious for Irish public finances to cope with. It is worth noting that the indicator of banking assets to GDP in this country was particularly high (around 800%). This is why in the presented analysis this indicator is complemented by indicators illustrating the value of loans and deposits to GDP.

Another criterion of evaluation is the structure of banking sectors. Within the structural criteria the authors evaluated the share of loans and deposits in the balance sheet of individual

sectors. A large share of loans in assets may indicate that banks from the given country fulfill the role of financial intermediary well. However, too large share of loans in total assets may, increase the risk of balance sheet and indicate a poorly diversified asset structure. Rate of deposits in total assets gained special significance in the post-crisis period. Deposits, especially household deposits, represent a stable source of funding for the banking business and in this context their high share may indicate a predominance of one banking sector over another.

The final analyzed criterion is the financial condition, which is understood as financial efficiency of individual banking sector. To evaluate these aspects the authors used ROE and cost efficiency measure, ie. cost to income ratio, in which the lower values are preferred.

A set of eight indicators included in the analysis is presented in the following table.

Table 1 Indicators included in the analysis of banking sectors

Indicator's name	Indicator's formula	Interpretation
Size of banking sector and its role in the economy		
Banking sector's size indicator	Assets of particular banking sector in relations to the total assets of the banking sector in Europe	Measures the size of particular banking sector compared to other banking sectors; higher value of the index is desired
Role of the banking sector in the economy (1)	Assets of the banking sector to GDP in%	Measures the importance of the banking sector in the economy of the country
Role of the banking sector in the economy (2)	Credits of the banking sector to GDP in%	As above
Role of the banking sector in the economy (3)	Deposits of the banking sector to GDP in%	As above
Structure of the banking sector		
Role of loans in the balance sheet structure of given banking sector	Share of loans in total assets of the banking sector (in %)	Measures the significance of loans in total assets and the role of the banking sector as a financial intermediary
Role of deposits in the balance sheet structure of the banking sector	Share of deposits in total assets of the banking sector	Measures the importance of stable deposits in the balance sheet total
Financial condition of banking sector		
Return on equity	Net profit / Equity	Measures the return on equity (profitability on equity capital) of the banking sector
Cost to income ratio	Operating costs of banks / Result on banking operations	Measures the cost efficiency of the banking sector

Source: Own elaboration.

Presented set of indicators was used to construct a multidimensional comparative analysis, which was based on taxonomic methods. Useful in international comparisons research is a method of hierarchical clustering, which is implemented in a statistical computer program STATISTICA. Ward's method was selected from among the hierarchical clustering methods. The choice of this method was dictated by the following features: it enables getting a spherical shape of groups or classes and gives good results in terms of high-density

distributions [12]. An important advantage of hierarchical methods is the ability of graphical recognition of the results and simple determination of the point at which the classification should be stopped. A description of this method has been omitted because of the volume of the article. Ward's method description and other methods of numerical taxonomy with an indication of algorithms and the advantages and disadvantages of individual methods can be found eg. in Walesiak's work [13]. Using this method allowed the authors to conduct a comprehensive assessment of European banking sectors, taking into account all the indicators adopted in the research. The result of the study was the distinction of homogeneous groups/classes of banking sectors in terms of the adopted criteria.

Indicators for individual banking sectors were calculated basing on a database of the European Central Bank – Statistical Data Warehouse (<http://sdw.ecb.europa.eu/>, access date: 10.26.2015).

24 EU's banking sectors undergone a thorough analysis – the ones for which a full financial data set was available. For the purpose of the research the group of countries of Central and Eastern Europe belonging to the EU include: Bulgaria, the Czech Republic, Estonia, Lithuania, Latvia, Poland, Romania, Slovakia, Hungary and Slovenia.

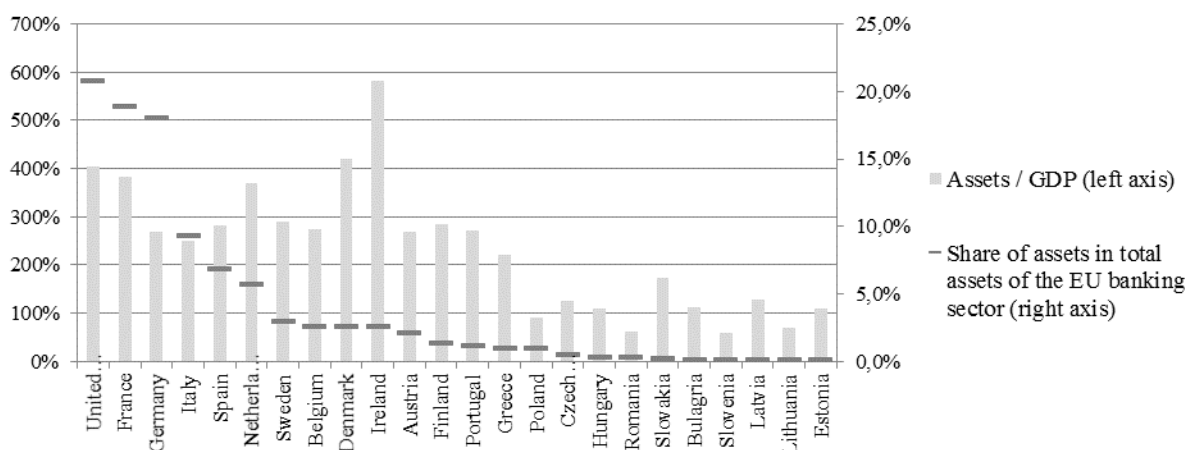
4 Results and Discussion

At the end of 2014 the value of the assets of the European banking sector amounted to 43438 billion euro and was 2.2 percent higher than year before. The share of CEE countries in total assets of the EU's banking sector is still low. At the end of 2014 it amounted to 2.33 percent and was only slightly higher than year before. The largest banking sector in the group of countries in Central and Eastern Europe is Poland, which participation in the European sector at the end of 2014 amounted to 0.9 percent and was twice higher than Czech sector's share and three times higher in comparison with the Hungarian banking sector.

The size of banking sector assets in the group of countries that joined the EU after 2014 increased between 2013 and 2014 by 2.2%, while in the group of Western countries by 1.9%.

Among the analyzed ten banking sectors of the CEE countries, the annual increase in the value of bank assets at the end of 2014 was recorded in six sectors - including Estonia (+7.5%), Lithuania (+6.0%), Latvia (5.5%) and Slovakia (5.3%). While, in the group of countries from Western Europe the increase in size of the banking sector was reported in 9 out of 14 surveyed sectors, including primarily Finland (10.0%), the Netherlands (+9.0%), Belgium (+7.9%) and Ireland (+ 6.2%).

Figure 1 The share of the banking sectors of Member States in the total assets of the European banking sector and the ratio of banking sector assets to GDP at the end of 2014



Source: own calculation based on ECB data (<http://sdw.ecb.europa.eu/>)

Analysis of the level of development of the banking sectors in Central and Eastern Europe against sectors of Western Europe must test the levels of total assets to GDP ratio, which reflect the overall development of the banking market. At the end of 2014, the average size of the analyzed relationship across the EU was 234%, while the average level in the group of countries from Central and Eastern Europe was more than twice lower - 104%.

The still low level of development of the banking sector in the CEE countries is revealed by the fact that no sector of this group exceeds the level of the assets to GDP ratio, even in the least-developed banking sector in Western Europe, which is Greece (222%).

It is also worth noting, that some banking sectors of Central and Eastern Europe reported a significant increase in the ratio of total assets to GDP in the post-crisis period, ie. after 2008, including, among others, Czech and Polish banking sectors, where the level of these relations has increased respectively by 30 and 20 percentage points.

Equally important indicator, illustrating the development of the banking market in different countries, is the ratio of loans to GDP. This paper includes a total value of loans to businesses and individuals (including consumer loans, residential loans and other consumer loans).

At the end of 2014 the average value of the examined relation for the whole EU was 160%, while in the group of Western countries the average value amounted to 264%, and in sectors of Central and Eastern Europe it reached 15%. So in this case the development gap is very significant.

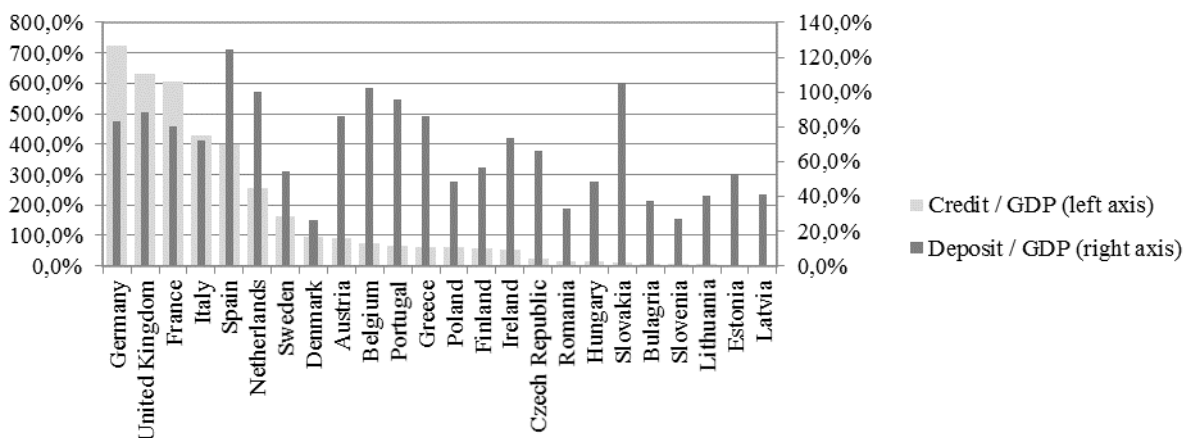
The highest level of credit debt in relation to GDP among new EU members characterized Poland, which result of 68% is comparable to the data achieved by Finland, Portugal and Greece.

It should also be noted that the development of the credit market in relation to GDP in other countries of Central and Eastern Europe is much lower. In the Czech Republic, which is in the second place in the analyzed group in terms of volume of loans to GDP ratio, it is almost three times lower than in case of Poland.

Another interesting information is the fact that, compared to 2008, only 6 out of the 24 surveyed sectors (United Kingdom, Sweden, Finland, Poland, the Czech Republic and Slovakia) reported an increase in the volume of credit debt in relation to GDP at the end of

2014. This was probably the effect of the economic downturn after the outbreak of the crisis in 2008 and a drop in demand for loans from businesses and consumers.

Figure 2 The ratio of loans and deposits of the banking sector to GDP in selected European countries at the end of 2014



Source: own calculation based on ECB data (<http://sdw.ecb.europa.eu/>)

Among the structural indicators used in this article there is also the ratio of deposits from enterprises and individuals to GDP.

The average level of the examined relation in the European banking sector established at 69.7%, wherein in Western Europe at 84.9% and in Central and Eastern Europe at 49.9%. Development gap in this case is not as deep as in the case of assets and loans in relation to GDP.

In the group of countries that joined the EU after 2004, above-average value of deposits to GDP ratio characterized Slovakia (105.5%), which ranks second in terms of the volume of the analyzed indicator across the EU, behind Spain (124.6%).

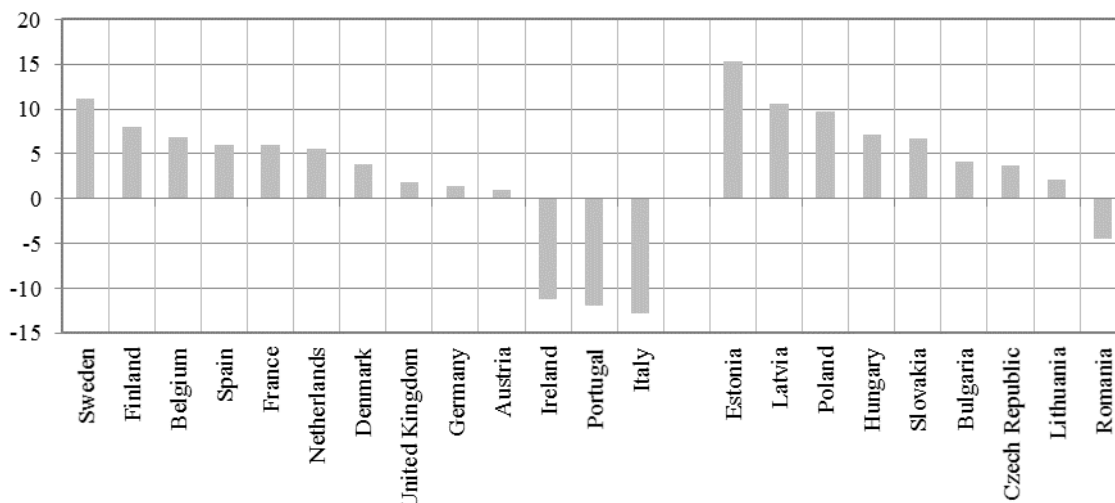
Compared to 2008, at the end of 2014 most of the banking sectors increased the level of deposits to GDP ratio. Interestingly greater ability to mobilize financial surplus of enterprises and consumers in relation to GDP characterized the countries of Central and Eastern Europe, which during 2008-2014 increased the level of analyzed ratio from 34.3% to 49.9%, (by 15.6 percentage points). At the same time, in the banking sectors of Western Europe the ratio of deposits to GDP increased by 7.3 pp.

A comprehensive comparative analysis of the European banking sector also includes the analysis of the structure of the banking sectors. The authors focused on analyzing the share of loans and deposits in assets of various banking sectors. The average share of loans in assets in the examined group of countries amounts to 40.37%. It should be noted, however, that the share of loans in assets is higher in the CEE countries than in the "old" EU. Our findings show that the difference is 17 pp. This means that the financial sectors in countries of the "old" EU are oriented more on the financial markets, which play a greater role in financing companies than in CEE's.

The third element of the evaluation of the development of banking sector is the profitability analysis, which was used ROE, describing a return on equity.

At the end of 2013, the average level of return on equity in the European banking sector amounted to 3.2%. A group of "young" banking sectors was characterized by twice higher level of return on equity (6.1%) than the EU average and five times higher than the one recorded among the sectors in Western Europe (1.2%).

Figure 3 Return on equity (ROE) in selected European countries at the end of 2013 (in %)

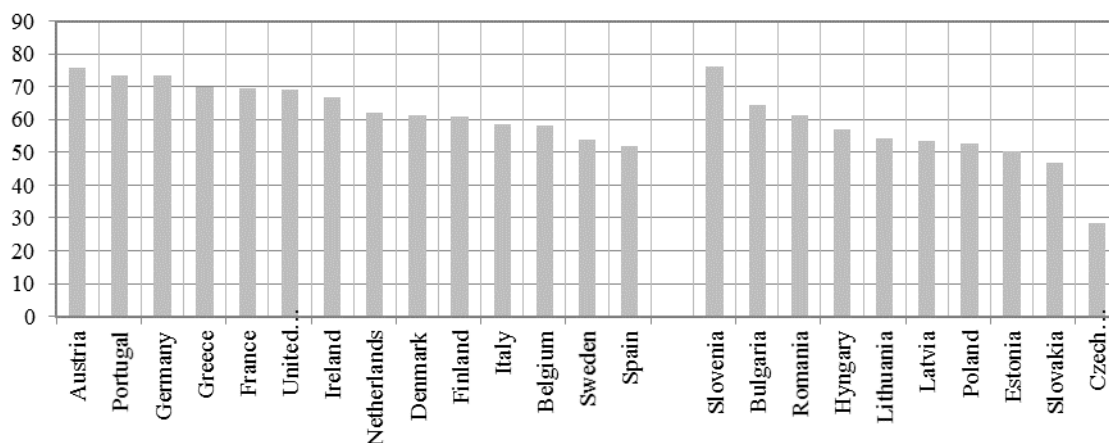


Source: own calculation based on ECB data (<http://sdw.ecb.europa.eu/>)

Profitability analysis indicates a significantly higher level of return on equity in the sectors of Central and Eastern Europe. In the examined group, only one country (Romania) recorded a negative rate of return on equity, while among the sectors of Western Europe, three - Ireland, Portugal and Italy. Moreover, Estonia, Latvia and Poland, alongside Sweden topped the sector's ranking with the highest level of analyzed index in the European Union in 2013.

High profitability of the banking sectors of Central and Eastern Europe confirm the results of the cost to income ratio (CIR rate). The average level for of the examined ratio in the EU at the end of 2013 was 60.4%, wherein in the sectors of Western Europe it amounted to 64.4% and 54,5% in the group of their competitors. Therefore, the advantage in terms of cost efficiency of "young" banking sectors is significant and reaches more than 10 pp.

Figure 4 Cost-Income-Ratio (CIR) in selected European countries at the end of 2013 (in %)



Source: own calculation based on ECB data (<http://sdw.ecb.europa.eu/>)

It should also be noted that the Czech banking sector is characterized by the highest level of the cost to income ratio (28.5 percent.) against the European competition. Below the average for the group sectors of Central and Eastern Europe, and therefore the ones with higher cost efficiency, are banking sectors of Slovakia, Estonia and Poland.

The results of multidimensional analysis using Ward's comparative method is presented in Table 2.

Table 2 Clustering of European banking sectors

Cluster	Banking sectors
1	Slovenia
2	Slovakia, Czech Republic
3	Romania, Poland, Lithuania, Estonia
4	Latvia, Hungary, Bulgaria
5	Germany, United Kingdom, France
6	Ireland
7	Sweden, Finland, Denmark
8	Spain, Italy, Netherlands, Belgium
9	Portugal, Greece, Austria

Source: own calculation

As a result of multidimensional analysis two large groups of banking sectors were distinguished. The first included all the banking sectors of the "old" EU, while the second contained the CEE's banking sectors. Such a division means that the banking sectors of CEE countries differ greatly in size, structure and financial condition. These differences, in our opinion, were intensified by the recent global crisis, which to a greater extent affected the banking sectors of the "old" EU. Finally the analysis led to distinguishing nine homogenous groups of banking sectors in the EU. None of the banking sector from CEE countries was in the same group with the banking sector from the "old" EU.

5 Conclusions`

In summary, the analysis of the level of development of the banking sectors of Central and Eastern Europe against their Western competitors identified three main issues.

First of all, the banking sectors of CEE are catching up with developed European banking sectors. This process is also supported by the slower development of the banking sector in the EU. In comparison to the data from the beginning of the financial crisis (2008), "young" banking sectors were generally characterized by higher growth of penetration rates, showing the relation of certain balance sheet items to GDP.

Secondly, it cannot be indicated that the banking sectors of Central and Eastern Europe are approaching the European average in terms of the main indicators of the development level. In many markets the development gap remains substantial, and penetration rates are low compared to other banking sectors in the EU.

Thirdly, multidimensional comparative analysis allows to note that the banks' financial efficiency, in the sectors that joined the EU after 2004, is in most cases higher than in the "old" EU. The essential features of "young" banking sectors are generally high return on equity and high cost effectiveness, reflected in low cost to income ratio. This is extremely important in the context of expanding the capital strength of the banking sectors in Central and Eastern Europe and building a protective buffer against the crisis.

The conducted multidimensional comparative analysis shows that the banking sectors of Central and Eastern Europe (the study included 10 countries) do not constitute a homogenous group in terms of financial efficiency. More homogenous group of countries is created only by

Poland, Lithuania, Estonia and Romania. It should also be noted that the banking sectors of Central and Eastern Europe do not constitute a homogeneous group of sectors with Western European sectors.

In case of Western European banking sectors a slightly higher level of homogeneity can be noted. Studies indicate the existence of one large homogenous group consisting of Spain, Italy, the Netherlands, Belgium.

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RISK MANAGEMENT METHODS AND BANKS' FIRM SIZE

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ABSTRACT

In this study on EU level sample from European Banking Authority database I analysed relationship between firm size and the choice of regulatory risk methodology (credit, market and operational risk). Based on my analysis emerges that the larger institutions are more inclined to apply more advanced methods. This is a favourable tendency from system risk point of view, since it is important that institutions with potentially higher systemic risk influence apply more conscious risk management. Statistical tests do not show that between 2008 and 2010 there would have been more intensive shifts towards advanced methods than in 2010-2013, even if one would think that with focus on mitigation of economic and financial crisis and regulatory changes would push banks for other tasks to be solved.

Keywords: risk management, banking sector, capital requirement calculation

JEL codes: G21, G32

1 Introduction

Owing to modern regulations and internal considerations, financial institutions pay increasingly careful attention to their risks. Until the 1990s the focus had been on credit and market risks, since beginning/ mid of 2000's also high interest had turned towards operational risk as well. It is worth examining what are the common characteristics of the financial institutions applying more advanced risk measurement approach.

Capital allocation means a specific dam against potential losses of depositors or those who provides loans for the bank, as all of the three main risk types means risk of losses. The literature on risk management defines credit risk as the risk of loss stemming from a debtor's non-payment, while market risk is defined as the risk of loss stemming from a change in the market price of financial assets. Meanwhile operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. The Basel II/ CRR/ CRD Directive framework obligatory for every financial institution in the European Union from the 1st January 2008, it is required to separately allocate capital for different key types of risks. My primary focus in this paper is on Pillar 1 capital requirements types, namely credit risk, market risk and operational risk. In all cases of these three key risk types the regulator require to apply adequate capital allocation methodology ranging from simpler approach to advanced, model based approach. More specifically, in case of market risk: standardised approach versus internal model approach (IMA), in case of credit risk: standardised approach versus internal rating based (IRB) approach, in case of operational risk: simpler basic indicator approach (BIA) or standardised approach (TSA) approaches versus advanced measurement approach (AMA). In this paper I survey the overall European level choice of methods and study how size is influencing choice of risk methods. First I highlight the literature related to my research, thereafter I

describe the data I used. Third I highlight the method choice separately for the three key types of risk, finally I do analyse statistically the shift of method choice between 2008 and 2010 and between 2010 and 2013.

2 Literature Review

In the literature, we only find a few examples on analysis of the correlation between institution size and risk management practice. Although there exist pieces of the literature (e.g. [1], [2]) which present overall best practices, but these do not analyse the underlying driving mechanisms. Therefore, as far as I know, my analyses prepared on the international, and on my home-country (i.e. Hungarian) samples are novelties: I have already published certain results in my own previous publications (see in essence [6]). Helbok-Wagner (2006) (i.e. [3]) concludes that in the early stages of operational risk management (between 1998 and 2001), the institutions with lower profitability disclosed more detailed data regarding their operational risk profile and operational risk management practice. The authors' explanation to this fact is that more profitable institutions depend less on higher transparency, while institutions with poorer performance can only improve their judgement by more developed risk management and with high-level disclosure. Although for example [4] and [5] presents a database consisting of 100 banks in connection with operational risk management data and methods, these OR&C articles do not contain any detailed statistical analysis. In my earlier research ([6]) I have highlighted that how operational risk loss exposure and firm size are correlated positively and also firm size and advancement are positively related, meanwhile no significant relationship is observable between operational risk method and profitability contrary to results of Article [3] already referred.

3 Data and Methodology

The data analysed in this paper are based on the European Banking Authority Supervisory Disclosure data (<http://www.eba.europa.eu/supervisory-convergence/supervisory-disclosure/aggregate-statistical-data>). The database contains separate spreadsheets for each of the years (currently from 2007 to 2013) with several focuses: basic data, credit risk, market risk, operational risk, and supervisory action and measures. The main descriptive data of the database could be found bellow in table 1. Data from 2007 are not valuable, as that time switch for Basel II was only optional.

Table 1 Descriptive statistics of EBA supervisory disclosure database

Descriptive statistics	2008	2010	2 013
Total assets (mn €)	45 309 818	42 444 016	42 074 134
Total GDP (mn €)	11 502 644	12 706 891	13 019 818
Number of institutions	7 134	6900	6 580
Total capital requirements (mn €)	1 428 664	1 291 324	1 159 049
Total capital (mn €)	3 836 448	3 930 917	4 038 221
Tier 1 capital (mn €)	2 943 868	3 325 189	3 597 567
Tier 2 capital (mn €)	1 122 282	750 888	442 136
CAR (%)	21,5%	24,4%	27,9%
Total asset/ GDP (%)	394%	334%	323%

Source: EBA (own calculations)

As one can see from Table 1 between 2008 and 2013 large deleveraging, enhancement of capital adequacy and capital quality (i.e. shift toward Tier 1 capital) were characterising European banking sector.

In this analysis I focus on credit institutions, even if data on investment firms are also published, but they are representing smaller focus within the overall financial intermediation. In the coming chapters mainly simple descriptive statistics and visual inspection are highlighted, however for the shift of methods between 2008 and 2010 and between 2010 and 2013 statistical testing is also used (Related sample sign test, Related samples Wilcoxon signed rank test).

Finally I should mention that the data quality of this EBA database is not at that high level, as one would expect. That is why lot of data cleaning efforts had to be done by me, but after that the database got a stage to be analysed in a proper way.

4 Results and Discussion

The aggregate result shows that in line with the fact that main purpose of banks to intermediate between saving and borrowing, credit risk is the overwhelmingly dominating part of capital requirement (see Table 2). In average since 2008 the market risk capital requirement's portion has been somewhat increased it might be related with the increased volatility on the markets.

Table 2 Average share in own fund requirement under pillar 1 – European average (unweighted)

	2008	2010	2013
Market risk part	3,0%	3,2%	3,3%
Operational risk part	7,6%	8,7%	9,5%
Credit risk part	89,5%	88,1%	87,2%

Source: EBA (own calculations)

As Table 3 shows in cases of all three major risk types internal model based approaches are not dominating in both of number of institutions and of own fund requirements. However in all cases own fund requirement based share is higher than number based share, from which we could conclude that larger institutions are tending more toward advanced approaches. Relatively higher proportion of market risk more advanced approach is related to its longer past (already in Basel I) than credit and operational risk. Headline numbers indicate that between 2008 and 2010 switch towards more advanced approaches was more intensive than between 2010 and 2013 (change in own funds' requirement approach in terms of own fund requirements: credit risk: +5,9% vs. +3,1%, operational risk: +9,5% vs. +4,2%). However it should be mentioned that more detailed, country level analysis is needed to check this relationship on a more robust statistical basis. In the following subchapters I will analyse these relationships in more detail by risk type and in some cases by country.

Table 3 Capital calculation approach share by average by number and capital requirement part (unweighted averages)

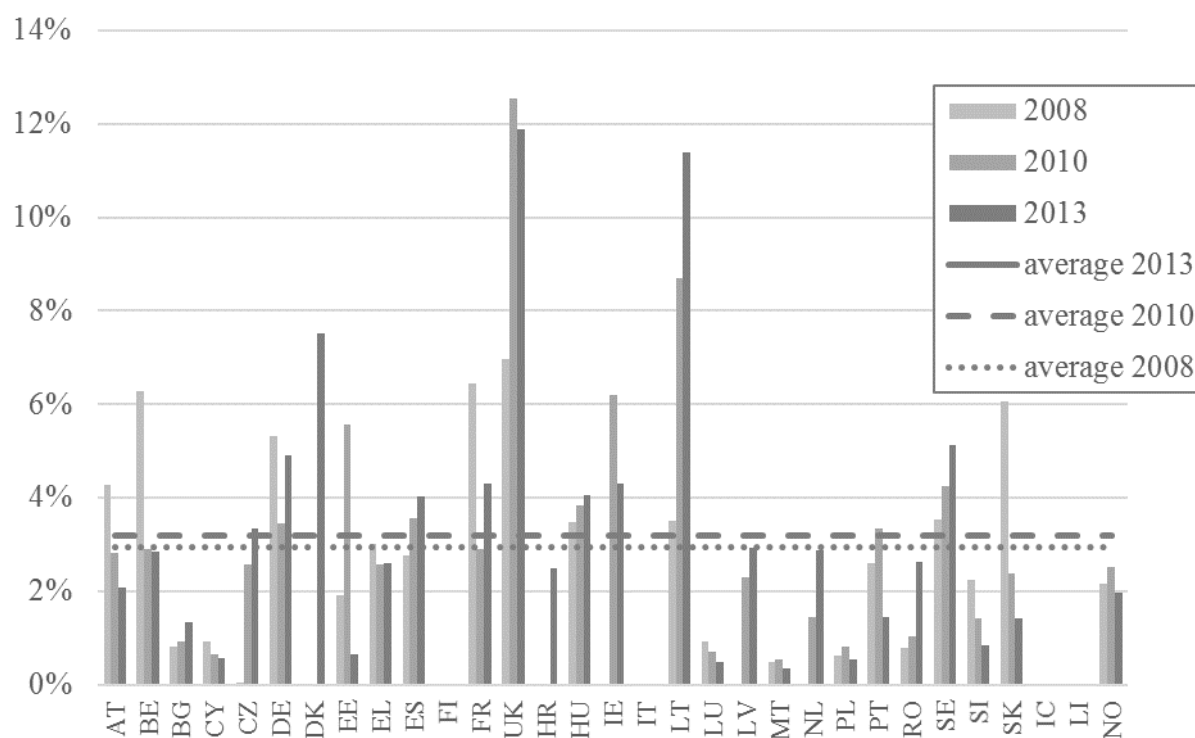
Method choice		2008	2010	2013
Market risk IMA	By number	31%	23%	19%
	By own fund req.	34%	27%	32%
Credit risk IRB	By number	13%	12%	13%
	By own fund req.	30%	35%	39%
Operational Risk AMA	By number	5%	6%	6%
	By own fund req.	8%	18%	22%

Source: EBA (own calculations)

4.1 Market risk

As already mentioned unweighted average of share of market risk capital in 2008 was 3.0%, in meanwhile 2013 it was 3.3%. Larger share is only typical for some countries only, from which UK could be reasoned by its deep financial markets and banks' participation in that, however Lithuania's high share is counterintuitive.

Figure 1 Market risk capital as of total capital requirements (%)

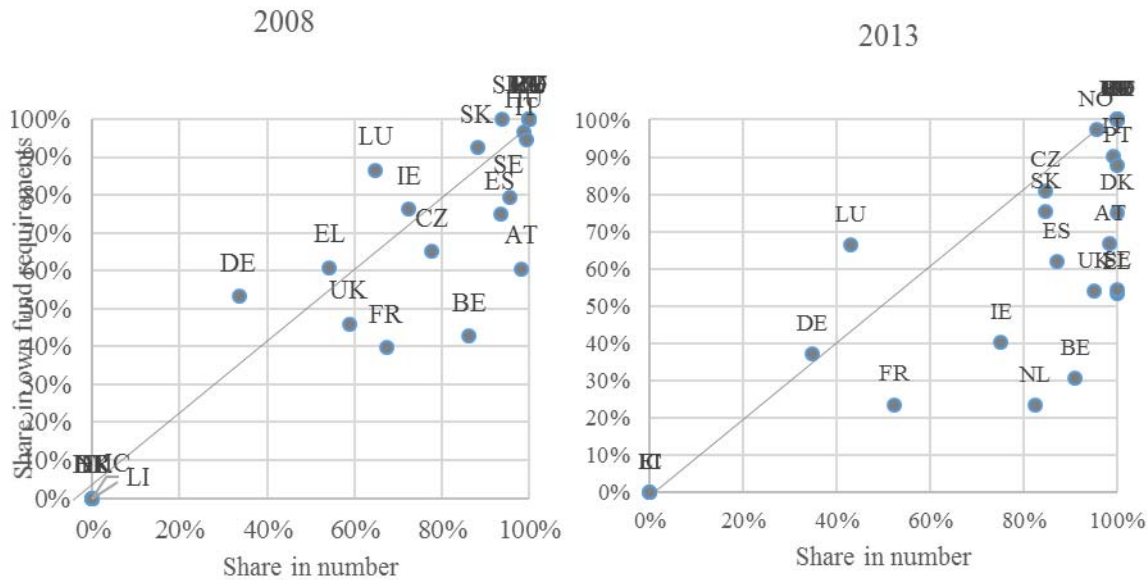


Source: EBA (own calculations)

As Figure 2 shows majority of banks are using standardised approach for market risk capital allocation. In lots of countries in 2013 only standardised approach were used: e.g. BG, CY, DK, EE, HU, LT, LV, MT, PL, SI. Capital requirements based proportion of banks using standardised approach is less than proportion based on number of banks, thus banks using internal model are larger (with larger market risk exposure). From 2008 bilateral movement

was observable in some countries increase of usage of standardised and in some countries decrease.

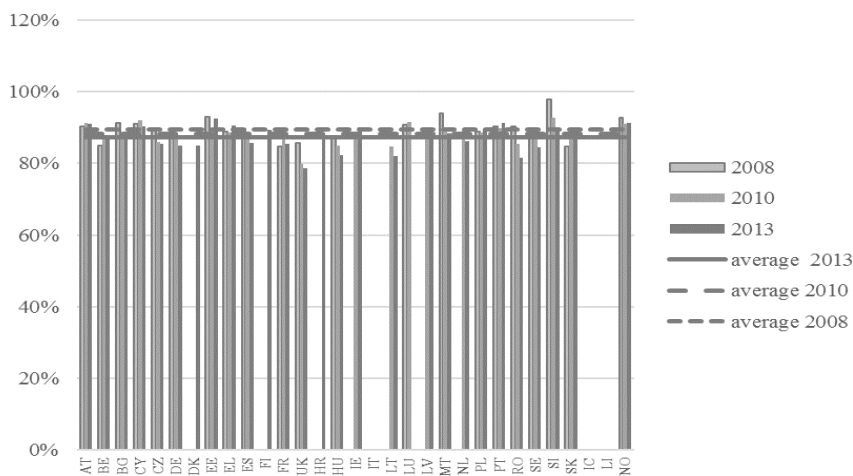
Figure 2 Share of banks using market risk standardised approach by number and own requirements



4.2 Credit risk

As already mentioned credit risk is dominating in terms of share of capital requirements. Unweighted average share was 89.5% in 2008, 88.1% in 2010, 87.2% in 2013. Among different countries remarkable dispersion could not be observed.

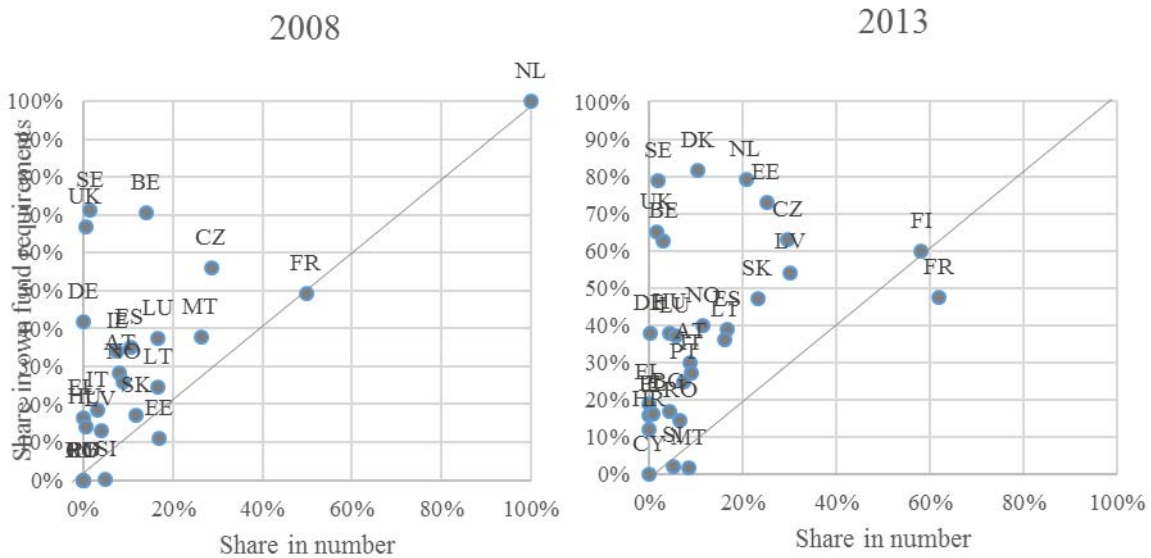
Figure 3 Credit risk capital as of total capital requirements (%)



Source: EBA (own calculations)

Majority of banks applies STA method in terms of number and size for credit risk. Between 2008 and 2013 IRB usage increased (Based on number: 2008 – 12.7%, 2010 – 11.5%, 2013 – 12.7%, Based on capital requirement: 2008 – 30%, 2010 – 35%, 2013 – 39%), mixed movements, seems to be slow down between 2010 and 2013. Capital requirements based proportion of banks using IRB is higher than proportion based on number of banks, that means IRB banks are larger.

Figure 4 Share of banks using credit risk internal rating based approach by number and own requirements

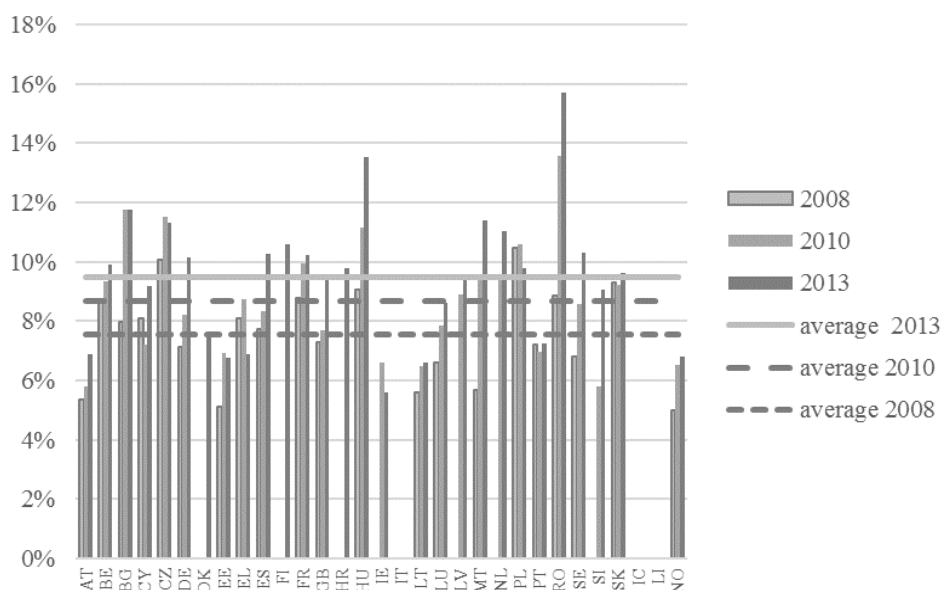


Source: EBA (own calculation)

4.3. Operational risk

Unweighted average of share of operational risk capital was 7.6% in 2008, 9.5% in 2013 in capital requirements. The dispersion of this proportion is less than it is the case for market risk. Higher share is in case of CEE countries, as income should be prepared for higher risks.

Figure 5 Operational risk capital as of total capital requirements (%)



Source: EBA (own calculations)

The usage of advanced measurement approach slowly started to increase, however during 2010-2013 lower increase was observable than between 2008-2010. Majority of banks in terms of numbers using BIA (BIA: 72%, TSA: 23%, AMA: 7%), meanwhile in capital requirements at standardised approach is the majority (BIA: 28%, TSA: 50%, AMA: 23%). Straight move for advanced method was observable (number of institutions: 2008 – 4,8%, 2010 – 5,8%, 2013 – 6,4%, capital requirements: 2008 – 8,1%, 2010 – 17,7%, 2013 – 21,9%). Moreover as capital requirements based proportion of banks using advance approach is higher than proportion based on number of banks, banks using advanced approach are larger. Between 2010 and 2013 signs of slower switch for AMA were observable.

Figure 6 Share of banks using operational risk advanced measurement approach by number and own requirements



Source: EBA (own calculations)

[6] (i.e. Homolya (2013)) provides overview on literature how firm size and operational risk exposure is positively related (larger institutions have higher operational risk loss exposure, which is driven mainly by frequency). That is why interesting particularly that larger institutions are using more advanced methods.

4.4 Statistical testing of approach switch between 2008 and 2013 and existence of switch slow-down between 2008-2010 vs. 2010-2013

In this subchapter I test the hypothesis whether the share of advanced method users are statistically significantly higher in 2013 than in 2008. Moreover I test whether after 2010 switch for advanced methods has been slowed down or not. For statistical testing I apply Wilcoxon signed-rank test and related samples sign test to be built in SPSS program package. The Wilcoxon signed-rank test is a non-parametric test used when comparing two samples, matched samples to assess whether their mean ranks differ. Contrary to the Wilcoxon test the related samples sign test do not focus on the ranks, but only the signs of differences. The null hypothesis in these tests is that the median of differences is 0. Of course these tests are only statistical test and could report about falsifiability of the null hypothesis and could provide perfect surety.

For testing I do use the full EU sample (24 countries filtering out countries with not adequate data: DK, FI, NL, LI, IC, NO, HR) and CEE sample (10 countries) is also applied. Considering CEE countries we do see that usage of advanced method for market risk is less widespread, than European average, however in case of credit and operational risk we do not see that level of difference (see Table 4). As already Table 3 showed for EU level total based on CEE sample we could observe that generally own fund based proportion of more advanced method user banks are higher, which is in line with the earlier mentioned results of Homolya (2013) ([6]).

Table 4 Advanced user banks' share in CEE countries

CEE average	by type	MarkRisk IMA average	CreRisk IRB average	OpRisk AMA average
2013	By number	2,80%	13,11%	9,10%
	By own fund req.	3,95%	33,94%	26,53%
2010	By number	3,60%	11,13%	7,73%
	By own fund req.	1,60%	25,69%	16,79%
2008	By number	4,11%	7,60%	4,92%
	By own fund req.	4,59%	12,36%	5,24%

Source: EBA (own calculations)

As the table 5 below shows share of advanced method user credit institutions significantly differs in 2013 from in 2008 for credit risk and market risk unequivocally, in case of market risk not. However, if we test the difference in changes in share of advanced method users between 2008 and 2010 and between 2010 and 2013 we get statistically insignificant difference. Based on table 6 we could not state that after 2010 a significant slowdown of switch for more advanced methods would have been observable.

Table 5 Statistical test of matching of 2008 and 2013 advanced methods' share (significance)

Shares 2008 vs. 2013 (significance)	Full sample		CEE sample	
	Related sample sign test	Related samples Wilcoxon signed rank test	Related sample sign test	Related samples Wilcoxon signed rank test
MR STA Number based 2008 vs. 2013	0,607	0,363	0,625	0,273
MR STA Own fund requirement based 2008 vs. 2013	0,143	0,022	1,000	0,686
CR IRB Number based 2008 vs. 2013	0,027	0,122	0,039	0,066
CR IRB Own fund requirement based 2008 vs. 2013	0,093	0,024	0,021	0,007
OR AMA Number based 2008 vs. 2013	0,017	0,101	0,021	0,022
OR AMA Own fund requirement based 2008 vs. 2013	0,004	0,000	0,002	0,005
N=sample size	24	24	10	10

Note: Grey fill means significance with higher than 95% level.

Source: EBA (own calculations)

Table 6 Statistical test of matching of 2008-2010 and 2010-2013 change of advanced methods' share (significance)

Share difference of 2008-2010 vs. 2010-2013 (significance)	Full sample		CEE sample	
	Related sample sign test	Related samples Wilcoxon signed rank test	Related sample sign test	Related samples Wilcoxon signed rank test
MR STA Number based 2008-2010 vs. 2010-2013	1,000	0,820	0,625	0,715
MR STA Own fund requirement based 2008-2010 vs. 2010-2013	0,002	0,006	0,375	0,138
CR IRB Number based 2008-2010 vs. 2010-2013	0,832	0,592	0,754	0,721
CR IRB Own fund requirement based 2008-2010 vs. 2010-2013	1,000	0,784	0,754	0,959
OR AMA Number based 2008-2010 vs. 2010-2013	0,286	0,445	0,344	0,878
OR AMA Own fund requirement based 2008-2010 vs. 2010-2013	0,523	0,263	1,000	0,878
N = sample size	24	24	10	10

Note: Grey fill means significance with higher than 95% level.

Source: EBA (own calculations)

5 Conclusions

Summarising the results of the paper, our most important result is that institution size has an important effect on risk method selection. That is, larger institutions may potentially incur greater total loss, at the same time, with the fixed costs related to risk management, they may be more inspired to use more advanced methods. Summarily these results are congruous with our basic intuitions, however, it is important to highlight that altogether; this is a favourable tendency from a systemic risk point of view, since it is important that institutions with potentially higher system risk influence apply more conscious risk management. Switch for

more advanced risk calculation approaches had no statistically different speed up between 2008 and 2010 and between 2010 and 2013, even if it would be intuitive based on current pressure on banks. It is interesting to see that until current times regulators had higher efforts to use more sophisticated approaches, but with the recent crisis culminated this enthusiasm seems to disappear, as Stefan Ingves, Chairman of Basel Committee has been expressed in recent speech ([7]: Ingves (2015)): “*When it comes to addressing the weaknesses in the RWAs framework, we can distinguish between three broad areas. The first of these is policy measures that directly limit the degree of RWA variability. This could be done by placing greater emphasis on standardised measurement approaches. Another way is by limiting the flexibility banks have in determining internal model-based estimates of RWAs.*” We will see the future developments, however I do think that advanced methods have own benefits besides their own weaknesses. Every wise change should be welcomed, hopefully benefits could be saved in this process.

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IMPACT OF TAX REVENUES ON THE STATE BUDGET BALANCE AND PUBLIC DEBT IN THE YEARS 2004 – 2013 – FOCUSING ON THE SR - SELECTION

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ABSTRACT

In conditions of SR the tax revenues represent in average 80% of the total revenues of the state budget. The volume of the collected tax revenues largely depends on the interest of the government to exercise a proactive tax policy and also on the ability of tax administration to eliminate tax evasions. The effective collection of taxes is an important factor to reduce, respectively to keep the government deficit below the level of 3% of GDP and to maintain the public debt below 60% of GDP, that correspond to the convergence criteria for the sustainable position of public finance. The monitoring of a relationship between the government budget balance, government debt and tax revenues in the Slovak Republic for the period of 2004 - 2013 are subject to the methods of investigation - especially the method of analysis, comparison and graphical method.

Keywords - balance of the state budget, state budget deficit, public debt, tax revenues, direct taxes, indirect taxes

JEL codes: H60, H69

1 Introduction

An irreplaceable role in the monitoring of the macroeconomic development of the state and of its financial situation, with its balance of revenues and expenditures, represents the state budget. The monitoring of the budget balance and public debt in SR is characterized, during the ten-year period (2004 - 2013), by the changes that are significantly affected by global crisis and its consequences. In general it was confirmed, that the high volume of budget deficits implicate an unsustainable growth of the public debt. [6].

Despite to the fact that the use of the Maastricht criteria and the Stability and Growth Pact has led to some recovery of public finances in the EU, there has been a slowdown in the economic growth. The consequence of this fact was the creation of budget deficits. These countries did not create during their economic boom sufficient reserves for a following period of the recession. Consequently it has led to the decrease of public revenues. [10].

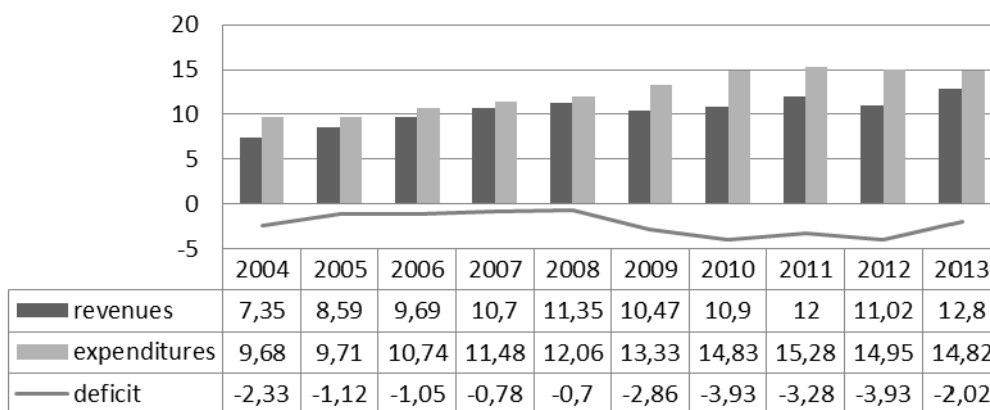
In order to consolidate public finance and to recover the economy, there were proposed several measures in Slovakia and also in the most EU Member State. These measures were related to the lowering of the government debt and to the increase of sources aimed to finance and cover the state debt. The measures were concerned not only to the reduction of budget expenditures, but also were focused on their income side. There were adopted several "packages of measures" that modify the tax rates, the tax bases, a classification of goods and services liable to higher, respectively lower VAT rate, ...by the higher tax rates were taxed the goods liable to exercise duties and so on. The tax measures should of course respect valid

legislation of the country, especially with the focus on the legislation related to the support of entrepreneur policy and the policy of employment. [11].

2 Revenue, expenditure and the deficit of the state budget

For the chosen period 2004-2013, total amount of expenditure has exceeded the total amount of revenues in the Slovak state budget. Slovak republic has reported in this period a budget deficit that had an unstable character.

Chart 1 Revenues, expenditures and the deficit of the state budget in billions EUR (2004 – 2013)



Source: own collaboration of the data, 2014 [2].

In terms of a ratio of total revenues and expenditures of a state budget, the most common type of the Slovak state budget is its deficit.

The years 2004 to 2008, except the year 2006, can be judged as the best years in Slovak republic in connection to the budget deficit. During this period, the deficit was below the level of 3% of GDP that was one of the basic requirements for a membership of our country in the European Union. However, this period is also associated with the efforts of SR to achieve and to fulfil the convergence criteria required for a membership in the EMU. For the chosen period up to this moment, we can briefly summarize the development of the budget deficit in SR in the following conclusions:

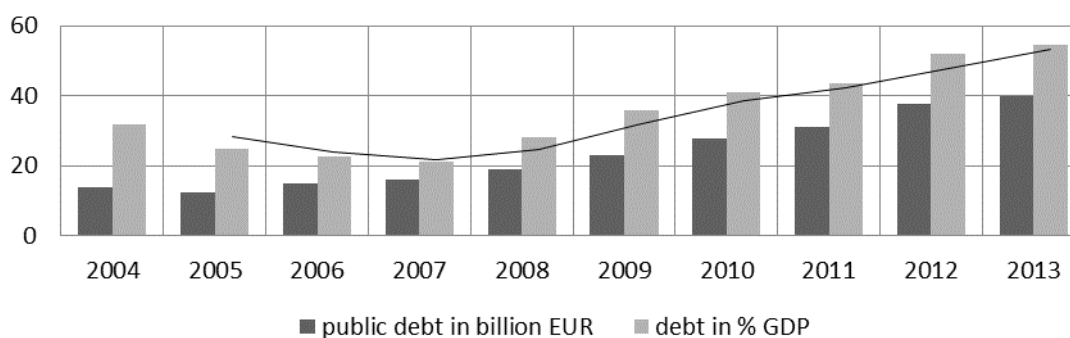
- In 2008, the deficit of the state budget reached the level of 2,2% of GDP, that represent more than 0,7 billion EUR. The level of revenues was fulfilled up to the level of 98% of a plan. The best collection was achieved in relation to the income tax (this area was fulfilled up to the level of 110%) and expenses were fulfilled to the level of 96% [7],
- The year 2009 represents the year with the highest state budget deficit since 2004. In comparison to the previous year, it has increased by 4,6% and has reached the level of 6,8% of GDP (2,86 billion EUR). At the same time, there has been broken one of convergence criteria (the deficit has exceeded the threshold of 3% of GDP). Following this fact, the European Council has started to apply an excessive deficit procedure towards Slovak republic [8],
- In 2010, the Slovak Republic has failed to fulfil the aim of initiating budgetary consolidation of public finances due to the fact that the deficit has reached the level of 7,54% of GDP. It has represented more than 3,9 billion EUR. Currently, there were repeatedly exceeded budget plans that were set on the level of 5% [9],

- the year 2011 was represented by the growth of the Slovak economy by 3,3%. Due to this fact the Slovak republic was one of the most fast growing economies within the Eurozone area. In this year, the budget deficit has increased by 4,76% of GDP. This situation was partially reached due to the better tax collection. [1],
- In year 2012, the deficit of the state budget has reached the amount more than 3,9 billion EUR, that was represented by 4,48% of GDP,
- In 2013, the government of Slovak republic has achieved the goal of reducing the government deficit below 3% of GDP to the level of 2,77%. Thus, the deficit has reached its lowest value since 2009. Consequently, the European Commission has stopped to apply the excessive deficit procedure towards Slovakia,
- For the year 2014, there was set the deficit in amount of 2,64% of GDP, but according to the estimations of the European Commission, the deficit has reached the level of 2,93% of the economy performance. In any case it was kept below the level of 3%
- In 2015, the Slovak government has set its objective in achievement of a deficit of 1,98% of GDP and thus handle with the deficit in amount of 2,44 billion EUR. For the following two years, they have even more optimistic view, as there is a forecast for the year 2016 to reach the deficit on the level of 1,43% of GDP. In 2017, there should be the deficit in the level of only 0,39% of GDP. The Slovak government plans to reach the higher level of tax collection that would contribute to the reduction of the deficit.

2 The debt of the public administration

Just, a growing deficit of the public finance, contribute very significantly to the deepening of the public debt of the relevant country. In the conditions of Slovakia, for the chosen decade, the debt of the public administration did not exceed the level of 60% of GDP – there were not exceeded any Maastricht criteria.

Chart 2 The debt of the public administration in SR in billion EUR and % of GDP for the period of 2004-2013



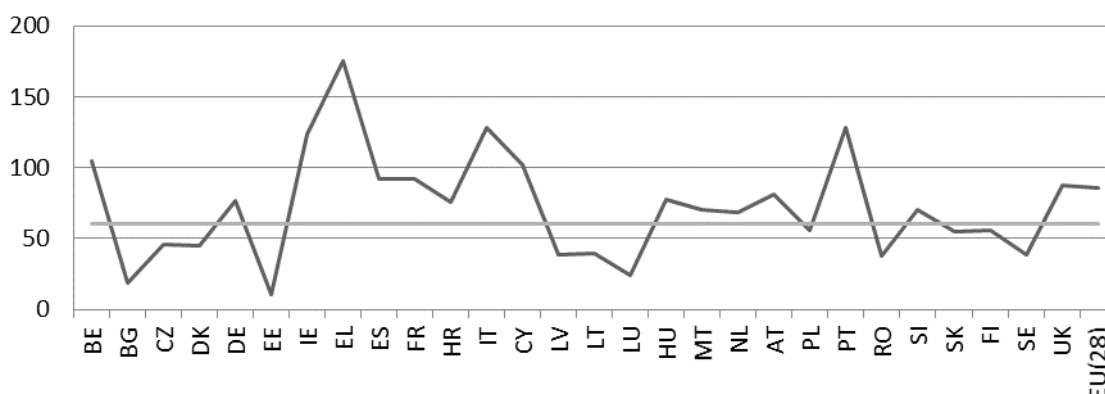
Source: own collaboration based on the data, 2014 [3].

From 2004 until the end of 2008, there was a decrease of the government debt to the level of 28,20% of GDP. It was deep below the limit set by the Maastricht criteria. The year 2009 represents the period of a sharper rise in public debt, in a comparison with the year 2008 up to the level of 36% of GDP. This level is represented by nearly 23 billion EUR. The main factor affecting the increase of the public debt was the financial and economic crisis, that are significantly reflected into the government deficit in the form of lower tax revenues and social contributions, the applied expansionary fiscal policy and an outflow of resources used to

finance and cover the state debt. [1]. In the following years, there was the increase of government debt up to the level of 54,6% in 2013.

Despite to the relatively high level of the government debt, Slovak republic is one of the countries that have relatively low debt and keep the level of their debt below the average level of the debt within the all EU countries and the countries of the Eurozone area. However, one of the negative sides is the rate of the economic growth of a public debt for the last six years. In relation to the performance of the economy, the debt had an increasing tendency by the sixth fastest rate among all EU Member States. A faster rate than in our country was only in countries such as Greece, Ireland, Spain, Portugal and Cyprus.

Chart 3 The debt of the public finance in countries of EU for the year 2013 in %

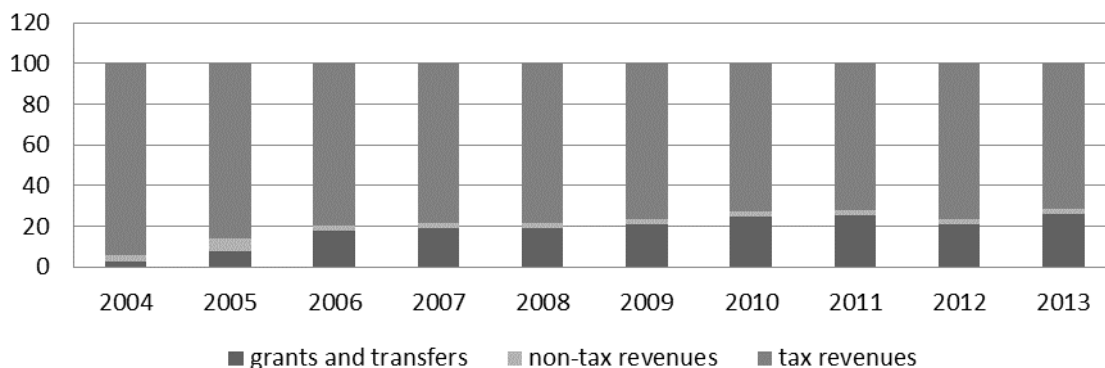


Source: own collaboration based on the data, 2014 [3].

3 Tax revenues of the state budget in Slovakia (2004 – 2013)

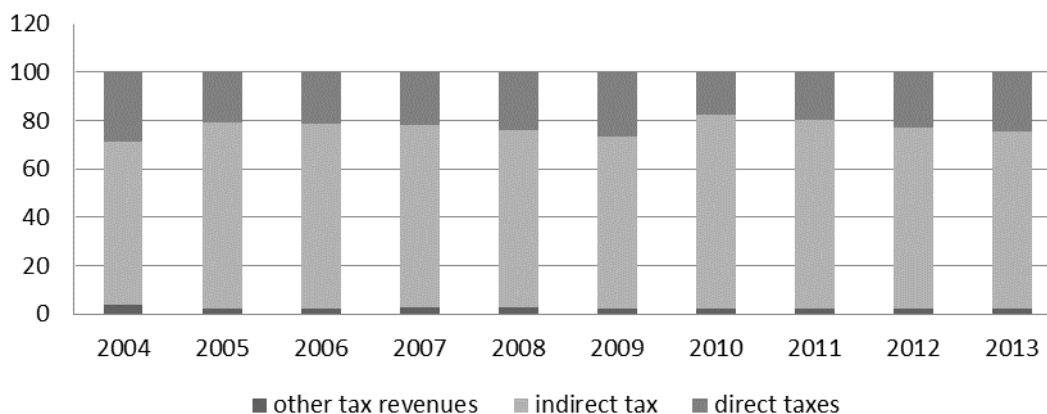
The largest and the most important component of the Slovak state budget revenues represent the tax revenues. Non-tax revenues have only negligible impact on the state budget revenues (fines, penalties, court fees, administrative fees, etc.). Grants and transfers represent the significant proportions of state budget revenues, especially those that flow from the EU budget.

Chart 4 The ratio of tax revenues, non-tax revenues, grants and transfers on the total amount of the state budget revenue in Slovakia (2004 – 2013)



Source: own collaboration based on the data, 2014 [4].

Chart 5 The ratio of direct taxes, indirect taxes and other tax revenues on the total amount of revenues of Slovak state budget (2004 – 2013)

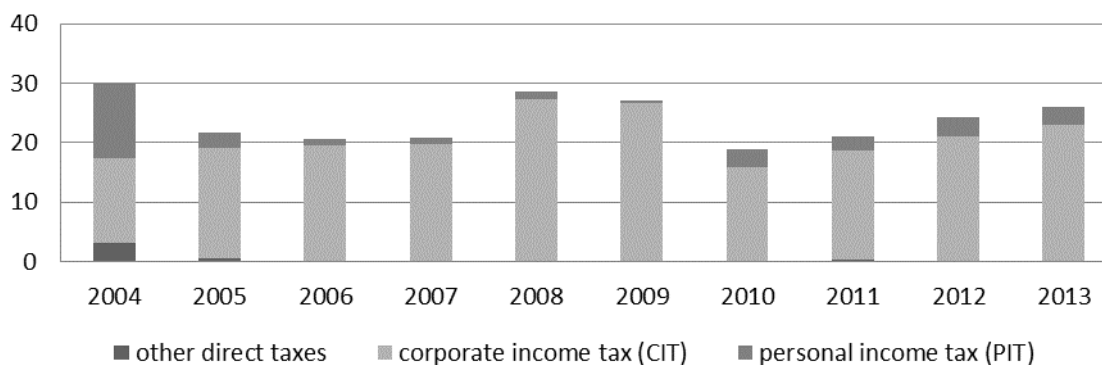


Source: own collaboration based on the data, 2014 [5].

Based on a deeper analysis of the tax revenues of the state budget for the chosen period of the last 10 years, the other tax revenues represent only a negligible part of the total state budget revenues (withholding tax, taxes on the international trade and transactions - such as import duties, import additional charges, customs penalties and so on as well as the fines resulting from the tax audit). In the Slovak Republic, the indirect taxes represent the largest amount on the revenues of the state budget. Their volume is represented by more than 60%.

The significant decline in the collection of income taxes in 2005 was due to the fact that a substantial proportion of the income tax paid by the individuals was transferred to the budgets of municipalities and higher territorial units – the mentioned tax has become a proportional tax.

Chart 6 The ratio of direct taxes on the total amount of tax revenues of the Slovak state budget



Source: own collaboration based on the data, 2014 [5].

The other direct taxes have in the Slovak state budget a minimum proportion (property tax and motor vehicle tax). Already in 2004, the motor vehicle tax represented the revenue of the state budget. However, from the next year, the tax revenue based on this tax has fully passed to the budgets of higher territorial units. Also property taxes (inheritance tax, gift tax and tax on transfer of property) were abolished in 2004 (in 2005, the revenues of the state budget consists of the payments that had their maturity in previous years). The decline in a collection of direct taxes was caused by the introduction of a unit tax rate in amount of 19% that was

applied to all income of individuals and corporations. The sharp drop in the amount of personal income tax flowing into the state budget in 2005 and in subsequent following years was caused by the decision regarding the fact that also this type of the tax has become a proportional tax. The largest amount of the revenues derived from this tax is flown to the budgets of municipalities and higher territorial units. The largest volume of the Slovak state budget revenues is represented by the corporate income tax.

Chart 7 The ratio of indirect taxes on the total amount of tax revenues of the Slovak state budget



Source: own collaboration based on the data, 2014 [5].

In the case of indirect taxes, we can see a relatively balanced process of tax revenues. The lowest amount of the collected value added tax for the chosen period of 10 years was in 2004 (even compared to the previous year 2003, there was an increase due to the introduction of a unit tax rate, due to the harmonized conditions related to the refund of VAT excesses and also due to the introduction of a lower threshold for a compulsory VAT registration, the result of that was an increase in the number of VAT payers). From the excise duties, the largest proportion of the collected tax was represented by the tax income from mineral oil and from tobacco products. [12].

4 Conclusions

In order to consolidate public finance, there were adopted and implemented several tax measures in the Slovak Republic and also in other EU countries. It can be concluded that these measures have influenced very significantly the revenue side of the state budget as well as the elimination of the government debt. Despite to this fact, the state still persists in its effort and is still adopting additional measures in the area of taxation aimed to combat tax fraud and tax evasions.

During the chosen period of the last ten years (2004 - 2013), the most significant government deficit was reached in Ireland in 2010 (32,4%). Conversely, the lowest government deficit for this period was reached within the EU country in Denmark, Estonia and Latvia. In most cases, these countries have applied the restrictive policy as well as the adjustments in taxation area (increase in rates of VAT and of the rates of certain excise duties, especially on alcohol and tobacco).

In 2013, the compliance of one (from five) convergence criteria – to keep the state budget deficit at the level of 3% of GDP have fulfilled 18 Member States, including the Slovak Republic. This standard did not fulfil 10 EU countries (Slovenia, Greece, France, Ireland, Spain, Croatia, Cyprus, Poland, Portugal and the United Kingdom).

The debt of the public administration in EU countries has started to increase notably since 2009, as a result of the global crisis. Since 2006, Greece is making very bad results in this way. From the mentioned year, the relevant amounts are exceeding the level of 60% of GDP,

the total public debt of the public finance is above 100%. In 2013, the mentioned criterion was met in 12 Member States, including the Slovak Republic.

For the respective chosen period in all EU countries represent the tax revenues the most important source of the state budget revenues. The highest share of tax revenues (over 70%) is reported by Denmark, Ireland, Sweden and the United Kingdom. Conversely, the lowest share of tax (less than 50%) is recorded in the Czech Republic, Slovakia and Lithuania. In the structure of total tax revenues of EU countries, the direct tax revenues (65,6%) significantly outweigh revenues derived from the indirect taxes (35,4%). The most significant representation of the indirect taxes from the total amount of the state budget revenues is in a tax system of Lithuania, Bulgaria, Estonia, Croatia, Romania, Poland and Slovakia (over 60%).

Acknowledgments

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ADVOCACY OF INTERESTS IN PUBLIC SPHERE

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ABSTRACT

Advocacy of interests constitutes one of important forms of communication and relationships between society and public authorities. It has been recognized as a form of social participation in political decision-making process, replenishment of political and functional representation of democratic society.

Public organizations effectiveness is determined by the possibility of shaping the legislative process by the dialogue between stakeholders and decision makers and by the ability of creating particular situational context for proposed solutions, which uses information systems and tools of public opinion shaping. Advocacy of interests may be enhanced by the tremendous influence of mass media, which are perceived as objective sources of information.

Keywords: advocacy, interests, public sphere, political decision, public opinion

JEL codes: G01, H12, H80

1 Introduction

According to Habermas public sphere is this part of social life, in which the citizens run public debates and consultations with regard to issues significant for the general public so as to determine the interests and find a consensus. It is to be held within the framework of constitutionally written rights and norms that guarantee the freedom to express opinions and ideas, or the freedom of assembly. [3]

The existence of the public opinion and patent channels of its expression is an extremely significant element of public sphere. This sphere is perceived as particularly sensitive as its operation influences the life of many people and social groups or the entire nation and its maintenance rests upon all taxpayers. The nature of the public spheres is special as the success criterion is not the financial criterion, but satisfaction of the needs of society. This sphere expresses the idea of common good. In functioning of the public sphere in mature democracies one can notice the influence of various groups of interest, which constitute an integral element of civil society, activity and socio-political engagement of citizens. Lobby becomes in a sense a mediator between the citizen and the representatives of authority.

Lobbying is an element of social and civil dialogue. The citizens through organizations, associations etc. or directly inform the authority on their own needs, deficiencies of the existing social solutions or alternative solutions. It enables the representatives of public administration and legislators to adjust the enacted law, regulations and procedures to the proposed optimum pattern. Making the citizens aware of the significance of advocacy of interests is indispensable and all interested parties should deal with it – i.e. active representatives of all lobbying groups as well as decision makers etc. However the greatest role is assigned to media, because they shape the perception of lobbying through the context in which they inform the society on it.

2 Literature Review

Literature of the subject is not univocal in the assessment of influence on the authority's decisions. Some acknowledge that collective political participation constitutes the basic determinant of democracy that allows to deliver information on social needs activating social groups [14]. Others indicate that lobbying leads to the occurrence of peculiar "privilege monopolization" [10].

Contemporary organization face the necessity to organize advocacy of interests as a part of enterprise strategy as it can become the source of competitive advantage. Organized groups of pressure are currently one of the main decision makers in the division of common social goods and that is why they should constitute an important component of economic analysis of public sphere [5] The social dialogue is traditionally defined as more or less institutionalized way of communication between the state authorities (usually the executive branch) and different social entities that represent the interests of significant fractions of society, the basic function of which is mutual delivery of opinions and settlements regarding targets, instruments and strategies of implementation of some kind of public policy". [2]

Krzysztof Jasiołkowski, Urszula Kurczewska and Małgorzata Mołoda – Zdziech, the authors of the book that widely analyzes lobbying activities, define lobbying as advocacy of interests compliant with the law and commonly accepted moral standards [4]. In Poland the definition of lobbying is stipulated in the Law of 7th July 2005 on Lobbying Activities in the Process of Law Making. Pursuant to the Law, lobbying activities are all activities, including earning activities, compliant with the law, the purpose of which is to impact the public authority bodies for the consideration of interests of people in the process of law making. [12]

Małgorzata Mołoda – Zdziech treats lobbying as implementation of certain new rules of game, which constitute an element of social change, transition from collective order to liberal and individualistic order. Both forms of order are accompanied by different methods and lobbying techniques. [7]

The specificity of public goods right in the beginning determines the entities particularly interested in possible benefits resulting from the division and redistribution of common social goods for the active, narrow-oriented political activities. Different activities of pressure groups usually focus on the sectors of economy that are characterized by a very high degree of state interventionism as the scale of potential economic benefits that may arise out of the division of public goods there is particularly large.

As a particular form of lobbying one can also acknowledge the social dialogue. In the European Union, the social dialogue is a developing process, in 1989 the issues were included in the fundamental rights covered by the Charter of Fundamental Social Rights. Wielding influence on the union forum constitutes a lawful technique. It belongs to one of the commonly valid forms of participation in the decision process. It will allow to understand that lobbying strictly speaking is not identical to corruption, but it can constitute an important element of democratic system in the procedure of decision taking, mandatory consultations, in the form of e.g. social dialogue. [7]

In order for lobbying to fulfil its functions of interest articulation in the democratic system, it should be open, the activities so transparent that the representations of interest could be identified and the presented opinions known. There are three models of lobbying shown in the literature of the subject: pluralistic, typical for the United States and Great Britain, neocorporativistic, characteristic for the countries of Western Europe and mixed – characterizing the European Union. However, advocacy of interests begins to be the activity run by global actors, which forces the necessity to elaborate legal regulations in this scope.

The development of new technologies and the rules of global cooperation impact also the appearance of new strategies of activities in lobbying. It becomes the reason of evolution of the existing lobbying models to grassroots lobbying, which takes different forms: from mass demonstrations and manifestations to web or on-line activities and refers to different forms of lobbying: political, economic and social lobbying.

3 Data and Methodology

In Polish conditions, the terms lobbying or the groups of pressure, the groups of interests generate very negative associations. The method of lobbying presentation in media is also controversial. Advocacy of interests is rarely shown as an integral component of democracy, lobbying occurs mainly in the context of scandals or affairs. There is very rarely information given to the public that the groups of interest and lobbying often perform positive functions from the point of view of public good, e.g. force access to information or implementation of anti-corruptive regulations.

Media very rarely inform that advocacy of interests accompanies almost all decision procedures, that it is successfully practiced in the countries of mature democracies. Both dynamic system transformation process and instability of political scene contributed to this. Long-term lack of institutions of revealing conflicts of interests caused distrust towards compromise and dialogue with various political and social groups.

The supporters of advocacy of interests give many arguments that prove positive sides of lobbying. One of the aspects is the fact that lobbying is to facilitate solution of disputes and problems regarding a particular group of interest. Another positive aspect surely is building relationship between the decision makers and advocates of environments that do not have direct impact on decision processes in the country. Lobbying allows communication of problems of environments, especially in those countries where democracy was born relatively short time ago. The activity of advocates forces on the ruling parties focusing on problems, to which without intervention from the outside they would not pay attention to. [6]

Social dialogue is considered to be a particular form of lobbying. In the European Union, social dialogue is a developing process, in 1989 the issues were included in fundamental rights covered by the Charter of Fundamental Social Rights. Wielding influence on the EU forum constitutes a lawful, recognized technique. It belongs to one of the commonly valid forms of participation in the decision process. It is a certain model, plane allowing to understand that professional lobbying is not identical to corruption, but can successfully constitute a part of democratic system in the procedure of decision taking, mandatory consultations, in the form of e.g. social dialogue.

4 Results and Discussion

Passing of the lobbying law in Poland brought benefits not only directly connected with lobbying. Facilitating access of citizens to the decision process, increasing its transparency or increase of officials' honesty and even initiation of scientific research and professional trainings regarding lobbying that positively influence its content-related level. [13]

However as experts indicate in many major articles the Law on Lobbying of 2005 in Poland is still a dead letter. As stated by Grażyna Kopińska, the expert of the Stefan Batory Foundation and the member of the Citizen Legislation Forum [11] the resorts fail to apply the provisions of the Law and reveal contacts with unregistered lobbyists, which they are obliged to. The legal framework to control the impact of lobbying on the legislation process is to create by

both the Law on Lobbying of 2005 and the new Regulation of the Labor of Council of Ministers effective as of January 2014, and in the meantime the key articles of the law are not applied.

The indicated provisions are these that order that if the administrative representatives are in a situation when "the activities within the scope of professional lobbying operation are performed by an unregistered entity" of professional lobbyists, they should "immediately" and in writing inform the competent minister for public administration, i.e. the chief of former Ministry of Internal Affairs and Administration and today of the Ministry of Administration and Digitization. He should draw the consequences with regard to such cases of unauthorized lobbying. As it turns out nobody has used this article and it is obvious that many lobbyists are interested in it and there certainly are many unregistered lobbyists who influence the officials' decisions.

Moreover the law orders that the authorities make available information on actions undertaken with regard to them by professional lobbyists, however there is no information in the ministries revealed ad hoc on the actions of professional lobbyists. Whereas another provision of law on the obligation to submit yearly general statements is performed, but the statements are very laconic. The example may be the statement for the year 2013 of the Ministry of Infrastructure and Development, which includes both the Ministry of Regional Development and the Ministry of Transport, Construction Industry and Maritime Economy. The report contains one sentence "not undertaken", which is hard to believe that with regard to such important resorts no lobbying activities were undertaken that year. [11]

Passing of the budget is a field of conflict of group interests. In this aspect one can indicate the course of protest in the State Fire Brigade, which started in March 2015. The firemen emphasized that they repeatedly asked the minister of internal affairs for the increase of salary and budgets of the State Fire Brigade Stations. The protest developed also in other uniform services. The reasons of the protest, which are given to the public opinion are among others freezing of officers' and employees' salaries from 2010, no guarantees of sufficient increases of salaries for officers and employees from January 2016 and lack of new modernization law for uniform services.

The disputes about the scope and aims of redistribution of financial means in the public sphere should be settled by the Tripartite Commission and the mechanisms of social dialogue. In this case the Social Dialogue Forum was established by the Minister of Internal Affairs and was held for the first time on 6th July 2015. The Forum is to serve among others solving social issues regarding uniform services and civil employees of the resort. The main task of the Forum is to perform social consultations and permanent dialogue with social partners. The issues of legal solutions or social and economic aspects of officers' and civil servants' work shall be discussed. It was agreed that the Forum meetings shall be held every quarter. [15]

However, the protests intensified in October, which was certainly connected with the hustings pending in Poland. The delegation of the protestants filed in the Sejm a petition with requests and the labor protest committee asked parliamentary clubs for amendments to the budget for the year 2016 in the scope of increasing the expenses for uniform services.

As experienced in practice, the groups of pressure become for elected politicians and bureaucratic machine peculiar clients that notify of the need for "good exchange" in the form of particular public good, advantageous legislation etc. In exchange they offer to the decision makers firstly permanent access to branch information, secondly potential electoral support of their members, thirdly specific financial support of e.g. hustings. The example may be the statement of the Lewiatan Confederacy of Private Employers, which was published after parliamentary elections: "We hope that the postulates presented during the campaign that hit

the economy and thus will limit the creation of work places and decrease the entrepreneurs' investment possibilities, will not be performed. We expect that the new government will not increase the deficit of public finances, which would expose Poland to conflict with the European Union and another imposition on our country of the procedure of excessive deficit.”[8]

In Poland similarly to many other European countries, the conflicts of interest between the employers and employees are solved by social dialogue, i.e. negotiations of employers' organizations and trade unions with the participation of representatives of government. It is performed within the framework of work of Tripartite Commission for Social and Economic Issues, which exists from 1994 and from 2001 acts by virtue of law. Trade unions (NSZZ „Solidarność”, OPZZ and Trade Unions Forum), employers' organization and government participate in works of this Commission.

However as shown in the research carried out by CBOS (Public Opinion Research Center), the social dialogue and its institutions are hardly known to the Poles. Only few people are interested in negotiations pending in the Tripartite Commission for Social and Economic Issues, there are no firm opinions on the participants of negotiations and their interests. [1] One can see small role of group negotiations in the socio-economic system. The reasons for this are that the employers' organizations have little possibilities to enforce decisions from own members and trade unions represent only a small part of the employed.

5 Conclusions

In stable democracies, active advocacy of interests, which is defined as lobbying, has permanently entered the landscape of public sphere, but it still keeps arousing controversies. It is indicated that lobbying becomes an element of organization management strategy based on pro-active attitude to the environment and on management of relations with the stakeholders. [9]

Contemporary organizations come face to face with the necessity of organization of advocacy of interests that is a part of enterprise strategy as it can become the source of competitive advantage. Lobbying is influencing the decision makers using legal methods. Putting it in a model, the citizens through organizations, associations etc. or directly with the aid of lobbying inform the authorities of their needs, deficiencies of the existing social solutions or alternative solutions. It enables the representatives of public administration and legislators to adjust the enacted law, regulations and procedures to the proposed optimum pattern. Thanks to this they can avoid mistakes as well as correct them. The legislators however cannot ignore the proposed solutions or the objections made, because advocacy of interests is also a peculiar “strength” with the public opinion behind it (e.g. within the framework of grassroots lobbying actions) or with organizations that participate in the process of consultation, e.g. within the framework of the Tripartite Commission.

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COMPARISON OF EXPENDITURE ON RESEARCH AND DEVELOPMENT IN EU COUNTRIES BY MEANS OF CLUSTER ANALYSIS

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ABSTRACT

The paper deals with financing of research and development, focusing on the comparison of research and development expenditure in EU countries. The results of the research provide a comparison of total expenditure on research and development (R&D intensity), in % of GDP, and Government budget appropriations or outlays for R&D, as % of total general government expenditure. By means of hierarchical cluster analysis, selected categories of research and development expenditure (expenditure in the higher education sector; expenditure in the government sector, and expenditure in the business enterprise sector) in EU countries in years 2004 and 2013 are compared. On the basis of the results of the cluster analysis, similarities and differences in expenditure on research and development in the individual countries, including their fluctuations, are provided.

Keywords: development, research, expenditure, EU countries, cluster analysis

JEL codes: H59, O32

1 Introduction

Gross domestic expenditure on research and development (GERD) includes all research and development (R&D) activities performed within the territory, whatever the origin of funding. This sector presents various indicators that provide information on GERD as a whole, GERD performance structure and GERD financing structure. The total expenditure on R&D (GERD) includes expenditure research and development in four sectors (government sector, higher education sector, business enterprise sector, private non-profit sector) [17], [18]. Government sector includes Government intramural expenditure on research and development (GOVERD) and includes all government research and development (R&D) activities by R&D performance structure and financing structure. The Government sector includes expenditure on the workplace of the Academy of Science, research facilities, libraries, archives, museums, and other institutions. Part of the higher education sector is higher education expenditure on research and development (HERD) which include R&D activities performed by the higher education sector. This sector includes public and state universities, teaching hospitals, and private universities, and expenditures on research and development associated with these institutions. R&D expenditure included in the government sector and the higher education sector is referred to as public expenditure on R&D and its role is to provide financial cover of individual national public policies [15]. Business enterprise sector includes business enterprise expenditure on research and development (BERD). This sector provides information on R&D performance, R&D financing structure, distribution of enterprises conducting R&D, R&D activities in the information and communication technology sector, industrial R&D tax support, R&D personnel and R&D activities by administrative region. In

addition, another sector involved is the private non-profit sector, which comprises but a small part of conducted R&D and associated expenditure.

The structure of expenditure in R&D is observed from a functional or institutional perspective. The structure by function involves the division of expenditure on R&D depending on the type of costs/expenditure on R&D (salaries, miscellaneous ordinary and investment costs), the type of the R&D activity (basic research, applied research and experimental development) and a prevalent group of the scientific field (natural, technical, agricultural, medical or social sciences, and humanities) and economic areas (NACE classification) of the subjects observed. The structure of expenditure on R&D by institutions is based on different types of subjects that carry out research and development or provide financing to these. These are private domestic (enterprise) resources which include R&D financing from own resources of the observed enterprises and other resources from the domestic business enterprise sector used for financing of R&D generally financed on demand in other enterprises and in public universities and research institutions. Public domestic resources which include mainly R&D financing from the national budget. Foreign resources include all financial resources from abroad provided as a source of financing R&D carried out in a given country [17], [19].

In fulfilling the Europe 2020 strategy in R&D, the priority is to improve the conditions for financing R&D and innovations, where an important prerequisite are financial capabilities in the individual EU countries. In the area of R&D, the member states should begin investing 3% of the GDP (1% from public resources, 2% from the private sector) by no later than 2020. [8]. Horizon 2020 is the largest and most significant programme that provides research, development and innovation financing at the European level. Horizon 2020 places an increased emphasis on supporting innovations and small medium-scale enterprises (e.g. implementing new loan instruments), which represent the backbone of the European economy. Simultaneously, Horizon 2020 focuses on social issues and supports the elimination of an inadequate link between research and the market. What is also supported is the connection to structural funds and other EU programmes.

The paper aims to compare the selected categories of expenditure on Research and Development (R&D) in EU countries. Attention is paid to the comparison of total expenditure on R&D and Government Budget Appropriations or Outlays on Research and Development (GBAORD) in 2004 and 2013. To compare the structure of total expenditure on R&D, using cluster analysis, expenditure on R&D in the government sector, the higher education sector and the business enterprise sector in years 2004 and 2013 are selected, and similarities and differences defined in the clusters.

2 Literature Review

The paper makes use of literature mainly dealing with R&D in EU countries. Trends in R&D and relations between R&D expenditure and other indicators in EU countries are supplied by research and studies already carried out [2],[4],[11],[13]. In relation to fulfilling the requirements of the Europe 2020 strategy in R&D, attention is paid to financing and assessment of R&D at the European level [8]. Also, other authors deal with the questions related to R&D, including its financial dimension, such as [1], [5], [6]. A number of publications focus on comparison and evaluation of R&D programmes [12] or the structure of expenditure on R&D depending on the scientific and research activity [10]. A comprehensive overview of financial resources, expenditure on R&D and other R&D indicators is provided in numerous studies and pieces of research [17],[18] or in an annually issued analysis of the state of research, development and innovations in the Czech Republic and its comparison with

the countries abroad [19]. A detailed overview of the key indicators in R&D, or rather in financing in EU countries, mainly total expenditure on R&D, the structure of expenditure on R&D by sectors or Government Budget Appropriations or Outlays on Research and Development is found in the Eurostat statistic database [7]. The most recognized is R&D statistics by OECD, which evaluates R&D in member states with more than 100 defined indicators [15], [16].

3 Data and Methodology

In this paper, analytical methods are applied which are used in the specialised literature and in EU documents. Regarding general scientific methods, the method of induction and deduction are applied, mainly in drawing conclusions. Also statistical data by Eurostat are applied. The set of selected countries comprise the EU28 (BE-Belgium, BG-Bulgaria, CZ-Czech Republic, DK-Denmark, DE-Germany, EE-Estonia, IE- Ireland, EL-Greece, ES-Spain, FR-France, HR-Croatia, IT-Italy, CY-Cyprus, LV-Latvia, LT-Lithuania, LU- Luxembourg, HU-Hungary, MT-Malta, NL-Netherlands, AT-Austria, PL-Poland, PT-Portugal, RO- Romania, SI-Slovenia, SK-Slovakia, FI-Finland, SE-Sweden, UK-United Kingdom). In EU countries, selected categories of expenditure on R&D are compared, i.e. total expenditure on R&D (research and development intensity) and Government Budget Appropriations or Outlays on Research and Development in 2004 (when ten countries joined the current EU28) and in 2013 (the last data available for all countries). The comparison of Government Budget Appropriations or Outlays on Research and Development (GBAORD) is carried out, with the exception of Croatia due to the unavailability of data in 2004. For the comparison of expenditure on R&D in EU countries using cluster analysis, expenditure on R&D in the higher education sector, expenditure in the government sector, and expenditure in the business enterprise sector in 2004 and 2013 are selected.

Cluster analysis is a multidimensional statistical method used to classify objects. It enables dividing observed units (EU28 countries in this case) into groups of similar units with other groups differing to the largest extent. For the purposes of this case study, the method of hierarchical cluster analysis was used, due to the low number of cases. Its advantage is graphic depiction of the process of clustering see [9], i.e. EU member states according to R&D expenditure (expenditure in the higher education sector, expenditure in the government sector, and expenditure in the business enterprise sector) see table 1. Thus, hierarchical tree diagram (i.e. dendrogram) is widely applied for depiction of final distances between objects. The horizontal line of the dendrogram expresses distance between clusters. Clusters unite based on the shortest distance, measured either with the Euclidean distance, or another, using any method of counting distance, such as average linkage, single linkage and complete linkage. The vertical line can determine the required extent of object clustering. As Ward's method was implemented to perform hierarchical cluster analysis, it was supposed to employ squared Euclidean distances as the initial distance between objects [9], i.e. the EU member states in this case. The advantage of Ward's method is its tendency to create clusters of small size to minimize building of clusters with one object only (ibid). Box plot was employed as a method of graphical visualization of differences in the variance of R&D expenditure by groups of the EU member states. Box plot, as one type of a diagram, divides continuous variables into quartiles, when 25% of elements have values below the lower quartile $Q0.25$ and 75% of elements have values lower than the upper quartile $Q0.75$. The middle "box" part of the diagram borders the 3rd quartile from the top, 1st quartile from the bottom, and between those is a line delimiting the *mean*. The size of the box is represented by the interquartile range. The lower whisker represents the values below the box, within the distance not exceeding 1.5-fold height of the box. End of the whisker corresponds with the

lowest value of the cluster. Similarly, upper whisker corresponds with the highest value of the cluster. Besides whiskers (below and above them), points that correspond to outliers are depicted.

The Shapiro-Wilk test was employed to control normal distribution of all variables as the sample size was small, i.e. $n < 30$. All performed tests proved assumption about normality of data ($p > 0.05$) with the exception of the variables R&D expenditure by business enterprise sector both for 2004 and 2013. However, the depicted box-plots did not show any observation as an extreme outlier, i.e. above three times the interquartile range. Thus, no transformation of the original data was implemented." Table 1 illustrates the utilised data, comparing R&D expenditure using a cluster analysis.

Table 1 R&D expenditure by sector performance in the years 2004 and 2013 (% of GDP)

EU country	GOVERD		HERD		BERD		EU country	GOVERD		HERD		BERD	
	2004	2013	2004	2013	2004	2013		2004	2013	2004	2013	2004	2013
BE	0.14	0.2	0.39	0.49	1.25	1.58	LI	0.19	0.19	0.4	0.52	0.16	0.24
BG	0.32	0.19	0.04	0.06	0.11	0.4	LU	0.18	0.27	0.02	0.18	1.43	0.71
CZ	0.26	0.35	0.17	0.52	0.72	1.03	HU	0.26	0.21	0.21	0.20	0.36	0.98
DK	0.17	0.07	0.59	0.97	1.65	1.99	MT	0.01	0.09	0.15	0.30	0.33	0.46
DE	0.33	0.43	0.40	0.51	1.69	1.99	NL	0.24	0.21	0.6	0.63	0.97	1.14
EE	0.11	0.16	0.39	0.74	0.33	0.83	AT	0.11	0.14	0.58	0.72	1.47	1.93
IE	0.09	0.07	0.32	0.36	0.78	1.14	PL	0.22	0.23	0.18	0.25	0.16	0.38
EL	0.11	0.21	0.25	0.29	0.16	0.27	PT	0.11	0.08	0.27	0.51	0.26	0.65
ES	0.17	0.23	0.31	0.35	0.56	0.66	RO	0.13	0.19	0.04	0.08	0.21	0.12
FR	0.35	0.29	0.39	0.46	1.32	1.44	SI	0.27	0.34	0.18	0.27	0.92	1.98
HR	0.22	0.21	0.39	0.2	0.43	0.41	SK	0.15	0.17	0.10	0.27	0.25	0.38
IT	0.19	0.19	0.35	0.35	0.5	0.67	FI	0.31	0.30	0.66	0.71	2.32	2.29
CY	0.12	0.07	0.12	0.27	0.07	0.07	SE	0.11	0.12	0.78	0.89	2.49	2.19
LV	0.08	0.17	0.14	0.26	0.18	0.17	UK	0.17	0.12	0.40	0.43	1.01	1.05

Source: Author according [7].

4 Results and Discussion

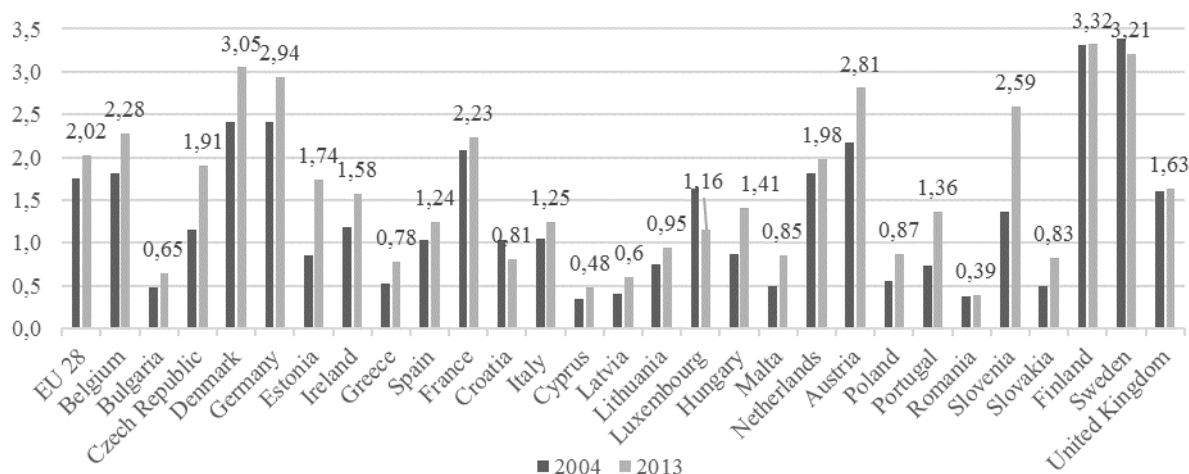
This part deals with the comparison of total expenditure on R&D and total GBAORD as % of total general expenditure in EU countries in years 2004 and 2013. An in-depth analysis provides a comparison of R&D expenditure (in the government sector, in the higher education sector and in the business enterprise sector), and their changes assessed by use of cluster analysis.

4.1 Total expenditure on research and development in the EU Countries

International comparison mostly measures total expenditure on R&D (GERD) towards GDP. This financial relation is called "research and development intensity" and belongs to the group of elementary structural indicators evaluating the progress of Lisbon-treaty objective-fulfilments in individual EU countries [17], [19]. Total expenditure on R&D (GERD) in GDP

% includes all non-investment and investment expenditure of a given year allocated to R&D in a given country, regardless of the source of financing. The substantial part of expenditure on R&D in EU countries comprises salaries and other non-investment costs [19]. Expenditure on R&D in the EU28 are in the region of 2% GDP. In 2004, expenditure on R&D reached 1.76% of GDP, equal to approximately 3.8% of the total general government expenditure. In comparison to 2013, this expenditure reached 2.02% of GDP (equal to approximately 4.1% of the total general government expenditure). Public expenditure in the EU28 reached merely 0.64% of GDP, equal to 1.4% of the total general government expenditure [7]. In 2013, the highest R&D intensities were recorded in Finland (3.32%), Sweden (3.21%) and Denmark (3.05%), all above 3% of GDP, followed by Germany (2.94%) and Austria (2.81%). Compared to 2004, the highest rise of R&D intensity was observed in Denmark, Germany, Austria, Slovenia and the Czech Republic in 2013 (Figure 1). At the opposite end of the scale, ten Member States recorded an R&D intensity below 1% of GDP: Romania (0.39%), Cyprus (0.48%), Latvia (0.60%), Bulgaria (0.65%), Greece (0.78%), Croatia (0.81%), Slovakia (0.83%), Malta (0.85%), Poland (0.87%) and Lithuania (0.95%). Compared with 2004, R&D intensity increased in twenty-two Member States, decreased in Croatia (from 1.03% in 2004 to 0.81% in 2013), Luxembourg (from 1.63% to 1.16%) and Sweden (from 3.39% to 3.21%), and remained almost stable in Romania, Finland and the United Kingdom. Total expenditure on R&D (R&D Intensity) in the EU Countries as % of GDP in years 2004 and 2013 is provided in Figure 1.

Figure 1 Total expenditure on R&D in the EU Countries as % of GDP



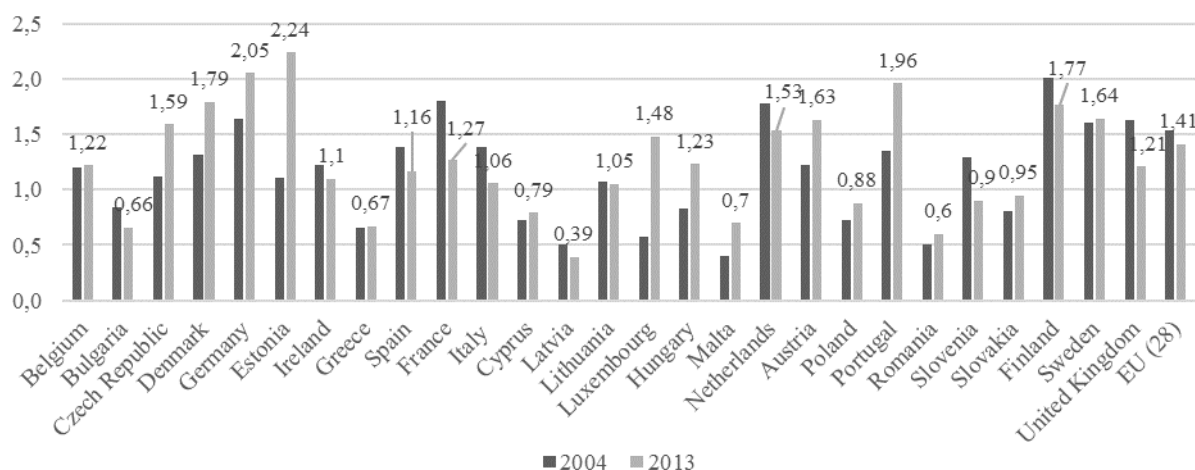
Source: Author according [7]

4.2 Government Budget Appropriations or Outlays on Research and Development

Further comparison of expenditure on R&D in EU countries is carried out by means of the Government Budget Appropriations or Outlays on Research and Development (GBAORD) indicator, as % of total general government expenditure. GBAORD data are measuring government support to R&D activities, or, in other words, how much priority Governments place on the public funding of R&D and are built up using the guidelines laid out in the Frascati Manual [17] or [18]. The GBAORD indicator should be perceived as a complement to indicators based on surveys of R&D performers, which are considered to be a more accurate but less timely way of measuring R&D activities.

GBAORD (as % of general government expenditure) reached 1.41% in 2004, compared to 1.54% in 2013, in the EU28. Marked differences can also be observed in the individual EU countries. The most notable changes in the rise in GBAORD (as % of general government expenditure) were observed in Estonia, Luxembourg and Portugal in 2013, compared to 2004. An increase of GBAORD was also observed in the Czech Republic, Germany, Austria and Denmark in 2013, compared to 2004. By contrast, the least significant differences in the Government Budget Appropriations or Outlays on Research and Development (GBAORD) are spotted in Greece, Sweden, Cyprus, Belgium and Romania. A decrease of GBAORD in 2013, compared to 2004, was observed in Bulgaria, Spain, France, Italy, Slovenia, Finland, the Netherlands and the United Kingdom. The results confirm an increase of GBAORD in the Czech Republic, Estonia, Austria, Germany, Denmark or Portugal in 2013, compared to 2004. These countries also typically show a rise in total expenditure on R&D. The growing GBAORD trend in 2013, compared to 2004, in Luxembourg, Ireland or Latvia fails to be in line with the increase of total expenditure on R&D. Based on the results of the comparison, it may be said that the R&D intensity trend fails to be accompanied with the identical trend associated with budgetary expenditure and R&D subsidies in several countries. The comparison of GBAORD in EU countries in years 2004 and 2013 is illustrated in Figure 2.

Figure 2 Comparison of total GBAORD in EU countries (as % of total general expenditure)



Source: Author according [7]

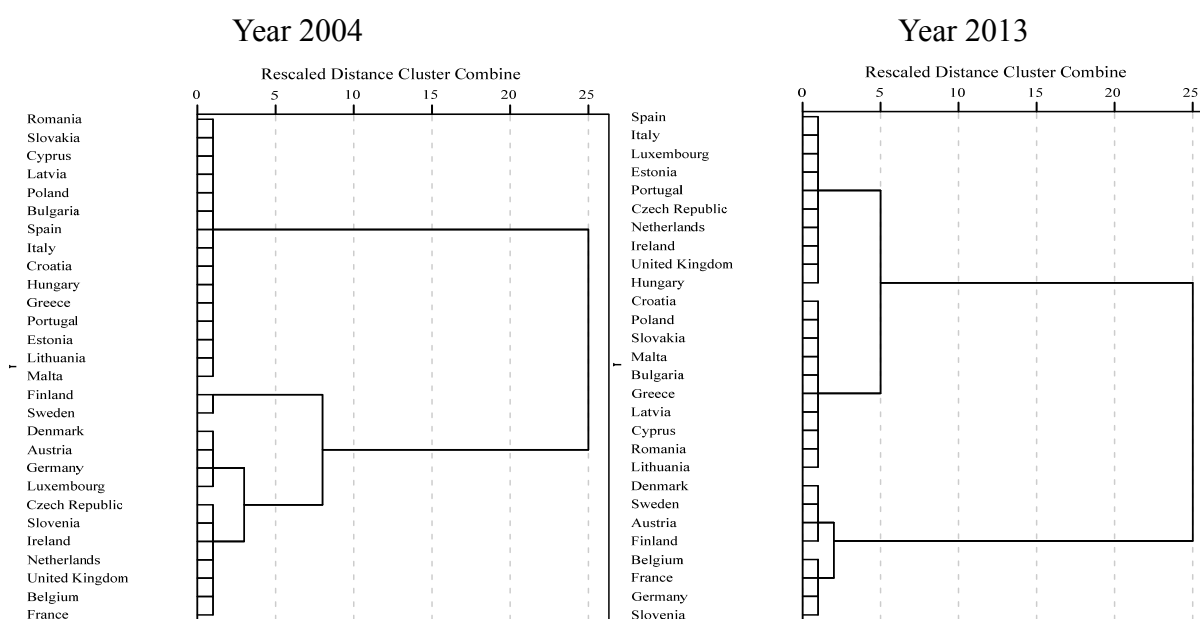
4.3 Comparison of expenditure on R&D in EU countries using cluster analysis

To compare expenditure on R&D in EU countries using cluster analysis, expenditure on R&D were selected by chosen sectors of execution, i.e. the government sector, the higher education sector and the business and enterprise sector (as % of GDP) in years 2004 and 2013. The dendrogram (Figure 3) depicts the process of clustering and dividing EU countries into three clusters on the basis of their similarities.

The first cluster was formed from countries similar in their structure of expenditure on R&D in 2004, with the least similarity in Germany and Ireland. It is a cluster of 11 countries characterised by a higher level of R&D, including expenditure on and investment into R&D. The second cluster comprises 15 countries with a relatively low expenditure on R&D. Finland and Sweden in 2004 form an individual cluster due to significantly high total expenditure on R&D in comparison to other countries, which is also reflected on in the structure of expenditure on R&D, namely in the business and enterprise and the higher education sector. In 2013, countries of the EU were again divided into three clusters by expenditure on R&D

depending on their internal similarities, using cluster analysis. Changes to the size and structure of expenditure on R&D in EU countries in 2013 were illustrated by a different division into clusters, compared to 2004. A change in the division of countries into clusters by the structure of expenditure on R&D can be observed in Sweden and Finland, which do not form an independent cluster any more. These countries are part of the first cluster, along with Austria, Germany, Belgium, Denmark, France and Slovenia. The smallest similarity of expenditure on R&D in this group of countries is in Austria and France. A significant rise in R&D expenditure can be observed in Slovenia, which moves into the category of countries with a higher level of R&D and research policy in 2013, which is apparent mainly in investments and development of R&D in the business and enterprise sector. In the second cluster, the division of countries in 2013 was identical to 2004. The exception is Estonia, Spain, Italy, Hungary and Portugal, which were moved to the third cluster, along with the Czech Republic, Ireland, the Netherlands, Luxembourg and the United Kingdom, due to their structure of expenditure on R&D. In the third cluster, more marked changes in expenditure on R&D can be observed in in the Czech Republic, Portugal and Estonia in 2013, through a rise of expenditure in the business and enterprise sector and in the higher education sector, compared to 2004. To some extent, this trend can be explained by the requirements of the Lisbon strategy to increase investments into R&D in EU countries by 2020 to 3% of GDP, i.e. 1% from public resources and 2% from the business and enterprise sector. Results of the division of EU countries into clusters in 2004 and 2014 are presented in Table 2.

Figure 3 Dendrogram division of EU countries by expenditure on R&D (as % of GDP)



Source: Author using program SPSS

Table 2 Division of the EU into clusters by expenditure on R&D using cluster analysis in years 2004 and 2013

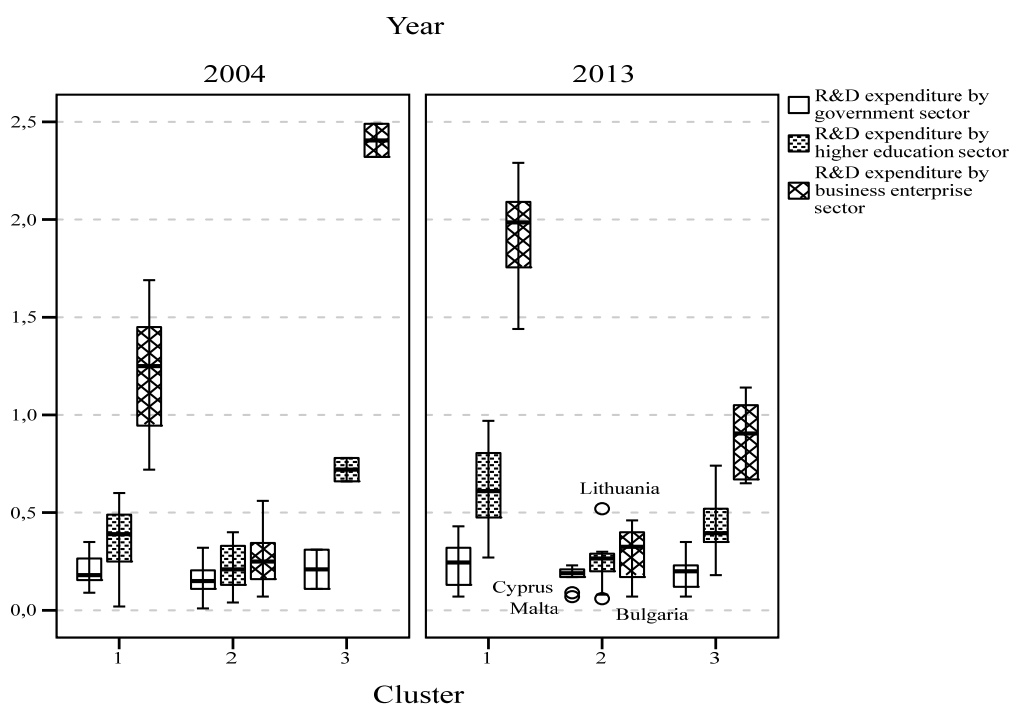
Cluster 1 (2004)	Cluster 2 (2004)	Cluster 3 (2004)
Belgium, Czech Republic Denmark, Germany, Ireland, France, Luxembourg, Netherlands, Austria, Slovenia, United Kingdom	Bulgaria, Estonia, Greece, Spain, Croatia, Italy, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Portugal, Romania, Slovakia	Finland, Sweden
Cluster 1 (2013)	Cluster 2 (2013)	Cluster 3 (2013)

Austria, Belgium, Denmark, Finland, France, Sweden, Slovenia, Germany	Bulgaria, Greece, Croatia, Cyprus, Latvia, Lithuania, Malta, Poland, Romania, Slovakia	Czech Republic, Estonia, Hungary, Ireland, Italy, Netherlands, Spain, Luxembourg, Portugal, United Kingdom
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Source: Author using program SPSS

Other results of the structure of expenditure on R&D as % of GDP are illustrated in the box plot (Figure 4). The comparison of the structure of expenditure on R&D by sectors (the government sector, higher education sector and the business and enterprise sector) in 2004 as well as 2013 proved the most marked differences in EU countries in the mean values in expenditure in the business and enterprise sector in all clusters.

Figure 4 Box plot - Changes in expenditure on R&D by clusters in EU countries (% of GDP)



Source: Author using SPSS

By contrast, the smallest differences in the mean values are apparent in all clusters in expenditure on R&D in the government sector. The most marked difference in expenditure on R&D were in countries of the second and third cluster in 2004. The third cluster of EU countries illustrates a specific position of Scandinavian countries (Sweden and Finland), whose mean values in expenditure on R&D (in the higher education sector of 0.7% GDP and in the business sector of 2.4% of GDP) is markedly higher than expenditure on R&D in the first and second cluster of countries. These are countries that have been showing a high level of science and research policy for a long time, which is visible in the structure of expenditure mainly in the business and enterprise sector. The comparison shows that the most balanced expenditure on R&D in 2004 had countries of the second cluster, where the mean value in expenditure on R&D in the government sector is in the region of 0.2%, in the higher education sector of 0.23%, and in the business and enterprise sector of 0.25% GDP. In 2013, neither Sweden nor Finland have a dominant position on expenditure on R&D allocated to the business sector. This is attributed mainly to the support of R&D and innovations in several countries which have been extensively investing into R&D due to the quality of education and

focus on the development of advanced technologies, investing into employment in high-tech industry and the development of innovative activities. The comparison in 2013 showed relatively equal mean values by structure of expenditure on R&D in the countries of the second cluster (the government sector approximately 0.2% of GDP, higher education sector approximately 0.25% GDP, the business sector approximately 0.3% GDP). This can be partially explained by the fact that the ten countries are found in the second cluster as in 2004 (except for five countries, see Table 2). These are mostly countries with a low R&D intensity, level of investments and support of innovations in R&D.

5 Conclusion

EU initiatives as well as individual countries have been increasingly focusing on the conditions of R&D and innovations over the past decades. Financial capabilities in individual countries are therefore an important precondition for fulfilling the Europe 2020 strategy in the areas of R&D. International comparison mostly measures total expenditure on R&D towards GDP. The results of comparison of total R&D expenditure in EU28 confirmed an increasing tendency by approximately 0.25% GDP in 2013, compared to 2004. The increasing R&D intensity can also be observed in individual EU countries, which is influenced by the requirements of the European research area. The most significant rise in R&D intensity was observed in Denmark, Germany, Austria, Slovenia and the Czech Republic. The comparison of the structure of expenditure on R&D in EU countries showed a dominant position of expenditure on R&D in the business and enterprise sector. Public expenditure on R&D showed a strong position of the higher education sector in comparison to the government sector in the majority of EU28 countries. This was also confirmed by the comparison of the structure of expenditure on R&D in EU countries, using cluster analysis by sectors in 2004 and 2013. In the business and enterprise sector, all clusters showed the highest mean values in expenditure on R&D but also the highest differences among clusters. By contrast, the smallest median values and relatively small differences were found in expenditure on R&D in all clusters in the government sector. It can, however, not be expected that without an adequate amount of financial means supplied by the government as well as the business and enterprise sector, R&D will render information, innovations and technologies competitive at the international level [3], [8],[14]. In relation to the financing of R&D in EU countries, several questions remain unanswered, which may serve as a topic for further research.

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FINANCIAL HEALTH OF CITIES IN SLOVAKIA

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ABSTRACT

Public administration reform was introduced in Slovakia in 2001 followed by the process of fiscal decentralization. Financial management and fiscal responsibilities of the cities and municipalities has risen in importance as they had more opportunities to access external funding. This papers aims to identify the financial health of cities with the linear probability model of default, thus recognizing the key determinants. The database contains 136 cities (and city districts) from among total of 148 cities (and city districts) in Slovakia. In total there are 47 financial indicators considered in the initial model; time series of the data are from the period 2008-2014.

Keywords: financial health, probability model

JEL codes: R51, H74, G24

1 Introduction

For municipalities and cities in Slovakia there was an important phase of public administration reform connected with the process of fiscal decentralization. Process of the implementation of new policies started in 2001. In years 2002-2004 there was a transition of over 400 competencies from the national government to the municipal governments, while at the same time the ownership of assets and properties has been transformed to the municipal level (see further [10]). The process of the fiscal decentralisation has begun in 2002 and it has also changed financial mechanism of the subventions from a budget of the national government and tax collection of municipalities. Slovakia accessed the European Union in 2004 and it provided new opportunities for municipalities to apply for funding from the Structural funds and the Cohesion fund to realise new investment projects (see further [11]). Municipalities were able to access external funding and use bank loans in the higher proportion. Credit trustworthiness became one of the very important factors. Financial management and fiscal responsibilities of the municipalities should be monitored and assessed more carefully [15]. Credit rating agencies issuing rating for municipalities employ default models among other measures as well [12].

The aim of this paper is to model the default of cities in Slovakia; the linear model is used to identify the key determinants of the municipal default. The database consists of 136 cities (and city districts) from among the total of 148 cities (and city districts) in Slovakia in the time period 2008-2014. In the initial model the total of 47 financial indicators are considered.

The contribution of this paper is mainly in pioneering the research of the municipal default in Slovakia and thus analysing financial health of cities in Slovakia. Another contribution is the construction of a predictive model of the municipal default, using the data of 92% of all the cities (and city districts) in Slovakia.

The paper is structured as follows. Section 2 provides an overview of the existing literature with regards to both the modelling techniques and the determinants of the municipal defaults. The methodology used in this study to analyse the determinants of the municipal default is described in the section 3; it includes the description of the data used in our research. Section 4 provides an overview of the empirical results, which are further discussed therein. The last part of the paper gives conclusions.

2 Literature Review

The issue of modelling the municipal default in Slovakia is not yet covered in the academic literature. There is work of several authors focusing on financial health and performance of Slovak companies [6] and [7], factors of destruction of Slovak companies [16], addressing broader issues of the default of Slovak companies [3] and [4]. The situation is different in the English speaking literature. However, the studies cover mostly the US municipalities and the idea of the municipal default is usually understood as the failure to pay municipal bonds. Even though the position, history and the legislation framework of the municipalities substantially differ from the Eastern Europe, this literature is still a good starting point. We could identify three streams in the literature with regard to modelling the municipal or corporate default [5].

The first approach is to use the credit ratings as the proxy for the default risk. There is an implicit assumption that the credit ratings reflect the true credit-worthiness of the rated municipalities. Moreover, Moon and Stotsky [9] argue that this approach may yield biased results since the cities are not rated at random but choose to be rated.

The second stream of literature estimates the default probability from market prices of the municipal bonds or from credit default swaps. The main idea of this approach lies in the fact that the bond yields should correspond to the risk of default. Again, this approach assumes, in accord with the efficient market hypothesis that all information is incorporated in the prices, which is not always the case [8].

The last approach would be to directly model the observed defaults using the appropriate limited dependent variable models. Commonly used approaches are discriminant analysis [1], logit [13] and probit [17]. The results from the modelling of the corporate default suggest the measures of leverage, profitability, activity, liquidity and solvency as the relevant predictors from the set of the financial ratios. Non-financial information is used, as well – in case of municipalities these may include region, population, socio-economic status of the citizens, governance and others.

Regarding the actual determinants of the municipal defaults, Palumbo et al. [14] selected only five possible predictors that are in their opinion related to the bond ratings and which could determine the probability of default. Their reasoning was based on Moody's methodology of municipal bond rating. Five variables reflected a municipality's economic strength, fiscal health, level of existing debt, and the effects of other related governmental units. Surprisingly the level of general obligation debt did not perform as expected.

Cohen [2] approached the topic of the failure determinants from wider historical perspective. In her narrative study (which did not include any econometric model) she claims that incidence of municipal default is linked to the business cycle; she further suggested the following factors of municipal default: business property and commodity cycles, optimism in project planning, underestimation of expenditures, mismanagement, politics, urban fiscal crisis and corruption.

Holian and Joffe [5] used econometric model as well as simple ranking model based on one proxy of the municipal default. They propose a hybrid model combining both approaches and they suggest four predictors of the municipal default: 1. Interest plus pension expense over revenue; 2. Annual revenue change; 3. General fund surplus (or deficit) over general fund revenue and 4. General fund balance over general fund expenditure. In their view the model could be further improved by including some socio-economic variables (e.g. population, Duncan's socioeconomic index). Needless to say they did not provide much explanation why they selected only a small group of possible explanatory variables.

3 Data and Methodology

The direct approach to the modelling of the municipal default is used in this paper. In order to do it, there is a need to define the dependent variable, the initial set of potential explanatory variables and the appropriate modelling framework. This section addresses these matters.

3.1 Definition of the municipal default and construction of the dependent variable

Legislation of Slovak Republic defines 2 conditions, which municipalities must meet in order to be eligible to receive funds. The ratio of total debt to actual income in the preceding year must not exceed the threshold of 60% and the ratio of debt service to actual income in the preceding year must not exceed the threshold of 25%. Once the municipality is not eligible to receive funding, it is practically in the default situation. Therefore those criteria could serve as a proxy of the default.

In addition to it there are two institutes of municipality management, which impose restrictions to the municipal governance in case of financial difficulties. Recovery regime is a "soft" governance restriction in the municipality requiring financial recovery plan and reporting to the Treasury. Administration is a "heavy" restriction in the municipality governance. Treasury appoints the administrator and municipal government has practically no control over financial decisions. Act of administration is considered in this study to be another proxy of the municipal default.

In this paper, the dependent variable is defined as binary. It is equal to 1 if the ratio of total debt to actual income in the preceding year exceeds threshold of 60% or if the municipality was in administration in the given year.

Technically there is another criterion defined by legislation – if the ratio of debt service to actual income in the preceding year exceeds threshold of 25%. The legislation dictates that additional (or exceptional) debt payments are excluded from the calculation of the ratio. However the information about the proportion of the additional (or exceptional) debt payments from the volume of the debt service is not publicly available. Therefore using the second criterion could distort the results.

3.2 Modelling framework

In this paper the aim is to model the inclination to cross the line of the 60% indebtedness together with or if the municipality was in administration in the given year.

As it was explained in the previous section the dependent variable is binary and my attempt is to determine the key predictors of the signal of insolvency. The linear probability model is used in determining the predictors. Even though linear probability model has certain statistical shortcomings, it is commonly used because its results provide straightforward interpretation and it has very good predictive performance.

Since panel data is used in the empirical study, the model enables us to use time invariant characteristics of respective cities in the form of individual unobserved effects (estimated as fixed effects).

The general form of the model is given by the following equation:

$$y_{i,t+1} = f(fin_{i,t}, ind_i, year_t) \quad (1)$$

where

$y_{i,t+1}$ is the indicator of the excessive indebtedness or the administration for the i -th city in the $t+1$ time;

$fin_{i,t}$ is the vector of financial ratios for the i -th city in the t time;

ind_i are individual (unobserved effects) for the i -th city;

$year_t$ is the indicator of the year t ;

the function f is in this case linear combination. The model is designed as a predictive model, i.e. the probability of failing in the current period is modelled using the information from the previous one. In this setting the explanatory variables may be considered exogenous in relation to the dependent variable and it allows us to avoid the endogeneity concerns.

Our database consists of 136 cities (and city districts) from among the total of 148 cities (and city districts) in Slovakia in the time period 2008-2014. Since we are not aware of any empirical study published on the topic of modelling of municipal default in Slovakia, in the initial stage of model building overall 47 financial indicators are considered. Table 1 presents overview of initial set of potential explanatory variables.

Table 1 Initial set of potential explanatory variables

Assets (ratio to total assets)	Liabilities (ratio to total liabilities)	Expenses (ratio to total expenses)	Revenues (ratio to total revenues)
Fixed assets	Equity	Consumption purchases	Operational revenues
Intangible fixed assets	Differences in valuation	Services	Activation
Tangible fixed assets	Funds	Personal expenses	Taxes, fees and customs revenues
Financial fixed assets	Retained profit	Taxes and fees	
Current assets	Profit of the fiscal period	Other operational expenses	Other operational revenues
Stocks	Liabilities (total)	Reserves and adjusting entries to operations	
Receivables (Long- term)	Reserves		
Receivables (Short- term)	Liabilities (Long-term)	Depreciation of fixed assets	Clearing of reserves & adjusting entries of operations
Financial accounts	Liabilities (Short-term)	Financial expenses	
Clearing among subjects of public administration	Clearing among subjects of public administration		
Loans and advances (Long-term)	Bank loans	Extraordinary activities	Financial revenues
Loans and advances (Short-term)	Relations with Treasury's clients	Reserves & adjust. entries to financial transactions	Clearing of reserves & adjusting entries of financial transactions
Relations with Treasury's clients		Transfer costs	Transfer and fiscal revenues
Assets accruals	Liabilities accruals		Extraordinary activities

Source: Publicly available financial statements of municipalities

4 Results and Discussion

In the first step of the analysis we eliminated those variables, which did not show any significant variability in terms of the dependent variable. This way we excluded 12 out of the initial set of 47 variables and thus we have retained 35. Next we used step-wise regression with general to specific approach to determine the main indicators of the default. After this step 7 variables were retained; main selection criteria was individual statistical significance of financial ratios and joint statistical significance in case of individual effects and time indicators. The results are reported in table 2, without including unobservable effects due to their large number (136). Important fact is that the impact of macroeconomic environment was not significant in the model; the dummy variables representing individual years were not statistically jointly significant.

Table 2 Results of the model

Variable	Estimated coefficient	Standard error	T-statistics	P-value
Tangible fixed assets	-0.65	0.26	-2.5	0.013
Receivables (Long-term)	9.43	4.19	2.25	0.025
Financial accounts (assets)	-0.93	0.36	-2.54	0.011
Differences in equity valuation	-0.76	0.36	-2.08	0.037
Clearing among subjects of public administration (liabilities)	-0.71	0.30	-2.36	0.018
Services (expenses)	0.27	0.13	1.97	0.049
Financial revenues	0.70	0.31	2.28	0.023
Intercept	0.41	0.24	1.74	0.083
Number of observations			788	
R-squared			0.581	

Source: Author's calculations

There are seven significant predictors; three from among them are variables describing assets, two of them describing liabilities and one each from expenses and revenues. Volume of both tangible fixed assets and financial accounts (relative to total assets) has positive impact on financial health; it decreases the propensity to default. However the higher the volume of long-term receivables (relative to total assets) the higher is the probability of default. It may be a signal indicating that the city may have difficulties to collect those receivables. Larger amount in differences in equity valuation (relative to total liabilities) indicates the lower danger of default. It could be linked to the fact that a city owns valuable assets, of which the market value increases over the time, which is recorded in the differences in equity valuation. Another indicator in the section of liabilities is the clearing among subjects of public administration. It can be viewed as trustworthy obligation, as the subjects of public administration will principally meet their commitments. From among expenses the significant predictor is services. If the volume of expenses the city spends on services (in proportion to total expenses) increases, it will have negative impact on the default indicator. Surprising finding is that the higher volumes of financial revenues (relative to total revenues) indicate the higher chance of default. The reason could be risky financial investment. Although in short term financial investment may generate high revenues in the end the principal investment may be lost. We have seen examples of financial frauds caused by non-bank financial institutions

and also frauds in business operations involving public investments or putting public assets at the stake.

Initially the time effects (dummy variables of years) were also included in the model; they are generally considered to be a proxy of wider macroeconomic environment in empirical studies. However, they did not prove to be significant in models of this study, contrary to the findings of Cohen [2]. Suggested explanation is that the study of Cohen [2] covered rather extended period of time.

5 Conclusions

The determinants of the municipal default in Slovakia are studied in this paper. The dataset consists of 136 cities (and city districts) from among total of 148 cities (and city districts) in Slovakia in the time period 2008-2014. In the initial model the total of 47 financial indicators are considered.

Linear probability model is utilized to identify the key determinants. Stepwise regression with general-to-specific approach was used. Based on preferred model seven significant predictors of propensity to default were identified: Tangible fixed assets, Long-term receivables, Financial accounts (assets), Differences in equity valuation, Clearing among subjects of public administration (liabilities), Services (expenses), Financial revenues. These factors suggest what areas could be the main focus when evaluating financial health of Slovak cities and when looking for predictors of financial distress.

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FINANCIAL CRISIS: INFLUENCE, CONSEQUENCES AND THEIR IMPLICATION

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ABSTRACT

Financial crisis term used to describe a wide range of situations in which some financial institutions or funds lose immediately a large part of their value. Many economists have offered their theories on how financial crises arise and are developed, what are the causes and their effects and ways to prevent them. But researchers have not yet reached a consensus on these issues, and financial crises still represent a common phenomenon in the world economy. Year 2008 will be remembered as a year that was marked by a financial crisis, which appears once in a century. The crisis caused unprecedented swings on Wall Street, the banking system and shook up scholarships, but also brought radical government intervention. The first signs of the economic crisis were presented in August 2007, but 2008 was the year of the real financial crisis, which brought the economy of the United States, Europe and Japan in recession for the first time after World War II.

Keywords: Financial crisis, Financial Institutions, Markets, Economic development

JEL codes: G100, G010

1 Introduction

Definitions and views about the financial crisis are varied. To mention a few: according to the business dictionary, a financial crisis is a 'situation in which the money supply exceeds the demand for money. This means that liquidity "vaporize" is available soon after withdraw moneys from banks, forcing banks to sell other investments to offset this decrease liquidity or to bankrupt". One of the best definitions for the financial crisis is given by R. Goldsmith in 1982, which sets out the financial crisis: "A sharp deterioration, fast, ultracyclic of all them or the greatest part of a group of financial indicators, shrift interest rates, asset prices, lack solvability and the failure of financial institutions ".

A determination closest in time is given by Frederic Mishkin, who determined the financial crisis from the perspective of the problems with asymmetry of information: "A financial crisis is a disorder in financial markets in which the problems with "adverse selection" and "moral hazard" become so sharp, and financial markets become unable to efficiently channel funds to those with productive investment opportunities. So, a financial crisis is a set of worsening sharp of financial and economic indicators, such as economic growth, imbalance between supply and demand for money, falling asset prices, which may be associated with the bankruptcies of financial institutions: banks, mutual funds and investment, but also bankruptcy of non-financial institutions. Based in the number of companies that bankruptcies, unemployment rise and moves towards a slowdown in economic growth. Problems associated with asymmetric information between lenders and borrowers grow and markets fail. Kindleberger argues that "financial crises are associated with roofs of business cycles."

Minsky, following the theories of J.M. Keynes believed that capitalist economies are cyclical. According to him, capitalism is a permanent state of imbalance, because no one knows for sure where he is going and this lack of knowledge leads to a boom cycles and failures. As the

economy moves towards the peak of the cycle, financial structures become more fragile after climbing to the top heavily financed with debt.

2 Causes and Consequences of the International Financial Crisis

The only thing we have to fear is unreasonable fear, which paralyzes efforts to pass from crisis in progress. (F.D.Roosevelt, 1933)

The shock of exchanges and financial markets throughout the third quarter of 2007 made everyone feel fear for a recurrence of the terrible scenario of great crisis in the history of modern capitalism, that of the years 1929-32 in the United States [1]. Situation seemed so critical in many financial institutions American, European, Chinese and Japanese, as many of their executives and shareholders of the capital referred this to catastrophe that happened in Asia and the Middle East in the 90th century to the XX century.

The world's leading financial barometers began several weeks in lower quotes of their historical, those who were accused of being "catastrophic sessions" [2]. Exchanges of Frankfurt, Paris, London, Milan, Amsterdam, Madrid, Dubai etc., opened and continued their function, losing up to 20% of their normal course. The figure of billions of dollars, pounds, yens or euro sometimes lost even within a day or several hours by major banks in US, Europe, China and Japan have caused a panic and fear in general to what might happen in the coming months: economic recession and global financial crisis. Within a short period, losses were estimated at 40-50000 billion dollars, an amount equal to the gross domestic product of the entire world in one year. Financial institutions were not encountered never in a situation so problematic with so many questions about their future. Director of the IMF, Dominique Strauss-Khan, called it "a very serious situation for the future of the world economy", while the Nobel Prize in economics, American John Kenneth Galbraith, one of the foremost experts in the world Crisis exchanges stated that 'what we are certain ... is that these crises are never calmly.

We should prepare for the worst even though most people think that it is unlikely to happen.' French newspaper Le Monde in one of the editorials, noted in large letters that 'crisis is not only that of bad loans in the US, but it is global ... credit crisis, financing, and in the world economy... whole financial system of the world, within a few months the situation went from absolute confidence in the situation of absolute doubt.

2.1 Crisis or Crises That Are Shaking the World?

The capitalism during the crises of 2007-2009 was at a critical point that requires radical solutions in the ways of composition and its management [3]. Now society at all is seen convinced that our planet has entered into a global crisis, which in itself consists specific crisis, such as: financial crisis, monetary crisis, economic, food, energy, ecological crisis.

This is the first time in our modern history of the last centuries, or precisely in 'period of capitalism' and industrial revolution that the world is facing so many worrying issues [4]. Experts, politicians, scientists and representatives of civil society are convinced that this time exiting from the crisis cannot be done only for some countries or different regions of the world, or partial to separate its special elements.

We should accept and explain true essence of it: Is the crisis of the development model? ... It self capitalism? ... The management of globalization? ... Or is it simply the product of history, concepts and international institutions. Everything began in 2007 simply as a financial crisis, which originated from bad loans in the US real estate market [2]. Personalities from the

prominent world economic and financial crisis as Alain Greenspan, Dominique Strauss-Kahn, Ben Bernanke, Jean-Claude Trichet, etc., that time treated more prudently crisis calling 'a turbulence of financial American markets' that should be carefully managed in its intensity and spread in Europe and elsewhere in the world. But very soon "turbulence" of financial circumstances hit the US dollar that began devaluating rapidly in relation to the euro, highlighting an alarming situation of the US economy. Meanwhile, in the first quarter of the 2008 financial crisis began to emerge in Europe. Initially in England, then in Swiss banks, French banks, German, etc. Initially, the IMF valued at 1000 billion dollars losses from the crisis, while that was not at all optimistic forecasts for economic growth and the level of inflation in the major economies of the planet. Parallel to this phenomenon, markets and economies of many countries of the world were shocked by the price of oil, which in this period amounted to a terrific level of 120 USD / Baril sowing panic for international future of solving energy problems in many countries of the world.

2.2 Euro or the Dollar, What the Fate Awaits?

"The dollar is our currency... and your problem" (John Connally, US Treasury secretary, 1973)

In early 2008, in the Albanian financial market, European currency gave signs of a progressive reduction of its value in relation to the lek and the US dollar [1]. Risk increasingly likely that the European economy to fall into recession, broadcasted live for impairment of the single currency, the euro. Considered historical value, such as that of April 2007 when the euro was exchanged for US \$ 1.60, at the beginning of 2008 the euro was exchanged for USD 1.46.

The prime reason for this decrease is deemed that became notification that 'gross domestic production in the euro zone fell by 0.2% in the second quarter and third of 2008' in relation to a modest increase of 0.7% that he knew in first quarter.

According to Gilles Mowe, economist at the Bank of America 'all those who view the euro as a guarantor of value and thought that as a result of this Europe was immune from the crisis, are reconsidering their position.' On the other hand, economic and financial analysts judged to promote economic growth, the European Central Bank (ECB) seems that there would be no choice but that lowering the base interest rate for the euro. But experts did not appreciate pessimistic collapse of the euro. 'If the economic situation of the EU is worrying, decline in the value of the euro is more like a return to normality in the US dollar', emphasized Gilles Mowe.

US analysts stressed that 'were American economy and finances those who fell first in crisis, but that will be just the first ones that will emerge from the crisis'. In the last days of February 2008 the euro was exchanged 1.51 with USD, spending the limit so that considered historical. The main cause of the strengthening of the euro relative to the US dollar was primarily a reflection of the progress and problems of the US economy and the strategy that the Federal Reserve (Fed) to face this crisis and in the second row, own objectives and instruments of the European Central Bank (ECB) in the framework of its monetary policy.

2.3 The Duel Between School of Keynes's and Friedman Continues: Who Is the Culprit of the Crisis?

Financial and economic crisis of 2007-2009 was due for a revival of the old ideological war between economists 'on the origin and causes of the economic recession ... the culprits and exit ways from it ... the prophets that economists should believe.

Their line of separation is obvious: in front of Keynes economists, that privilege public intervention in the economy, liberals who are partisans stay at free market and globalization without limit [3]. According Keynes this crisis sounds like a revenge against the past 30 years of liberal doctrines held by the so-called 'universal success of her'.

For Keynesians and generally to all those known as 'etatists', the crisis was caused by lack of regulation and the weakness of state that left free path to financial superspeculation phenomenon. According to economist Anna Schwartz it is technically impossible to try to fix the financial markets when they 'groan under the weight of money'. It is just for this reason, Milton Friedman recommended that money should be managed according to criteria and not by mathematical and central bankers will or governments. Although differences between Keynes and Liberals are many, the core of their conflict to the crisis lies in the role and presence of the state in the economy. In conditions when the consequences of direct financial crisis seems recession and figures minimal economic growth, the only hope seems to rely on the effect of the so-called 'multiplier Keynesian', according to which, each monetary unit invested in the economy, increases by several times its value, and if so also increases employment.

But the core of this crisis lies not simply and solely on ways of promoting economic growth, whether public or private expenditure. The roots of the crisis are financial and monetary policies. Its main problems appeared in the banking system and the financial markets. State, through increased public spending would be the deciding factor for the rapid exit from the crisis. In the same logic lies Krugman, which states that 'the current financial crisis is a classic in the sense Keynesian crisis". According to him, the explosion of the real estate bubble significantly invalidates the mortgage securities held by banks and reduced lending, causing all of economy to fall into recession.

So, ultimately, at the first from a macroeconomic perspective, all this crisis was due to the contraction of consumption and credit.

3 Factors that Cause Financial Crises

To understand why banking and financial crises occur, specifically shrinking economic activity, we shall examine the factors that cause them [3]. Financial crises can cause four factors: increased interest rates, increased uncertainty, the effects of the real market balances and banking panic.

3.1 Rise of Interest Rates

Individuals and enterprises with investment risk projects are exactly the subjects that are ready to pay the highest rate interest. If increased interest rates are quite because of increased demand for loans or due to reduction of the money supply, is less certain that it will receive loans to enterprises with high credit risk, whereas high-risk enterprises creditor will still want to take account of rising loan. Negative selection issues, lenders would not want to lend. Substantial large borrowing leads falling investment and overall economic activity [5].

3.2 Increase of Uncertainty

Dynamic growth of uncertainty in the financial markets that could occur due to failure of financial and non-financial institutions, the recession or the collapse of the stock market, hinder the possibility that lenders to distinguish good credit risks from bad ones [6]. Such

inability of creditors to solve the problem of adverse selection makes to be less willing to lend, causing a decrease in lending, investment and overall economic activity.

3.3 Impact of Property Markets in Balance

The enterprise balance sheets have important implications on the seriousness of the problems of asymmetric information and financial system [3]. The biggest fall in the stock market can be a serious deterioration factor of balance, which can increase the problem of adverse selection and moral hazard in financial markets and to cause the financial crisis. The weakening of the stock market means that net corporate value has fallen because stock prices determine the estimate value of net (own capital) to corporations.

The decline in net value, which is created as a result of the weakening of the stock market, makes lenders less willing to lend, because as we have noted, net enterprise value is similar to the role of collateral [7]. When the value of collateral falls, the lender offers less protection, which means that losses of loan will certainly be serious. Since then lenders are less protected from the consequences of negative selection, reduce the amount of the loan, which was conditional on the investment decline and overall production. Reduction of net corporate value, which is the result of loss of market share, increased moral hazard, encouraging borrowers to undertake enterprises risky investments, because now you can lose less if he fails investment. In economies with artificial inflation, characteristic of most developing countries, many debt contracts of very long periods of expiration and with fixed interest rates [8]. In such an institutional environment, unforeseen reductions of aggregate price level also reduce the net value of the enterprise. Since the return of debts is determined by the contract with the minimum amount, the sudden drop of the price scale increases the real value of the enterprise. The result of this is the decline in the net fair value (the difference between assets and liabilities in real amount).

Therefore, the rapid decline in the price level causes considerable decrease in net fair values and increase adverse of problem selection and risking the moral, most lenders faced. In short, the sudden collapse of aggregate price level, leading to the reduction of lending to economic activity. Due to uncertainty regarding the value of the local currency, in developing countries (but also in some developed countries), many non-financial enterprises, banks and governments, is more simply to lend in foreign currencies. This could cause a financial crisis similar to the reduction of the inflation surprise. Most debt contracts denominated in foreign currency when there is a sudden depression or local currency devaluation, increasing the burden of domestic enterprises [9]. Although we have seen how the increase in rates of interest directly affects the growth of the problems of adverse selection, the rates of interest also play a role in terms of promoting the financial crisis, including the increase of payment of interest for family and enterprise, reduce the cash flow of the enterprises, the difference between revenues and expenditures. Reducing the flow of money causes a deterioration in the balance sheet, because reduces liquidity of enterprises and households, making knowledge of lenders more difficult, that if the families and enterprises will able to pay liabilities (debts) [10].

So, there is an additional reason why the sudden increase in interest rates can be an important factor which causes financial crisis.

3.4 Problems in the Banking Sector

Banks play a key role in financial markets since they are well positioned to engage in the production of information activities, which facilitate productive investment in the economy.

Balance sheets of banks have an important role in bank loans [11]. If banks suffer the deterioration of their balance and serious contraction caused in their capital, will have available a much smaller funds, which will be able to borrow at banks and borrowings from banks will be reduced.

Contraction of consumer loans will do investment decline, which will slow economic activity. If the deterioration of the bank balance is serious enough, banks will begin to collapse, fear will expand from one to the other, causing the demolition of sound banks [4]. Multiple collapses of banks are recognized as the panic banking. Infection source again are asymmetric information. In a state of panic, depositors, fearing for the safety of own deposits (if they lack insurance deposits) and not knowing the quality of loan portfolios of banks, attract deposits from the bank, and this goes to the point at which banks destroyed. The disappearance of the large number of banks within a short time means that there is a shortage in the production of financial markets, and thus the direct loss of possession through the banking sector.

Reduction of bank lending during the financial crisis also reduces the cash offer of borrowers, which causes increased interest rates [12]. The result is to increase the problem of adverse selection and moral hazard in the credit markets. This produces an even greater decline in borrowing, which reduces contraction productive investment and causes even greater economic activity.

4 Conclusions

The 2008th year, among other things, ended Wall Street's, as such we know, one of the largest funding institutions, which succumbed under the burden of major losses from loans, prompting the collapse of oil prices. The year 2008 will be remembered for the unprecedented radical measures by the authorities, in an effort to alleviate the crisis. US authorities acknowledged that the economy need pushing, but the words of President George Bush, when asked for financial incentives, were very quiet: We can take an injection in the arm to keep our economy healthy fundamental.

This will help economic sectors that are troubled, as the housing market should not affect other parts of our economy, Bush said. But the crisis had its roots deeper. Many people received loans for their homes without opportunity turning back. When many of them failed, lenders began collapse. Banks appear huge losses in the system of securities linked to loans for their home. The collapse of other banks made at the height of the crisis arise plan 700 billion of government to buy up bad debts. This happened because the crisis caused reactions array in the financial system. The failure of Lehman Brothers made difficulties for businesses and even the salaries of the employees. One financial innovation helped indirectly development of the credit market sub-standard and practice of lending careless "greedy" was the "securitization". "Securitization" in the context of the mortgage market meant collecting hundreds or thousands of mortgage loans and then selling bonds that rely on this package of loans.

Many economists say their theories about how financial crises develop and in what way to deal with it. According to many researchers, all crises occurred for the same reason: financial speculation neglected to get the most! Financial crisis is a situation in which the value of financial institutions falls real soon. The financial crisis is often associated with panic or a situation in the banks, in which investors sell assets or to withdraw money from savings accounts waiting for the value of these assets will drop if they will continue to stay at the financial institution.

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BUSINESS, FINANCIAL, ACCOUNTING AND LEGISLATIVE ASPECTS OF THE DEVELOPMENT OF SMALL AND MEDIUM-SIZED ENTERPRISES IN THE CZECH REPUBLIC

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ABSTRACT

The article determines the business of financial, accounting and legal aspects of research solutions for small and medium-sized enterprises. The authors evaluated the results of its own (copyright) surveys of the development of SMEs in the years 2009 to 2014 with a total of 350 respondents from the Czech Republic. In this context we monitored indicators analyzing ways of fundraising for business using mathematical and statistical methods, including analysis of their own resources, bank loans, lease financing and European Union funds. The article also analyzed the amount and percentages involving other forms of fund raising for small and medium-sized enterprises in the form of loans from family members, grants, and also factoring related barriers. The results confirm the difference in the amount of usage of own and external sources of financing from various sources in industry, trade and services.

Keywords: bank loans, leasing, legislation, small and medium-sized enterprises, private sources of funding

JEL codes: G32, M21, M41

1 Introduction

The subject of the paper is to determine the key issues of the current theory and practice of accounting, financial and tax legislation in the Czech Republic in the context of the current world trends. In this context, the paper deals with the monitoring of the indicators analyzing ways of obtaining financial resources used for business activities, including other forms of raising funds for SMEs: loans from family members, grants, factoring, as well as the related barriers (using mathematical and statistical methods) including the analysis of own resources, bank loans, leasing and co-financing from the European Union (EU). This paper aims to bring the issue of securing funds for the implementation of business activities to the SMEs.

The first part of the paper specifies the businesses and the SMEs of the Czech Republic and outlines the possibilities of various sources of funding in the fields of production, trade and services. The second part presents the results of the research conducted among the businesses in the period of 2009 - 2014, including the analysis and percentages involving other forms of raising funds for SMEs: loans from family members, grants, leasing, factoring and related barriers. The final part of the paper provides an evaluation of the sources of financing SMEs.

Small and medium-sized enterprises (SMEs) are an important sector of the market economy across Europe, as they are able to respond quickly and effectively to changing market conditions and are considered the foundation of the national economy, mainly because of their flexibility, creation of new job opportunities, promotion and development of a competitive environment and their individual and unique character [11]. SMEs rapidly absorb free labour force if they meet the qualification requirements or can fulfil the role of subcontractors. According to the Czech Statistical Office, on 31. 12. 2013 SMEs participated in the total number of active business entities with 99.84%, next year (31. 12. 2014) the proportion was over 99.84%. The share of employees of SMEs in the total number of employees of the business sector in the Czech Republic amounted to 60.9%. Apart from the above positive effects, SMEs have to solve many problematic areas, one of which is the securing of financial resources and their efficient use. Both during the establishment as well as the course of business, each business entity deals with funds and sources of financing of its business activities, including investment decision-making, which affects the financial management in the area of acquisition of financial sources which has become one of the main activities of the financial management of an enterprise. Each entrepreneur can choose from several alternative sources of funding: own, external or alternative sources. Although there is a variety of sources of funding, problems with lack of awareness of SMEs appear and that is why this paper analyzes the sources of financing of SMEs heading towards obtaining the capital.

Accounting system in the Czech Republic is regulated by Act no. 563/1991 Coll., on Accounting, as amended (the "Accounting Act"). This standard was last amended by Act no. 221/2015 Coll., in response to transpose Directive of the European Parliament and Council Directive 2013/34 / EU of 26 June 2013 on the annual accounts, the consolidated financial statements and related reports of certain types of companies for amending Directive of the European Parliament and Council Directive 2006/43 / EC and repealing Council Directives 78/660 / EEC and 83/349 / EEC, with effect from 1 January 2016.

The aim of the amendment to the Accounting Act from the year 2016 is the transposition of the EU Directive on the annual accounts, the consolidated financial statements and related reports of certain types of companies. Directive assigned the individual Member States to apply the modified legislation for the first time on the financial statements prepared for the financial year beginning on 1 January 2016 or during the calendar year 2016. The Ministry of Finance simultaneously also prepared a draft amendment to Decree No. 500/2002 Coll. Amendment of the decree implementing the law on accounting for business entity has changed the structure of reporting and accounting of inventory and assets. The amendment is based on the updated amendment to the Accounting Act, which introduces a new classification in business entities, also new categorization entities and categorize consolidation groups. They are divided into large, medium, small and micro entity, obligation to have their financial statements audited, and prepare a balance sheet, profit and loss statement and notes to the financial statements in full will have large and medium sized entity, but small and micro entity will have some simplification or exemption.

2 Literature Review

The policy of the European Union as well as the launch of the Single Market on 1st January 1993 contributed significantly to the reorientation on the issues of small and medium-sized enterprises. The launch of the Single Market, along with the democratization of the Eastern Europe and the enlargement of the European Union caused significant changes in the global business environment. Within the National Programme for the Preparation of the Czech Republic for the Membership in the European Union, the Czech Republic pledged to unify the definition of small and medium-sized enterprises with the European Union. For this reason, in 2002, the Czech Republic passed the Act no. 47/2002 Coll. on promotion of small and medium enterprises which clearly defines the concept of small and medium enterprises and unifies the terminology with the standards of the European Union (as amended as of 15. 1. 2005) [14]. Small and medium-sized entrepreneurship in different economies is perceived differently with respect to its national context, for that reason there is still no comprehensive, universally accepted definition of small and medium enterprises. The decisive criterion for the definition of small and medium enterprises is usually the number of employees. The European Union characterizes SMEs on the basis of three fundamental criteria [6] - the number of employees, economic independence (an enterprise is independent when 25% or more of its capital or voting rights is not owned by another enterprise or jointly by several enterprises) and the annual turnover of the enterprise (or the annual balance sheet) [6].

In the Czech Republic the sources of business financing are studied in numerous monographic publications on corporate finance [5], [9], [10], [12], [13]. These publications deal with the problems of sources of SMEs financing only in sub-chapters and generally deal with the structure of the sources of business financing. The authors distinguish several basic types and sources of financing on the basis of ownership, relevance of financial resources and the period of financial usability. An overview of the sources of financing is presented in Table 1.

Table 1 Classification of the Sources of Financing by Synek

The ownership of the sources	own sources	own sources (financial and material contribution of the owners, share issue , assets sales)
	borrowed capital	borrowed capital (loans, bonds, leasing)
	self-financing	profit, additional internal sources
The relevance of financial resources	internal resources	generated by own activities of an enterprise (depreciations, profit, revenues)
	external resources	commercial loans, unpaid wages, bank loans, grants, donations, leasing, factoring, forfaiting
The period of financial usability	permanent capital	capital for an indefinite period
	temporary capital	capital for a definite period

Source: own processing according to Synek (Business Economics, Managerial Economics)

The lack of equity (own funds) is usually a weak point during the establishment, development and functioning of SMEs. To overcome the shortage, SMEs can use various forms of the borrowed capital. This borrowed capital, known as an external source of funding or as an

alternative source of funding is understood from several points of view. An overview is presented in Table 2. It is necessary to underline that not all the external sources of funding can be used by SMEs. Some of them are not available because of the legislative changes in the Czech Republic and can be used e.g. by large companies quoted on the stock exchange (bonds and shares issue) only. Similarly, certain provisions of the Accounting Act must be taken into account.

Table 2 External sources of financing by Synek

	bank
Loan	commercial (contractor, consumer)
	from employees
	financial
Leasing	operational
	undisclosed (concealed)
Factoring	disclosed (open)
	domestic
Factoring	external

Source: own processing according to Synek (Business Economics, Managerial Economics)

In the Czech Republic, the issue of financing of small and medium-sized enterprises in terms of individual sources of financing and their optimizing was studied by authors [4] who carried out a three-year questionnaire analysis of the sources of financing of SMEs in the European Union and compared the theoretical background with the practical knowledge. Their findings resulted in recommendations for SMEs on how to effectively manage and enhance the competitiveness within the market environment of the European Union. They pointed out that it is necessary to analyze the macroeconomic conditions, the common currency, all the business spheres and legislative changes.

Not only the Czech Republic, but also the Slovak Republic, which has a similar historical development as the Czech Republic (the two countries were unified until 1993 as Czechoslovakia), has become the subject of public discussion as it is a part of the European Union. [2] Authors analyzed the basic business systems of SMEs in the Slovak Republic including the distinction between **the sources of financing of an enterprise** and the financial support of enterprises as well as the **classification of the financial and non-financial support**. A questionnaire survey among 410 SMEs has shown that the tax and levy burden, clientism, law enforcement, corruption, administrative burdens, unfair trade practices of the other businesses, availability of financial resources, intensity of changes in legislation, awareness of business support, clarity of information about SMEs obligations, reliability of business partners are the most serious obstacles for SMEs. All these are the obstacles to entrepreneurship that cannot be regulated without the intervention of the state, but in terms of the functioning of the market mechanism, they are not right. Those findings are confirmed by authors [3] who found out that the position of the business environment in the Slovak Republic is getting worse every year. Authors [7] analyzed SMEs companies active in Czech and Slovak republic in years 2009-2011 and they confirmed medium-sized and big industrial companies are growing up and most suffered above all micro enterprises. The impact of crisis on management of group accommodation facilities and other groups in 2007-2012 were analyzed authors [1]. They showed that all industries has been considerably affected by the

global economic crisis over the most recent years, with its roots identified in the US mortgage market segment that this crisis has caused fluctuations in the markets across all industries, triggering uncertainty in nearly every business person in the Czech Republic. It necessary focused on a change of managers and their decision making and management and other measures taken by managers during the crisis, and the consequences of these measures. Some publications that directly affect the period under review and comparison of the current state of accounting and tax legislation provide in empirical studies or legislation of Ministry of Finance of the Czech Republic (2015) and the Chamber of Auditors of the Czech Republic [15].

3 Data and Methodology

The primary aim of the research was to map and explore the ways of **obtaining financial sources** for SMEs business activities in the Czech Republic. Due to the aim of the research a method of the questionnaire survey, which was supposed to verify the financial sources and funding opportunities of SMEs, was chosen.

In the analyzed period from 2009 to 2014, the survey involved a total of 350 respondents - enterprises (accounting entities) from the Czech Republic; they represented all the regions of the Czech Republic so that the sample of respondents was relevant. Changes related to the development of SMEs business and focused on the financing of the surveyed enterprises were continuously collected for each of the respondents in the period under review. In this context, the comparison of results obtained in the surveyed period was conducted. The trends in methods of financing business operations among the surveyed SMEs were determined. What is particularly interesting in this context are not only the alternations of various combined methods of financing of SMEs, connections to the related accounting, tax and legislative aspects, connections to **the legal form of the enterprise**, but also the barriers analyzing the ways of obtaining financial resources.

Individual conclusions mentioned in the questionnaire surveys and their subsequent evaluation are influenced by the respondent, that is why we set the following requirements related directly to securing of financial sources of the surveyed enterprises:

- size of the investigated enterprise (business entity) or the accounting entity,
- number of enterprise employees,
- requirements for the authorized person representing the respondent in connection with the ongoing survey (the financial manager, financial director, tax adviser having a general power of attorney, accounting methodologist, certified accountant, chief accountant etc.),
- identification of sources of financing: internal and external resources (bank loans, leasing, factoring).

All the qualitative data obtained by the primary research were evaluated using Microsoft Office Excel and the Decision Analysis Module for Excel. The program evaluation of the research was also made with the help of STRATEX and EVALENT.

4 Results and Discussion

Due to extensive legislative changes, **the way of obtaining financial resources for SMEs has recently become more challenging**. The analyzed period of time from 2009 to 2014 is dominated by combined cases, 59 % in 2009 and 70 % in 2014 (characterized **particularly** by personal investments **into business**, loans from family members, **credits and loans from**

financial institutions). The number of SMEs financing their business activity with the help of loans or grants decreases. **Those changes**, to be precise the comparison in the years 2009 – 2014 **are documented** in the following Table 3.

Table 3 Ways of **obtaining financial sources** for business activities (in the years 2009 - 2014)

Ways of obtaining financial sources for business activities / percentage in each year (2009- 2014)	2009	2010	2011	2012	2013	2014
Combined method (personal investments into business, credits and loans from financial institutions)	59	63	65	66	66	70
Personal investments into business	22	16	15	17	18	20
Loans from family members only	9	10	11	9	9	9
Loans from financial institutions only	6	7	6	5	5	4
Grants, investments into business, loans from family members	4	4	3	3	2	3

Source: own processing

The percentage related to other sources of financing was obtained by analyzing further additional questions. Different percentages are evident for enterprises engaged in production, trading activities, services or a combination of individual activities (production and trade, production and services, services and trade). According to the survey, the percentage of the surveyed respondents engaged in production from own resources amounts to 35%, leasing - 20%, bank credits - 20%, co-financing from the European Union - 19%, non-bank loans - 4 %, factoring - 2%. Different percentages of individual respondents in all sectors of production, trade and services are a source of a number of outcomes studied and evaluated as they have become the basis for a number of professional discussions and a source of authors [8].

When we focus further on the comparison of the business results during the period under review for individual respondents (2009 to 2014) for the financial period 2008-2013, a steady decline of the number of SMEs having positive economic results is evident. A positive economic result was achieved in 2014 (for the financial period of 2013) by only 34% of the surveyed respondents, while 66% of respondents reported a loss. In this context, the difference established by the research of 2009 is particularly noticeable. Positive economic results (profit) were achieved in 2009 (for the year 2008) by 43% of the surveyed respondents, 57% of respondents reported a loss. In 2008 (for the financial period of 2007) positive economic results were achieved by 41 % of respondents. The number of respondents with negative economic results prevails. The following Table 4 presents the comparison in the years 2009 - 2014.

Table 4 Business results of SMEs in the years 2009 – 2014 (for the financial period 2008-2013)

Business results of SMEs	2009 for the year 2008	2010 for the year 2009	2011 for the year 2010	2012 for the year 2011	2013 for the year 2012	2014 for the year 2013
Profit (%)	43	41	40	39	37	34
Loss (%)	57	59	60	61	63	66

Source: own processing

To evaluate the financial situation of an enterprise data from available, especially enterprise sources of the surveyed respondents were used. **These sources were divided into three groups:**

- enterprise accounting data were drawn from the financial (accounting) statement of the financial accounting, managerial and cost accounting as well as from the annual reports,
- **other enterprise data** were based on reports on business activity (sales, production activity, etc.), business statistics, internal regulations of an accounting entity, management forecasts and reports as well as on other internal company documents and reports,
- external data, precisely external economic-environmental data of an enterprise were used for comparison reasons. These were the secondary data of the Statistical Office and official sources, SWOT analyses of individual enterprises, **analyses of competitive enterprises**, accounting sets of suppliers and customers, creditors, including billing overview within 30 days after the due date, 60 days, 90 and 180 days, the total amount of financial claims and liabilities, percentages and other indicators that could reveal e.g. the secondary insolvency **of the surveyed enterprises**, etc.

The survey also investigated the importance of the financial analysis for the further development of SMEs, the use of the economic accounting software (EIS), the complexity in particular of information drawn from the enterprise financial reports in monetary units (balance sheets, profit and loss statements, cash flow statements), connection with individual financial indicators, financial decision-making of an enterprise, potential financial and business risks as well as a number of other factors.

Individual enterprises, examined accounting entities, respondents of our surveys confirmed the corresponding decisions that accompany their work, especially in the area **of their business activities financing**. In this context, the necessity of deciding whether to expand, retain or limit the business activity of the examined accounting entity, which new business contacts to establish, whether or not to pay bonuses, whether to conclude a financial leasing contract with subsequent purchase, whether to use the services of the tax or financial advisor was also confirmed.

The financial decision-making of an enterprise unambiguously verified the three main issues:

- deciding where to invest,
- **deciding on the method of financing (financial coverage) of investments,**
- **decisions on profit distribution.**

All these three types of decision-making are mutually connected; the conducted research stressed the necessity to optimally combine them from the point of the main aims of the enterprise.

Deciding where to invest

Based on our research, it was verified that this type of decision-making is the most important one from the point of view of the main aims of the enterprise; individual respondents also call it the investment decision-making (but in essence, it covers not only the area of investments in tangible assets, but also other, circulating investments or financial assets, intangible assets). The most essential one is the decision-making about investments in tangible assets, because it involves substantial amounts of financial means the benefits of which will be realized in the future. Decisions are made in conditions of greater or lesser uncertainty - the risk factor is involved. In this context, an important fact was confirmed. Investment decision-making is not only investing in new investments, but also deciding on the change in the composition of the existing assets, excluding some items and replacing them with others.

Deciding on the method of financing (financial coverage) of investments

This issue is understood by the surveyed respondents in the same way, it is directly related to deciding where to invest. It means that each investment (and not only investment) option was confirmed by the surveyed respondents identically. They always have to simultaneously evaluate any investment, from which sources it will be financed (own funds, credit, loan, leasing, donation).

Decisions on profit distribution

It is an integral part of the financial decision-making as it is directly linked to the optimization of financial sources. When dealing with the distribution of profits, the surveyed respondents have a different point of view. Decision-making is based on the allocations e.g. to the reserve fund, reward fund, the possibility of capital increase, the enterprise development.

Concerns of respondents - business and financial risk

Each enterprise in pursuit of profit takes over the risk of failure. This risk can be caused by many different factors and influences. The surveyed respondents are commonly concerned about the external risks in the form of natural phenomena (floods and droughts) or economic impacts on business (changes of interest rates, changes in credit, finance, pricing, purchasing, and sales policies).

As for the internal factors, the respondents are concerned about the personal (excellent employees leaving, decease, embezzlement, theft), capital (irrecoverable debts, depreciation of machinery, rotten goods, loan cancellation, interest rate increase, lack of money to cover liabilities) and operational (affecting active and inactive businesses) influences; e.g. loss while purchasing raw materials and materials (see: evaluation of individual studies in the years 2009-2014). The importance of the internal factors influence - the level of corporate and internal governance, work organization, efficiency and profitability of the enterprise, profit distribution plans, etc. - was confirmed.

According to the survey, the main problem of SMEs is a lack of financial means essential for the establishment and development of the business or the subsequent capital raising with the help of loans from various financial institutions. Entrepreneurs are concerned about and constantly confronted with a decline of the bank lending activity and stricter criteria for lending, particularly in terms of the requirements for securing a loan. A move away from properties towards securities, third party liability (mostly a legal person), restriction of deposits, deposit blockages, etc. were recorded.

A series of small, especially newly established Czech enterprises are under-capitalized, most of them emphasize the necessity of gaining further, additional capital (particularly bank loans, but not a bond issue or new share issue subscription). Interest rates and loan repayment are a significant problem for many SMEs. Many small enterprises are characterized by an insufficient development of specialized financial functions. This often leads to mistakes in financing, disproportional extent of fixed assets, including the lack of additional operational capital, wrong decision-making, sometimes underestimating the importance of the economic information system, quality accounting software, accounting specialists as well as the requirements for a tax adviser.

The last but not least, support and individual grant programmes have become important factors for the development of entrepreneurship.

In this context, on the basis of the conducted survey, the percentage of individual barriers in obtaining external financial sources was determined and evaluated. In the amount of 28%, there are complicated, long procedures demanding complicated administrative, 16% of respondents report high demands on fulfilment of individual obligations to be the main barrier, 13% of respondents are concerned e.g. about loans repayment problems and requirements for obtaining security. 11% of respondents mention very high costs as an important barrier, 10% of the surveyed respondents do not have enough own sources due to co-financing or bank guarantees. 6% of respondents report a lack of information and knowledge about financing, 2% of respondents report organizational legal reasons. No barriers are reported by only 1% of the surveyed respondents.

The survey of financing small and medium-sized enterprises was conducted in order to examine the problem areas and sources of SMEs financing in the Czech Republic. The survey results confirmed that the most common source of financing in production, trade and services are the own sources and a combined method of obtaining and using financial resources. SMEs are sensitive to changes of various conditions that can occur over time and should be confronted. According to the conducted survey, 20% of enterprises consider own sources of financing, 70% of enterprises consider the possibility of a combined method of financing. The disadvantage of SMEs is usually a lack of own financial capital. To overcome this lack, SMEs can be financed from various external sources - in the form of loans. The most common one is leasing, the share of financing amounts to 20% and a bank loan with the share of 20%. Leasing is primarily used for its accessibility, compared to a bank loan. Banks do not provide a bigger loan than are the guarantees of the enterprise; to provide a secured loan banks require tangible assets, financial claims or bills of exchange that most of the SMEs have a problem to obtain. SMEs also have to demonstrate excellent business results to get a loan and there is a limitation in the amount of these resources. It is also interesting to note that public financial grants are used by only 19% of the SMEs.

5 Conclusions

It may seem that the financing options are common in a number of enterprises; however, there are certain problem areas in deciding how to deal with financing that need to be solved by the enterprises, which was also shown by the results of the conducted surveys.

The last but not least, support and individual grant programmes have become important factors for the development of entrepreneurship.

The way of obtaining financial resources for SMEs has recently become more challenging. The analyzed period of time from 2009 to 2014 is dominated by combined cases, 59 % in 2009 and 70 % in 2014 (characterized **particularly** by personal investments

into business, loans from family members, **credits and loans from financial institutions**). The analyzed period of time from 2009 to 2014 is dominated by combined cases, 59 % in 2009 and 70 % in 2014 (characterized **particularly** by personal investments **into business**, loans from family members, **credits and loans from financial institutions**). The number of SMEs financing their business activity with the help of loans or grants decreases. In this context we observe significant conclusions individual surveys. Due to the achieved results, we recommend to continue further investigations and including the use of mathematical and statistical methods. We also recommend to compare the results obtained with other countries in the European Union and also in year 2015.

In this context, on the basis of the conducted survey, the percentage of individual barriers in obtaining external financial sources was determined and evaluated. In the amount of 28%, there are complicated, long procedures demanding complicated administrative, 16% of respondents report high demands on fulfilment of individual obligations to be the main barrier, 13% of respondents are concerned e.g. about loans repayment problems and requirements for obtaining security. 11% of respondents mention very high costs as an important barrier, 10% of the surveyed respondents do not have enough own sources due to co-financing or bank guarantees. 6% of respondents report a lack of information and knowledge about financing, 2% of respondents report organizational legal reasons. No barriers are reported by only 1% of the surveyed respondents.

From the range of external financial sources, 70% of SMEs prefer a combined method of financing through a bank loan and leasing. As far as SMEs are concerned, a bank loan and its availability confirms that it is more complicated to obtain it by an enterprise, however, it is not always the case. Leasing next to the bank loan is a popular form of alternative financing, by means of it SMEs can finance most of the movables in the form of the rent (for a predetermined period of time) and we can generally confirm the findings that for SMEs the loan and the leasing are substituted and one of their disadvantage is the possibility of the removal of the leased asset. Other external sources of financing recommended by the theory in practical application from the side of SMEs are unknown, less known and therefore unused. In case of entrepreneurial entities, knowledge and approaches to obtaining sources of financing are mostly affected by their experience and possibilities of their acquisition.

By a suitably chosen method of financing the enterprise influences the future economic results, competitiveness, profitability and financial stability.

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FINANCIAL REPORTING ON INFORMATION ABOUT THE FINANCIAL POSITION AND FINANCIAL PERFORMANCE IN THE FINANCIAL STATEMENTS OF THE PUBLIC SECTOR

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ABSTRACT

The financial statements of the public sector are the presentation of the information on the financial position and financial performance of the public sector entities. Information on the financial position and financial performance is recognized in the financial statements in the reporting on information about relevant elements such as assets, liabilities, net financial position, expenses, revenues, surplus or deficit. The paper deals with the examination of the reporting on the information about the financial position and financial performance in terms of the characteristics and recognition criteria of the elements in the financial statements of the public sector. The result of examination of that topic is a comprehensive set of knowledge about the financial reporting on the financial position and financial performance in the financial statements of the public sector in a way that meets the objectives of financial reporting to provide information that is useful for accountability and decision-making purposes.

Keywords: public sector, financial reporting, financial statements, financial position, financial performance

JEL codes: M40, M41, H83

1 Introduction

The financial statements of public sector are the structured representation of the financial position, financial performance, changes in financial position and cash flows by the statement of financial position, statement of financial performance, statement of changes in net assets/equity and cash flow statement. This representation shows the financial effects of all transactions and other events that have occurred in public sector entities by grouping them into broad classes which have common economic characteristics. These broad classes are called the elements of financial statements. The financial statements of public sector must give a true and fair view of all the elements in financial statements such as assets, liabilities, net financial position, expenses, revenues, and surplus or deficit. In order to respect true and fair view of all events and transactions, the elements in the financial statements comply with the definition and the recognition criteria. The elements in financial statements provide the basis for recording, classifying and aggregating economic data and activity in a way that provides users with information that meets the objectives of financial reporting to provide information that is useful for accountability and decision-making purposes. This issue is internationally regulated by the Conceptual Framework for General Purpose Financial

Reporting by Public Sector Entities (hereinafter Conceptual Framework) and the relevant International Public Sector Accounting Standards. This Conceptual Framework was issued in 2014 by the International Federation of Accountants and it establishes the concepts that are to be applied for general purpose financial reporting by public sector entities prepared and presented under the accrual basis of accounting.

Accrual basis means a basis of accounting under which transactions and other events are recognized when they occur (and not only when cash or its equivalent is received or paid). Therefore, the transactions and events are recorded in the accounting records and recognized in the financial statements of the periods to which they relate. [2]

2 Literature Review

The researched object that is financial reporting on information about the financial position and financial performance in the financial statements of the public sector was chosen because of its timeliness and dynamic development. This topic was not a comprehensive solution until 2014 because there is now conceptual framework for public sector reporting. We got information about the researched object from book and magazine sources, conference proceedings and from our own previous knowledge of the research activities. We have worked with the current literature published in 2014, which was mainly in English. This literature is listed in the references section. The above issue deals mainly with Conceptual Framework for General Purpose Financial Reporting by Public Sector Entities that was first published in October 2014 on the IFAC website [1]. We used the provisions of International Public Sector Accounting Standards that are listed in the Handbook of International Public Sector Accounting Pronouncements, which was published in 2014 on the IFAC website and it was divided into two volumes [2], [3]. We also used our knowledge of our research activities that is listed in monograph related to international harmonization of financial reporting in the financial statements of the public sector [4] and articles in scientific journals related to financial reporting on revenues from non-exchange transactions [5], analysis of the Conceptual Framework for General Purpose Financial Reporting by Public Sector Entities [6] and financial integration of the public sector finances [7]. The knowledge gained forms the basis for the processing of results and discussion.

3 Data and Methodology

The aim of this paper is to describe and analyze financial reporting on the information about the financial position and financial performance in terms of the characteristics and recognition criteria of the elements in the financial statements of the public sector. We applied epistemology as a basic method for researching this problem. Standard research methods, such as selection, analysis and synthesis, presenting basic methodical approach to paper processing are applied. We combined the obtained knowledge to form new, higher level of knowledge of research problems. In particular, ways of understanding and explaining characteristics and recognition criteria of the elements in the financial statements of the public sector, the inductive-deductive and analytic-synthetic logical scientific methods are used. In the conclusion, we stated opinions, in which we highlighted the importance of financial reporting on the financial position and financial performance in the financial statements of the public sector in a way that meets the objectives of financial reporting to provide information that is useful for accountability and decision-making purposes.

4 Results and Discussion

Definition of assets, liabilities and net financial position of public sector entities recognized in the statement of financial position is internationally regulated by the Conceptual Framework.

An asset under the Conceptual Framework is a resource presently controlled by the public sector entity as a result of a past event. It means that the asset under this definition must meet three conditions, namely:

- It is a resource;
- It is presently controlled by the public sector entity; and
- It is a result of a past event.

A resource is an item with the ability to generate economic benefits or service potential. The resource may not have a physical form. The ability to generate economic benefits or service potential may arise directly from the relevant resource or from the rights to the use this resource such as the right to use the resource to provide services, the right to use resources belonging to an external party to provide services, the right to change the resource into cash and dispose of this resource, the right to benefit from an increase the value of resource or the right to receive cash flows. Economic benefits are the ability to directly or indirectly contribute to cash flows. These cash flows can be derived, for example, from the use of assets in the production and sale of services or from the direct exchange of the assets for cash or other resources. Service potential is the ability of the public sector entity to provide services that contribute to achieve its objectives. The assets of the public sector, which is embodied service potential, may include, for example, heritage, community, defense, recreational and other assets that are held by the government and other public sector entities and that are used to provide services to third parties.

The resource is presently controlled by the public sector entity, which means that the public sector entity must have control of the resource. Control of the resource includes the ability of the public sector entity to use resources (or directly identify the other parties on use the resources) so as to derive the benefits of the economic benefits or service potential embodied in the resource for achieving the objectives such as service delivery or other objectives.

In assessing whether the resources are presently controlled by the public sector entity, the existence of these indicators is assessed [1]:

- Legal ownership,
- Access to the resource, or the ability to deny or restrict access to the resource;
- The means to ensure that the resource is used to achieve its objectives; and
- The existence of an enforceable right to service potential or the ability to generate economic benefits arising from a resource.

The identification of these indicators and their analysis can provide information to decide whether the resource is controlled by the public sector entity

In assessing when the control of rights to resource arise, the public sector entities take into account these events such as the general ability to generate the power, establishing of the power through the statute, exercising the power by law to create the right, establishing the right of the event which gives rise to the right to receive resources from the external parties. Assets as a resource of public sector entity arise when the power is exercised and there is a right to receive resource.

The resource is a result of a past event is a condition that requires resource that is under the control of a public sector entity arising from past transactions or other past events. The past transactions or events that result in the fact that the resource is under the control of the public sector entity may be different. The public sector entity may obtain assets from exchange transactions or from non-exchange transactions, including taxes and transfers.

Exchange transactions are transactions in which one entity receives assets or services, or has liabilities extinguished, and directly gives approximately equal value (primarily in the form of cash, goods, services, or use of assets) to another entity in exchange. Non-exchange transactions are transactions that are not exchange transactions. In a non-exchange transaction, an entity either receives value from another entity without directly giving approximately equal value in exchange, or gives value to another entity without directly receiving approximately equal value in exchange. [5]

A liability under the Conceptual Framework is a present obligation of the public sector entity for an outflow of resources that results from a past event. It means that liability under this definition must meet three conditions, namely:

- It is a present obligation;
- It leads to outflow of resources; and
- It results from a past event.

The present obligation is a legally binding obligation or non-legally binding obligation and the public sector entity has little or no real option to avoid this obligation. Obligation is a present obligation if it is not a binding obligation and there is a possibility to avoid this obligation. Binding obligation can arise from exchange transactions or from non-exchange transactions. The obligation has to be to the external party. It means that obligation gives a rise to the liability. The public sector entity cannot be obligated to itself even where it has publicly announced intention to behave in a certain way. Identification of the external parties is an indication of the existence of an obligation giving a rise to the liability. Legally binding obligation is enforceable in law. Such legally enforceable obligations may arise from different situations. Exchange transactions usually have a contractual nature and therefore they are enforceable through the laws of the contract. Non-legally binding obligations differ from legally binding obligations in that the party to whom the obligation exists cannot take legal action to strengthen settlement.

Non-legally binding obligations which give a rise to the liability, have the following attributes [1]:

- The public sector entity notifies the other parties in the manner applied in the past, published policies or a sufficiently specific current announcement that it will accept certain responsibilities;
- As a result of such announcement, the public sector entity has created a valid expectation on the part of those other parties that will be fulfilled these responsibilities; and
- The public sector has little or no real option to avoid the obligation arising from these responsibilities.

In the public sector, obligations may arise in various ways, for example, in implementing the program and the realization of services by making a political promise, declaration of political direction, introduction and approval of the budget and becoming effective of the budget.

The fact at which the obligation gives a rise to the liability depends on the nature of the obligation. Factors that could affect the decision of whether other parties may validly conclude that the obligation is such that the public sector entity has little or no real option to avoid an outflow of resources include the following:

- The nature of a past event or events which gives a rise to an obligation, for example, the election promise is unlikely to rise to a liability because election promise rarely creates realistic expectations on the external parties that the public sector entity has little or no real option to avoid fulfilment of obligation. The announcement in relation to the events or circumstances that have occurred may have such political support that the government has little option to withdraw from such announcement. Where the government has committed to provide the necessary budgetary provision such the announcement may lead to a legally binding obligation;
- The ability of the public sector entity to modify or change the obligation until it clears, such as announcement of policy course generally does not lead to the non-legally binding obligation which cannot be changed before the announcement will become effective and if the obligation depends on future events;
- Existence of the correlation between the availability of financing to settle the specific obligation and creation of the present obligation, for example the non-binding legal obligation may exist in case where the current budget item has been approved and financing is assured through the appropriation, the availability of contingency financing or a transfer from a different level of the government. The absence of the budgetary provision does not itself mean that the current obligation has not arisen.

It leads to outflow of resources that are an outflow of resources that leads to settlement. The obligation that can be settled without the outflow the resources from the public sector entity is not treated as a liability.

It results from a past event, which means that the present obligation arises as a result of the past transactions or other past events and requires an outflow of resources from the public sector entity. The complexity of the programs and activities of the public sector mean that the number of events in the development, implementation and operation of the certain program may give a rise to the obligation.

Net financial position under the Conceptual Framework is the difference between assets and liabilities after adding other resources and the deducting other obligations recognized in the statement of financial position. A net financial position can be a positive or negative residual value.

Definition of costs, revenues and profit or loss of public sector entities recognized in the statement of financial performance is internationally regulated by the Conceptual Framework.

Expense under the Conceptual Framework is a decrease in the net financial position of the public sector entity, other than decreases arising from ownership distributions.

Ownership distributions under the Conceptual Framework are outflows of resources from the public sector entity, distributed to external parties in their capacity as owners, which return or reduce an interest in the net financial position of the public sector entity.

Revenue under the Conceptual Framework is an increase in the net financial position of the public sector entity, other than increases arising from ownership contributions.

Ownership contributions under the Conceptual Framework are inflows of resources to a public sector entity, contributed by external parties in their capacity as owners, which establish or increase an interest in the net financial position of the public sector entity.

Surplus or deficit for the period under the Conceptual Framework is the difference between revenue and expense reported on the statement of financial performance.

The recognition criteria for assets, liabilities, revenues and expenses in the financial statements of public sector entities are internationally regulated by the Conceptual Framework.

An asset is incorporated and included in amounts displayed on the face of the statement of a financial position of public sector entities when it meets the following recognition criteria:

- An asset satisfies the definition of an element in the Conceptual Framework; and
- Can be measured in a way that achieves the qualitative characteristics and takes account of constraints on information in the financial statements of public sector entities.

A liability is incorporated and included in amounts displayed on the face of the statement of financial position of public sector entities when it meets the following recognition criteria:

- A liability satisfies the definition of an element in the Conceptual Framework; and
- Can be measured in a way that achieves the qualitative characteristics and takes account of constraints on information in the financial statements of public sector entities.

An expense is incorporated and included in amounts displayed on the face of the statement of financial performance of public sector entities when it meets the following recognition criteria:

- An expense satisfies the definition of an element in the Conceptual Framework; and
- Can be measured in a way that achieves the qualitative characteristics and takes account of constraints on information in the financial statements of public sector entities.

A revenue is incorporated and included in amounts displayed on the face of the statement of financial performance of public sector entities when it meets the following recognition criteria:

- A revenue satisfies the definition of an element in the Conceptual Framework; and
- Can be measured in a way that achieves the qualitative characteristics and takes account of constraints on information in the financial statements of public sector entities.

All items of financial statements of public sector entities that satisfy the recognition criteria are recognized in the financial statements. In some cases, in accordance with the objectives of financial reporting to provide information that is useful for accountability and decision-making purposes, it may be provided that the resource or obligation which does not satisfy the definition of an element in the Conceptual Framework is to be recognized in the financial statements provided it can be measured in a way that meets the qualitative characteristics and constraints on information in the financial statements. The decision whether the relevant element is recognized in the financial statements includes an assessment of uncertainty related to the existence and measurement of the element. The conditions that lead to uncertainty can

change and it is important to assess the uncertainty at each reporting date. Uncertainty about the existence of an element is determined by considering the available evidence in order to make an independent decision on whether the element meets all the basic characteristics of the definition of that element, taking into account all the facts and circumstances at the reporting date. If it is identified that the element exists, uncertainty about the amount of ability to generate economic benefits or service potential represented by that element is taken into account in the measurement of that element. Preparers of financial statements assess and recover all available evidence in identifying whether an element exists and is recognized and whether that element continues to meet the recognition criteria or whether there has been a change to an existing element.

In order to recognize an element in the financial statement of the public sector entities, it is necessary to value that element in the manner set out in the Conceptual Framework. That is selection of the measurement basis and determining whether the measurement of the element meets the qualitative characteristics, taking into account the constraints on information in the financial statements, including the fact that the measurement is sufficiently relevant and faithfully representative for the elements to be recognized in the financial statements of public sector entities.

The principal measurement bases for assets under the Conceptual Framework are the following:

- Historical cost;
- Market value;
- Replacement cost;
- Net selling price; and
- Value in use.

Historical cost for assets is the consideration given to acquire or develop an asset, which is the cash or cash equivalents or the value of the other consideration given, at the time of its acquisition or development.

Market value for assets is the amount for which an asset could be exchanged between knowledgeable, willing parties in an arm's length transaction.

Replacement cost for assets is the most economic cost required for the public sector entity to replace the service potential of an asset (including the amount that the public sector entity will receive from its disposal at the end of its useful life) at the reporting date.

Net selling price for assets is the amount that the public sector entity can obtain from sale of the asset, after deducting the costs of sale.

Value in use for assets is the present value to the public sector entity of the asset's remaining ability to generate economic benefits or service potential if it continues to be used, and of the net amount that the public sector entity will receive from its disposal at the end of its useful life.

The principal measurement bases for liabilities under the Conceptual Framework are the following:

- Historical cost;
- Cost of fulfilment;
- Market value;

- Cost of release; and
- Assumption price.

Historical cost for liabilities is the consideration received to assume an obligation, which is the cash or cash equivalents or other value of the other consideration received at the time the liability is incurred.

Cost of fulfilment for liabilities is the costs that the public sector entity will incur in fulfilling the obligations represented by the liability, assuming that it does so in the least costly manner. Market value for liabilities is the amount for which a liability could be settled between knowledgeable, willing parties in an arm's length transaction.

Cost of release for liabilities is the amount that either the creditor will accept in settlement of its claim, or a third party would charge to accept the transfer of the liability from the debtor.

Assumption price for liabilities is the amount which the public sector entity would rationally be willing to accept in exchange for assuming an existing liability.

The basic qualitative characteristics on information under the Conceptual Framework are relevance, faithful representation, understandability, timeliness, comparability and verifiability.

Relevance on information means that financial and non-financial information is capable of making differences in achieving the objective of financial reporting in the case of a confirmatory value, predictive value, or both values. Information has confirmatory value if it confirms or changes past or present expectations, for example, the information will be relevant for accountability and decision-making purposes when it confirms expectations about such matters as the extent to which managers meet their responsibilities for the effective and efficient use of resources and achieve service delivery objectives in accordance with relevant budgetary, legislative and other requirements. Information on anticipated future service delivery activities of the public sector entity, the objectives of the public sector entity, costs and the amount of the sources that are intended to be allocated to providing services in the future will have a predictive value and be relevant for the accountability and decision-making purpose.

Faithful representation on information means that information (where to be helpful) must faithfully represents the economic and other transactions and events that it purports to represent. Faithful representation illustrates the nature of the transactions and is achieved when the presented phenomena are complete, neutral and free from material error to the maximum possible extent.

Understandability on information enables users to understand its importance in such a way that information is classified, characterized, and presented clearly and concisely. The presented information respond to the needs and knowledge base of users, for example, explanation information on service delivery and other achievements during the reporting period and expectations for future periods should be written in plain language and presented in a manner that is easily understandable by users.

Timeliness on information enables users to have the information available for them before it loses its ability to be useful for accountability and decision-making purposes. If users had relevant information available sooner, it can increase its usefulness as a basis to the assessment of accountability and its ability to inform and influence a decision to be taken.

Comparability on information enables users to identify similarities in and differences between the two sets of phenomena. Comparability differs from the consistency in such a way that

consistency uses the same accounting principles and policies in each period and within the public sector entity or in the single period in several entities and its application increases the usefulness of any comparison of the predicted and actual results. Comparability is the objective and consistency helps in achieving this objective [4].

Verifiability on information helps to ensure the users that the information faithfully represents the economic and other phenomena that it purports to represent. Verifiability means that different knowledgeable and independent observers could reach general agreement that the information represents the economic and other phenomena without major errors and distortions, such as the measurement bases or representation methods are used without major errors and distortions. The assumptions on which the information is provided, the methods adopted in compiling the information and the factors and circumstances that support any opinions expressed or disclosures made have to be transparent. This enables users to form an opinion on the appropriateness of these assumptions and methods of compilation, measurement, representation and interpretation of the information.

Constraints on information included in financial statements under the Conceptual Framework are materiality, cost-benefit and balance between the qualitative characteristics.

Materiality means that its omission or misstatement could influence the acceptance of accountability by the public sector entity or make decisions based on the reported information prepared for the reporting period. Materiality depends on the nature and amount of the items that are specific to each public sector entity, such as information on service delivery achievements during the reporting period and expectations regarding to service delivery and financial results in the future. The assessment of materiality is carried out in accordance with the legislative, institutional and operational environment in which the public sector entity operates and in respect of the expected information, knowledge of preparers and expectations about the future.

Cost-benefit refers to the fact that financial reporting gives a rise to costs and benefits of financial reporting should justify those costs. Assessing whether the benefits of providing information justify the related costs is a matter of judgment, because it is often not possible to identify and/or quantify all the costs and all the benefits of the reported information.

Balance between qualitative characteristics means that the quality characteristics work together in order to contribute to the usefulness of information. The relative importance of the qualitative characteristics is a matter of professional judgment. The aim is to achieve an appropriate balance between the qualitative characteristics in order to meet the objectives of a financial reporting. [6]

5 Conclusions

The aim of this paper was to develop knowledge about the specific problems of financial reporting by public sector entities, in particular the examination of the reporting on the information about the financial position and financial performance in terms of the characteristics and recognition criteria of the elements in the financial statements of the public sector. These issues are covered by the Conceptual Framework for General Purpose Financial Reporting by Public Sector Entities and relevant International Public Sector Accounting Standards. The result of examination of that topic is a comprehensive set of knowledge about the financial reporting on the financial position and financial performance in the financial statements of the public sector in a way that is useful for preparers of financial statements to meet the objectives of financial reporting to provide information that is useful for accountability and decision-making purposes. This comprehensive set of knowledge is useful

to a wide range of users in making and evaluating decisions about the allocation of resources and demonstrating the accountability of the public sector entity for the resources entrusted to it by providing information about the sources, allocation, uses of financial resources, providing information about how the public sector entity financed its activities and met its cash requirements, providing information that is useful in evaluating the public sector entity's ability to finance its activities and to meet its liabilities and commitments, providing information about the financial condition of the public sector entity and changes in it and providing information useful in evaluating the public sector entity's performance in terms of service costs, efficiency, and accomplishments.

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PERFORMANCE MEASUREMENT MODELS

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ABSTRACT

The aim of this paper is to describe the evolution of performance measurement models from a cybernetic to a holistic view. An overview is first provided, then each of these views is analysed. Performance measurement models have moved from a cybernetic view whereby performance measurement was based mainly on financial measures and considered as a component of the planning and control cycle to a holistic view based on multiple nonfinancial measures where performance measurement acts as an independent process included in a broader set of activities. This paper contributes to the performance measurement literature by establishing the origins of the performance measurement models and by shedding light on unexplored fertile areas of future research.

Keywords: performance measurement, cybernetic view, holistic view, multiple nonfinancial measures, planning and control cycle

JEL codes: G10, G01

1 Introduction

Performance measurement is a process of quantifying the efficiency and effectiveness of past actions, a process of evaluating how well companies are managed and the value they deliver for customers and other stakeholders. Performance measurement is an element of the planning and control cycle that captures performance data, enables control feedback, influences work behavior and monitors strategy implementation. In a holistic view, performance measurement plays a key role in the development of strategic plans and evaluating the achievement of organizational objectives as well as acting as a signalling and learning device.

The aim of this paper is to provide an overview of the evolution of performance measurement models.

2 Literature review of performance measurement models

Simon, Guetzkow, Kozmetsky and Tyndall in a study related to the organization of a controllership function, addressed three uses of performance measurement: score-card use, attention-directing use, and problem-solving use. They maintain that no sharp dividing line can be drawn between the score-card and the attention-directing uses, because employees tend to redirect their attention in accordance with the variances that issue from the score keeping process. For higher-level management, the attention-directing use arises from the managers' need to keep their subordinates alert and to convince them that "the boss knows what is going on". The problem-solving use, because of its contribution to the managers' decision process, represents an extension of the decision-making role [12].

The majority of researchers in the second half of the 20th century studied performance measurement as part of the planning and control cycles, and the roles addressed were limited to control, decision making and external communication. It was not until the early 1990s that signalling and learning emerged.

At this time the role of short-term financial performance measurement became inadequate for the new conditions of companies (e.g. accelerated changes in technology, needs for innovation and flexibility, shortened product life cycles). The importance of nonfinancial indicators, which are based on organizational strategy, which include key measures of success and which overcome various shortcomings of financial measures, was stressed by several authors [6, 7]. Gradually, performance measurement began to be based on the use of financial and nonfinancial measures; examples include the balanced scorecard [8], integrated performance measurement [3, 5], stakeholder model [2], and performance management framework [11].

Simons summarizes the use of information in a context of performance measurement and management control. Five different uses are presented, which reflect the cybernetic and holistic views of performance measurement:

- Decision making - refers to the improvement of decision processes through *planning* (setting performance and strategic goals and ensuring an adequate level and mix of resources) and *coordination* (integrating disparate parts of a business to achieve objectives).
- Control - refers to *feedback* to ensure the input-process-output system is properly aligned and to motivate and evaluate employees.
- Signalling - refers to *cues* sent by managers throughout the organization related to their values, preferences and where the employees should be focusing their attention and energy.
- Education and learning - refers to the organizational *understanding* of changes in the internal and external environment and the *links* between their components.
- External communication - refers to the diffusion of information to external constituents (stockholders, investments analysts, lenders, suppliers, business partners, customers etc.) [13].

Cybernetic vs holistic view

Cybernetic view: Performance measurement has been viewed as an important requirement of a cybernetic model of control that also includes stated objectives or goals, a predictive model and a tool to facilitate the choice of alternative actions. Two sets of variables need to be measured: those defined by objectives and those required by predictive models.

From a cybernetic viewpoint the use of performance measurement is associated mainly with control of accomplishment of organizational objectives and strategy implementation. Performance measurement is thus implicitly linked to the notion of diagnostic control systems, described as formal feedback systems used to monitor organizational outcomes and correct deviations from preset standards of performance.

Performance measurement models from a cybernetic view operate with financial measures, which express results of decisions in a comparable measurement unit and capture the cost of trade-offs between resources as well as the cost of spare capacity. It may encourage conservatism and a “playing it safe” attitude. Managers need to be encouraged to identify defined areas within which a degree of experimentation and risk-taking might be beneficial [10]. Financial measures discourage senior managers from innovating, investing in market share or developing sources of competitive advantage and encourage conformity. Moreover, strategic planners’ flexibility and creativity may be inhibited by formal control systems.

Control systems create a climate that can act against successful strategy implementation and formulation processes [14].

Holistic view: The holistic view of performance measurement is an extension of the cybernetic model. It involves feedback to control the objective setting, modification of the organizational assumptions, targets and strategic plans and thus represents a learning experience.

The performance measurement role is extended from a single loop to a double loop learning dimension [1]. Performance measurement is in this case seen as promoting organizational learning. The relationship between organizational learning and management control system is both recursive and two-way, with the two concepts inextricably interwoven [9]. Otley introduces a performance management framework that is designed to go beyond the measurement of performance and clearly represents the essence of the holistic view. The framework is basically grounded in a cybernetic approach where:

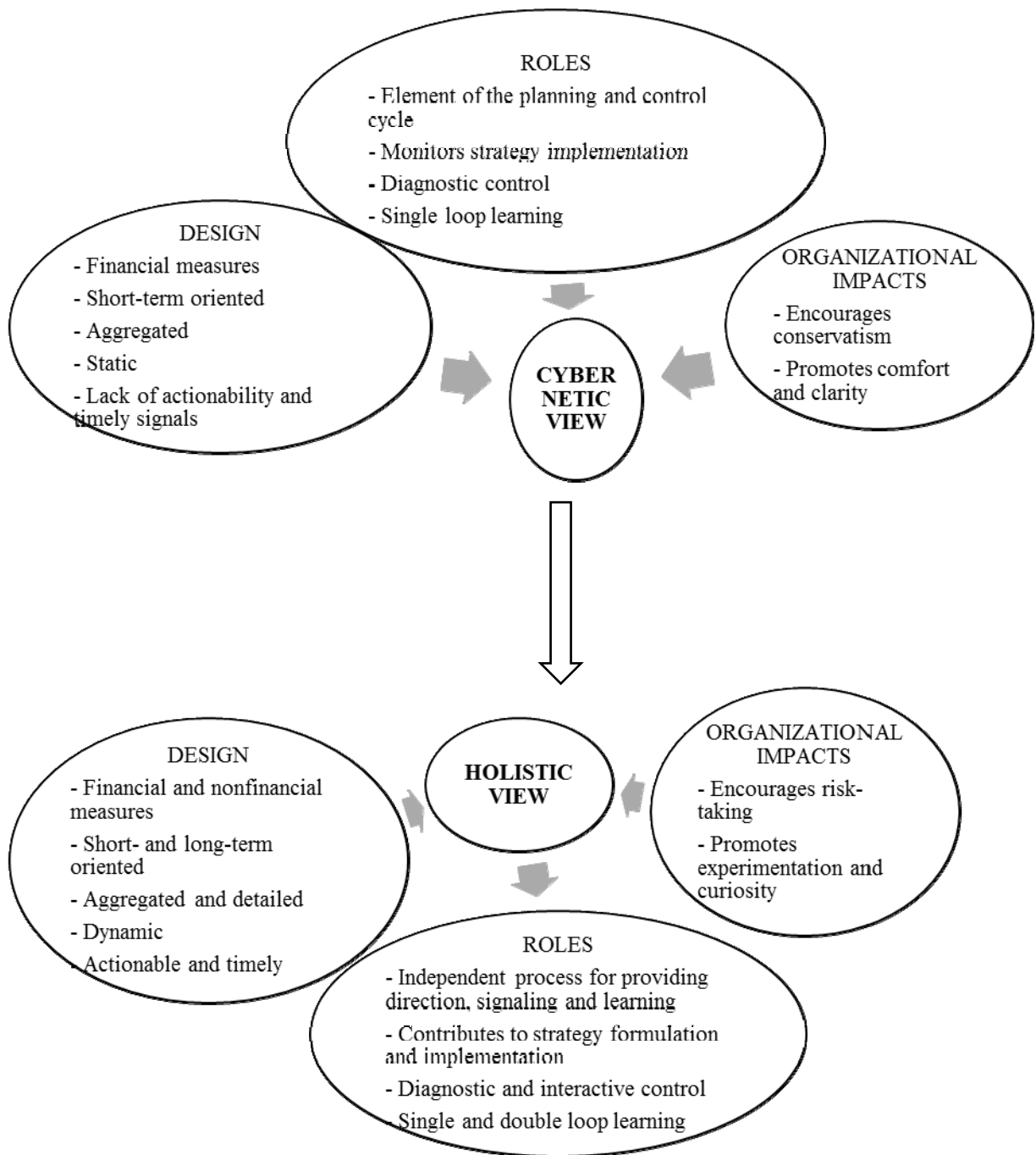
- stakeholder interests determine the organizational key objectives,
- strategies and plans are adopted, and the processes and activities required are identified,
- performance is measured and rewarded,
- feedback is provided [11].

In order to stimulate learning and contribute to strategy formulation, performance measurement systems focus attention on strategic priorities, create visibility within the organization to ensure coordination, inspire action and enhance communication considered essential to learning [15]. The discussions, debates, action plans, ideas and tests throughout the organization foster learning that encourages the gradual emergence of new strategies and tactics. More than just being a diagnostic system, performance measurement also represents an interactive device [4].

Performance measurement in a holistic view contributes to strategy formulation and implementation by revealing the links between goals, strategy, lag and lead indicators and subsequently communicates and operationalizes strategic priorities.

Figure 1 presents the main differences between cybernetic and holistic views in terms of role, design and organizational impacts.

Figure 1 Evolution of performance management



Source: Simons, R. (2000). *Performance measurement and control systems for implementing strategy*. Upper Saddle River, New Jersey: Prentice Hall. Otley, D. (1999). *Performance management: a framework for management control systems research*. *Management Accounting Research* 10, pp. 363-382.

3 Conclusions

Within the management accounting literature, performance measurement has evolved from a component of the planning and control cycle relying on financial information (cybernetic view) to an independent process used as signalling and learning devices for strategic purposes based on multiple nonfinancial measures (holistic view). It facilitates to measure movement in

a strategic direction instead of distance from a goal, which is different from the planning and control cycle.

In conclusion, in its transition from a cybernetic to holistic view, the management accounting literature reflects an evolution in the role, design and organizational impacts of performance measurement. Organizational theory has contributed to this development and has potential to do so in the future. Synergistic effects could be obtained from the combination of specific knowledge and expertise from accounting and organizational theory as well as fields such as strategic management, operation and production management and finance. Multidisciplinary perspectives could contribute to a more comprehensive understanding of performance measurement issues.

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THE INFORMATION CONTENT OF ECONOMIC VALUE ADDED

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ABSTRACT

While proponents of the measure economic value added (EVA) generally report high levels of correlation between the measure and shareholder value creation, other researchers have reported conflicting results. It is, therefore, not clear whether the measure is able to outperform more conventional accounting measures when attempting to account for the variation in share returns. In this paper the ability of the measure EVA to explain market adjusted share returns is investigated for a sample of American companies and compared to that of traditional and other value based financial performance measures.

Keywords: economic value added, market adjusted share return, value based financial performance measures

JEL codes: G3, G32

1 Introduction

Value based financial performance measures provide an estimate of a company's economic profit by incorporating its total cost of capital in their calculation. In those cases where these measures yield positive values, economic profits are generated, and consequently shareholder value is expected to increase. Negative values indicate the destruction of shareholder value [1, 7]. Traditional financial performance measures exclude the company's cost of capital, and no provision is, therefore, made for the opportunity cost on the capital invested by the shareholders [6]. These traditional measures are also based almost exclusively on information obtained from official financial statements. Consequently, these measures are exposed to accounting distortions. Despite these limitations analysts and investors still widely apply the traditional measures.

The measure economic value added (EVA) was developed and introduced by a consulting company of Stern Stewart and Co. during the early 1980s. The company trademarked the measure and placed strong emphasis on the advantages of adopting and implementing EVA, mainly on the strong relationship between a company's EVA and shareholder returns.

EVA is determined by calculating the difference between the cost of a company's capital and the return earned on capital invested, and multiplying it with the amount of capital invested in the company:

$$EVA_t = (r - c^*) \times IC_{t-1}, \quad (1)$$

where

r - the return on the capital invested

c* - the company's after-tax cost of capital

IC_{t-1} - the invested capital at the beginning of period t

EVA quantifies the surplus return earned by the company. Alternatively, the measure can be calculated by comparing the net operating profit after tax with the total cost of capital invested.

$$EVA_t = NOPAT_t - \text{Total cost of IC} = NOPAT_t - (c^* \times IC_{t-1}), \quad (2)$$

where

NOPAT_t - Net operating profit after taxes

If a company is able to earn NOPAT values in excess of its total cost of capital invested it generates a positive EVA figure. However, should NOPAT be insufficient to cover the company's total cost of capital, a negative value for EVA is calculated. The rationale behind the calculation of EVA is that shareholder value can only be created in those cases where a company can reward all relevant parties (shareholders and debt providers) for the capital they provided. This means that sufficient profits need to be available to cover the costs of capital, and that surplus profits (if any) are available to increase the shareholder value. If a company is not able to cover the costs of capital no surplus profits would be available to increase shareholder value.

The objective of this paper is to evaluate the incremental and relative information content of selected value based performance measures above the traditional financial performance measures.

The information content of a financial performance measure refers to the additional information that the market deduces from its publication and incorporates into the expected future financial performance of the company. Incremental information content indicates whether one financial measure provides additional information over and above that provided by another measure. Relative information content refers to the information content of one financial measure compared to another.

2 Literature Review

While proponents of the value based measures report high correlations between the measures and the creation of shareholder value, a large number of studies have found far weaker relationships. It is thus not clear whether the implementation of a value based measure will actually benefit a company in its quest to maximise its shareholders' value.

According to Stewart empirical research on the actual behaviour of share prices supports the link between EVA and shareholder value created. He reports that the changes in EVA account for almost 50% of the changes in market value added (MVA). When considering traditional performance measures a much lower explanatory power is observed. Growth in earnings per share, for instance, only accounts for between 15% and 20% of the changes in MVA [12].

The strong relationship between EVA and MVA, as well as EVA and changes in MVA, is also highlighted by Walbert [13]. Lehn and Makhija also observe a positive correlation between EVA and MVA [9]. Furthermore, the correlation between EVA and share returns is higher than any of the other measures investigated in their study.

O'Byrne argues that EVA has a greater explanatory ability than earnings per share (EPS) when considering share returns. According to him researchers fail to recognise this ability since they ignore certain market valuation characteristics with regard to EVA. He states that [10]:

- The market places a higher multiple on positive EVA values than negative values when firms are valued.
- The market allocates higher multiples for smaller companies.

Worthington and West investigate the relative and incremental information content of EVA and compare it to other financial measures. The results from their study indicate that EVA is more closely associated with share returns than the other measures investigated. They also conclude that the accounting adjustments required to calculate EVA contribute statistically significant information content [14].

Biddle investigates the information content of the measures EVA, residual income (RI), earnings before extraordinary item (EBEI) and cash from operations (CFO). Based on their results they reject the claim that EVA has the highest informational content. EBEI is found to be significantly more highly associated with annual market-adjusted share returns than RI, EVA and CFO. Although EVA did provide incremental information to EBEI when explaining share returns, the incremental contributions of the EVA components are economically insignificant. Furthermore, earnings dominate EVA in explaining company's values [2].

Dodd and Chen also report low levels of correlation between EVA and share returns. The studies also indicate that unadjusted accounting measures are more closely correlated with share returns than EVA [3].

Clinton and Chen find that most of the correlations between EVA, share prices and share returns are either negative or insignificant [4].

In another study that investigates EVA's ability to explain share prices, De Villiers and Auret determine that EPS outperforms EVA. Year-on-year changes in EPS also offer a better explanation for share prices than changes in EVA [5].

Based on an evaluation of the relative and incremental information content of EVA, Palliam concludes that EVA is a relatively poor predictor of share returns [11]. The relationship between EVA and shareholder returns is found to be weak, and earnings manages to outperform the measure in the relative information content tests.

Similar results are reported by Kyriazis and Anastassis for a sample of firms listed on the Athens Stock Exchange [8].

3 Data and Methodology

The measures earnings before extraordinary items (EBEI), operating cash flow (CFO), residual income (RI) and economic value added (EVA) are calculated for a sample of American companies in a period from 1993 to 2012.

On the one hand, we worked with the figures from the 2013 US 1000 EVA/MVA Annual Ranking Database, which comprises the figures of EVA, NOPAT, MVA, market value (MV) and revenues of 1000 biggest US companies from different sectors.

On the other hand the financial statements and annual reports were elaborated and other figures, such as EBEI, CFO, RI and share returns were calculated.

In order to evaluate the relative and incremental information content of the various independent variables, an approach applied by Biddle is implemented. The different measures are included in individual regression analyses, and the adjusted R² values are compared. Based on these results the relative information content of the measures can be evaluated. By subdividing EVA into its contributing components, the information content of specific components is also evaluated.

4 Results and Discussion

This part of the paper investigates the relative and incremental information content of EVA and the measures CFO, EBEI and RI.

Relative information content: The descriptive statistics of the winsorized values of market adjusted return, EBEI, CFO, RI and EVA included in the relative information content tests pooled across time are provided in Table 1.

Table 1 Descriptive statistics on the dependent and independent variables in the relative information content tests

	Market Adjusted Return	EBEI	EVA	RI	CFO
Mean	0.13	0.180	-0.161	-0.105	0.278
Median	0.013	0.129	-0.019	0.002	0.146
Std. Dev.	0.785	0.618	0.506	0.524	0.671
Correlations					
	Market Adjusted Return	EBEI	EVA	RI	CFO
Market Adjusted Return	1				
EBEI	0.295	1			
EVA	0.114	0.328	1		
RI	0.161	0.449	0.861	1	
CFO	0.187	0.485	0.009	0.031	1

Source: Results of calculations provided by the authors.

The measure CFO show the largest mean and median values, followed by EBEI, RI and EVA. The measures CFO and EBEI exhibit positive mean and median values. In the case of the two value based measures EVA and RI, the median values calculated for the pooled data are close to zero. Statistically significant positive correlations are found between most of the measures. The correlations between CFO, and EVA and RI, however, are not statistically significant. In terms of the correlations between the dependent and the independent variables, the highest correlation is observed between Market Adjusted Return and EBEI. This is followed by CFO, RI and EVA.

Incremental information content: According to the approach applied by Biddle EVA is partitioned into its contributing components:

$$EVA = CFO + Accrual + Interest - Capital Charge + Accounting Adjustments, \quad (3)$$

where:

Accrual - total operating accruals of the company

Interest - interest expense after provision for tax

Capital Charge - capital charge based on the cost of capital and the invested capital at the beginning of the financial year

The descriptive data of the winsorized EVA components included in the incremental information content tests pooled across time are provided in Table 2.

Table 2 Descriptive statistics on the dependent and independent variables in the incremental information content tests

	Market Adjusted Return	CFO	Accruals	Interest	Capital Charge	Accounting Adjustments
Mean	0.13	0.279	-0.07	0,079	0.369	-0.059
Median	0.013	0.141	-0.02	0.025	0.162	-0.015
Std. Dev.	0.785	0.649	0.589	0.172	0.654	0.301
Correlations						
	Market Adjusted Return	CFO	Accruals	Interest	Capital Charge	Accounting Adjustments
Market Adjusted Return	1					
CFO	0.179	1				
Accruals	0.053	-0.487	1			
Interest	0.077	0.231	-0.081	1		
Capital Charge	0.135	0.451	-0.031	0.619	1	
Accounting Adjustments	-0.025	-0.024	-0.021	-0.189	-0.148	1

Source: Results of calculations provided by the authors.

The mean and median values of both Accruals and Accounting Adjustments are negative. This is consistent with the smoothing effect of these components on a company's CFO. The significant negative correlation between CFO and Accruals could be attributed to the same reason. The correlation between CFO and Accounting Adjustment is also negative, but not statistically significant. Statistically significant positive correlations are found between CFO, Interest and Capital Charge. According to Biddle, companies with higher CFO also have

higher debt and equity costs. When the dependent variable is considered, the highest correlation is observed between Market Adjusted Return and CFO.

5 Conclusions

In this paper, the information content of the measure EVA was compared to that of the measures RI, EBEI and CFO to determine whether EVA is able to outperform the other measures in explaining share returns. An approach similar to Biddle was applied to a sample of American companies to evaluate the relative information content of the individual measures, as well as the incremental information content of the EVA components.

The results of the relative information content tests indicated that EVA does not outperform earnings (EBEI) in explaining the variation in the market adjusted return of a company's shares. In the majority of the tests EVA also does not manage to outperform RI, a less complex value based measure. On this basis, the relatively complex accounting adjustments required to calculate EVA do not add significant information.

The incremental information content tests show that EVA components do not add significant additional information content beyond that contained in earnings (EBEI). More specifically, it appears that the capital charge and accounting adjustments required to calculate EVA did not add statistically significant incremental information content at all. Based on the results reported in this chapter, claims that EVA outperforms other financial performance measures could not be supported.

The results of this study are in a line with those of Biddle, Chen, Dodd and Clinton (mentioned above in Part 2).

The object of further research could be a similar comparison of EVA and traditional performance measures in another environment, for example in Europe (European companies).

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EMPIRICAL RISK ANALYSIS AND ITS EFFECTS ON THE ENTERPRISE PERFORMANCE BY USING 3-D ENTERPRISE RISK MODEL WITH FOCUS ON SLOVAKIA

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ABSTRACT

In our paper we conduct an empirical risk analysis and apply the effects on the enterprise financial performance in the period of 2004-2014 by using novel enterprise 3-D risk model, with focus on Slovakia within the euro area. The method of this paper is based on the methodology of CAPM in comparison with Building-up I Model (proposed in Czech Republic), used to evaluate the Cost of Equity and its applications in Slovak conditions. Our hypothesis that the valuation of Cost of Equity with application of systematic risks using historical data (based on CAPM) was lower than the valuation with application of business and financial risks using expected market data (based on Building-up I), was confirmed. Finally, we designed novel 3-dimensional Enterprise Risk Model according to Slovak market conditions using our approach to modelling and scoring of risks. Models can be applied in risk controlling and Mergers and Acquisitions processes for synergic effects, too.

Keywords: business and financial risks, effects, valuation of Costs of Equity, enterprise performance, 3-D Enterprise Risk Model

JEL codes: G3, G32, G12

1 Introduction

Risk controlling in entrepreneurship is one of the newer ways of controlling within the scope of controlling system but its importance is growing worldwide. Financial controlling as a conception of financial stability and performance of companies and risks solution based on controlling is irreplaceable in a modern company. The issue of implementation of effective financial decisions in times of global crises is often conditioned by factors such as conflict of interest, the time deficit and deficit of financial sources and alternatives, deficiencies of organizational and managing skills [5]. To reduce the risks means to anticipate, predict and

create possible alternative scenarios of companies' development and their financial characteristics [18]. Modern approaches to effective financial management are based on Value Based Management, Enterprise Risk Management, economic capital and economic profit models.

For this paper, we focus on empirical risk analysis in enterprise activities and especially risks that come into the valuation of Cost of Equity in models and consequently into the calculation of the company's performance models and mergers and acquisition processes, too.

The research questions and research problems are as follows:

The probability and dimension of financial losses in entrepreneurship in global context increase because of the impact of global risks exposure. Which enterprise performance models, capital pricing models based on risk controlling must be applied in managing practice for the purpose of early identification, quantification, minimization, and prevention of business risks more comprehensively?

2 Literature Review

To manage risks more effectively, risks can be divided as follow [13]:

- business and financial risks that are necessary to be known in the case that we summarize the input for the valuation of Cost of Equity with the application of the particular partial risks,
- systematic and unsystematic risks on the market are necessary to be known in relation to the purpose that the valuation is being made for and to the model that is used for assessment. Systematic (external) risks are represented as beta- β coefficient, which has been modified to levered β coefficient. The second group of risks represented risks arising from the internal enterprise environment as unsystematic risks. These ways of looking at risks were investigated in many empirical studies [12], [14], [16], [19].

Business risk consists of [13]:

- sector risk – the dynamics of the sector, sector dependence on the business cycle, innovation potential of the sector, determining trends in the sector,
- risk of the market on which the business operates - market capacity, risk of achieving lower sales, the risk of market penetration,
- risk of competition – competition and competitiveness of the products, prices, quality, research and development, advertising and promotion, distribution and service,
- management risk – vision, strategy, key employees, organizational structure,
- risk of the production process – evaluation in terms of production risk, technological opportunities of production, labour force, suppliers,
- other business risk factors – level of fixed costs, position of the business towards customers and suppliers, entry barriers into the sector.

Financial risk can be evaluated through known financial indicators: Indebtedness (Debt/Equity ratio), Interest Coverage (EBIT (Earnings before interests and taxes)/interest expense), Debt Service Coverage Ratio (Coverage repayments from Cash Flow), Enterprise Safety indicator (Share of net working capital on current assets), Current ratio and Quick ratio, Average Collection Period, Inventory Turnover [13].

Business and financial risks [13] are not strictly divided into systematic and unsystematic risks, but these risks are mixed together and arise from expected market development. This fact will be interesting for our further research and next modelling.

The Capital Asset Pricing Model (CAPM) by [17] and [11] represented the formation and the

fundamental concept of asset pricing theory. Five decades later, the CAPM is still widely discussed, improved and used in practice, e.g. in estimating the Cost of Capital for firms and the performance of managed portfolios. Many experts dealt with it and developed several different versions of CAPM to explain market pricing for risk and return of portfolio. Finance textbooks often recommend using CAPM risk-return relation to estimate the Cost of Equity capital. Damodaran [1] improved the CAPM model at several levels and the first approach was based on the introduction of Country Risk Premium (CRP). Further alternatives were developed in his works [2], [4] for better ways of measuring risk and estimating expected returns. Recent progress in the measurement of beta and market volatility has resulted in improvements in the evaluation of alternative beta and volatility forecasting approaches [10]. Building-up II model proposed by [15] with the evaluation of unsystematic risks (ex post) and Building-up I model proposed by [13] with the evaluation of systematic and unsystematic risks (ex post and ex ante from market development) can better correspond with national market conditions in the Czech Republic and Slovak Republic, too, within the European Union.

3 Data and Methodology

The objective of this study is to analyze the effects of systematic and unsystematic risks on the enterprise performance with focus on business and financial risks using two approaches based on the methodology of Capital asset pricing model (CAPM) in comparison with Building-up I model [13] and its applications on Slovak conditions for an enterprise in the food industry. And subsequently, this paper outlines *our approach of scoring the financial indicators, scoring risks and creating 3-dimensional (3-D) enterprise risk model*, which solve the effects of risks on the enterprise financial performance and can reduce, diversify and evaluate risks more comprehensively.

In the valuation of risks and valuation of Cost of Equity in models we investigate, compare and develop *two theoretical approaches*:

- the first approach – the methodology based on CAPM model [4] with valuation of systematic risks (using historical ex post data)
- the second approach – the methodology based on Building-up I model [13] with the valuation of business and financial risks (and systematic and unsystematic risks), proposed in the Czech Republic (using ex post and ex ante data).

These models are not used in managing practice in Slovak Republic within the euro area and for this reason we investigate, compare and apply them for specific Slovak conditions using our approach of scoring the financial indicators, scoring risks and creating of risk models. But the models are dynamically developing and used more and more worldwide.

In the part with the main goal, the research hypothesis for enterprises in the food industry in the Slovak Republic in this study is as follow:

Research Hypothesis:

We suppose that the valuation of Cost of Equity with application of systematic risks using the methodology based on CAPM Damodaran modification with historical data will be lower than the valuation with application of business and financial risks. We suppose that the Cost of Equity evaluated with application of business and financial risks (systematic and unsystematic) using the methodology based on Building-up model I with expected data from market development will be higher than the valuation based on CAPM.

We suppose that the enterprise performance with the application of systematic risks and estimated business and financial risks according to Building-up I model will be more comprehensive for risk analysis, using the novel 3-D Enterprise risk model.

For the creation of 3-D Enterprise Risk Model (ERM) were used secondary data from the financial statements of selected enterprises in the food industry in Slovakia from the years 2004– 2014, selected risks and risk parameters, based on CAPM and Building-up I model and prediction models.

Our novel 3-dimensional Model (ERM) based on CAPM and Building-up I model consists of these three selected dimensions:

- *Risks: systematic and unsystematic risks:* (Levered β , Equity Risk Premium (ERP), Country Risk Premium (CRP), Total Risk Premium by [4]) - *the first attribute of risks, business and financial risks:* Debt/Equity ratio - Indebtedness, EBIT (Earnings before interests and taxes)/interest expense – Interest Coverage, Coverage repayments from Cash Flow - Debt Service Coverage Ratio, Share of net working capital on current assets - Enterprise Safety indicator, Current ratio and Quick ratio, Average Collection Period, average period of inventories - Inventory Turnover (by [13]) – *the second attribute of risks,*
- *Financial performance indicators:* (Current Ratio, Average Collection Period, Turnover of Liabilities, Cash – to – cash, Debt Equity Ratio, Return on Assets, Return on Equity, Stability),
- *Prediction P-Models:* (Altman Model, Index IN05, Index creditworthiness, Taffler Model, Springate Model, Fulmer Model, Balance sheet Analysis by Doucha I, Quick test).

3.1 Methodology based on CAPM for application of systematic risks for the valuation of Cost of Equity

For the analysis of systematic risks and the valuation of Cost of Equity (rate of Equity, r_e) with these risks we use CAPM model in the modification by Damodaran [4]:

$$r_e = r_f + \beta \cdot ERP + CRP \quad (1)$$

Coefficient of systematic risk - β

Another parameter within CAPM model is coefficient of systematic risk β that shows the sensitivity of an investment to the market changes. Some of the authors have the opinion that β coefficient is the standardised risk rate of an asset that is added to the risk rate of an entire market - systematic risk. β is set by the method of analogy. This method is based on the idea of setting β coefficient by comparing with similar enterprises that are listed in the stock market and their activities are not diversified. It is necessary to take into account possible differences in business risk and differences in financial risk that depend on the capital structure of evaluated enterprise. Influence of this capital structure is according to CAPM evaluated in relation between “levered” and “unlevered” β that is edited with β of debt capital, which is considered to be zero.

$$\beta_L = \beta_U \cdot \left(1 + (1 - \tau) \cdot \frac{D}{E} \right) \quad (2)$$

where:

β_L – levered β of enterprise, β_U - unlevered β of enterprise, t - tax, D - Debt capital, E - Equity.

3.2 Methodology based on Building-up I Model for the valuation of business and financial risks

As a starting point for the valuation of business and financial risks it was important to state risk factors. These factors were divided using the mentioned methodology into factors of business risk and factors of financial risk. Among the business risk factors (twenty five risks) were factors of risk in the level of food industry branch, level of market factors, competition level, management level, production level, as well as other factors related to the production margin. Financial risk was evaluated by application of seven mentioned risk factors.

Risk weight of factors after the calculation was 32.8. For calculation of weight of risk factor we used degrees (x): 1 - low, 2 - average, 3 - increased, 4 - high [13].

4 Results and Discussion

4.1 Calculation of the valuation of Cost of Equity with business and financial risks for the food industry in Slovakia

After the calculation of Risk Premium for Slovakia in our previous study [8] we can calculate particular business and financial risks for analysed years. To test the Hypothesis we used presented methodology based on Building-up I model [13] for calculation of business and financial risks of the food industry in Slovakia. Firstly, we focused on the calculation of business risk for year 2015. Then we applied the methodology for calculation of business risks for the entire analysed period of years 2004 - 2014. Within the valuation of business, risk factors that were part of both systematic as well as unsystematic risks occurred. Based on this, we can confirm that the business risk is the sum of systematic and unsystematic risks. Business Risk Premium for year 2015 is 5.30% and Financial Risk for year 2015 is 3.53%. Within the financial risk, also very high risks occurred and they were influenced mainly by current liquidity, enterprise safety indicator and partially by interest coverage. Values of current liquidity are below 1 in the long term. Net working capital is negative, which as a result threatens the safety of the food industry in Slovakia. Overall development of business and financial risk as well as the Cost of Equity is shown in Table 1.

Table 1 Development of business and financial risks and Cost of Equity (%)

<i>Indicators</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>
<i>r_f</i>	4.22	4.39	4.70	4.02	2.21	3.84	3.29	1.88	1.76	3.04	2.17	1.80
<i>Business Risk</i>	6.47	6.52	6.60	6.41	5.55	6.35	6.14	5.30	5.20	6.03	5.52	5.30
<i>Financial Risk</i>	3.62	3.62	3.61	3.62	3.56	3.62	3.61	3.53	3.51	3.60	3.55	3.53
<i>Cost of Equity</i>	14.3	14.5	14.9	14.1	11.3	13.8	13.0	10.7	10.5	12.7	11.3	10.63

Source: Authors' calculating and processing in software

Expected Cost of Equity for year 2015 is 10.63%. This cost is among the lowest in the analysed time period. Lower Cost of Equity was only in 2012. In that year there were also lower business and financial risks. For year 2015 we can point out the historically lowest yields of Slovak government bonds that copy the yields of government bonds within the EU [20]. To show the influence of chosen risks on the performance of food industry in Slovakia, we firstly have to point to the business risks that incorporate both systematic and unsystematic

risks. Systematic risks are influencing all branches of the industry in Slovakia and this is why it is important to focus mainly on unsystematic risks that are characteristic for food industry, particularly on the absence of chosen resources, high depreciation of machinery, high costs, absenting of Research and Development and many other factors. In food industry there is prevailing high operational risk that demonstrates the EBIT reduction in relation to revenues.

4.2 Calculation of the valuation of Cost of Equity with application of systematic risks for the food industry in Slovakia

For the valuation of Cost of Equity with systematic risks we apply the CAPM model [3], [4]. Necessary inputs are shown in the Table 2. Similarly as in the case of valuation of business and financial risks, we calculated it for the year 2015.

Table 2 Development of systematic risks and Cost of Equity (%)

<i>Indicators</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>
<i>Unlevered β</i>	0.50	0.50	0.61	0.66	0.63	0.69	0.72	0.47	0.71	0.66	0.82	0.80
<i>D/E</i>	22.03	27.28	22.39	19.46	35.37	29.31	27.62	26.81	27.42	28.74	21.46	20.13
<i>Levered β</i>	0.58	0.61	0.72	0.77	0.80	0.86	0.87	0.58	0.87	0.77	0.97	0.93
<i>ERP</i>	4.84	4.80	4.91	4.79	5.00	4.50	5.00	6.00	5.80	5.00	5.70	5.75
<i>CRP</i>	1.43	1.20	1.05	1.05	2.10	1.35	1.28	1.28	1.50	1.28	1.28	1.28
<i>r_f</i>	4.22	4.39	4.70	4.02	2.21	3.84	3.29	1.88	1.76	3.04	2.17	1.88
<i>Cost of Equity</i>	8.46	8.52	9.29	8.76	8.31	9.06	8.92	6.64	8.31	8.17	8.98	8.51

Source: Authors' calculating and processing in software

From the Table 2 it is evident that the Cost of Equity for the year 2015 of the food industry calculated with the CAPM model and with the application of systematic risks is 8.51%.

By *consequent comparison* of the used methods and with different application of risks we found out that there are differences in the values of Cost of Equity. In the case when we calculated the Cost of Equity with the application of business and financial risks (the systematic and unsystematic, based on Building-up I model), the Cost of Equity was higher than the value calculated with the application of systematic risks (based on CAPM). For the year 2015, the price difference was 2.12%. This difference represents the influence of unsystematic risks on the company or the industry respectively. Our Hypothesis (in part one) was confirmed.

4.3 Enterprise Risk Model (ERM) for an enterprise in the food industry in the Slovakia for risk analysis

In the following part of this paper we focus on testing of our Hypothesis (in part two) and the evaluation of an enterprise performance in the food industry in Slovakia, using our approach of scoring financial indicators, scoring risks and creating 3-D ERM model.

The next Table3 presents the outputs in numbers of the new model 3-D Enterprise Risk Model (ERM) for selected enterprise in the food industry in the Slovak Republic with focus on impact of estimated business and financial risks. Similarly, using this method, the best values of input variables were assigned a maximum of 5 points; the worst values of the input variables were assigned 0 points and total number of points was 120.

Table 3 The outputs of 3-D ERM in numbers

YEAR	FINANCIAL PERFORMANCE	P- MODELS	RISKS	SCORE
2004	28.30	33.91	34.88	97.10
2005	28.75	27.27	35.49	91.52
2006	20.28	23.38	35.19	78.85
2007	17.81	18.28	35.48	71.57
2008	18.41	16.16	33.72	68.29
2009	18.89	18.23	34.38	71.50
2010	17.57	17.44	34.15	69.16
2011	16.75	16.22	36.55	69.52
2012	16.97	16.09	34.71	67.77
2013	19.70	20.14	34.83	74.68
2014	17.80	17.38	34.30	69.48

Source: Authors' calculating and processing in software

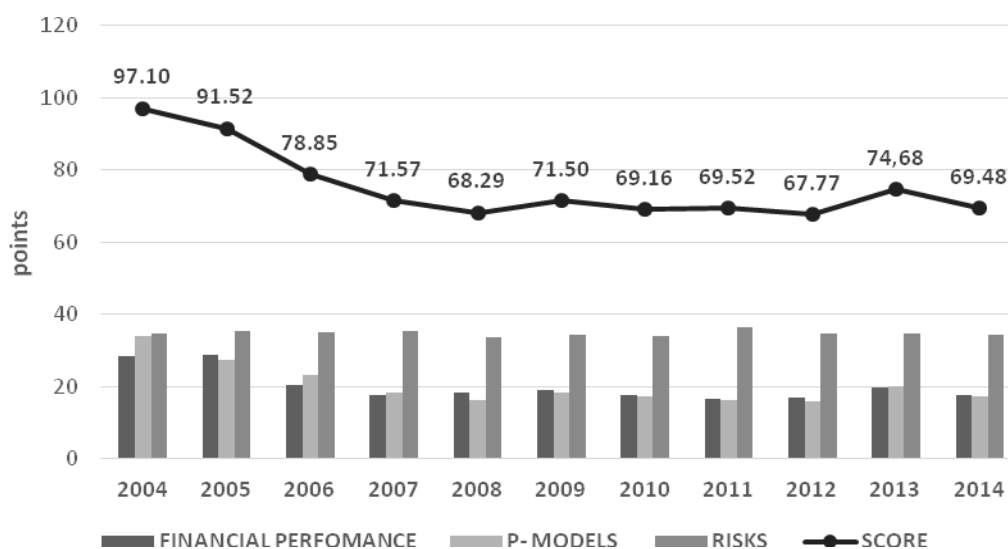
Note: the calculating basis of 3 dimensions is 40-40-40 points, total score is 120 points

In the years 2004-2005, this analysed enterprise in the food industry reached the best position in the ERM Enterprise Risk Model, from the viewpoint of risks, financial performance and from the viewpoint of business successfulness, too. In the next years, the position of enterprise has deteriorated gradually due to global crisis. In years 2013-2014 the position of enterprise moderately increased.

Overall point score of enterprise's performance is 69.48 (69.5) points in 2014 what with the maximum of 120 points assumes the average position in reached resulting performance using ERM and this position is from the viewpoint of risk relatively stable. Systematic risks and risks that are the forecasting ex ante in the area of business and financial risks, give the higher value score than the risks specified from accounting historical data.

In the following Figures 1, 2 is constructed the 3-dimensional Enterprise Risk Model (ERM) for our selected company in Slovakia created by software STATISTICA V.12 that comprises the business and financial risks more effectively. Model (ERM) for an enterprise in the food industry in the Slovak Republic with impact of risks expresses the influences between selected financial indicators, selected systematic and unsystematic risks (by Damodaran and Marik models, thirty two Marik business and financial risks) and selected prediction models. All values of input indicators were calculated using the scoring method, too.

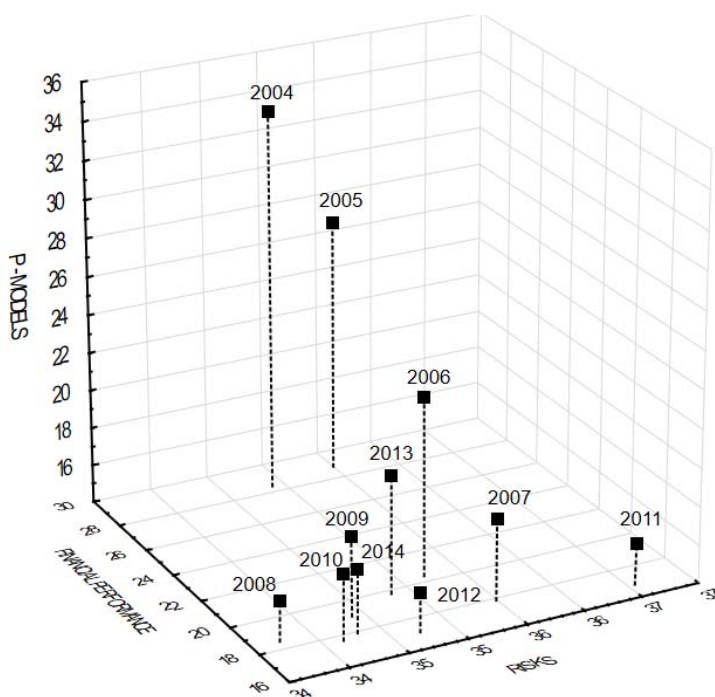
Figure 1 The novel 3-D Enterprise Risk Model in the graph - overall score



Source: Authors' calculating and processing in software

The 3-dimensional Enterprise Risk Model (ERM) can evaluate risks in the past and in the future better than other models because it includes thirty two business and financial risks using ex ante data from expected market development.

Figure 2 The novel 3-D Enterprise Risk Model



Source: Authors' calculating and processing in software STATISTICA V.12

ERM is the model whose resulting position of analysed enterprise is more effective from the risk viewpoint. It is presented because the evaluation of business and financial risks according to [13] is more comprehensive in total as the evaluation of only unsystematic risks. The risks in the model ERM are extrapolated based on the analysis of business risks (systematic and unsystematic) and from expected market development and not from historical ex post data.

5 Conclusions

Finally, it is necessary to evaluate the applied capital asset pricing models and enterprise risk models for risk analyses. Based on mentioned conclusions, we can consider the constant attraction of the CAPM as the most appropriate model for valuation and quantification of Cost of Equity [6]. These models need to be modified by conditions of Slovak Republic. Considering this issue, we need to encompass the financial risk, which is specific for the food industry, because according to the calculations it is evident that the liquidity has the poor, low place in this sector.

Based on the mentioned findings it is possible to set the following general effects which we have reached partially also in our previous study [8]:

- Despite numerous problems with the application of CAPM, this model represents the only theoretically based model of Cost of Equity valuation. It is also the model recognised throughout the world as a model of calculation discount rate of market valuation.
- It is recommended to apply this model in such a way that market risk and β would be applied based on the US data and these would be supplemented by Risk premium of the given country.
- It is recommended to modify and supplement Cost of Equity by significant Equity Risk premiums of particular enterprise, with emphasis on replenishment of unsystematic risk.
- If the requirement of diversification is not met, it is recommended to use the calculation of total β . However, this method of calculation leads to high values of equity valuation.
- For Slovak conditions in this case, it is advisable and appropriate to apply Building-up I model [13] with the modification for assessment and forecasting of risks more comprehensively from expected market development.
- ERMs can be used in managing practice for effective risk management in order to minimize, diversify and predict risks better and more comprehensively on global markets and to improve enterprise performance [9].

Main findings:

Based on the presented facts and creating of novel 3-D Enterprise Risk Models (ERM) we can confirm the Hypothesis that the valuation of Cost of Equity with application of systematic risks using historical data was lower than the valuation of Cost of Equity evaluated with the application of business and financial risks, which arose from expected market development. For the year 2015, the price difference was 2.12%. This difference represents the influence of unsystematic risks on the company or the industry respectively.

Similarly we can confirm: The reached resulting enterprise performance was more comprehensive in 3-D ERM, including systematic risks and business and financial risks with application data from expected market development.

Consecutively, it is important to emphasize the fact that CAPM is still the most suitable and most applicable model for calculating the Cost of Equity. But it is important to take into the account that this model accepts only systematic risks. Because of that it is suitable to add chosen unsystematic risks, or to apply universal *Building model* with the use of business and financial risks, as the supplementary model to the CAPM. Beside the stated, this model is also great tool for future risk in risk controlling and serves well as an early warning model. But the applicability of models for national markets, for practitioners to decision-making processes and convergence of models in practice is important.

Risk management and risk controlling tools allow managers to explicitly address uncertainties by identifying and generating metrics, by developing responses and by tracking risks [7]. The modern managing methods can be classified as e.g. quantitative methods, causal models, and time series analyses, benchmarking, Workflow Management Systems and dynamically

developing Balanced Scorecard, where within the scope of financial perspective it is possible to capture and solve risks of enterprises on time, link financial controlling and controlling of the risks. The effect of ERM is that it is better equipped to manage long-term financial performance and to make risk-informed strategic decisions in companies in Mergers and Acquisitions processes for synergic effects, too, on global competitive market.

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OPTIMAL GOVERNMENT SIZE IN EUROPEAN UNION IN INTERACTION WITH ECONOMIC GROWTH

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ABSTRACT

Fiscal policy for many countries has become a major macroeconomic tool with which it is possible to influence the whole economy. The importance of the instrument is among the countries of the European Union and especially in the countries of Economic and monetary union because of the fact that the countries adopting the euro as a national currency, they gave up the creation of an independent monetary policy. The relationship between the size of government and economic growth is discussed topic among academics. The present contribution of shifts given problem a bit further, and is not intended only to determine the correlation, but also to determine the optimal size of government maximizing economic growth. In this paper the optimal size of government was determined at intervals of 45.49% and 52.06% for member countries of European Union.

Keywords: government size, economic growth, government expenditure, BARS curve

JEL codes: C23, E62, E63

1 Introduction

The government size presents an important factor in the economy, which is attributed with many features and tasks. In addition to its stabilizing effect and the ability to smooth cyclical fluctuations in the economy, its influence on the economic growth is also important. Government size can be quantified through a various number of indicators, and it is not possible to capture the entire context and the role of government in a manner of its expression. Most often however, the government size expressed commonly as a percentage ratio of public expenditure on gross domestic product, which generally refers to the degree of redistribution of resources in the economy. A method of quantifying the size of government through the expenditure approach also captures significant factor considered by us, which is the possibility of borrow funds by government (government size quantified by revenue approach is abstracting from this factor), opening up new opportunities for financial coverage of government activities. Public debt on the other hand also affected the inflow of foreign investment and also the government's ability to borrow at more favourable terms, which in the end also affect the level of economic growth. [3]

Issue of correlation between economic growth and the government size has recently become a topic of discussion; general theory is more inclined to a negative correlation between government size and economic growth. Some explanation is that the public sector has a tendency leading to inefficient use of economic resources due to high government taxation than by the private sector and thus when in an economy dominates public sector, it is deteriorating and efficient use of economic resources. [15] We must have in mind the fact that bigger governments are also associated with the crowding out effect, which can harm the

economy and dampen economic growth. [10] On the other hand public sector can boost economic growth through public investment (provision of public goods, building infrastructure and social security). Support economic growth by increasing the amount of public expenditure can be achieved also through subsidies to the public sector; e.g. higher subsidies to agriculture would increase employment in this sector, which would be positively reflected in the level of economic growth. [23]

However, this rule cannot be generalized for all conditions and countries. Recent studies have confirmed that the government size contributes to enhancing the economic growth, but if the size of government exceeds a certain critical level, appears its destabilizing effects and its negative impact on the level of economic growth. In this case, it is already not a classical linear relationship between the increase of economic growth and size of government, but it can be argued that in this case there is a nonlinear relationship between the government size and economic growth. By the existence of certain level, government size begins to act on determining the optimal size of government maximizing the highest possible economic growth.

The paper is structured as follows. The second section provides literature overview of the authors deal with this topic. The third section named Data and Methodology describes data sources, time period, representative sample and empirical procedures, which are used to determine optimal government size. The fourth section presents our results in comparison with results provided by other authors. The fifth section is the last part of paper and gives conclusion.

2 Literature Review

Gemmel, N. – Au, J. (2012) divided the empirical studies regarding economic growth and government size in three generations: [7]

- **I. generation** (before 1990) – in this period only certain hypotheses was created, which dealt with the negative correlation between government size and economic growth. Concerned hypothesis was not supported with the relevant theoretical background and suffered from a lack of empirical evidence.
- **II. generation** (1990-2000) – during this period, authors developed the endogenous theory of economic growth based on the neoclassical model. Barro (1990), King and Rebelo (1990), Baxter and King (1993) has significantly contributed to the creation of a theoretical basis for the already mentioned hypothesis regarding the ability of fiscal policy to positively influence long-term economic growth. The present theoretical basis was explained through empirical studies but abstracted from complex econometric and statistical techniques.
- **III. generation** (since 2000) – with adequate theoretical basis began to estimate the relationship between government size and economic growth in the long period based on panel data regression.

As we can see, the question of the impact of government size on economic growth is delight already a number of decades, which are continuously developed and improved, respectively still opens up new questions detailing the economic conditions affecting the present correlation. Here is also some insight into contemporary literature (III. generation), which discusses the correlation between the government size and economic growth for better rendering direction of contemporary science that deals with this topic.

Afonso, A. – Furceri, D. (2009) investigated the effect of government size and fiscal fluctuations on economic growth in the OECD countries and the EU. Measured the size of

government by revenue and expenditure approach, it worked negatively on economic growth in OECD countries as well as in the EU, while increasing the size of government by 1% cause decline of economic growth in the range of 0.12 to 0.13%. A negative effect on economic growth has also fluctuations in public finances than on the expenditure and the revenue side in their composition and amount primarily through increasing the degree of uncertainty of the private sector. The only type of public spending, which positively influence economic growth are net social transfers. This correlation is specific only for EU countries. [1]

Afonso, A – Jalles, J. T. (2011) modified previous study expanded to affect the quality of services and goods from the public sector. Representative sample consist of 108 countries with differing levels of economic development during the period 1970-2008, while reaffirming negative correlation between economic growth and size of government. On the contrary, the quality of the institution and provision of public goods is positively correlated with economic growth. The most important findings are that the negative effect of increasing of the size of government on GDP per capita is stronger in the case of low-quality provision of public goods. In other words we can say that a positive effect on economic growth through improving the quality of service of public goods is stronger in countries with smaller government. [2]

From previous studies it suggests that there is negative correlation between economic growth and the size of government. The present reality cannot be generalized to all countries. The issue to be dealt by *Bergh, A. – Henrekson, M. (2011)*, focusing mainly on the Nordic countries and the Anglo-Saxon legal system. For these countries it is typical to have a government relate with high taxation and high public spending, but with a relatively high percentage of economic growth. The authors also offered an explanation to this phenomenon. First explanation mentioned, those countries with higher levels of social trust are able to provide a government services without hurting the economy in some way. The second reason is that the country offset the high tax burden and public expenditure incurred by the favourable market policies in other areas of the economy. [5]

Kustepeli, Y. (2005) examined the relationship between the size of government and economic growth in the 14 countries¹ (among them was the Slovak Republic) during the period 1994 - 2001. In the event that all countries examined together, it has concluded that a relatively small government cripple economic growth. Midsize government acted contrary to positive economic growth. [13]

The expansion of knowledge concerning the impact of government size on economic growth in a sample of European Union countries during the period 1980-2002 are credited by authors *Sáez, M. P. – García, S. A. (2006)*. In general, they confirmed the positive correlation between the size of government and economic growth in the European Union, but this relationship depends mainly on the specifics of each country, time period and the approach how people quantify the size of government. [21]

With the development of econometric methods are gradually begins to examine the relationship between economic growth and size of government in detail and from various aspects. *Loizides, J. – Vamvoukas, G (2005)* observed (using Granger causality test) correlation between size of government quantified as a proportion of public spending on GDP and economic growth. The present causal relationship has been observed in three countries (United Kingdom, Ireland and Greece). It concluded that the increase in the size of government increases the level of economic growth in all countries in the short term. In the

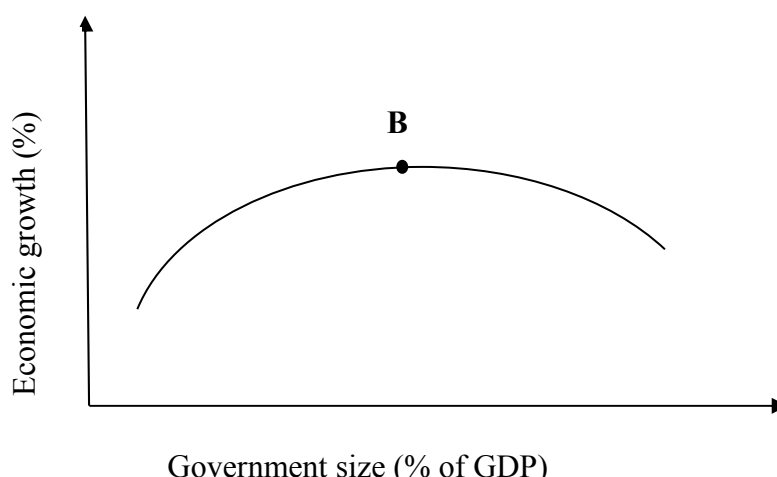
¹ Representative sample: Bulgaria, Croatia, Romania, Turkey, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Malta, Slovakia and Slovenia

long run this relationship is confirmed in Ireland and the UK, which means that public spending caused by economic growth. He confirmed the causal relationship between economic growth and size of government in the UK and Greece. In other words, economic growth causes the growth of government expenditure, which is in line with Wagner's law. [16]

Another approach based on the quantile regression to examine the impact of government size and growth rate of economic growth in the 24 OECD countries using panel data chose *Sheng-Tung, Ch. – Chi-Chung, Ch. – Yoonbai, K. (2011)* while reached the following conclusions. Size of government has different effects on economic growth, depending on the quantile. In case that national economy achieved low economic growth, an additional increase in the size of government will have a positive effect on the level of economic growth. Conversely, if economic growth is high, the additional increase in size of government will entail a reduction in economic growth. [22]

The recent studies shift the given problem a bit further. Already it is not only the examination of the relationship between government size and economic growth, but we showed some mention of the optimal size of government. The optimal size of government is closely related to the point when the economy achieved the highest economic growth in view of the size of government. To quantify the size of government is the exploitation of a modification of the Laffer curve, known by the name "**BARS**" curve in the shape of inverted U. Graphically it can be expressed as follows in the **Figure 1 : BARS curve**.

Figure 1 BARS curve



Source: own processing according to Gwartney J, Lawson R, Holcombe R (1998): *The size and functions of government and economic growth*. Joint Economic Committee. [8]

On the vertical axis is the value of economic growth achieved under a certain size of government (expressed by the percentage of public spending on GDP), which is located on the horizontal axis. The positive relationship between the government and the amount of economic growth can show up to point **B**, when economic growth is the highest. Then increasing the size of government by raising public expenditure would lead to a reduction in economic growth. This relationship can be expressed mathematically in written form as: [20]

$$GDP_{t,c} = \beta_1 + \beta_2 EXP_{t,c} - \beta_3 EXP_{t,c}^2 + u_{t,c} \quad (1)$$

GDP reflects the value of economic growth in a given year (*t*) and for a certain country (*i*). In accordance with this graphical expression of **BARS curve** represents the movement of the curve to the point **B**, the given variable represents the percentage share of public expenditure in GDP and affects the amount of positive economic growth. Conversely, variable captures the

negative effect of increasing the size of government at the height of economic growth and is expressed graphically move on the curve from the point *B* to the right.

Several authors have attempted to quantify the exact size of the government in the country, especially taking advantage of the already mentioned **BARS curve** in the mathematical expression. **Pevcin, P. (2004)** determined the optimal size of government (measured as the share of public expenditure in GDP) for 12 European countries in the range of 36 – 42% of GDP. [20]

The optimal size of government, expressed as a percentage of public spending to GDP also addressed the Bulgarian economists **Chobanov, D. – Mladenova, A. (2009)**, who also used the **BARS curve** for its determination. They found that for the OECD countries the optimal size of government may not exceed 25% of GDP. Finally, although the authors noted that the actual optimal size of government may be lower owing to certain deficiencies belonging to the lack of relevant data and the quality of government not included as a variable. [11]

Forte, F. – Magazzino, C. (2010) pointed out that at present public expenditure in EU-27 exceeds the peak BARS curve by 10%, resulting in a reduction in economic growth of 2.1%. For the country's top **BARS curve** at 37.29% of GDP, while the average value of the size of government is 47.9% of GDP. Concerned investigation included the years 1970 - 2009, with the Slovak Republic (along with other Eastern European countries) has been calculated the optimal size of government in the range 37-39% (average size of the government in that period for Eastern European countries stood at 47% of GDP). [12]

Hajamini, M. – Ali Falahi, M. (2012) investigate nonlinear effect of government size on economic growth (inverted U-shaped curve) in 15 countries of the European Union. To quantify the size of government have used a total of four indicators. The results of their work bring to the table below. [9]

Table 1 : Optimal government size

Indicator of government size	Optimal government size
Total expenditures/GDP	41.7%
Final consumption expenditure/GDP	15.8%
Current expenditures other than final consumption expenditure/GDP	19.4%
Government gross fixed formation/GDP	2.5%

Source: Hajamini, M. – Ali Falahi, M. (2012). Economic growth and the optimum size of government in 15 European countries: A threshold panel approach. In MPRA Paper no. 39616. [9]

Relationship between the size of government quantified by expenditure approach and economic growth are dealt **Mutaşcu, M. – Miloş, M. (2009)** and grace that quantify the optimal size of government divided EU countries into two groups: the old members (EU 15) and the new members of the EU (EU 12). The time period represented in this case was years between 1999 and 2008. The size of the optimal level of government for the EU15 was set at 30.42% of GDP and for the EU12 was at the level of 27.46%. [18]

Another approach was chosen by author **Obben, J. (2013)**, who focused on the relationship between these two variables in the 24 OECD countries, and many countries are represented by the members of the European Union for the time period 1973-2011. In his work he focused on the following three aspects:

- the existence of inverted U – curve as an expression of correlation relationship between government size and economic growth (*BARS curve*) and determination of optimal government size;
- through quantile regression analysis estimate the influence of government size on different ranges of economic growth;
- decomposition of government size by time series to determine permanent or temporary effect on economic growth.

Government size was expressed as a government final consumption to GDP. After empirical testing, *Obben, J. (2013)* confirmed negative impact of government size on economic growth. On the other hand the BARS curve was revealed in 13 countries, while in every country the optimal government size was exceeded.

Quantile regression showed that the size of government has a positive but statistically insignificant effect on economic growth at the low levels, while with increasing values are given effect disappeared slowly and after exceeded a certain threshold, shows a negative and statistically significant effect of government size on economic growth.

In regarding issues relating to permanent or temporary effect of the government size on the economic growth, the results showed that this impact is permanent (except Australia). [19]

The optimal size of government can be determined not only at the national level, but also at regional level, as evidenced by the study authors di *Liddo, G – Magazzino, C. – Porcelli, F. (2013)*, who observed the optimal size of government at regional level in Italy with regard to decentralization in the country. If the extent of decentralization of the country remained at 31%, the optimum size of the regional governments survived constant at 51% of the GDP as the results of existence of the *BARS curve*. At constant size of the regional government decentralization also reflected positively on the level of economic growth. [14]

From the results from previous studies we can suggest that cannot be generalized negative effects of government size on economic growth, but it is important to define other conditions that may present a negative correlation influence. This is particularly the determination of the economic development of the countries surveyed, the optimal size of government, decomposition of public expenditure and revenue and the examined time period.

3 Data and Methodology

To capture the correlation relationship between government size and economic growth we use theory of BARS curve. After reaching a certain level of the government size, the size of government becomes ineffective and begins to dampen economic growth. The optimal size of government is therefore given level of government size that maximizes economic growth, which we estimated in this article.

A representative sample of countries consists of all member countries of the European Union and the time period covers the years 1995-2013. Values of the economic growth come from the statistical database of the World Bank and to express the size of government through quantified the percentage of public spending were used statistical data from the World Economic Outlook database managed by the International Monetary Fund.

To estimate the correlation between the government size and economic growth is used regression analysis based on longitudinal data. Based on our assumptions, we chose fixed effects model, which is used in the case that the representative sample constitutes individual effects, which are unobservable, but correlated with the explanatory variables. All subsequent effects then includes in diameter through estimable conditional relationship:

$$\alpha_i = \alpha_1 z_{i1} + \alpha_2 z_{i2} + \dots + \alpha_q z_{iq} \quad (2)$$

The resulting fixed effects model can be written in the form:

$$y_{it} = \alpha_i + \beta_1 x_{it1} + \beta_2 x_{it2} + \dots + \beta_k x_{itk} + u_{it} \quad (3)$$

where α_i it is referred to as fixed effects, which is different for each cross-sectional unit (in our case the country) different.

To confirm the appropriateness of the type of model (fixed effect model) we used several tests that can determine the best model describing the tendency in our dataset. The first is essentially based on dispersion levels, pointing to an associated significance of different mean values in groups. If the p-value is less than the value of 0.05, we reject the null hypothesis, which says that fixed effects are the same for each cross-sectional unit (pooled regression model is preferable) and accept alternative hypothesis, which claims that the regression model with fixed effect is more suitable for our purposes.

The second test called **Breusch-Pagan test** compares that the alternative is better between the pooled regression model and regression models with random effects based on the fundamental equation regression model with random effects:

$$y_{it} = X_{it}\beta + v_i + \varepsilon_{it} \quad (4)$$

the null hypothesis in the present assay provides for the dispersion is equal to 0, and thus it is preferable to use the pooled regression model. If we reject the null hypothesis, we accept the alternative hypothesis, which argues in favour of using random effects model. [6]

The last of those tests is **Hausman test** which compares the effectiveness of using a regression model with random effects versus fixed effects model. The null hypothesis in this case suggests that there is consistency parameter estimates generalize the method of least squares (regression model with random effects), and the least squares method (regression model with fixed effects). In view of this, the use of the least square method was not effective. An alternative method on the other hand says that the only method of least squares is consistent, and thus appears to be fixed effect model as suitable options. [17]

Dependent variable in this case will provide economic growth and the independent variable is the size of government, expressed as a percentage of public spending. Exceeding the optimal size of government and its consequent negative effects on the level of economic growth captures another independent variable and the square of the size of the government in its logarithmic version.

Econometric model to determine the optimal size of government can be written in the form:

$$GDPgrowth_{it} = \alpha + \beta_1 GOV_{it} + \beta_2 GOV_{it}^2 + u_{it} \quad (5)$$

And we estimate a positive sign of the coefficient a trap positive impact of public spending in support of economic growth and a negative sign a coefficient that captures exceeding the optimal size of government and its consequent negative effects on economic growth.

The resulting econometric model to transform the basic shape of the quadratic equation is written below:

$$ax^2 + bx + c = 0 \quad (6)$$

using of Viet formulas, we estimate the government size that maximizes economic growth by formula. [12]

$$GOV = -b/2c \tag{7}$$

The optimal size of government will maximize the economic growth will be subsequently expressed by confidence levels, given the fact that in the case of using a regression model with fixed effects is for each cross-sectional unit calculated in constant characteristic only for that country. Thus we select the lowest and highest constant and calculate the range of values for the optimal size of government in the countries of European Union.

4 Results

In this case, we observed a relationship between economic growth as the dependent variable on the one hand and the size of government and its square form (in logarithmic version) on the other. To eliminate a possible heteroscedasticity and autocorrelation of residues we used "Panel Corrected Standard Errors", whereas we used to the repair from the outset and therefore we can move on to choosing the appropriate type of model.

Table 2 Determination of the most appropriate model

First test (pooled regression model vs fixed effects model)

Residual variance: 0,544983/(660 - 30) = 0,000865053

Joint significance of differing group means:

F(27, 630) = 2,67981 with p-value 1,18428e-005

Breusch-Pagan test (pooled regression model vs random effects model)

F(27, 630) = 2,67981 with p-value 1,18428e-005

Hausman test (random effects model vs fixed effects model)

H = 24.7143 with a p-value = prob (chi-square (2) > 24.7143) = 4,29888e-006

Source: own processing based on output from Gretl

Based on the results of the test in this issue we concluded that the most appropriate model was the regression model with fixed effects, the estimate of the impact of the size of government and the bringing of the square in the following **Table 3**.

Table 3 Estimate a regression model with fixed effects

Estimate a regression model with fixed effects, 660 observations					
28 cross-sectional units					
length of time series: minimum 12, maximum 34					
Dependent variable: GDPgrowth					
	<i>Coefficient</i>	<i>Standard Deviation</i>	<i>t- statistics</i>	<i>p-value</i>	
constant	-0.387483	0.191949	-2.0187	0.04394	**
GOV	0.37647	0.225933	1.6663	0.09615	*
LogGOV²	-0.348276	0.128614	-2.7079	0.00695	***
LSDV factor		0.231650		Factor determination	0.147774
LSDV F (29, 630)		6.549615		P-value (F)	8.68-22
rho (autocorrelation)		0.413278		Durbin-Watson statistic	1.115900

coefficient)

Source: own processing based on output from Gretl using data from statistical databases of WB and IMF

As we can see from the model results, both independent variables are statistically significant and explain 14.78% (coefficient of determination takes the value 0.147774) of the overall variability of economic growth. Based on the low *P-value* (*F*), we can reject the null hypothesis that says the immateriality of the model as a whole and accept alternative hypothesis about the significance of the model. A positive sign for the variable size of government (*GOV*) it expressed a positive effect of government size on economic growth, while negative values of the square of the size of government ($\log GOV^2$) expressed a negative impact on economic growth. On the basis of the conclusions we can conclude that the existence BARS curve in the EU member countries is confirmed.

Substituting the values into the formula

$$GOV = -b/2c \quad (8)$$

we can express the size of government that maximizes economic growth by BARS curve in the member states of the European Union. The optimal size of government for the EU member states will be in the range of values 45.49% and 52.06% GDP. Regarding to the fact, that the average government size in the countries of European Union in that time period was on the level 45.65% GDP, this knowledge creates space for additional public spending ensuring increased economic growth. Our results are, however, contrary to the authors **Forte, F. – Magazzino, C. (2010)**, because they calculated the optimal size of government at a level between 35.6% and 37.3% GDP. **Pevcin, P. (2004)** determined the optimal government size in EU 12 in the range between 36% and 42% GDP, which is even closer to our result than in the previous empirical studies. Slightly higher are our results in comparison with results made by **Hajamini, M. – Ali Falahi, M. (2012)**; optimal government size expressed as ratio of total government expenditure to GDP was set up on the level 41,7% GDP in EU15 (in this paper we estimated optimal government size within the range 45.49% and 52.06% GDP for EU 28). Differences in the results (not only with ours, but also compared with other authors) we can also see in the work of **Mutaşcu, M. – Miloş, M. (2009)**. They split the European Union countries into two subgroups and set up the optimal level of government spending for each subgroup separately: EU 12 – 27.46% GDP; EU 15 – 30.42% GDP.

5 Conclusions

The article deals with the issue of correlation between the size of government and economic growth and to determine the optimal government size maximizing economic growth based on the existence BARS curves in the European Union during the period 1995-2013. Optimal government size for EU countries during the years 1995 and 2013 was set within the range 45.49% GDP and 52.06% GDP, while the average value of the government size for that time period was equal only to value of 45.65% GDP, which provides additional space for its increase. Different results among the authors in a particular field can be caused by several factors: time period; a representative sample of countries, the method how to quantify the size of government; starting economic and social conditions; use of different econometric techniques and economic development of each country.

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THE MAIN FEATURES OF TAX SYSTEMS, SOCIAL CONTRIBUTIONS AND SOCIAL TRANSFERS DEVELOPMENT IN EU COUNTRIES

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ABSTRACT

One of the important problems in economies of EU countries is the harmonization of tax systems and reducing of tax burden for business and economically active population. But the higher taxes maintain the better social and living standards and support for the society. In our paper we analysed the tendencies of tax revenue in EU countries for 2002-2012. For classification of tax systems we used cluster analysis (k-means method) and grouped EU countries into clusters according the structure of tax revenue by countries. By means econometric models we analysed the relationships between social transfers, subsidies and other current transfers (dependent variables) and taxes and net social contributions (independent variables). The results obtained in this paper can be useful for the discussion of tax systems development in EU countries and harmonization of social support mechanisms in EU.

Keywords: tax, tax systems, social contribution, econometric models, cluster analysis

JEL codes: H20, H21, C10

1 Introduction

The problem of rationales for taxes and transfers is very popular among as researches as well as policy makers. The tax and transfer system should be effective at reducing inequality of market incomes. Taxes and transfers fulfill four main functions: 1. Public good provision (due to the tax revenue such public goods as defense, roads, education, health care and social works are financed); 2. Redistribution (tax-transfers allocation and design to implement a fair distribution of income, wealth, welfare, etc.); 3. Externalities (some taxes or subsidies schemes can induce external effects, as carbon tax); 4. Stabilization (taxes and transfers can also to be considered as automatic stabilizers). In most countries the total taxes is about 40% of national income and total monetary transfers are approximately 15% of national income. Usually monetary transfers are public pensions, unemployment and family benefits, means-tested transfers. Other government spending or in-kind transfers is made approximately 25% of national income and they are used for education, health care, police, defense, roads, etc. On long-run dynamics the ratio taxes to national income is essentially changed, from less than 10% in the early of twenty century to 40% in nowadays. Enormous growth of this ratio was observed between 1950 and 1980, when the concepts of fiscal and social states were created and gradually implemented in European countries, then, this ratio is more less stabilized at level of 40% in most developed countries. One of the important problems is the study of impact of taxes and transfers on inequality. It is should be noted that different countries have own experience in the tax-transfers or tax-benefit systems and their efficiency in the reducing inequality between social and ethnical groups, migrants and native population, etc.

2 Literature Review

A lot of publications concerned the study of income transfers and their role in reducing inequality was published in the USA. In the USA the wide income transfers programs are developed, such as: Social Security (OASDI), Unemployment insurance, Workers' compensation, Veterans' disability compensation, railroad retirement, "Black lung", Medicare and Medicaid, Aid to Families with Dependent Children (AFDC), Supplemental Security Income (SSI), Food Stamps, Housing assistance etc. Some of income transfers are in the form of cash benefits (such as OASDI, AFDS, SSI), another in the form of in-kind benefits (Medicare and Medicaid, Food Stamps, Housing Assistance) [1]. These authors studied the role of income transfers in the observed reduction of income inequality among regions in the USA during two decades in the XX c. (from 1960 till 1980); geographical distribution of regions with greatest income inequality; the efficiency of income transfers programs in reducing regional market inequality and set of factors determine the impact of transfers in reducing inequality within states and regions. Another authors, such as X.Wu, J.Perloff and A.Golan studied the effects of taxes and other governmental policies on income distribution and welfare in the USA during period of 1981-1997 [8]. They examined the distributional effects of major government tax and welfare policies in the USA and found that marginal tax rates have larger income redistribution and equilibrating welfare effects, than social insurance of direct transfers programs. Nevertheless, the large difference in the efficiency of tax-transfers or tax-benefit systems is observed between macro regions and countries in the world. M. Luebker shows results of the impact of taxes and transfers on inequality for different macro regions and countries [3, 4]. According to the analysis provided in his paper, the Latin American [2] and East Asian countries have mildly redistributive transfer systems, but European countries have well-developed social security systems [5]. Australia, Canada, Israel and the USA have noticeably higher inequality of disposable incomes than Europe [3, 4, 6]. Luebker argued that the income inequality growth over the past decades was driven by a greater dispersion of market incomes, but countries with the same market inequality achieved different outcomes [4], so political choice and institutional factors in the formation of effective redistributive results are very important in the national tax and transfers systems [7].

3 Data and Methodology

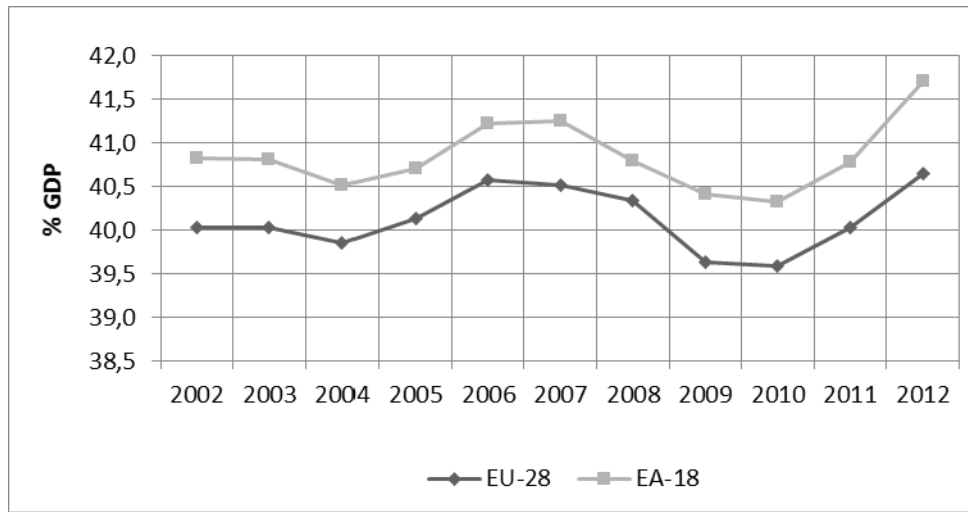
The purposes of this research are: to study the dynamics of tax systems, social contributions and transfers in the EU in last decade; to reveal the main features of tax systems, social contribution and transfers; to analyse the relationship between tax and transfers mechanisms in the EU countries. As data source we used Eurostat, main tables concerning general government expenditure and revenue in the EU, government finance statistics for the period of 2002-2012. For this research and study of the main indicators we used descriptive statistics, cluster analysis (k means) and econometric methods.

4 Results and Discussion

Taxes have main contribution to the government revenue, tax revenue made up about 90% of total government revenue in the European Union. Government revenue, expenditure and deficit/surplus are main objectives of fiscal policy and the analysis of their dynamics plays very important role in the formation and coordination of the strategic and tactic tasks for socio-economic development in the countries. For the comparative analysis tax revenue are measured in absolute magnitudes (in millions of euro) or as ratio of taxes to GDP, or as ratio of absolute magnitudes to taxes to the inhabitants. In Fig.1 and Fig.2 the total tax revenue and

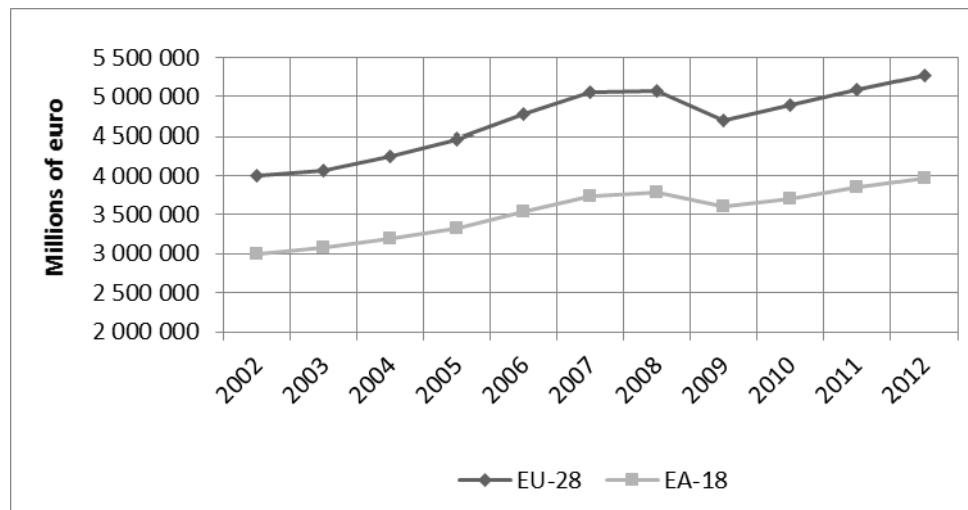
social contributions in EU-28 and EU-18 (in % of GDP and in millions of euro) are presented for period of 2002-2012.

Figure 1. Total revenue from taxes and social contributions for period of 2002-2012, EU-28 and EU-18, % of GDP



Source: Eurostat (gov_a_tax_ag)

Figure 2. Total revenue from taxes and social contributions for period of 2002-2012, EU-28 and EU-18, millions of euro



Source: Eurostat (gov_a_tax_ag)

As it is observed according to Eurostat data the overall tax-to-GDP ratio started decreasing from 2000. Until 2004 tax-to-GDP ratio reduced, but from 2004 till 2007 this trend is increased (Fig.1, Fig.2). In 2002, revenue from taxes and social contributions in the EU-28 made up 40.0% of GDP and in EU-18 this ratio was 40.8%. In 2004 tax revenue (including social contributions) in the EU-28 was 39.9% of GDP and in the EU-18 this value made up 40.5% of GDP. In 2006 and 2007 the higher values of these ratios were observed, in 2006-2007 in EU-28 the tax revenue (including social contributions) to GDP varied at 40.6%, and in EU-18 this value varied at 41.2%. But from 2008 and till 2010 due to the essential impact of global economic crisis revenues from taxes and social contributions were dropped. For example, in the EU-28 in 2010 tax revenue (including social contributions) made up 39.6% of GDP and the relevant value in the EU-18 was 40.3% of GDP. In 2012 as a ratio of GDP, tax

revenue (including social contributions) increased and made up 40.6% of GDP in the EU-28 and 41.7% of GDP in EU-18. So, the ratio of tax revenue to GDP in the euro area (EA-18) was slightly higher than in the EU-28.

Across countries revenue from taxes and social contributions varied. In the table 1 the data for tax revenue (including social contributions) as percentage of GDP is given for EU-28 countries for period of 2002-2012.

Table 1. Tax revenue (including social contributions) as % of GDP

	2002	2006	2008	2010	2012	Min	Max	Mean	Std. Dev.	Coefficient of variance, %
BE	47.5	46.71	46.61	46.34	48.04	45.93	48.04	46.84	0.595	1.27
BG	28.5	30.72	32.26	27.52	27.91	27.29	33.32	30.12	2.159	7.168
CZ	34.61	35.36	34.46	33.61	35.04	33.43	35.95	34.93	0.864	2.474
DK	48.77	50.52	48.6	48.4	49.1	48.4	51.75	49.38	1.031	2.088
DE	40.37	39.96	40.17	39.33	40.4	39.33	40.82	40.09	0.438	1.093
EE	31.09	30.79	31.98	34.15	32.66	30.65	35.5	32.03	1.573	4.91
IE	29.66	33.45	31.01	29.55	30.19	29.55	33.45	30.88	1.387	4.491
EL	35.68	33.44	34.19	33.89	36.57	32.83	36.57	34.34	1.059	3.084
ES	34.96	37.55	33.79	33.25	33.57	31.64	37.96	34.78	2.015	5.793
FR	45.07	45.87	45.03	44.48	46.95	44.08	46.95	45.27	0.761	1.681
HR	37.95	37.12	37.07	36.41	35.9	35.45	37.95	36.78	0.728	1.979
IT	40.81	41.96	42.97	42.84	44.3	40.34	44.3	42.2	1.266	3
CY	30.88	35.75	38.61	35.57	35.27	30.88	40.09	35.18	2.617	7.438
LV	28.77	30.81	29.67	27.43	28.13	27	30.83	28.85	1.266	4.388
LT	29.09	30.29	31.07	28.84	27.54	27.54	31.07	29.4	1.18	4.014
LU	40.17	36.7	38.37	39.12	40.3	36.46	40.81	38.81	1.377	3.548
HU	38.1	37.44	40.44	38.16	39.28	37.42	40.54	38.64	1.242	3.214
MT	31.38	34.48	34.37	33.57	34.95	31.38	35.28	33.83	1.309	3.869
NL	38.73	39.78	39.91	39.64	39.65	38.38	39.91	39.16	0.56	1.43
AT	45.35	43.04	44.23	43.8	44.77	43.04	45.35	44.16	0.75	1.698
PL	32.71	33.77	34.3	31.76	32.51	31.47	34.82	32.77	1.086	3.314
PT	34.19	35.56	35.94	34.76	34.89	33.8	36.18	35.02	0.771	2.202
RO	28.5	29.15	28.8	27.61	28.46	27.61	29.79	28.45	0.651	2.289
SI	38.07	38.51	37.53	38.02	37.87	37.48	38.87	38.04	0.444	1.167
SK	33.13	29.44	29.25	28.32	28.48	28.32	33.13	30.18	1.802	5.971
FI	44.84	43.94	43.02	42.65	44.27	42.65	44.84	43.68	0.677	1.55

SE	47.92	48.74	46.95	45.91	44.78	44.78	49.34	47.31	1.513	3.198
UK	36.3	37.7	38.74	36.78	37.08	35.93	38.74	36.97	0.821	2.221

Source: own statistical elaboration based on Eurostat data (gov_a_tax_ag)

It is seen from the data in table 1 and statistical calculations, that for EU-28 countries values of tax revenues (including social contributions) as percentage of GDP are changed slowly or varied at the certain level. It is should be noted that tax revenues in the main tax categories displayed a corresponding pattern, with a differing fiscal lag for direct taxes, indirect taxes and social contributions.

In Table 2 structure of tax revenue by country of EU is presented. Tax revenue can be grouped into tree main categories or types: indirect taxes (taxes on production and imports), direct taxes (current taxes on income, wealth, etc.) and capital taxes.

Table 2. Breakdown of tax revenue by country in 2012 (millions of euro and % of GDP)

	D2 Taxes on production and imports		D5 Current taxes on income, wealth etc.		D91 Capital taxes		Total tax receipts	
	in millions of euro	in % of GDP	in millions of euro	in % of GDP	in millions of euro	in % of GDP	in millions of euro	in % of GDP
EU-28	1,764,212	13.6	1,677,454	12.9	30,684	0.2	3,472,350	26.8
EA-18	1,260,830	13.3	1,180,607	12.4	25,625	0.3	2,467,062	26.0
BE	50,239	13.4	62,230	16.6	3,139	0.8	115,608	30.8
BG	6,125	15.4	1,987	5.0	97	0.2	8,209	20.7
CZ	18,748	12.3	10,963	7.2	9	0.0	29,720	19.4
DK	41,334	16.9	74,514	30.4	518	0.2	116,366	47.4
DE	304,660	11.4	319,390	12.0	4,310	0.2	628,360	23.6
EE	2,475	14.2	1,184	6.8	-	-	3,659	21.0
IE	18,393	11.2	20,691	12.6	765	0.5	39,849	24.3
EL	24,603	12.7	19,613	10.1	160	0.1	44,376	22.9
ES	110,246	10.7	105,453	10.2	3,826	0.4	219,525	21.3
FR	318,940	15.7	243,388	12.0	9,616	0.5	571,944	28.1
HR	7,970	18.2	2,682	6.1	1	0.0	10,652	24.4
IT	238,138	15.2	237,449	15.2	1,517	0.1	477,104	30.4
CY	2,666	15.0	1,961	11.1	2	0.0	4,630	26.1
LV	3,734	11.8	2,434	7.7	3	0.0	6,172	19.5
LT	3,757	11.4	1,608	4.9	1	0.0	5,366	16.3
LU	5,563	13.0	6,284	14.6	71	0.2	11,919	27.8
HU	17,894	18.5	6,776	7.0	505	0.5	25,175	26.0
MT	939	13.7	935	13.6	16	0.2	1,890	27.6

NL	71,056	11.9	65,589	10.9	1,383	0.2	138,028	23.0
AT	45,580	14.8	41,159	13.4	32	0.0	86,771	28.3
PL	50,034	13.1	27,518	7.2	70	0.0	77,623	20.4
PT	22,932	13.9	15,278	9.3	258	0.2	38,468	23.3
RO	17,612	13.4	8,043	6.1	-	-	25,655	19.5
SI	5,153	14.6	2,742	7.8	17	0.0	7,912	22.4
SK	7,259	10.2	3,967	5.6		0.0	11,227	15.8
FI	28,253	14.7	30,859	16.0	509	0.3	59,621	31.0
SE	76,351	18.7	74,709	18.3		0.0	151,059	37.0
UK	263,556	13.6	288,049	14.9	3,859	0.2	555,464	28.7

Source: Eurostat (gov_a_tax_ag)

Taxes on production and imports (D.2) are divided into taxes on products (D.21) and other taxes on production (D.29). Taxes on products include value added type taxes (VAT, D.211), taxes and duties on import excluding VAT (D.212) and taxes on products except VAT and import taxes (D.214). In 2012 in the EU-28 revenue from taxes on products and VAT were main elements in total taxes on production and imports (they made up 83% and 53% respectively of total taxes on production and imports).

Current taxes on income, wealth, etc. (D.5) are divided on taxes on income (D.51) and other current taxes (D.59). Taxes on income include taxes on individual or household income and the income or profit of corporations, and include taxes on holding gains.

Capital taxes (D.91) are taxes levied at irregular and infrequent intervals on the net worth or value of assets owned, or transferred in the form of legacies or gifts.

Social contributions are very important part in formation of government revenue and they are analysed as absolute magnitudes and ratio to GDP. In table 3 the structure of social contributions by country of EU is shown.

Table 3. Breakdown of social contributions by country in 2012 (millions of euro and % of GDP)

	D611 Actual social contributions		D6111 Employers' actual social contributions		D6112 Employees' actual social contributions		D6113 Social contributions by self- and non-employed persons		D612 Imputed social contributions	
	in millions of euro	in % of GDP	in millions of euro	in % of GDP	in millions of euro	in % of GDP	in millions of euro	in % of GDP	in millions of euro	in % of GDP
EU-28	1,685,408	13.0	960,495	7.4	518,593	4.0	206,319	1.6	128,947	1.0
EA-18	1,395,307	14.7	789,225	8.3	418,338	4.4	187,744	2.0	114,491	1.2
BE	55,073	14.7	33,434	8.9	16,515	4.4	5,124	1.4	9,894	2.6
BG	2,861	7.2	1,683	4.2	975	2.5	204	0.5	:	:
CZ	23,833	15.6	15,216	9.9	4,847	3.2	3,770	2.5	25	0.0
DK	2,316	0.9	190	0.1	2,126	0.9	:	:	2,269	0.9
DE	421,340	15.8	180,020	6.8	170,080	6.4	71,240	2.7	27,560	1.0

EE	2,000	11.5	1,845	10.6	137	0.8	18	0.1	28	0.2
IE	7,186	4.4	5,023	3.1	1,864	1.1	298	0.2	2,466	1.5
EL	20,972	10.8	9,270	4.8	8,816	4.6	2,886	1.5	5,503	2.8
ES	123,206	12.0	86,520	8.4	17,837	1.7	18,849	1.8	10,639	1.0
FR	346,376	17.0	235,111	11.6	84,376	4.2	26,889	1.3	40,625	2.0
HR	5,032	11.5	2,629	6.0	2,326	5.3	77	0.2	:	:
IT	212,760	13.6	145,703	9.3	37,659	2.4	29,398	1.9	4,248	0.3
CY	1,620	9.1	1,100	6.2	446	2.5	75	0.4	-	-
LV	2,673	8.4	1,824	5.8	833	2.6	16	0.1	64	0.2
LT	3,612	11.0	2,397	7.3	717	2.2	499	1.5	109	0.3
LU	4,961	11.6	2,103	4.9	2,249	5.2	608	1.4	416	1.0
HU	12,838	13.2	7,487	7.7	4,922	5.1	429	0.4	71	0.1
MT	414	6.0	190	2.8	188	2.7	37	0.5	90	1.3
NL	95,780	16.0	32,608	5.4	41,726	7.0	21,446	3.6	3,829	0.6
AT	46,114	15.0	21,487	7.0	18,795	6.1	5,832	1.9	4,787	1.6
PL	46,764	12.3	18,840	4.9	18,542	4.9	9,382	2.5	:	:
PT	14,999	9.1	8,417	5.1	6,011	3.6	571	0.3	4,147	2.5
RO	11,792	9.0	7,496	5.7	3,780	2.9	516	0.4	-	-
SI	5,380	15.2	2,061	5.8	2,706	7.7	614	1.7	100	0.3
SK	8,929	12.6	4,810	6.8	2,138	3.0	1,981	2.8	96	0.1
FI	25,524	13.3	17,698	9.2	5,963	3.1	1,863	1.0	:	:
SE	30,685	7.5	29,715	7.3	302	0.1	667	0.2	864	0.2
UK	150,369	7.8	85,618	4.4	61,720	3.2	3,031	0.2	11,118	0.6

Source: Eurostat (gov_a_tax_ag)

It is seen that social contributions (D.61) composed of actual social contributions (D.611) and imputed social contributions (D.612). Actual social contributions are split into Employers' actual social contributions (D.6111), Employees' actual social contributions (D.6112) and Social contributions by self- and non-employed persons (D.6113). Actual social contributions covers the compulsory and voluntary contributions payable to government by employees, employees and self- and non-employed persons.

For more detailed characteristics of common features or distinctions in main elements of tax composition (including social contributions) in EU countries we used cluster analysis and k-means method. For grouping of EU countries six basic elements of tax system were used: V1 - Taxes on production and imports (% of GDP), V2 - Current taxes on income, wealth etc. (% of GDP), V3 - Capital taxes (% of GDP), V4 - Actual social contributions (% of GDP), V5 - Imputed social contributions (% of GDP) and V6 - Capital transfers from general government

to related sectors representing taxes assessed but unlikely to be collected (% of GDP). For the cluster analysis data of tax structure for EU countries was used for period of 2005-2012.

We revealed six clusters. This number of clusters was based on the study of tree diagram and variance analysis for clusters. Each cluster is characterized by mean and standard deviation for each variables (V1-V6) used in the cluster analysis.

The 1-st cluster included data from such countries as: Belgium (2005-2012); Italy (2005-2012); Luxembourg (2005, 2009-2012); Austria (2008); Finland (2005-2012); Sweden (2005-2012). The 2-nd cluster included data from such countries as: Czech Republic (2005-2012); Germany (2005-2017); Spain (2005-2008); France (2005-2012); Hungary (2005-2012); Netherlands (2005-2012); Austria (2005-2007, 2009-2012); Slovenia (2005-2012); Portugal (2007, 2008). The 3-rd cluster included data from such countries as: Ireland (2005-2012); Cyprus (2007-2012); Luxembourg (2006-2008); Malta (2005-2012); United Kingdom (2005-2012). The 4-th cluster included data from only Denmark for period of 2005-2012. The 5-th cluster included data from such countries as: Estonia (2005-2012); Greece (2005-2012); Spain (2009-2012); Latvia (2005-2015); Lithuania (2005-2012); Poland (2005-2012); Romania (2005-2012); Slovakia (2005-2012) and Portugal (2009-2012). The 6-th cluster included data from such countries as: Belgium (2005-2012); Cyprus (2005, 2006); Hungary (2009-2012); Portugal (2005) and Croatia (2012).

From results of cluster analysis of tax structure in EU it is shown that in most countries situations concerned tax structure were not changed and these cases belonged to the same clusters during all time period, e.g. from 2005 till 2012. Then, in some clusters we observed the cases from countries, which similar each other according to socio-economic conditions, culture, etc. For instance, cluster No.3 included English speaking countries; in cluster No.5 we observed post socialist countries (Estonia, Latvia, Lithuania, Poland, Romania and Slovakia), as well as countries with transition process due to serious problems in the economy after global financial and economic crisis of 2008-2010 (Greece, Spain, Portugal). But also we can observe some national, political and economic diversity inside clusters, which joined different countries.

For the study of social benefits and transfers features of EU countries we used cluster analysis and three variables: S1 – social transfers (% of total government expenditure); S2 – other current transfers, payable (% of total government expenditure); S3 – subsidies payable (% of total government expenditure). For cluster analysis we used available data for 2013-2014.

According to our calculations the 1-st cluster included data from such countries as: Ireland (2013, 2014); Greece (2014); Spain (2013, 2014); Portugal (2013, 2014). The 2-nd cluster joined data from Bulgaria (2013, 2014); Greece (2013); Poland (2013, 2014); Slovenia (2014); Finland (2013, 2014). The 3-rd cluster included data from Denmark (2013, 2014); Sweden (2013) and Hungary (2013). The 4-th cluster included data from such countries as: Belgium (2013, 2014); Czech Republic (2013, 2014); Germany (2013, 2014); France (2013, 2014); Italy (2013, 2014); Luxembourg (2013, 2014); Netherlands (2013, 2014); Austria (2013, 2014); Slovakia (2013, 2014). The 5-th cluster joined such countries as: Estonia (2013, 2014); Cyprus (2013); Hungary (2014); Romania (2013, 2014); Slovenia (2013) and United Kingdom (2013, 2014). The 6-th cluster included Cyprus (2014), Latvia (2013, 2014) and Malta (2013, 2014).

As in previous clustering we obtained some clusters with more similar countries in view of national, socio-economic and political conditions and some clusters where the data of social benefits and transfers were enough homogenous inside clusters, but the countries had such data varied significantly in the view of their national and economic features.

Thus, despite some similarities of the data about tax systems and social benefits inside clusters, countries have these data may be different in point of their political and economic systems.

Nevertheless, tax and social contributions, in one hand, and social benefits and transfers, in other hand, are connected in the fiscal system in each country. For the analysis of this relation we used multiple regression with endogenous variables - Y1 (social transfers, % of government expenditure), Y2 (other current transfers payable, % of government expenditure) and Y3 (subsidies payable, % of government expenditure) and exogenous variables – X1 (taxes, % of total government revenue) and X2 (net social contributions, % of total government revenue). As data we used information about taxes, social contributions and social benefits & transfers for EU countries for period of 2013-2014.

The results of the regression analysis of such dependences are given in tab.4.

Table 4. Results of the regression analysis for taxes, social contributions and social benefits & transfers

	Y1	Y2	Y3
C	-24.3035*	5.0963	-7.9887**
	(14.0156)	(4.0338)	(3.6952)
X1	0.5991***	0.0106	0.124***
	(0.1622)	(0.0467)	(0.0428)
X2	1.057***	-0.0213	0.1255**
	(0.1806)	(0.052)	(0.0476)
R	0.6883	0.1944	0.37
F	23.862	1.0404	4.2035
S.E.	4.8199	1.3872	1.2708

Note: * - estimation is significant at level $p < 0.1$; ** - estimation is significant at level $p < 0.5$, *** - estimation is significant at level $p < 0.01$. In the parentless the standard deviations of the estimated parameters are given.

Source: own statistical calculation based on Eurostat data (gov_10a_main)

As it is seen from the table 6 in the first model the variables X1(taxes) and X2 (net social contributions) have significant positive impact on the Y1 (social transfers); in this model coefficient of multiple correlation is 0.6883. In the second model the estimations of the parameters for variables X1 and X2 are not statistically significant and coefficient of multiple correlation is closed to 0, it means that no essential effects of variables X1 and X2 impact on Y2 (other transfers payable). In the third models estimations of parameters for X1 and X2 are statistically significant and positive, but their influence is not so strong on the variable Y3 (subsidies payable), because coefficient of multiple correlation is only 0.37.

5 Conclusions

The main types of government revenue are taxes on production and imports, current taxes on income and wealth and net social contributions. Taxes and social contributions correspond to revenue, which are levied (in cash or in kind) by central, state and local governments, and social security funds. Analysis of tax general government revenue trends shows that in many EU countries taxes and social contributions are increasing in absolute magnitudes, but enough stable in ratio terms. Application of cluster analysis for grouping EU countries in the

homogenous groups – clusters in view of tax structure had shown that many countries hold stable ratios of main taxes to GDP, without significant changes. Only a few countries have changed these main taxes to GDP ratios and moved in another cluster for certain time period. Due to the cluster analysis we revealed similarities and differences in the composition of tax systems in the EU countries. Taxes and social contributions influence to social benefits and transfers and define the wealth and social standards in the countries. In the EU we observed some diversity in the social benefits and transfers, in one hand, and their efficiency in point of social equality, in other hand. The efficiency of tax and transfer systems in the different EU countries depend not only from the more appropriate variant of composition taxes and social contributions, their redistribution in the forms of social benefits and transfers, but also from the various institutional factors, the transparency of national fiscal systems, their synchronization and capacities to fulfil related administrative functions by their central, state and local governments.

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THE COMPARATIVE ANALYSIS OF HIGHER EDUCATIONAL INSTITUTIONS FUNDING IN DIFFERENT COUNTRIES

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ABSTRACT

The competitiveness and development of higher educational institutions as important part of global educational infrastructure are the main problems in different countries of the world. Successful and leading universities and other higher educational institutions need huge funding and attract the best students and academic staff from different countries. Nevertheless, the problems of funding of higher educational institutions in different countries and level of their economic development and wealth are closely connected. That is why it is important to consider the different approaches to higher educational institutions funding on the example of countries with different level of economical development and wealth. In this paper the main approaches to financing higher educational institutions from public and state funds are discussed and the recommendations for the Ukraine countries are given

Keywords: *higher educational institution, funding, mechanism, public funds, model funding*

JEL codes: I22, I28

1 Introduction

National competitiveness of any country is first of all connected with the effectiveness of the education system higher education in particular: the success of economic and political reforms depend on the effectiveness of education as one of the main areas of modern society. Higher education has never played a more important role than today. It is a key aspect of stable development of the global economy, providing individual, social and economic mobility. Education is necessary for the increasingly complex management of various companies and organizations, as well as for political and civic conviction that social problems should be analyzed and solved not only by traditional methods but also through the use of innovative solutions resulting from the increase of knowledge.

In the late XX and the early XXI century Significant changes in the global marketplace due to globalization processes, the transition to the information economy and the knowledge economy, led at first to the latent and then to explicit crisis of education. Famous Western scholars of education systems noted: "Higher education needs deep, radical and immediate transformation. Most of all we should fear that as a result of complacency, caution or uncertainty changes will be too slow and limited to local innovations. Models of higher education, which are widespread in the second half of XX century, no longer work" [1].

Policy of higher education accessibility, which was dominant in the 1980s of the XX century, almost in all developed countries, contributed to the emergence of negative effect - the growth rate of budget allocations in higher education no longer keep up with the increasing demand for educational services. This led to the emergence of the global crisis of education and the need for a radical revision of the educational policy.

A characteristic feature of the crisis of higher education in modern conditions is the reduction of its public funding against the background of the autonomy of higher education institutions and the search of alternative financing ways. This happens due to the changing perception of the higher education role in society, in particular, to the fact that some of the basic characteristics of higher education as a public good, a measure of good, social investment and human right is increasingly ignored.

Therefore, in recent years almost in all countries of the world we observe much more active research for finding ways of effective alternative financing of higher education. It is explained by the necessity to make informed management decisions on the allocation of public funds among universities and the further development of the higher education system on the whole.

2 Literature Review

Reform of the education system is a highly structured process that involves a variety of aspects of the higher education development. This leads to the existence of a whole range of scientific and practical areas in which the current research is conducted. For example, the problem of the globalization processes impact on the educational policies formation in different countries is studied by such scholars as L. Serich, D. Cogburn, W. Beck, N. Berbul, C. Torres, L. Kuehn, A. Green and many others. Specific character of neoliberal reforms in education and contradictory consequences are studied by S. Lacy J. Manibo, F. Ramirez, E. Stewart and several other authors.

Among Ukrainian scientists the problems of education reformation for finding the balance between education and labor markets at the national, regional and local levels are studied by such scholars as T. Bogolib, A. Boyko, E. Grishnova, L. Koleshnya V. Kutsenko, E. Libanova, A. Lukyanenko, M. Chernichenko, L. Shaulsky. Problems of state regulation of the labor market focus on the work of scientists V. Bakumenko, V. Dorofienko, V. Ilyashenko, L. Kostrovets, A. Merzlyakov, P. Nadolishny. Recent research of new forms of training specialists on the basis of competence approach and the interaction of the education market and the labor market is given in the works of scientists such as N. Anishin, D. Goddess V. Vasil, E. Grishnova, L. Koleshnya, A. Kolot, E. Libanova, E. Martyakova, V. Ponomarenko, V. Yaroshenko et al. Such scholars as I. Svityaschuk A. Solodko, E. Herd, B. Sarioglo, O. Kupetc, L. Lisogor et al. are engaged in the problem modernization of public financing of training specialists with higher education.

The increased interest in this issue on the part of scientists underlines the high level of its urgency.

3 Data and Methodology

The system of higher education funding includes to the public and private (market) funding. Budget funding of higher education is the source of government financing of educational services for training students in different field and professions. Public funding of higher education institutions is made from the state budget, local budgets and resources of the central executive bodies.

The main reasons for the state's participation in higher education financing are:

1) *control over the system of education is a public good and the market is not able to carry out and finance it in full.* The current stage of development consider education not only as a sector, which consumes goods and services, but also as an area that needs investment on the part of stakeholders in order to increase income and social status of the students, and thus the state on the whole;

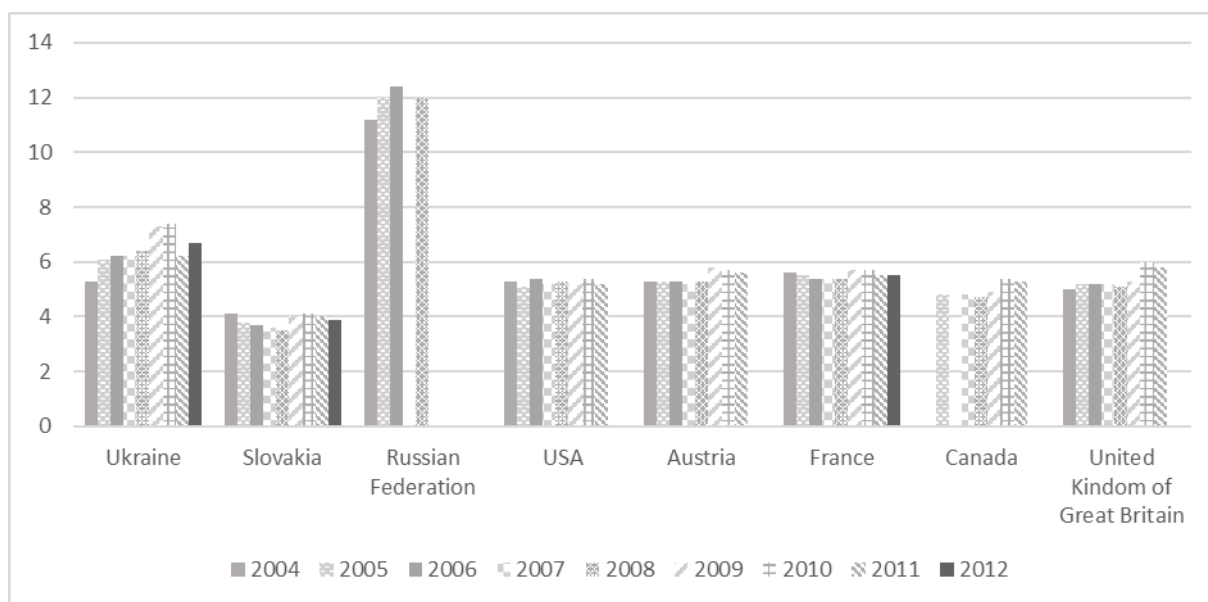
2) *the complexity of determining the proportion and formation mechanisms of private investment in education.* Nowadays there is a tendency of increasing the share of private education funding by the population. It is explained by the high income differentiation and the state budget deficit in many countries. According to the researchers, this factor is not so much necessary mobilizing but measure in the development of educational services;

3) *justified redistribution of resources between rich and poor in terms of differentiation of the population by income level that provides access of different sections of the population to higher education and education in general.*

The indicators that comprehensively characterize the funding of education in general and higher education the country, in particular, are: government expenditure on education as % of GDP, government expenditure on education as % of total government expenditure, budgetary funding of education as % total government expenditure, expenditure on higher education in% of GDP; expenditure on higher education per capita monetary unit; expenditure per student per year, monetary unit. These indicators, in turn, depend on the level of socio-economic development of the country and condition a certain level of development of the higher education system [2-4].

Fig. 1 shows the dynamics of changes in public expenditures on education as % of GDP.

Figure 1 Government expenditure on education as % of GDP



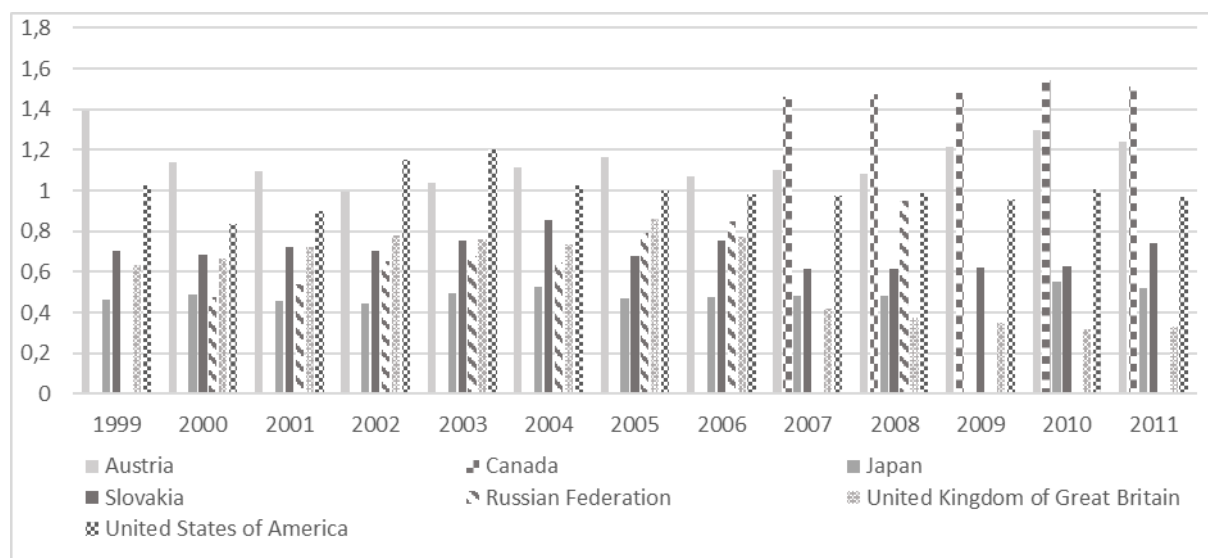
Source: UNESCO Institute for Statistics, <http://data.uis.unesco.org/>

The graph shows that on average, these expenditures vary between 3.5 - 7.5%, with the exception of the Russian Federation, where these costs are almost 2 times higher than the world average. However, if in the developed world, these expenditures have almost stable values (Austria - 5.5%, USA - 5.2%, Canada - 4.9%), in countries that have a short history of

the market relations construction (Ukraine, Russia), these values tend to increase. This proves that the developed countries have found the optimum value per cent of public spending on education and, given that the GDP of these countries is significantly higher than that of developing countries, in volume terms, the education sector receives much more public investment in its development.

On average the countries allocate for high education development from 0.5% (Japan) to 1.15% (Austria) of their GDP (Fig. 2).

Figure 2 Government expenditure on high education as % of GDP



Source: UNESCO Institute for Statistics, <http://data.uis.unesco.org/>

Summarizing the foreign practice of financing higher education [5-7] it should be noted that today there is a whole range of different financing schemes that constitute the educational policy of the state. The main differences between these schemes consist in varying degrees of state tuition coverage at the university; the mechanism for selecting potential students in conditions of high competition; inclusion on non-state in public universities along with state universities in the system of financing; vouchers coverage of higher education; the level of universities autonomy in setting prices for education; priorities for children from unstable or low-income families and so on. [8-10]. Table 1 shows the basic models of financing education and their characteristics [11].

Table 1 The basic models of financing education in the world

Type model	The country where the model is used	Character traits
Model A		The model is focused on the state support of the university, where the budget comes directly from the state. It is characterized by rather low degree of universities autonomy.
Model A₁	Countries in South, Central and Eastern	It provides for the obligation of universities to train specialists with the necessary qualifications for society. In this case, the price instruction is set and agreed in advance, the payment is made from the state budget.
Model A₂		Provides high schools participation in competitions for

	Europe, Africa, Latin America, Russia	receiving the state order for specialists training, provides effective distribution of government jobs and a reduction of government expenditures. The order is received by the university, whose educational services meet the requirements' of competition in the best way and the cost of training is optimal.
Model B	Romania, Denmark, Sweden, UK, The Netherlands	The model is focused on the status of the university, provides for the allocation of public funds, depending on the results of its operations. The amount of funding is determined by the number of graduate students admitted to the first year, the results of monitoring of students' knowledge, the complexity of the training courses, the number of defended dissertations
Model C	Australia, Austria, Brazil, China, Hungary, Kenya, New Zealand, Tanzania and others.	The model is aimed at the meeting of labor market needs, provides the payment of educational services directly to consumers and focused on the demand and the domestic needs of the institution. This model uses state obligations transferred in the form of coupons, certificates (vouchers) directly to consumers of educational services. A significant limitation of the student is the validity of the voucher.

It should be noted that the distinction between these models are quite conventional, since most countries use a combination of options for universities financial resources.

Thus, choosing a particular model of higher education financing, the state has the following objectives:

- a) ensuring of necessary range of the education market in terms of higher education, that is, ensurance education macroefficiency;
- b) provision of efficient distribution of funding between universities in accordance with the interests of the state, the labor market needs and the benefits of students, that is, ensurance education microefficiency;
- c) equal opportunities for higher education by all socio-economic groups of the population, that is, the ensurance of higher education access and educational opportunities equality.

The essential point in the formation of high-quality educational policy is reasonable choice mechanism for financing education. Comparative analysis of the budget financing practice in the world allowed us to recognize the following main mechanisms:

- a) **base funding mechanism**, based on an assessment by the state bodies of the university the expenditures in the prior period, or on the results of the negotiations between the public authorities and a university, where the draft budget presented by a university was discussed;
- b) **formula-funding mechanism** where the amount of funds for universities is determined by the calculation formulas on the basis of expenditures or the results of the of the university achievement;
- c) **contractual mechanism or trust fund**, based on the contract made between universities and government concerning the provision of educational services in accordance with the strategic goals of the country and the university for specific targeted funding of specific educational and research projects;

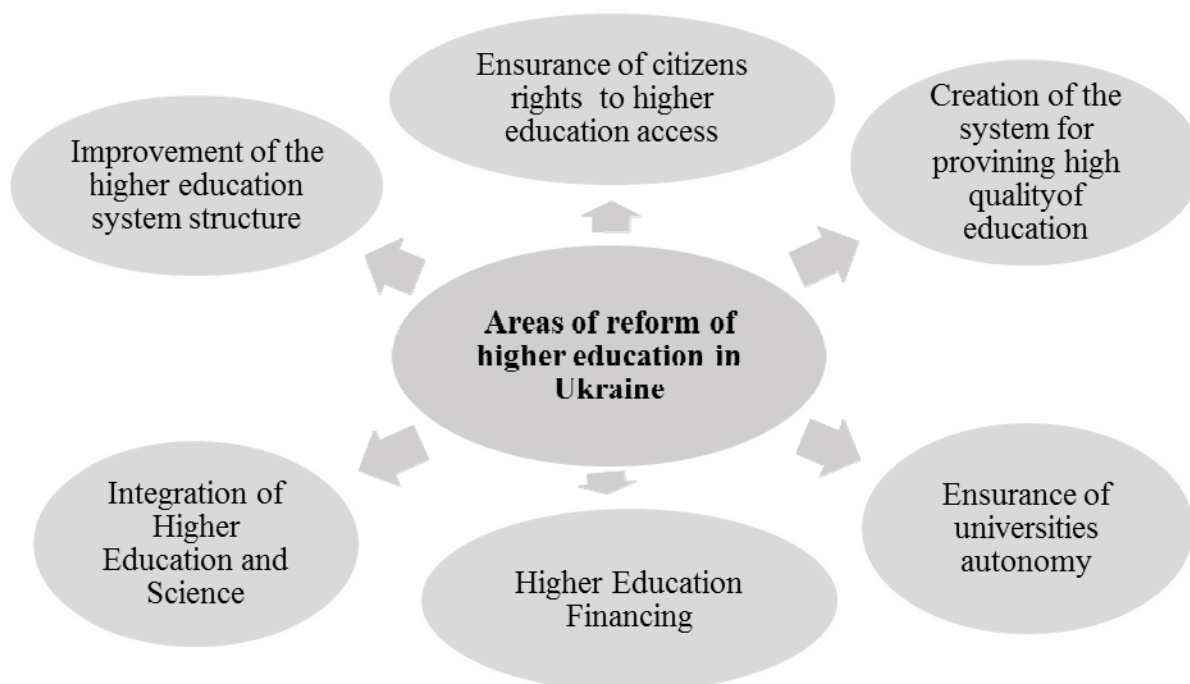
d) **competitive funding mechanism** shall be based on competitive bidding between universities, which offered planned targets for the graduates in various specialties and their expenditures. Preference is given to those universities in which these expenditures are minimal;

e) **funding mechanism for education expenses of students**, based on the demand for higher education in specific disciplines.

4 Results and Discussion

Currently, Ukraine is in the process of active restructuring of the higher education system reform which involves all its aspects. According to the draft strategy of higher education reforming in Ukraine until 2020, developed by a working group of the Ministry of Education and Science in 2014, the main goal of modernization serves the formation of an attractive and competitive national system of higher education in the country focused on the integration into the European educational and research space [12]. The main directions of the Strategy are presented in Fig. 3.

Figure 3 The main directions of higher education system reform in Ukraine



Source: The strategy of reforming higher education in Ukraine until 2020 (draft) https://search.ligazakon.ua/1_doc2.nsf/link1/NT1109.html

Without belittling the importance and urgency of the development of all the areas of strategy, it should be noted that the trend for reforming of the global education system earth the XXI century is the search for new approaches, tools and ways of financing higher education system with the reduction of public expenditures on it. Therefore, the aim of reforming the Ukrainian system of financing higher education advocates improvement of public expenditures efficiency while maintaining their fair share in the total amount of the consolidated budget of the country. One of the essential tasks of achieving this goal is to change the dominant system of financing - the state order for the new modern forms and mechanisms of public funding.

Analysis of the above mechanisms application (see. Table. 1) around the world made possible to highlight the benefits (Table. 2) and risks (Table. 3), which are inherent in national education systems.

Table 2 The advantages of using the mechanisms of higher education financing

The name of the mechanism	Benefits for the educational system
Basic funding	<p>aimed at supporting non-profit basic research;</p> <p>promotes free distribution of funds between education and research;</p> <p>provides the basis for strategic planning of the university</p>
Formulaic funding	<p>focuses on improving teaching and research programs;</p> <p>allocates funds for universities by transparent formula;</p> <p>provides a rapid response to requests from the government;</p> <p>makes possible to evaluate the effectiveness of government policy in a particular area, to compare the activities of different universities;</p> <p>encourages universities to improve their performance, enhances the openness and transparency of their activities</p>
Special-purpose financing	<p>in the structure of financing reflect the interests, national priorities;</p> <p>maintains a balance between teaching and research programs, and between basic scientific research and the needs of the market in the new research</p>
Competitive financing	<p>reduces expenditures through a competitive bidding;</p> <p>makes possible you to plan the activities due to certainty of financing;</p> <p>promotes efficient and dynamic research programs;</p> <p>stimulates the competitive activity of universities themselves</p>
Financing based on demand	<p>supports equality and access to higher education;</p> <p>guarantees the access to education for people from all walks of life;</p> <p>promotes learning throughout life</p>

Table 3 Risks of financing mechanisms of higher education

The name of the mechanism	The risk for educational system development
Basic funding	<p>greater reliance on a source of financing that does make possible for the university to solve problems in their own way;</p> <p>the needs of higher education institutions to provide the relevant obligations may lead to a reduction of funding necessary in other activities</p>

Formulaic funding	<p>the effectiveness of the university is determined by the selected indicators, which fully can not give a proper idea of its effectiveness;</p> <p>Indicators included in the formula, and the formulas themselves are significantly different in different countries, regions and training, even within a one country;</p> <p>relatively easily measurable indicators, as a rule, are not indicative of the final result and don't reflect the real quality of the universities activities</p>
Special-purpose financing	<p>the emphasis is shifting towards short-term goals, while the long-term changes may be delayed or completely ignored;</p> <p>the priorities of universities may be distorted due to their consent to any financing</p>
Competitive financing	<p>universities expenditures on the preparation of proposals for tenders, may never be recovered;</p> <p>during the competitive bidding the research departments or the researchers themselves bear additional bureaucratic burden;</p> <p>there is a risk of reducing the quality of education due to excessive research activity</p>
Financing based on demand	<p>creates dependency on the quantity and quality of information for the students who should make the choice of university and training programs;</p> <p>gives advantage to the university that can afford the high cost of self-promotion;</p> <p>gives advantage to large and long-established universities to small and newly established ones</p>

Estimating the advantages and risks of financing mechanisms variety the draft Strategy for Reforms of Higher Education up to 2020 suggests the following methods of higher education budget financing [12].

1. Block funding, which involves the support of universities public funding in accordance with the achieved qualitative and quantitative indicators of educational activity. Each university will independently distribute the amount of budget places by specialties in which it trains specialists that will increase the degree of the university autonomy. The basis of the block funding is founded on the mechanism of universities funding.

2. Voucher funding. This type of funding is focused on applicants who have the intention to get higher education. Depending on the results of the external independent testing, the level of knowledge acquired in high school, the applicant is entitled to receive a grant covering the full cost of any training in high school, or part of it. The grant will be transferred to the school, chosen by the applicant. It is proposed to use four types of vouchers - the usual full, exclusive and social. The usual amount of the voucher includes the average cost of training in high school; full - the maximum amount of training in high school; the special voucher covers the full payment of the course of studies in specialties which are of primary importance for

the state conditioned by tactical and strategic needs of the labor market; the social voucher is intended for disparate people of society.

3. Credit financing of educational services offers the student an opportunity to get a loan for a period of 10-15 years with a grace period for the time of studies at the university. This system of funding suggests the possibility of repayment by the student himself, by the employer, or through tax deductions. The state takes all the risks connected with possible failure to repay loan in time, that is the state acts as guarantor of the student. In addition, the student may not repay the loan, if after graduating from the university he works in the public sector of economy, in rural areas or has outstanding scientific achievements.

As the implementation of these methods of financing involves solving a whole range of issues, the urgent problem for Ukraine, is the development and adoption of legislation and regulatory provisions which form the legal framework ensuring the possibility of practical application of these methods.

5 Conclusions

Change of systems, methods and funding mechanisms is the primary consideration of education systems modernization in all countries in the XXI century. This is conditioned by a sharp increase of the students number, provoked at the end of XX century by the transition from the model of "elite education" to the model of "mass education", the limited budgetary resources, which requires the involvement of non-state funding sources, the changes of nature, content and form of higher education.

The task of ensuring Ukraine's professional staff is one of the strategic tasks of maintaining security and socio-economic progress of the country. Joining the Bologna Convention, Ukraine began radical modernization of the higher education system towards the creation of conditions for its compliance with international quality standards of training, optimization of the structure of higher education, greater independence and autonomy of universities, increasing their responsibility for the selection of financing sources for its activities. In this regard, the study and application of foreign experience of higher education funding will result in more efficient use of public funds and active introduction of innovative financing instruments.

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THE CONTROVERSY ASSOCIATED WITH THE POST-CRISIS REMUNERATION OF THE EXECUTIVE OF MAJOR FINANCIAL INSTITUTIONS IN THE COUNTRIES OF CENTRAL EUROPE

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ABSTRACT

The level and structure of remuneration of the executive of financial institutions were strongly criticised during the financial crisis 2007-2009. Irrational level of remunerations and their weak structure in the view of the European Commission formed one of the major causes of the financial crisis. EU market regulators attempted to link remunerations with measures of efficiency and safety of financial institutions (Directive 2010/76/EU) as well as to limit the level of remunerations (Directive 2013/36/EU). The purpose of this study was to verify the association of remunerations of the largest financial institutions executives in the countries of Central Europe with selected measures of efficiency and safety of banks and to analyse the remunerations level. The performed study showed strong association between the executive remuneration and the selected variables, however there has been demonstrated (depending on the country) different direction of the variation influence of the explanatory variable on the response variable.

Keywords: remuneration, financial institutions, Central Europe

JEL codes: G22

1 Introduction

During the financial crisis of 2007-2009 financial institutions have not always been suitably managed, and a high level of remuneration fostered taking risky decisions in order to achieve the highest short-term goals in exchange for care for long-term development of the institution. Excessive risk taking could lead to the collapse of numerous financial institutions around the world. Market regulators after the financial crisis made many attempts to regulate remuneration of the executive of financial institutions, which showed that the executive remuneration should be connected with the chosen measurements of efficiency and safety of the bank. The purpose of the article is to analyze the post-crisis regulations of remuneration; the tendency of financial institutions executive remuneration and the verification of linking them to the selected variables in CE countries in the period 2008-2014.

2 The review of literature and regulation of financial institutions executive remuneration in the post-crisis period

Appropriately designed remuneration system may play a significant role in ensuring proper corporate governance. Badly designed system of executive remuneration may lead to the collapse of institution, through inefficient remuneration growth, led by shareholders to the executives who have too much freedom in shaping the level and structure of remuneration [7]. The work of Bebchuk and Fried [2] indicated that the executive of institution (management

board or executive directors in the board of directors) has too much impact on the supervisory authority (supervisory board or non-executive directors in the board of directors), in establishing the level and structure of their remuneration.

In the literature on the subject the determinants of the level and structure of remuneration form the focus of numerous studies. However, there was no clear correlation between selected variables and the level of executive remuneration. Frequently, studies by various authors lead to contradictory conclusions. Positive correlation between the net financial result and total remuneration of the executive has been confirmed, among others, in the work of Jensen and Murphy [9] and Gayle and Miller [8]. Negative correlation of net financial result and total remuneration has been confirmed in the work of Balachandran and Ferri [1]. The work of Wallstein demonstrated a statistically significant correlation only in the case of increase of the net financial result [14]. A significant relationship between the size of the institution (in terms of total assets and market capitalization), and the level of remuneration was shown in the work of, among others, Clementi and Cooley [4]. The high level of the correlation between productivity and profitability of assets, and remunerations was confirmed in the work of Mayers and Smith [10].

Lower ethical standards of the executive have been noticed by the market regulators, both within the European Union and the United States. Various documents [5,12], indicated that improperly designed remuneration systems of financial institutions executive, encouraged managers to take excessive risks that could be one of the main reasons for the financial problems of financial institutions during the crisis. Nevertheless, the problems connected with improperly conducted remuneration policy in financial institutions are more profound. Very often visible is the low quality of published data and non-compliance with the information requirements demanded by the market regulators [6,13]. A major problem is the lack of connection of the level and structure of remuneration with measures of efficiency and profitability of financial institutions [11].

After the year 2009 - crisis in the financial sector, this area has been subject to numerous regulations. In many EU documents (including Directive CRD III, CRD IV), it was clearly specified that high level of the executive remuneration fostered making high-risk decisions, and such behaviour of the executive was one of the reasons of the financial crisis. Regulation of the whole financial sector has also concerned the financial institutions executive remunerations in the European Union and the United States.

Market regulators, in a specific way undertook the attempts to regulate irrational levels of variable remuneration. In directive 2010/76/EU [5], it was indicated that the main objective of this regulation is to point clear principles concerning correct remuneration system intended to ensure that the structure of remuneration does not encourage individuals to take excessive risks. In particular it was indicated that the total remuneration should not be a moral hazard and must be related to the risk taken by the financial institution. The major modifications carried with the regulation, concerned variable components of remuneration. The directive indicated that guaranteeing variable remuneration is not possible, with one exception, which is guaranteeing variable remuneration in the first year of work, but such an option should be applied only in exceptional circumstances. This record may be a matter of controversy because variable remuneration by definition should depend on the realization of specific goals of the enterprise, it should never be guaranteed. Nevertheless, the guarantees of premiums and bonuses have become a very popular method concerning remuneration of executives managing financial institutions in the twenty-first century. In the mentioned directive it was highlighted that the payment of a considerable part of variable remuneration - 40 - 60%, should be spread over a period of not less than 3 to 5 years. A major part of any variable

remuneration exceeding 50% should consist of shares or corresponding instruments of ownership of the financial institution. The document includes a very significant provision of the possibility to reduce the variable remuneration, when a financial institution achieves weaker or negative financial performance. This concerns both the current premiums and also reductions in payments of amounts previously earned, among others by reduction of remuneration (malus) or taking back previously paid premium (clawback).

The next part of the document includes numerous information obligations that must be fulfilled by financial institutions. Competent national authorities need to gather information about people whose earnings exceed EUR 1 million. Banks must, at least once a year make public information about: the composition and terms of reference of the committee with regard to remuneration, major parameters and justification of any variable remuneration systems, quantitative information on remuneration (including the amount of remuneration for the year) - divided on the fixed and variable remuneration, the amount and form of variable remuneration (including cash, shares and share-linked instruments), the amount of deferred remuneration - divided into parts already accessible and not accessible yet and the amount of payments related to the termination of employment contracts.

However, it turned out that this regulation is not sufficient. Therefore, the European Union since the beginning of 2013 has been working on a new tightening of the rules concerning executive remuneration. It was proposed that from January 2014 to establish the maximum level of the premium - calculated as a percentage of the basic remuneration. The European Union has proposed to limit premiums to 100% of remuneration in the form of annual salary. Nevertheless, it would be probable to raise the percentage limit to 200% with the approval of the shareholders. The United Kingdom was against such restrictions - due to the high level of variable remuneration in several financial institutions in this country. Discussions determining the text of the directive having a significant impact on the level of bank executive remuneration were completed in June 2013. On the day of 26 June 2013 the directive was announced on the conditions of credit institutions admission to the activity and on the prudential supervision over credit institutions and investment firms [Directive CRD IV], as well as the regulation on prudential requirements for credit institutions and investment firms. In these documents several obligations were signalled that ought to be fulfilled by institutions covered by this directive and regulation.

The directive significantly conditioned variable remuneration to certain aspects, considerably limiting them. In determining the level of variable remuneration a special emphasis should be placed on assessing the individual worker and the whole institution. This assessment should be carried out over several years, rather than short-term (annual) results. The directive highlights the non-guaranteed variable remuneration. The most significant change that has been introduced is determining the ratio of variable remuneration in relation to the fixed remuneration. Institutions establish the appropriate ratio of the fixed components of the total remuneration to the variable components, regarding the fact that:

- the variable component may not exceed 100% of the fixed component of each person total remuneration,
- Member States may introduce a lower maximum percentage,
- Member States may authorize the shareholders, owners or stakeholders to approve the maximum level of fixed component of the remuneration to the variable remuneration, provided that the total level of the variable component shall not exceed 200% of the fixed component concerning the total remuneration of each individual.

3 The level of executive remuneration in the CE countries

Introduced provisions were supervised by *EBA*. In published reports [6] on the level of wages in the financial institutions of the EU countries, a detailed description of the level and structure of executive remuneration was presented.

The analyzed data concern the years 2010 - 2012. Among all of the EU countries, in 2010 only two did not give information on the number and the level of remuneration, one in 2011, whereas all the countries provided this information in 2012. In 2010, Hungary and Poland did not meet the obligation to provide information to EU supervisors. In 2011, only Poland did not provide this information (in these cases, the data was given by foreign parent companies). The largest number of people remunerated for their work in financial institutions above EUR 1 million per year, occurs in the United Kingdom. In this country the number of people remunerated over EUR 1 million accounted for 77% of all persons paid in excess of this amount across the European Union. The ratio of variable remuneration in relation to the fixed remuneration (not meeting the criterion of 100%) in 2012 was not fulfilled in at least 13 EU countries. It should be however noted that as many as 8 countries have not distinguished people that are remunerated more than EUR 1 million. The number of persons remunerated more than EUR 1 million in financial institutions and the indicator of the relation of variable remuneration to fixed remuneration, in CE countries is shown in Table 1. In the analyzed period (2010-2012) in the Czech Republic and Slovenia there were no people employed in financial institutions that would be remunerated more than EUR 1 million a year. In Poland, Slovakia and Hungary, in none of the studied years, the relation of variable remuneration to the fixed remuneration did not meet EU requirements.

Table 1 Selected data on the verification of regulations concerning implementation of the directive in the CE countries

Country	Number/ratio	2010	2011	2012
Czech Republic	Number of high earners	0	0	0
	Ratio variable/fixed remuneration in %	-	-	-
Hungary	Number of high earners	1	8	9
	Ratio variable/fixed remuneration in %	528	293	260
Poland	Number of high earners	2	4	7
	Ratio variable/fixed remuneration in %	143	277	278
Slovakia	Number of high earners	1	2	1
	Ratio variable/fixed remuneration in %	100	1911	571
Slovenia	Number of high earners	0	0	0

Ratio variable/fixed remuneration in %	-	-	-
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Source: EBA, Report High Earners (2010-2012).

4 Data and Methodology

The study conducted in the article analyses the total remuneration of the largest financial institutions executive in the CE countries (the Czech Republic, Hungary, Poland, Slovakia and Slovenia). Total remuneration of the executive was understood as the total (annual) cost incurred by the shareholders regarding the company management fee. The executive board is composed of persons employed as executive directors in boards of directors or members of company management board. The period of analysis covered the years 2008 - 2014, in each of the analyzed countries.

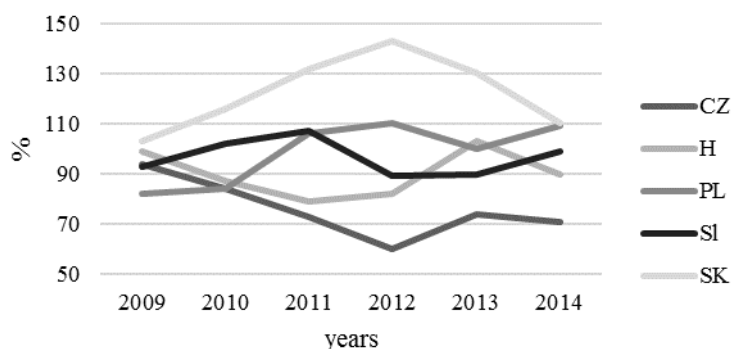
Among the major financial institutions analyzed in particular countries, the executive remuneration was examined in the following banks (in brackets Market shares 2014, EOP [3]):

- The Czech Republic - CS, KB, UniCredit (40.7%)
- Hungary - OTP, K&H, MKB (35.9%)
- Poland - PKO BP, Pekao Bank, mBank, ING Bank, BZ WBK (35.1%)
- Slovakia - SS VUB, Postowa, Prima, Sberbank (55.5%)
- Slovenia - Nova L., Unicredit, SKB, Nova, Abanka.

In the first part of the analysis a tendency was shown of total remuneration of the executive in particular countries (Figure 1), and in the second part of the study the panel research was conducted using GRETL program (Tables 2-4).

Analyzing the tendency of the largest financial institutions executive remuneration in particular countries (Figure 1), there has been a significant increase of the level in Slovakia in the years 2010-2013, in comparison to the remuneration received in 2008. A different tendency was observed in the Czech Republic, where the executive remuneration in the years 2009 - 2014 was never higher than in 2008. The financial crisis that began in 2008 could be reflected in the remuneration of the executive of largest financial institutions in Poland, where the executive remuneration in 2009 and 2010 was much lower than in 2008, whereas in the years 2011, 2012 it substantially increased.

Figure 1 The tendency of the executive remuneration in the CE countries 2008 = 100%



Source: Annual reports of financial institutions.

In order to verify the determinants influencing the level of the executive total remuneration a multiple regression was used. Statistical data which describe a multiple regression are panel data. In presenting the results of the regression the weighted method of least squares was used formulated by Gauss and developed by Markov. Using this method made it possible to apply a set of equations whose number was greater than the number of variables. In multiple regression the response variable was presented as total annual remuneration, received in a given year by the entire executive board in the country, which will be clarified by the changeability of the explanatory variables. The estimation was made by using the "gretl" program. Multiple regression allows the presentation of some values in the form of logarithm - in order to avoid excessive variability. This possibility was used in case of the dependent variable - the total annual remuneration of the executive and the independent variable of total assets. The explanatory variable in the model was the logarithm of the total remuneration (annual) of the executive **lnW**. To determine the influence of selected variables different explanatory variables were chosen:

- macroeconomic variables: **Δ GDP** - economic growth measured by change in GDP at constant prices in the country, and GDP per capita - **GDPpc**, as an explanatory variable determining the average standard of living in the country,

- microeconomic variables: bank size, measured by the logarithm of the value of assets **lnSA**, the scale of human capital management, measured by the number of job positions in a given year **LZ**, the level of capital, as security of the business **Tier 1**, operational efficiency measured by the return on average equity **ROAE** and the share of costs in income **C/I**, the net financial result, as the profitability of a business – **WF**, the ratio of credits to deposits - **K/D**.

The importance of all variables is presented assuming ceteris paribus. For the entire research group executive staff total remuneration is affected in a very significant way by the size of the bank, achieved net financial result, the return on average equity, the ratio of credits to deposits and number of employees. But it is worth to highlight that as a result of research carried out for the entire study group with the decrease in net financial result, the executive remuneration rises. The reason for this may be a strong relationship between these variables in the Czech Republic and Slovakia. In addition, the executive remunerations in the Czech Republic are dependent on the size of the bank, Tier 1 indicator, and the macroeconomic variables. Nevertheless, however, in the case of GDP this relationship has a negative direction, which may suggest that the poorer the society the higher the executive remuneration. In Slovakia the executive remunerations are very strongly associated with the size of the bank - the bigger the bank, the higher the executive remuneration, and with the number of employees - together with the decline in employment in the institution the executive remuneration increases. In Slovenia there is an opposite trend - the bigger the bank, the lower remuneration of the executive and the more people employed in the institution the higher the level of analyzed remunerations. In Poland, the executive remunerations grow with the increase in the net financial result, share of credits in deposits, an increase in the share of costs in income and a decrease in the number of people employed in the institution. Hungary can not confirm the significant impact of the analyzed variables on the level of financial institutions executive remuneration.

Table 2 The research results (1)

Variable	Wholeresearch group			Hungary		
	Factor	Value p	Significance	Factor	Value p	Significance
Free term	-4,31665	0,00006	***	-2,81599	0,79272	
lnSA	0,592473	<0,00001	***	0,752607	0,37378	

WF	-5,75833e-05	<0,00001	***	2,15339e-05	0,12185
ROAE	0,0145807	0,00098	***	-0,0525922	0,50019
C/I	0,00513529	0,11107		-0,00626665	0,45146
Tier1	-0,0109951	0,74959		0,0576389	0,18593
K/D	0,0305542	<0,00001	***	-0,00292002	0,44841
LZ	7,00523e-05	<0,00001	***	8,82557e-06	0,81299
Δ PKB	-0,0112533	0,72646		0,0513688	0,11663
PKBpc	-5,4288e-05	0,12786		5,93315e-05	0,15035
R2	0,887297			0,964071	
Adjusted R2	0,879893			0,934675	

Source: Own research.

Table 3 The research results (2)

Variable	Slovakia			Slovenia		
	Factor	Value p	Significance	Factor	Value p	Significance
Free term	-23,7021	0,00142	***	13,4475	0,00001	***
lnSA	3,10832	0,00051	***	-0,910205	0,00774	***
WF	-3,74249e-05	0,06348	*	-1,28348e-06	0,53764	
ROAE	0,120077	0,08980	*	0,00415685	0,05835	*
C/I	0,0220444	0,23133		-0,000521575	0,38330	
Tier1	0,0108335	0,81816		-0,000516451	0,96488	
K/D	-0,00381091	0,69906		0,000747292	0,44414	
LZ	-0,0013223	0,00056	***	0,000262518	0,00215	***
Δ PKB	0,0582366	0,05536	*	-0,00319271	0,73207	
PKBpc	3,23697e-05	0,65151		-1,36111e-06	0,94280	
R2	0,626611			0,654658		
Adjusted R2	0,492190			0,530335		

Source: Own research.

Table 4 The research results (3)

Variable	Czech Republic			Poland		
	Factor	Value p	Significance	Factor	Value p	Significance
Free term	-2,04471	0,70520		0,106782	0,97372	
lnSA	0,742344	0,08385	*	0,2627	0,39947	
WF	-2,81406e-05	0,00067	***	0,000722653	0,00052	***
ROAE	0,0221097	0,42518		-0,00645022	0,67414	
C/I	0,0173815	0,16154		0,0483728	0,00031	***
Tier1	-0,157297	0,01324	**	0,0323963	0,14176	
K/D	-0,00344733	0,82590		0,0137557	0,00107	***
LZ	-1,19529e-05	0,88543		-9,39948e-05	<0,00001	***

Δ PKB	-0,0617141	0,07668	*	-0,0145731	0,65602
PKBpc	-9,54037e-05	0,09548	*	2,16636e-05	0,28572
R2	0,820302			0,810427	
Adjusted R2	0,673276			0,742181	

Source: Own research.

5 Conclusions

The executive remunerations arise much controversy around the world - especially their level and structure. The European Union after the financial crisis decided to significantly regulate the market of the largest financial institutions executive remuneration. In the early years of the introduced regulation it has been shown that directive 2010/76 was not sufficiently effective, which is why it was decided to further - deeper regulation of this market. Even though the analyzed CE countries are combined by geographical location and history, very often they do not show a clear tendency as to the level of remuneration and determinants affecting them. The article shows a statistically significant effect of selected variables on executives total remuneration level, but nevertheless the direction of this impact was dependent on the analyzed banking sector. In the statistically significant models, adjusted R², fluctuated in the limit 74% - 88% for Poland and the whole research group and 67% for the Czech Republic and 50% -54% for Slovakia and Slovenia, which proves the significant level to clarify the influence of the analyzed variables on the variability of the executive total remuneration managing the largest financial institutions in the analyzed countries.

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EVOLUTION OF TAX EVASION IN THE SLOVAK REPUBLIC

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ABSTRACT

The article deals with analysis of tax evasion in the Slovak Republic for the period 1997-2012. The amount of damage caused by tax evasion is evaluated in terms of long-term development. The second part of the article deals with the detailed analysis of 2012 in terms of individual autonomous regions, the amount of damage caused by tax evasion is divided into individual quarters. Autonomous regions are also compared in terms of the proportion of the total damage, which was caused by tax evasion in 2012. The article concludes briefly summarized evaluation of the tax system of the Slovak Republic by international institutions and here are characterized recommendations issued by international institutions in order to support further fight against tax evasion.

Keywords: comparison, development, recommendations, tax evasion

JEL codes: H26

1 Introduction

Recently, we can see that there is not only the time of the economic development, but also the time of increasing economic crime, which are mainly associated with taxation.

The creation of tax evasion significantly affects the formation of the government deficit, as is the cause of lower public budget revenues. In general we can say that tax evasion is a situation where the taxpayer partially or completely avoids the fulfillment of tax obligations. [8]

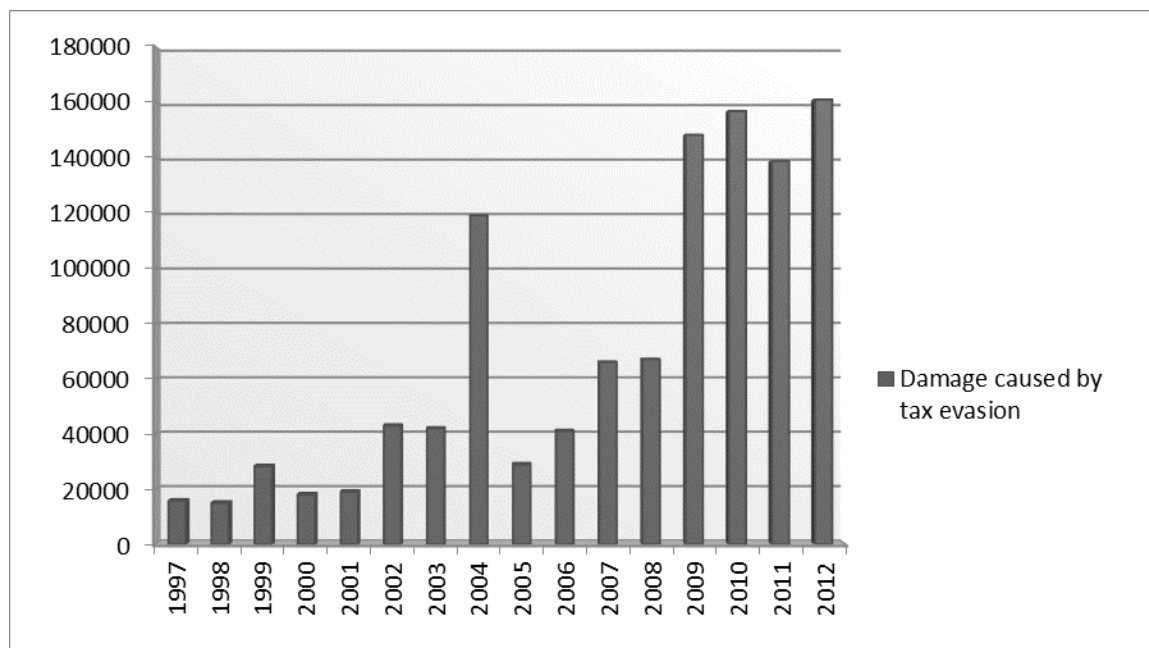
The reason for such action may be to minimize the tax burden. [3, 4, 5] Based on the available literature currently distinguish between legal and illegal tax evasion. Use of legal options in order to avoid tax liability is a legal tax evasion. On the other hand, illegal tax evasion is also avoiding tax obligations made beyond to legislation. [1, 6]

Ministry of Interior of the Slovak Republic regularly publishes various statistics, through which we can observe an increase in tax crimes. Data regarding this issue has been by the preparation of this article available for the period 1997 to 2012. In 2009 the Slovak Republic adopted the euro as their currency, data from the period before the change of the national currency have been converted from Slovak crowns to the euro 30.1260.

2 Tax evasion in the Slovak Republic

Development in the field of economic crime in the Slovak Republic in the period was associated with several political and economic changes. [2] In Figure 1 we can see the evolution of tax evasion in the Slovak Republic denominated in thousands €.

Figure 1 Development of tax evasion in the Slovak Republic (in thousand €, from 1997 to 2012)



Source: Own processing of the data available on the Ministry of Finance of the Slovak Republic (<http://www.minv.sk/?statistika-kriminality-v-slovenskej-republike-csv>)

Values of tax evasion in the period from 1997 to 2003 oscillated around the level from 20 000 thousand of € to 40 000 thousand of €, while the lowest value was recorded in this period in 1998. The increase in the quantification of damages resulting from tax evasion between 1998 and 1999 can be justified not only increased the number of tax inspections, but also a change of government, that political factors. There has also been an increase in GDP of the Slovak Republic, where GDP in 1997 reached the value of 23 867 400 € but in 1999 the value of GDP was at the level of 28 109 100 €. This increase may have contributed to the growth of tax evasion, but at the same time we can say that a growing number of money in circulation is not the only reason for the growing number of tax evasion.

The sharp rise in tax evasion is noticeable on the chart for the first time in 2004. In 2002 and 2003, the amount of tax evasion was in the range from 45 million € to 47 million €. Changing political situations but also led to an increase in the number of tax inspections that were carried out targeted. These changes led to the detection of evaluating the damage far greater than the previous period. In 2004, therefore, the amount of tax evasion increased up to 119 080 000 €. This fact led to the introduction of the necessary changes in the tax legislation of the Slovak Republic. There has been a change in the rate of value added tax, as well as changes in income tax and corporate tax. Subsequently, in 2005, decreased tax evasion to 28 932 million €, what is almost half that amount of tax evasion in 2002 and four times lower value compared to 2004.

After the political situation changed again in 2006, the situation concerning tax evasion deteriorated again. This year amounted damage caused by tax evasion value of 41 026 000 €. In 2007 and 2008 there was a further increase, but in 2009 the value of evasion increased to a value of 148 175 000 €. As the main cause of this increase can be seen coming economic crisis, which led to the development of the informal economy, not only in our country but also abroad. In 2010 there was a further increase in tax evasion, while the value was close to the level of 160 million €. The year 2011 brought a decline in the level of tax evasion to 138 661 000 €, but 2012 was the year of increase in the amount of 160 969 000 €.

This period may be considered a turbulent in terms of economic uncertainty. However, it is questionable whether the growth damages arising from tax evasion caused by the economic and political situation, or rather a growing number of tax audits, and thus to an increase of detected evasion.

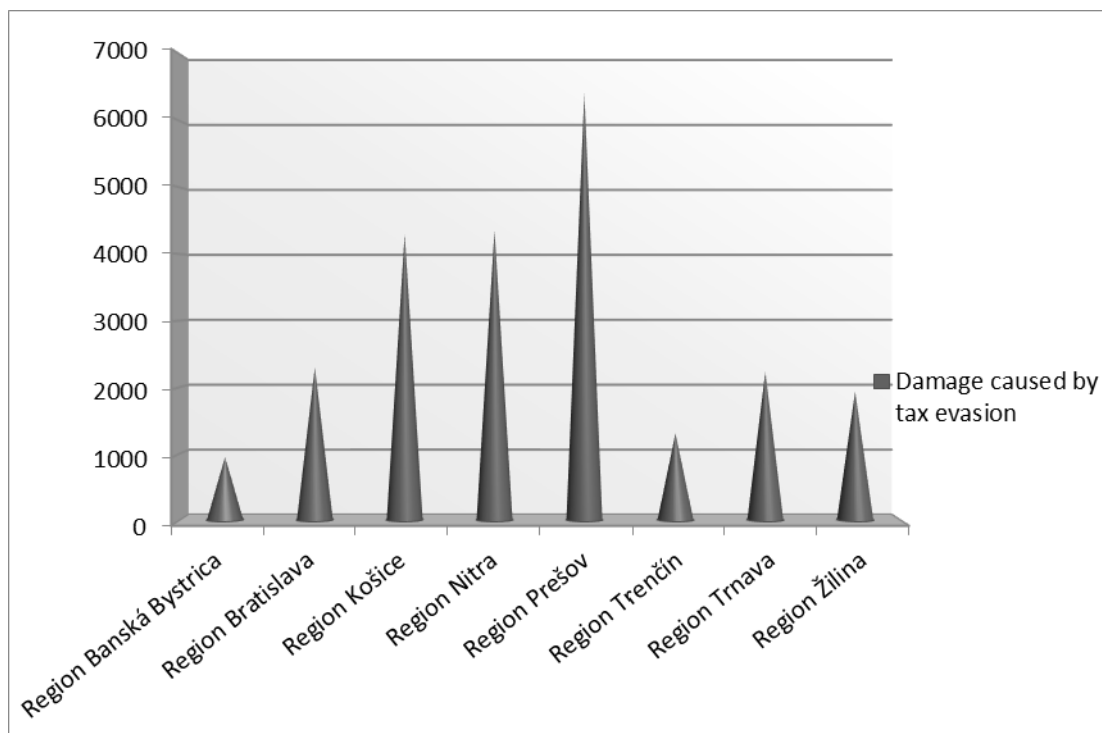
3 Tax evasion in individual autonomous regions

The latest available data from 2012 are also analyzed in terms of regional disparities in the Slovak Republic. Our territory is made up of eight self-governing regions.

The following chart shows us the value of the damage caused by tax evasion in individual regions of the Slovak Republic with respect to the division into quarters.

Although the general opinion that the economically most developed regions of Slovakia is region Bratislava, and therefore it would be expected that the largest tax fraud will be revealed right here, the highest damage of the clarified tax evasion in the first quarter of 2012 was caused in the region Prešov, amounting to 6 418 000 €. Region Prešov is followed by region Nitra, which has suffered damage amounting to 4 356 000 €. Trinity of regions with the highest evasion closes region Košice with damages amounting to 4 304 000 €. In the Bratislava region was the amount of damage caused by tax evasion 2 297 000 €. Although this is the smallest administrative and territorial unit of the Slovak Republic here has its seat a large number of companies.

Figure 2 Evolution of the damage caused by tax evasion in the individual regions (in thousand €, 1st quarter 2012)

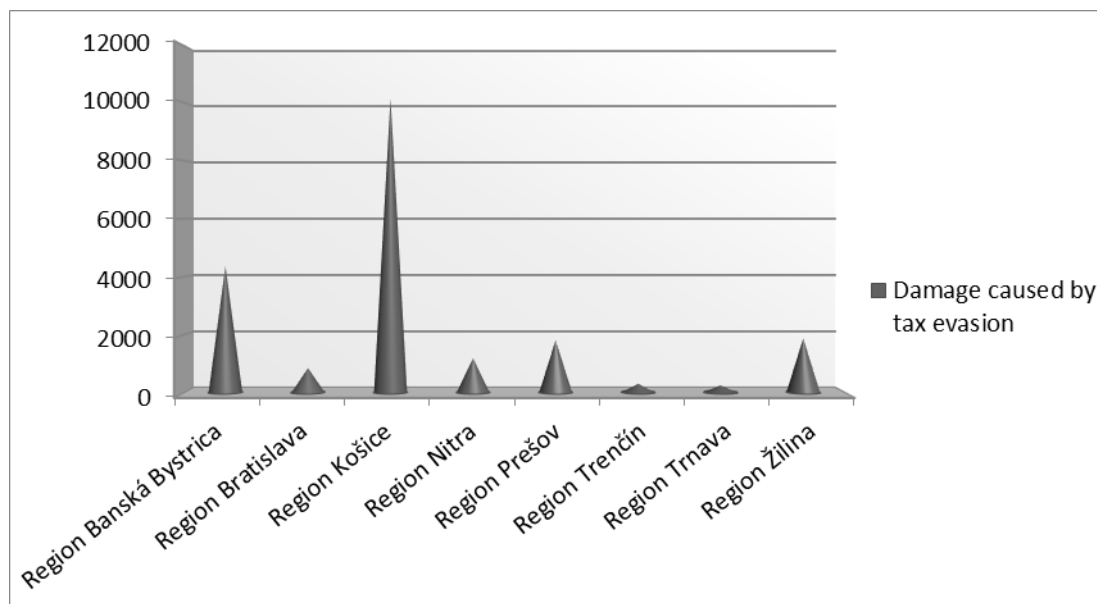


Source: Own processing of the data available on the Ministry of Finance of the Slovak Republic (<http://www.minv.sk/?statistika-kriminality-v-slovenskej-republike-csv>)

The second quarter of 2012 was in some municipalities associated with a decrease, but in others with a stronger increase in caused damage. As an example we can mention the significant decrease in region Bratislava where damage was caused by tax evasion in the amount of 846 000 €. On the other hand, region Banská Bystrica recorded compared to the

damage 949 000 € in the first quarter increase to 4 358 000 €. The significant increase was in the region Košice. Damage caused by tax evasion reached in the first quarter of 2012 the amount of 4 304 000 €, but in the second quarter was an increase to the level of 10 167 000 €, which is clearly the highest value of all the autonomous regions in the second quarter 2012.

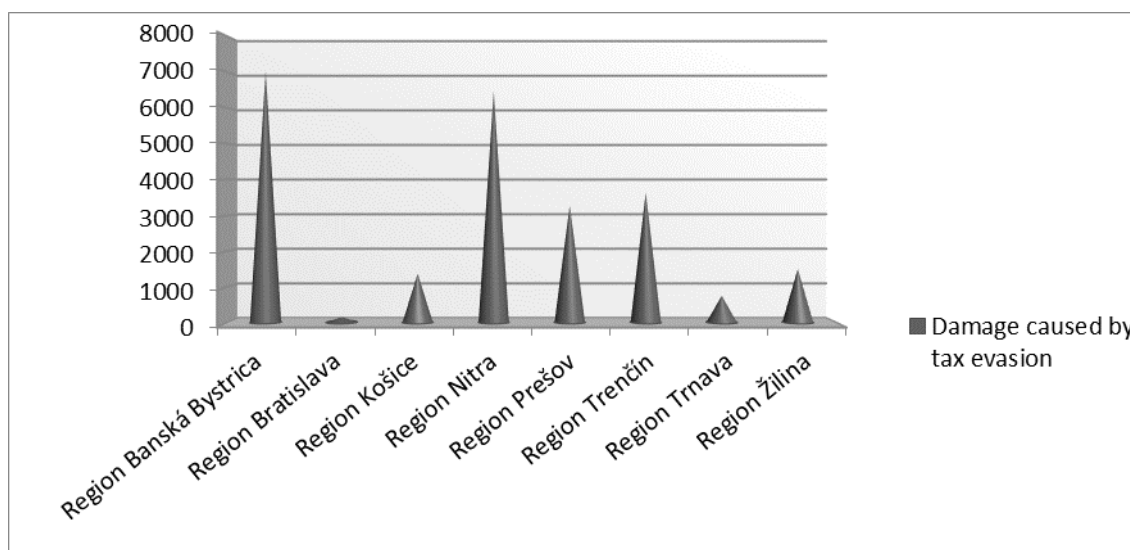
Figure 3 Evolution of the damage caused by tax evasion in the individual regions (in thousand €, 2nd quarter 2012)



Source: Own processing of the data available on the Ministry of Finance of the Slovak Republic (<http://www.minv.sk/?statistika-kriminality-v-slovenskej-republike-csv>)

In the third quarter of 2012 was the highest damage caused by tax evasion in region Banská Bystrica, amounting to 7 040 000 €. In region Nitra grew damage caused by tax evasion to the value of 6 484 000 €, thus found himself in second place among all the individual regions of the Slovak Republic. Between the three regions with the highest tax evasion is region Trenčín, in which was damage caused by tax evasion in the amount of 3 643 000 €.

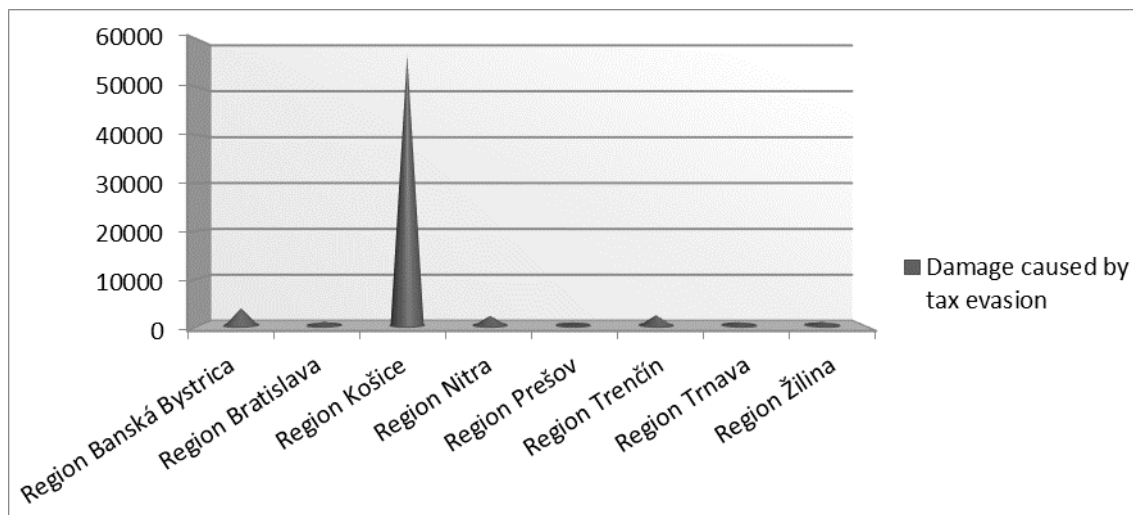
Figure 4 Evolution of the damage caused by tax evasion in the individual regions (in thousand €, 3rd quarter 2012)



Source: Own processing of the data available on the Ministry of Finance of the Slovak Republic (<http://www.minv.sk/?statistika-kriminality-v-slovenskej-republike-csv>)

In the last quarter of 2012 was a noticeable highest damage caused by tax evasion in region Košice, amounting to 57 039 000 €, representing an increase over the previous quarter to 41 times. The second highest loss was recorded in region Banská Bystrica, reaching a value of 3 679 000 €. In third place among individual regions of Slovak Republic was region Trenčín where was achieved the damage caused by tax evasion in the amount of 2 217 000 €.

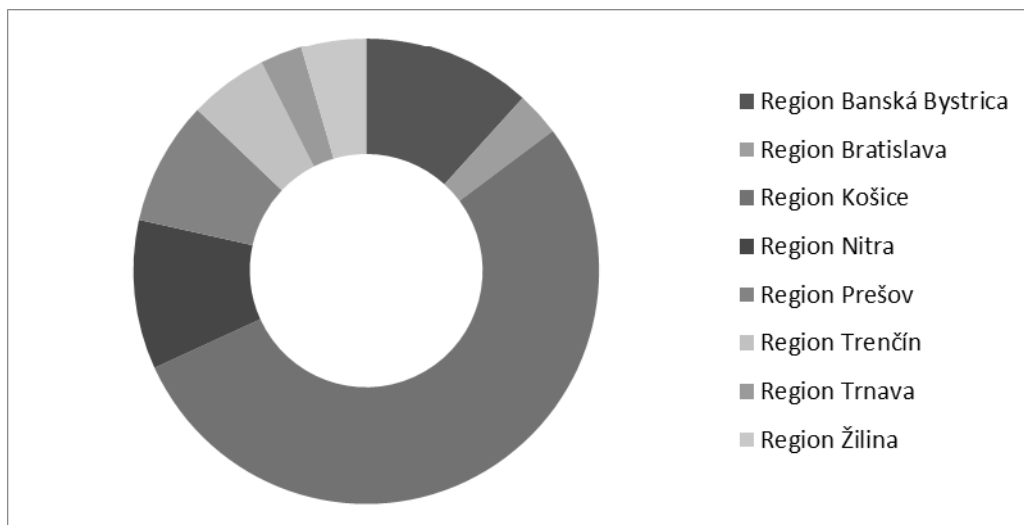
Figure 5 Evolution of the damage caused by tax evasion in the individual regions (in thousand €, 4Q 2012)



Source: Own processing of the data available on the Ministry of Finance of the Slovak Republic (<http://www.minv.sk/?statistika-kriminality-v-slovenskej-republike-csv>)

On the following picture we can see the percentage distribution of total damage caused by tax evasion in the Slovak Republic in 2012. Significantly high proportion - over 50% of the total damage caused by tax evasion reaches region Košice. This can be justified by the detention of entrepreneur operating in the region Košice, which was accused of tax fraud amounting to 40 million €. Later, however, allegations of tax fraud were widespread and the value was charged to reach the level of 58 million €.

Figure 6 Percentage of individual regions to the total damage caused by tax evasion in the Slovak Republic of the damage caused by tax evasion in the individual regions (in percent, year 2012)



Source: Own processing of the data available on the Ministry of Finance of the Slovak Republic (<http://www.minv.sk/?statistika-kriminality-v-slovenskej-republike-csv>)

4 Results and Discussion

Global institutions regularly issued various publications dealing with the assessment of national fiscal and tax policies. One part of the report of the World Bank, the International Finance Company (IFC), and PricewaterhouseCoopers in 2009 was positive valuation of tax reform that took place in the Slovak Republic in 2004. At the same time, the report highlights the considerable administrative burden on taxpayers.

In March 2015 it was published OECD analysis developed in cooperation with the Institute of Financial Policy of the Ministry of Finance of the Slovak Republic. Its aim was to provide an overall assessment of the tax system and provide recommendations for future tax policy of the Slovak Republic. According to the authors current effort to increase tax collection and compliance with tax laws, must continue to be strengthened. Relatively weak tax administration is liable to create barriers to the introduction of further tax reforms. The Slovak Republic will also face the challenge to remain attractive for foreign investors. [7]

Although already considerable efforts to support tax compliance in the case of VAT, the OECD report recommends continuation of the Action plan of fight against tax fraud, which was drawn up on the basis of the Government Programme. The authors also assessed introduced minimum tax on corporate profit, which violates horizontal equity, creates economic inefficiencies and increases administrative costs and costs associated with ensuring tax compliance. Additional revenues should be enhanced by increase of some taxes on personal capital income. Another recommendation is to increase taxes on immovable property and its linking with the market value of immovable property.

5 Conclusions

The issue of tax evasion is currently one of the most watched economic issues. In the local and international scale are tendencies to increase cooperation between institutions focused on these issues. The main objective is to increase the efficiency of tax collection, in particular by increasing the number of detected tax evasion. The estimated amount of tax loss is very high, and therefore it is necessary to focus on targeted control of taxpayers. To avoid tax evasion, it is necessary to realize the cooperation between tax inspectors, specialized inspection teams and between departments, and internationally between countries.

Acknowledgments

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REVIEW OF THE OCCUPATIONAL PENSION SCHEMES AND PRODUCTS

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ABSTRACT

We compare the concepts and role of occupational pension schemes and products in the pension systems in the latest decades. Under the liberal social philosophy, dominating the Czech pension policy in the nineties, occupational and social insurance schemes ought to be avoided. In high income economies the occupational pension schemes differentiated to reflect various welfare regimes and different pension gaps. The opt-out method of soft compulsion was used by neo-liberal economists and politicians to change the pension pillars and products, some countries were hit by misselling practices. Latest developments utilize the analyses of pension products and markets and the efficiency of occupational schemes' administration to define the future potential of these schemes. New workplace pensions with defined-ambition products are supported by national pension institutions, trying to reduce the overhead costs and increase the pension savings.

Keywords: occupational pensions, welfare regimes, soft compulsion, workplace pensions, pension savings

JEL codes: H55, J32, O16

1 Introduction

The formation of universal pension schemes is preceded by pensions provided by the employers. Under the 1896 Act on Civil Servant Pensions which remained in force, in principle, until 1948, 10 years of service in our country gave rise to entitlement to a retirement pension amounting to 40% of the final salary, increased by extra 2% for every 2 additional years. Loyalty was a typical prerequisite for public service as well as for the right to benefit from of a follow-up pension. The same still applies today in many western countries. A modern version of a special public service pension scheme exists in Germany for instance; the pension is calculated under the basic formula:

$$1.79375\% \cdot \text{years of service} \cdot \text{final salary} \quad (1)$$

The significant differences compared to the social insurance scheme used today in the private sector include a higher coefficient (1.79375 compared to 1.5) and the application of the final salary which is, as a rule, at the highest level achieved throughout the service career. In addition, public servants do not pay contributions for their pensions. After WWII, there was a certain conversion between these occupational pensions and other pension systems in the relevant countries. However, the advantages consisting in the relatively high levels of public service pensions remained – otherwise these separate schemes would lose their sense of existence for that matter. At present, 13 (of the 25 listed) OECD countries have separate pension schemes for public servants, while 12 countries have an integrated system [13].

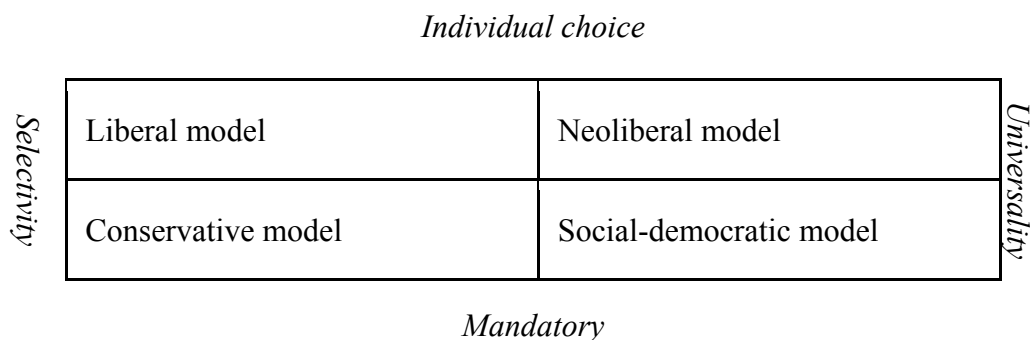
A similar path led to the development of occupational pension schemes in the private sector. Also here, the initial efforts aimed at applying the “loyalty” nature of these pensions. After WWII, occupational pension schemes experienced a major boom in a great number of countries and grew up to nearly nation-wide fully funded systems. Tax deductibility and similar treatments were of major importance for the development of occupational pensions in the different countries. Nowadays, emphasis worldwide is placed on the portability of the pension rights arising in such a manner.

This paper aims at analysing, in particular, the contemporary development trends in the occupational pension schemes in advanced countries, their interconnection with the basic pension social models and, thus, the possibility of using occupational pension schemes in the present Czech conditions.

2 Literature Review

A great number of various pension schemes have developed worldwide as a result of the historical development of social policy in the relevant countries. Among those, we may recognize several typical systems which can be considered to apply basic welfare regimes, as defined by Esping-Andersen [3]. Consequently, we can distinguish liberal, conservative and social-democratic social models. We also add the neoliberal model, which has developed since the 1990's, to the range of pension models. Choosing between these social models is a matter of public choice in terms of modern public policy. The fundamental differences in the four aforesaid basic social models and, thus, also pension models can be schematically illustrated on the different emphasis on universality or selectivity, as the case may be, of the pension security scheme, as well as on the individual choice or mandatory nature of this security scheme – see Figure 1.

Figure 1 Typology of social models



Source: author.

From the historical point of view, occupational schemes were an option under the conservative pension model in the private sector, existing next to the public servant schemes. The formation and development of social insurance systems for mine workers and, in particular, for the blue-collars and white-collars in the private sector gave an essential drive for the further development of conservative systems. Social pension insurance systems concern the relevant social groups in the territory of the entire state, and are significantly state-regulated, from financing and pension structure up to, among other, pension indexation. After the development of social insurance systems in the relevant countries, the occupational pensions were “shifted” to the role of a “second” pillar or, where appropriate, a substitute system – if this system provided a higher level of pensions. In this manner, the “substitute

pension institutions” survived in the pre-war Czechoslovakia; similarly, it was possible to avoid the newly established State Earnings-Related Pension System in the United Kingdom at the end of 1970’s provided that the employer had an adequate occupational system (“contracting-out”).

The occupational pensions in the role of the second pension pillar represent mostly a bonus in addition to the social insurance scheme – both segmented (conservative model) and universal (social-democratic model). Voluntary occupational pensions may also complement the liberal system (currently in Ireland). The modern-age extreme theoreticians of liberalism fought hard against the employers’ engagement in the social area, including occupational pensions; in their opinion, the employers should dedicate themselves fully to generating profit in their businesses. This policy won its way in the UK, for instance, where a “second” contracting-out – from occupational schemes to personal pension schemes, i.e. to a third pension pillar – was promoted under the Thatcher’s administration. It resulted in a great shame, as the sales representatives of private financial corporations were often willing – because of their commission – to “advise” their clients to shift to the pension scheme even if it was utterly disadvantageous for them. This mis-selling could easily take place also due to the fact that the occupational pension schemes were, and still are today, strongly differentiated even within the different countries. The Czech liberal Klaus-led government prohibited the formation of occupational pensions in the early 1990’s and this prohibition applies until today in fact. In practice, neoliberal economists mostly focus on transforming social insurance systems to mandatory personal pensions, and are not bothered by occupational pensions. Mandatory occupational pensions are, in practice, also often provided by private financial institutions, such as in Switzerland.

An analogical product to the initial fully-funded social pension insurance scheme can be classified as a typical conservative occupational pension system, without the non-insurance components such as the basic pension amount and with the pension being calculated from the final wage, the years of employment with the relevant employer and a coefficient valuing each year of employment. A person becomes entitled to pension after a prescribed minimum number of years in employment. In the initial version, an employee who “prematurely” terminated his/her employment contract lost all pension rights. In the innovated version, pension rights are retained upon a change of jobs, but they cannot be transferred elsewhere and there is also no indexation of the final wage that the employee was earning from the employer whom he left at own initiative or due to own fault. The products of this type are called defined benefit (DB), because here it is defined that the pension is calculated using the indicated pension formula rather than based on the amount of contributions paid. In the DB occupational pension schemes, the employer is liable for the entire scheme – and it is up to the employer to ensure that there are enough funds in the system to pay the pensions. The employer may also agree with the trade unions or the employees that employees will also pay contributions – and the level thereof. The employer’s contribution may even be conditional upon a specific amount of contribution paid by the employee.

An extreme example is the Netherlands where more than 90% of employees participate in the occupational pension schemes based on nation-wide collective agreements – for that reason, the system is sometimes referred to as quasi-mandatory. It is a fully-funded scheme, mostly with a relatively high target replacement ratio at 70% of the wage.

A modern modification of occupational pensions consists in the possibility to transfer the funds to another occupational fund or to a personal account held with a private financial institution, such as an insurance company. This does not pose any problem from the actuarial point of view – but also specific parameters are always essential. In this transfer, an employee

does not transfer his/her pension rights, but rather certain capital, the so-called “pension pot”. And from this point, there is only a relatively short path to leave the DB system, to divide it into two time-based stages – the first phase is a defined contribution (DC) savings system and the second stage is the pay-out phase, the purchase of a life-long annuity for a lump-sum premium. A transition from DB to DC systems is not only a mere change in the product, but also a significant change in the governance and management system.

Occupational pension schemes of all types contribute to the segmentation of the pension security system, particularly those on a voluntary basis; this path is also commonly followed by the trade unions and their policy. All employers cannot afford to contribute to occupational pensions. At the same time, however, these systems make it possible to adjust the pension scheme to the specific work conditions in the particular sectors or branches. The specifics can also be taken into account where a universal system exists, in the form of a supplement to the system.

The occupational pensions in the different social systems play much differentiated roles. It is no wonder: departmental liberals were refusing occupational pensions as an inefficient paternalism. On contrary, conservatives were altogether satisfied with them, thanks to the emphasis on “performance” or, in practice, rather on social stratification. The communists abolished the occupational pensions because of being in contradiction with the central planning as well as with the Leninist ideology of state social benefits at the full wage level, to then introduce labour categories as a preference for manual and hazardous work within the otherwise uniform state pension security system. Our liberal Prime Minister Klaus enforced the abolishment of labour categories and, as certain compensation, allowed the employer’s contributions to supplementary pension insurance provided by private companies. The social democratic social model combines two universal pension pillars: uniform social insurance and flat-rate or means-tested pension. In the logic of the matter, the social democratic policy is also supported by the trade unions – and vice versa, which results in the promotion of occupational pensions, in particular through collective agreements of higher and nation-wide type.

The application of various social models resulted in very strong variation of importance of occupational pensions in different countries. In the US, for instance, pensions sponsored by the employers are considered to constitute a third layer in a five-layer pyramid – after the public pension pillar and property housing, followed by individual retirement accounts (including transfers from occupational pensions) and other assets. Although the importance of each layer differs depending on the income quintiles of the households, altogether they allowed the last generations of pensioners to retain, on average, their existing living standard in retirement [6].

3 Administration and Costs

In their initial and basic form, occupational pensions are managed by foundations or trust funds in the interest of the employees. Here the employers are in the position of sponsors responsible for the financing of the scheme. This does not exclude contributions from the employees; such contributions may even be a pre-condition for the contributions provided by the employer, with auto-enrolment being used as well, etc. In addition, the specific terms and conditions for the entitlement to a pension are nowadays also primarily a matter of mutual agreement between social partners. There is no possibility of choice for a product or provider within a single occupational pension system. It is in fact a collective pension insurance scheme managed by a non-profit institution.

Occupational pension schemes can be of a various size and, just for that reason already, outsourcing is often used for asset management as well as for ordinary administration. In this manner, the non-profit institution can be restricted to the “mere” strategic management by the administrative board, which entails not only economies of scale, but also potential conflicts of interest with administrators and investors. The non-profit institutions operate in a more or less perfect market environment and their overhead costs, which are reflected in the level of pensions and other benefits, are very differentiated, in particular depending on the volume of assets under their management.

The conventional model of occupational pension provision does not require any sales force because the participants in the scheme include solely the employees of the relevant undertaking or institution or even the relevant sector or branch. In some advanced countries, this model survived in the competition with other occupational schemes (e.g. in Germany), in other countries it was significantly unified into nation-wide social insurance-like systems (e.g. in Finland), while in Switzerland and Australia, occupational pensions simply became mandatory. When replacing DB systems with DC schemes, most countries experienced a fundamental product change affecting the content and, thus, the administration of occupational pensions.

In DB schemes, the crucial part of the financial risk is borne by the employer, while in DC-type schemes, the employer “only” pays a contribution – and the investment risk is primarily borne by the client. It is then – in a certain way – systemically logical that the client has the possibility to choose a pension fund in which “her/his” pension savings are to be invested: the collective pension scheme is transferred to individual retirement accounts – which may or may not be facilitated by the employers, thus turning into a personal pension savings or insurance scheme, which is a fully different provision model. The basic differences in the bearing of the most risks are shown in Table 1.

Table 1 Risk Bearing for Different Types of Scheme

Type of Scheme	Working	Retirement
Defined benefit	Employer	Employer
Defined contribution	Member	Insurer

Source: Sutcliffe, Ch. (2010). *Back to the Future: A Long Term Solution to the Occupational Pensions Crisis. Insurance Markets and Companies: Analyses and Actuarial Computations*, vol. 1, p. 20.

The common hypotheses that have been put forth to explain the shift to DC plans include the following [7]:

- the simplicity of DC plan designs
- the reduction in risk to employers when undertaking such a change in plan design
- the opportunity for plan sponsors to reduce their annual contributions
- the rising costs associated with the government's increased regulation of DB plans and
- the superior portability properties of DC plans, which fit today's more mobile and independent workforce.

The neoliberal supporters of privatization are in favour of DC schemes, arguing that the individuals may allocate their pension wealth into financial assets according to their preferences [2]. From purely ideological point of view, this argument is understandable; nevertheless, the vast majority of clients of these schemes is inert and has no interest or real possibility to make use of this option, and even government programmes to raise financial

literacy are of no help here. The economic theory indicates that employees are not suitable economic entities (agents) to bear investment and annuity risks [11].

The objective advantage of the transition of occupational pension schemes from DB to DC type consists in the introduction of easy portability of savings from one fund (employer) to another; the need for this portability arises even just from the modern labour market itself. It is not possible to build major pension systems on the hypothesis that an employee will work for a single employer throughout her/his life or, more specifically, that it is at least impractical to acquire pension rights from several employers and have, in her/his old age, the “partial” retirement pensions paid from all or most of the employers, and all this regardless of the fact that every occupational pension scheme also has its “technical minimum requirements” for becoming entitled to a pension which means that, in some cases, entitlement to a partial pension may not always arise.

Historically, occupational pensions are “associated” with pension pay-out; the transition to a DC system provides conditions for not using the annuities as a part of the pension scheme. This is usually also the case in practice, unless provided otherwise – in exceptional cases – by state regulations or by agreement between employers’ associations and trade unions. An exception of this type is the Netherlands where the DB type occupational pensions continue to prevail (used by ca. 90% of participants) and where a life-long annuity must be paid to DC type scheme participants as well. Switzerland is another exception – there the annuitization is not mandatory but, on the other hand, the conversion rate of the pension pots to annuities is regulated by the state. Since 2014 the minimum conversion rate of 6.8% in the mandatory occupational insurance scheme applies to clients at 65 years of age. In the optional occupational insurance scheme, this regulation does not apply and the conversion rates are significantly lower!

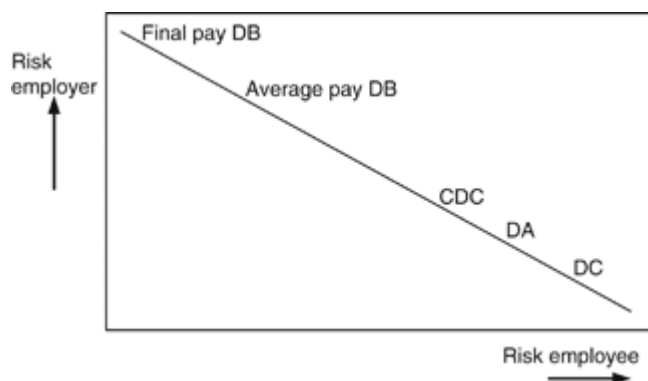
4 Results and Discussion

The quasi-mandatory Dutch model of occupational pensions raises interest of theoreticians and politicians in a number of other countries, also due to the fact that the local DB systems of these pensions have been in a modification process since the beginning of this century; these transformations were accelerated after the decrease of investment yields around the world, which resulted and continue to result in a pressure to increase the occupational pension contribution rates, while this pressure has already become unbearable for the business sphere. The main modification of the DB system was the setting of ceilings for the existing contribution rates (in 2012, the average contribution rate was approximately 17.5% of the wage, of which 11.3% was paid by the employer) and the subsequent partial shifting of the investment risk (and the longevity risk) to the employees and pensioners. In 2013, in particular, there was even a decrease in the nominal pensions paid. Many authors are of the opinion that – in this manner – the country actually developed a combined DB + DC system or, in other words, established a stand-alone collective pension scheme [1]. Generally speaking, there may be a range of such combined scheme – depending on whether the product is closer to DB or DC or somewhere “in the middle” between the two, as the case may be. Two options of these combined products are illustrated in Figure 2: one product is referred to as CDC (collective DC), the other as DA (defined ambition). The DB product is present in two versions here: the historically first product derives the pension from the final salary, while the later DB product calculates the pension from the average life-long (valorised) salaries.

In Great Britain, the occupational pension scheme was and is significantly different from the Dutch system. Less than 50% of employees were participating in this pension pillar in Great

Britain in 2013. DB systems continue to prevail, as the DC-type occupational systems have not developed much (8-9% of employees). The contribution rates in the DB and DC systems were and still are diametrically different: in DB systems, the average contribution earlier was 14% of the wage (of which 4% were paid by the employee), while in 2013 the average contribution was as high as 20% (with 5% of the wage paid by the employee). On contrary, the average contribution in DC systems earlier was 7% (of which less than 3% paid by the employee) and less than 10% of the wage (of which 3% paid by the employee) in 2013 [12]. The new UK Pension Schemes Act (2015) focuses on scheme classification, introduces the concepts of DB, DC and shared risk pensions, which is the legislative term for the DB and DC combinations. An essential reform consists in the transition to a workplace pension system, which is to be completed in 2016.

Figure 2 Risk profile of pension systems



Source: Schouten, E. – Robinson, T. (2012). Defined ambition pensions – Have the Dutch found the golden mean for retirement savings? *Pensions*, vol. 17, p. 337.

In Great Britain, the administration decided to implement a number of major reforming changes in order to increase transparency, reduce administrative and other costs, etc.; the occupational pensions are under transformation to workplace pensions – with auto-enrolment of employees. The reason behind this is the high expenses of private pension savings providers. The basic services should newly be provided by the employer, including the use of a default fund and the possibility to use NEST, a low-cost national pension company (competing with both the private companies and the employer funds). The products should be simple; the system is restricted to “pension” savings (NEST will not provide annuities). Workplace pensions are a solution for the problems in the occupational pension provision on the basis of soft compulsion, in reality it is in fact a different model of these pensions.

The developments of occupational pensions in the Netherlands and in Great Britain, for example, imply that the choice of product/system in this pension pillar is of a major importance. The transition from DB to DC entails not only “unburdening” the employers from full financial liability for “their” systems, but also an essential trend to reduce the pension system to a savings system only. In addition, a large number of comparisons showed that DC systems provided by the private sector are significantly more costly and less profitable for the clients – under otherwise the same, comparable circumstances. Bovenberg and Nijman [1], also referring to many other authors, indicate that the costs of the individual defined contribution systems are 50-100 p.p. higher than the costs of occupational pension funds. Pitt-Watson [9] documents that, in the past 57 years, collective pensions in Great Britain would have generated 33% better results than the individual pensions and would have also been more predictable. This conclusion is also reproduced in a research paper of the British House of Commons [12].

As from the new fiscal year of 2015, Great Britain abolished the mandatory annuitization of a substantial part of pension pots in DC pension schemes under the slogan “Freedom and choice in pensions”. The official explanation of the competent Secretary was that “as nature of retirement changes, annuities are no longer the right product for everyone”. Another essential reason was that “the annuities market is currently not working in the best interests of all consumers. It is neither competitive nor innovative and some consumers are getting a poor deal” [4]. Following public consultations, the explanation was modified as follows: “Annuities will remain the right product for some, but I believe that people should be free to make their own choice about how to use their savings. I have been encouraged by the way in which the pensions and investment industry is creating innovative new products designed around the needs and preferences of consumers, and that will better suit the changing nature of retirement” [5].

In the US, there was a strong trend of transforming occupational pensions to DC plans, with a one-off disbursement of pension savings (upon reaching the “retirement age”, here usually 59.5 years). In the middle of 2011, DC-type occupational funds and DB-type occupational funds held USD 7.9 trillion and USD 2.5 trillion of assets, respectively; the assets of citizens held at the individual retirement accounts were estimated at USD 4.9 trillion at the same period. The level of annuitization in DC-type funds (incl. IRA) is negligible. Employers are not interested in annuitization; for them, it is only a complication resulting in higher costs [8].

Following the major change in the concept of voluntary occupational pensions in some countries where the employers were degraded to payers of contributions in favour of pension accounts of their employees, the main purpose and the reason for existence of the occupational pensions should be redefined. Personal pensions can fully assume their role, at least from the technical and legal perspectives. There is only a single possible reason left for the existence of occupational schemes, namely the economic reason: the potential advantage of occupational pensions compared to personal pensions consists in their costs – under otherwise identical conditions, occupational pensions entail significantly lower overhead costs because there are no sales and similar costs and no profit margin. In addition to the adequate governance, the relevant pension funds must be aggregated at a sectoral or nation-wide level in order to be able to realize these potential advantages of the occupational schemes, such as based on the Dutch or Swedish models. If this is implemented, the resulting system will already be closer to or essentially equal to a segmented social pension insurance scheme.

In our country, the occupational pension system was rejected by the Klaus government in the beginning of 1990’s for ideological reasons as well as because of the concerns at that time related to the siphoning-off of funds in the situation of insufficient infrastructure for state regulation of financial institutions. The later right-wing governments consistently continued in the rigorous rejection of occupational pensions – to such an extent that they went into a conflict with the European Union which promoted a single EU market in the segment of (fully funded) occupational pensions in order to decrease the costs of these systems, through the so-called EU Pensions Directive (Directive 2003/41/EC on the activities and supervision of institutions for occupational retirement provision /IORPs/). Essentially, the Czech government won this conflict although, finally, the Directive was transposed by the Act (amendment in 2011) on activities of “institutions for occupational retirement provision from EU Member States ... in the territory of the Czech Republic” providing, however, that these institutions may not be established in the territory of the Czech Republic (Section 10h of the amendment) and are not entitled to be granted a licence even if they meet the requirements. The VF Corporation UK Pension Plan was granted registration by the state supervision authorities (the Czech National Bank); however, the activities of this institution are not clear.

The EU Pensions Directive aimed at developing a single market in the segment of those pension funds that are run under the standard rules of comparable financial institutions – thus contributing to reduced overhead costs. The purpose of this Directive was to establish pan-European pension funds, such as at the level of large multinational corporations. The resulting effects of the Pensions Directive are negligible, as there were 75 active pan-European funds last year. A revision of this Directive has been ongoing and pending for several years. However, the problem might be of a more fundamental nature than the EU officials have been willing to admit so far.

The occupational pension provision model has been differentiated to a large extent: in some countries, the original system was essentially retained (Germany) while, in other countries, the occupational pensions have become quasi-mandatory on a collective basis (the Netherlands, Sweden, Finland) or mandatory, in one way or another, based on workplace pensions (Australia, Great Britain) and, last but not least, there has been a mix between the occupational and personal pensions with a robust tax support (US).

The differentiation of the occupational pension provision is, in principle, determined by the choice of the social pension model. Collective systems tend to incline to the segmented social insurance and generate significantly higher pensions under otherwise identical circumstances. The more or less neoliberal policy is associated with high margins for the private savings and annuities providers and with the efforts to regulate the products and use the entire occupational pension system to reduce the overhead costs, largely by using the behavioural economics; national pension institutions as providers of low-cost pension savings are also being joined to this system; a successful concept of low-cost private annuities is lacking and the pay-out phase of these pension systems is left out of the sphere of interest of the politicians with liberal orientation, e.g. under the slogan of freedom and choice for the participants in the modified occupational pension systems.

5 Conclusions

In the past decades, the world has witnessed major transformations of occupational schemes and products arising from the changes in the labour markets as well as in the financial markets, with a significant link to the development of pension welfare regimes. In several countries, the occupational pensions came very close to the segmented social insurance system. Other countries implemented neoliberal reforms aiming at transforming occupational pensions into mandatory personal pensions; in reality, however, personal pensions entail higher overhead costs that forced the governments to significantly extend the state regulation, including the establishment of a low-cost national pension institution, exit from annuitization of pension savings and the application of auto-enrolment of employees into the system. The EU Pensions Directive, which was expected to enhance competition in the segment of occupational pensions and to reduce the overhead costs of IORPs, continues to be of low importance overall. Occupational pensions have their irreplaceable role in the pension security system of employees in specific sectors and may also play an important role in the pressure to reduce the costs of private pension savings providers. That holds for the Czech Republic as well; the neoliberal pension model is to be abandoned.

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EXPERIMENTAL INVESTIGATION OF FACTORS INFLUENCING THE WILLINGNESS TO PAY TAXES

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ABSTRACT

Problems of taxation and effective tax collection are subject to debates both at national and international governmental levels. Tax rate, likelihood of tax audit and system of penalties setting are extremely important variables when considering tax policy. We investigated the issue through economic experiment, which was conducted at UEBA with 48 subjects. We examined two factors affecting the willingness to pay taxes. Tax rates that were determined at levels of 10%, 20%, 30% and 40%; and the probability of realization of tax audit, which was set at 5%, 20% or 0%. We confirmed the assumption that, if the probability of realization of tax control increases, taxpayers are more complying the tax regulations. Regardless the probability of tax audit realization, we found that the percentage of declaration of the income decreases with increasing tax rate up to the level of 40%, where it stagnate.

Keywords: experiment, willingness to pay, taxes

JEL codes: H29, C90

1 Introduction

Issues in taxation and effective tax collection are subject to Parliamentary debate both, at national and international levels. In search for answers we can use different methods of economic research and laboratory economic experiment is one of them.

The tax rate, the likelihood of tax audit and system of penalties are extremely important variables when considering tax policy.

2 Literature Review

For the first economic experiment dealing with tax issues we can considered work of Friedland, Maitai and Rutenberg, which focused on the clarification of the impact of possible tax penalties and controls in seeking to avoid taxes while setting different tax rates. Their results suggest that governments should focus more on the correct system of the fines rather than increasing the frequency of tax audit. [8]

Becker, Buchner and Sleeking extended the previous experiment and added that participants of the experiment had to earn an income. [5] Alm, McClelland and Schulze [1] conducted an experiment influenced by the work of Kahneman and Tversky [9] and their theory of overvaluation and undervaluation of probability levels. They conclude, that people overestimate the likelihood of tax audits and declare more than the theory of expected utility assumes.

The likelihood of audit completion was replaced in the article of Alm, McKee and Cronshaw from 1993 by internal rules for determining where the tax audit will take place. [2] Alm and

McKee continued in examining the implications of alternative endogenous strategies of implementation of tax audits. They applied the rule that for tax audit were selected those tax returns where taxpayers showed lower than the average taxable income. [4]

Origin of funds in tax related experimental research emerged as one of the important factors that affect the amount of tax paid. Scott J. Boylan and Geoffrey B. Sprinkle [6] conducted an experiment, in which they focused on determining whether a way of obtaining resources affects the relationship between the tax rate and tax compliance. The results show that the different tax entities invest time and effort into obtaining income and therefore react differently to changes in tax rates and other changes in tax policy. This may in turn affect the overall income of public funds, as well as effectiveness, fairness and credibility of the perception of tax system by different social classes of taxpayers [3].

Experimental economics is focused in the field of taxation and tax policy on: finding the ideal tax rates, the examination of the impact of age, gender, education and other demographic factors on decision about the amount of tax returns, the impact of origin of funds in the business on tax returns, the impact the possibility to decide about the use of selected funds for public purpose and it also examines how potential fines or audit affect tax compliance of taxpayers.

3 Data and Methodology

For the needs of our research, we created the following design of experiment.

The likelihood of a tax audit - the percentage chance that the tax return of a particular taxpayer will be subject to random tax audits. The value is between 0 (zero probability of realization of tax audit) and 1 (tax audit will occur with certainty).

The rate of tax compliance - a ratio of income declared to the real income of the taxpayer. The value is between 0 (no income was reported) and 1 (full income was reported).

Donated income (subsidy) - initial endowment allocated to participants in Phase 2 - without any effort to obtain it

Treatments of experiment:

- Treatment with earned income (Treatment was organized in two stages: earning and taxation.), and
- Treatment with donated income.

To simulate the effort to acquire an income participants in the first phase of the first treatment were summing the numbers in each row and column of the table for 10 minutes. For each correctly calculated row or column participant received 5 points.

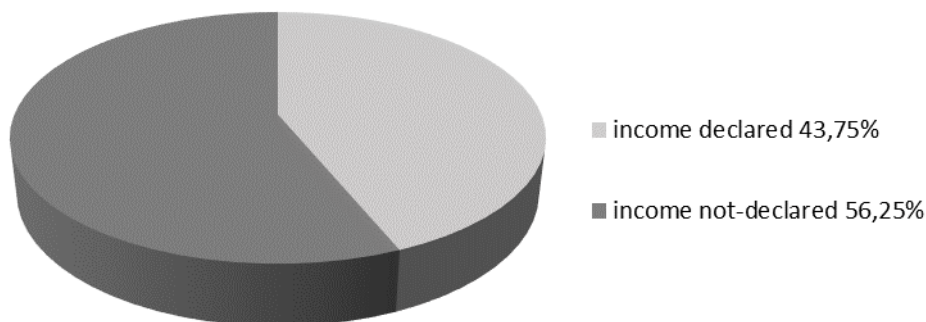
This phase was followed by a second one, where participants were first informed of the necessity to tax the income earned and, that if the tax audit reveals wrong amount of tax liability, the participant will be fined by 100% of the tax liability. Participants later responded 10 questions, each question determined the tax rate and the probability of tax control. Tax rates were determined at 10%, 20%, 30% or 40%. The probability of tax audit was either 0 %, 5 % or 20 %.

Second treatment was conducted only in one phase, as the subjects did not have to use any effort to obtain income and they received initial endowment of 600 Euro. They were informed that this amount is subject to tax and they had to declare how much tax they are willing to pay for given combination of tax rate and the probability of tax audit.

4 Results and Discussion

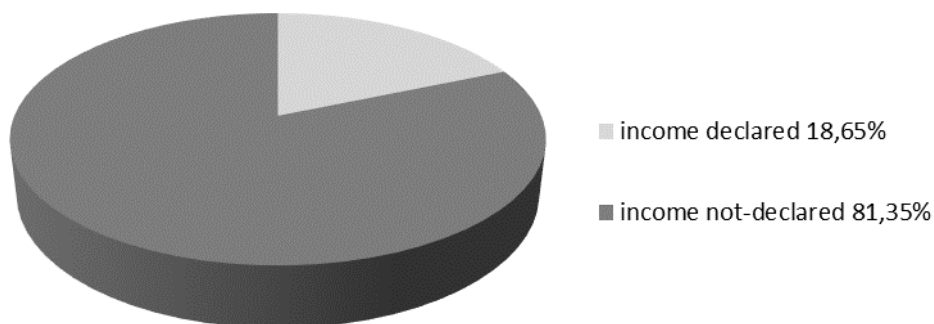
In experiment participated 48 subjects - students of the University of Economics in Bratislava of the bachelor and master studies. [11] Participants were randomly assigned to the two Treatments of the experiment equally (24 participants in each Treatment). Only three participants from a total of 48 (6,25 %) declared in all rounds their real income. Participants in the experiment declared on average 34,35 % of their taxable income. However, while women on average declared 43,75 % of their income, for men it was only 18,65 %. Different attitudes among genders in risky behavior is well covered in experimental literature and market specific survey on insurance market done by Pastorakova et al supports previous findings on data from central Europe. [10]

Figure 1 The share of declared income – women



Source: own calculations based on experimental data

Figure 2 The share of declared income – men



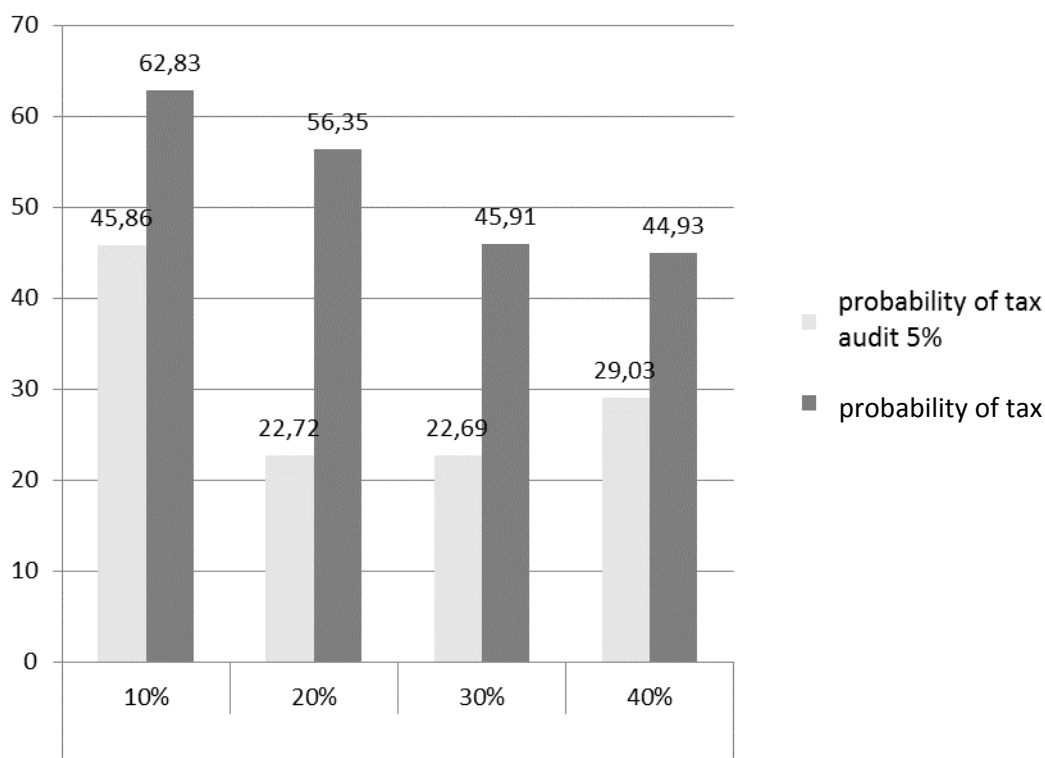
Source: own calculations based on experimental data

When analyzing the data obtained in terms of origin of the income, we observed a slightly lower rate of declared income in treatment with earned income (average 31,93 %) than in option with income endowed (average 36,77 %).

The results in declaring taxable income by men and women are contradictory. Women reported their endowed earnings at an average of 47,50 % and their earned income at 37,25 %. We may conclude, that women declared at higher rate endowed income, than income

collected with efforts. This is because women tend to present the effect of sunk costs. This means that they were more risky with income earned with effort to keep as much from their input costs (time and effort) in return. Conversely, men declared at an average of 10,72 % of their endowed income and 26,92 % of their earned revenue. Men reported earnings clearly on higher levels than the endowment. We attribute it to the house money effect, which motivate men to take more risks with the endowed income since they did not put any into obtaining it. Even if the tax audit finds errors in their tax return, they will not lose any money, for which they spent any time and/or effort. Analyzing the relationship between the likelihood of tax audit and tax compliance, we observed that if the probability of tax audit increases, taxpayers are trying to comply more with tax regulations.

Figure 3 Reported taxable income by the probability of tax audit and tax rate



Source: own calculations based on experimental data

Figure 3 documents how taxpayers perceive growth of tax rate and how they adapt their decisions. Unless the tax rate is relatively low (10 %), taxpayers are willing to declare relatively high share of their income (at the 5% probability of tax audit 45,86 % of income and at 20 % probability of tax audit 62,83 % of their income).

Regardless of the probability of tax audit, we found that the share of income declared decreases with increasing tax rate up to the level of 40 %, where no further decrease is reported. We can confirm that the level of tax rates influence the decision of taxpayers.

5 Conclusions

With increasing probability of tax audit, taxpayers are trying to comply more with tax regulations. An interesting result gives the observation of taxpayers' tax returns in the case of zero probability of tax audit. In terms two different treatments the results follows. In treatment with endowed income, men did not report any income. Two women declared actual amount of

their income and three women declared it partially. In treatment with earned income only two men and two women reported partial income. No woman in this treatment did declare her full income, which also corresponds to previous findings that women tend to tax income endowed more than income earned.

If the tax rate is relatively low (10 %) taxpayers are willing to declare a relatively high share of their income. Regardless of the probability of tax audit, we found that the percentage declaration of income decreases with increasing tax rate up to the level of 40%.

Acknowledgments

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SOCIAL ENTERPRISES IN SLOVAKIA AND UKRAINE: FOCUS ON FINANCES

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ABSTRACT

Social enterprises are considered by the European Commission to be key driving force of social innovation and thus social change at both micro and macro levels. Society as well as local and state authorities in Slovakia and Ukraine are still apprehending the fact that social enterprises, like any type of innovation, need initial investments prior to providing societal benefits. This article investigates historical background, existing institutional framework, and current finance structure of social enterprises in both countries. Based on conclusions from conducted interviews and examples from other countries we suggest ways to diversify seed capital and finance opportunities to help nurture social enterprises in both countries.

Keywords: social enterprise, seed capital, community development finance institutions, Ukraine, Slovakia

JEL codes: L31, G21, G29

1 Introduction

Currently around the world social entrepreneurship is mentioned as development strategy and organisational forms of social enterprises are listed among the main social innovation of recent decades. Social entrepreneurs help to address poverty and economic disparities through financial inclusion, not charity. They allow to combine the best of non profit and for-profit worlds to face the needs that are not currently met.

In Slovakia, as well as in Ukraine, social enterprises are just starting to play a role in fostering socio-economic development. These European post-transitional countries are characterized by under-capacitated social sectors and often unmet social needs. While distinctive features make them unique, similarities are evident. Historically, cooperative movement was strong in both countries, but years of Soviets ideology destroyed peoples trust. Despite taking different approaches both countries had a rough start in re-introducing the concept of joint efforts that can simultaneously create economic and social benefits.

First of all we will analyse historical background and provide overview with the emphasise on main similarities and differences of social economy development in Ukraine and Slovakia. Initially attention will be paid to cooperatives, third sector, and companies actively practicing corporate social responsibility as they laid ground to the concept of social entrepreneurship. The study of social enterprises them selves will commence with exploring the divergence in definitions and legislative approaches toward social enterprises. Later, in line with the existing literature, we will analyse results of surveys conducted in both countries. This will allow not only to see the existing finance structure of social enterprises, but also to evaluate both

demand and supply side of the capital market available to them. As a result, using experience of community development finance institutions in other countries, we will discuss range of financial solutions tailored to fit social enterprises unique needs and giant goals, such as providing real community solutions and sustainable social outcomes.

2 Literature Review, Historical Background, and Current Framework

While social enterprise as an organizational form is a relatively recent phenomenon, the concept of social entrepreneurship dates back to early times. Cooperatives, as a hybrid organizational form with focus on community need, were initially a social innovation [18]. By creating financial, agricultural, and trade cooperatives people were able to obtain less expensive loans, pay less for products, and thus not only to improve their living standard but also to start saving. Both individuals and communities were benefiting from joint efforts.

Historical foundations of social entrepreneurship

Ukrainian cooperative movement originated in western part of Ukraine, which at that time was under the Austria–Hungarian Empire. Ukrainian “Prosvita” (Просвіта) society, which initially was dedicated to education and culture, started organizing credit unions, coop stores and community-owned warehouses. Since the beginning of cooperative movement in 1883 and until 1939, they have grown to 700,000 members and 15,000 employees [6].

Ukrainian Catholic Church with its leader Andrei Sheptytsky, not only supported the idea, but was financially involved in the movement. As it result in economic prosperity of communities and resurgence of national consciousness, no wonder that first Polish and later Soviet authorities treated cooperatives as threat and by 1939 managed to close them all.

Cooperative movement in Slovakia, which started with the creation of Farmer's Association in Sobotište in 1845, has a longer history. Similar to Ukraine it played essential role in both economic and social sphere. In 1960-1970 mainly credit and consumer cooperative societies were created [5]. Agricultural cooperatives, although number of are currently declining, continues to be the most important form in Slovakia since the establishment of coops. [12].

Thus, social economy in both Ukraine and Slovakia, with its assumptions of the solidarity, subsidiarity, and justice roots back in centuries. Church as institution used to promote idea of cooperation, creating background for the development of the new sector. Later cooperatives became part of the socialist policy, but their fundamental pillars – voluntarism and democratic organisation – were omitted [14]. Thus the idea was totally destroyed by distorting it original meaning. Years of Soviet’s inappropriate use of the word “cooperatives” for state owned farms “kolhozy” (колхоз, коллективное хозяйство) destroyed peoples faith in power of cooperation.

Re-emergence of the state, business, third sector, and social entrepreneurship idea

Collapse of the Soviet empire led to the emergence of new countries, including Slovak Republic and Ukraine, with three main standard sectors players: business, governments, and nonprofit/nongovernmental organisations. According to the State Statistic Service of Ukraine there were 646 NGOs officially registered in 1995; 1,300 – in 2000; 31,000 – in 2005; 323,300 – in 2010. Cooperatives shared the same tendency of growth in numbers, but as well as nonprofits they were lacking behind in terms of efficiency and scale of social impact. Among many reasons for that was the poor access to funding opportunities.

International organizations, such as the USAID or the British Council, tried to re-introduce the concept of solidarity, first by promoting corporate social responsibility and later by focusing on social entrepreneurship. Both educational campaigns and financial support led to

the creation of respective organizations (eg. in Ukraine: Zlagoda/Злагода, Zdorovja/Здоров'я, Vygodna/Вигода, and SpektrPljus/Спектрплюс), followed by the limited number of empirical studies of those organizations. Later includes but is not limited to county specific studies (Phillips [15], Alter [1]) and comparative studies (Lucas and Vardanyan [11]; Galera [7]; UNDP/EMES publication on social enterprises in the CIS [2]).

Situation in Slovakia was different in a way that it was the first to define social economy and social entrepreneurship in legal terms and try to promote it financially using state and EU capital. Based on the results of the European Social Fund EQUAL initiative, the amendment of Law no. 5/2004 Coll. on employment services was made in 2008. It defined social enterprises, thus allowing it support and promotion at local and national levels.

According to this law social enterprise (sociálny podnik) is an entity which: (1) employs those who were considered disadvantaged according to the law in the number that is at least 30% of the total number of employees; (2) provides support and help to employees who prior to the employment were disadvantaged applicants on the labour market; (3) uses at least 30% of income that remains after covering all production costs and corresponding taxes to create new working positions or improve working conditions; (4) is registered in the social enterprises registry. It can be legal entity or physical entity, town, county, association of towns or counties, budget organization or contributory organization whose founder is town or county.

While law allowed for the provision of benefits and improved access to finance for social enterprises, altogether it did not work well for the social entrepreneurship in Slovakia. Eight out of ten funded by the state social enterprises were bankrupt within 2 years [13]. Unethical use of budget subsidies by leaders of the first wave of social enterprises brought back memories and distrust to the concept of social entrepreneurship. Despite numerous information campaigns about advantages of social enterprises and their contribution to social economy in other countries, the impact is situation of is felt until present.

Meantime Ukraine did not rush neither to legally recognising social enterprises (соціальне підприємство, socialne pidpryjemstvo) nor to provide financial support, tax subsidies, and/or institutional framework in which they can receive necessary funding.

The current discussion in Ukrainian society includes those who argue that definition has to be as explicit as possible (for the purpose of financial support by the state); others who formulate it very broadly (arguing that little limitations will stimulate development of the concept in all possible forms/ways); and also those who believe that it is better not to have it defined by the law at least for now (referring to the Slovak experience, as well as emphasizing grass root and business aspect of social entrepreneurship).

On the one hand by waiting Ukraine can place social entrepreneurship in a privileged position as it will be able to limit the amount of personal mistakes by referring to the rich experience of other countries and world-class institutions. On the other hand, lack of legal definition limits access to specially designed institutional support or supplementary funding.

The draft of Feldman's law №2508 was introduced in 17.04.2013 for Ukrainian parliamentary and public hearings but have not been neither accepted nor declined. Thus social enterprises in Ukraine exist in various legal forms (cooperatives, nonprofit organizations, private entrepreneurship, and associations of entrepreneurs) and use the term social enterprise exclusively for market positioning. Most social entrepreneurs in Ukraine use, in fact, hybrid schemes, when a nonprofit organizations is a founder or partner of for-profit entity (LLC or private entrepreneur), and they coordinate different types of complementary activities. This allows social entrepreneurs to use advantages of both legal forms while staying in compliance with legal and taxation requirements of Ukrainian government.

Current situation and possible trends

So far social entrepreneurship is an emerging field in both countries. Cooperative movement is seen as strong actor of social economy, but according to Strečanský and Stoláriková it does not currently identify itself with the concept of social entrepreneurship [17].

International organisations have dedicated time and financial resources to the development of social entrepreneurship in Ukraine, while in case of Slovakia it was done mainly by the state. Both approaches resulted in a small number of social enterprises and were highly criticised.

According to Majerčáková the weaknesses of Slovak approach include: misunderstandings of the concept; financial system not interested in social investments; corruption; absence of specified subsidies, tax exemptions or privileges; no existing crowdfunding system; growing poverty; lack of knowledge and experiences in the social entrepreneurship [13]. Same is true for the case of Ukraine, especially the first one. Social enterprise are mainly seen as part of the third sector which is constantly dependent on the external funding [14].

While social enterprises do need financial support, especially at initial stages, the real issue is the accessibility of financial options available to them. Limiting their access to the financial market, by not recognising peculiarity of such entrepreneurial activity, might lead to their actual transformation into third sector. Thus we will now study existing ways in which social entrepreneurs rise seed capital and based on this try to estimate demand and supply side of financial market for social entrepreneurs.

3 Data and Methodology: Slovakia and Ukraine

For this study we are using two databases. In case of Slovakia it is the official registry of social enterprises which as for 2014 comprised 44 entities. Due to existing legislation, they all have common objective - employment of unemployable (namely people aged 50 or older; with soft physical disabilities; and/or unemployed longer than 5 years).

Ukraine, as already mentioned, does not have legal definition of social enterprises and thus has no official registry. However, there is Ukrainian center for social entrepreneurship "Social Initiative" which formulated main criteria for social enterprises and used them to create a national catalogue of social enterprises. According to these criteria organization has to be:

- business (no matter which type, traditional or innovative, manufacturing or services, agriculture or education, but it has to be generating cash flow),
- with a clearly defined social objectives (stated in official documentation),
- with profits either reinvested in the expansion or directed at achieving social goals,
- and with democratic governance (general meeting of shareholders to decide in what proportions the revenue to reinvest and social goals).

Organizations were encouraged to apply and after pre-screening, if they met the above listed criteria, to join the community and be represented in the catalogue. As catalogue was created based on self-reporting concept we can't claim that it shows exact number of social enterprises in Ukraine. However, it perfectly serves as source of information for our comparative study.

Altogether our study includes 42 Ukrainian organizations that classified themselves as social enterprises and 44 that are present in Slovak registry of social enterprises. The study adopted a qualitative research method and semi-structured interviews have been conducted together with email surveys in order to gather data.

Majority of social enterprise in both Ukraine and Slovakia were founded by leaders from the third sector. As a result there is a problem of changing mindset: some still don't recognize the existence of competition or the need to use existing capital market when looking for financial resources. Being used to the typical NGO funding structure, they tend to think that social enterprises primarily compete for what should be a supplemental funding (grants, government funding, corporate and private donations), instead of market-created cash flow that comes from clients, goods and services. Results support previously discussed ideas that social enterprises in Slovakia are more oriented toward state and EU financial support. While in Ukraine they mainly compete for international grants and volunteers, who help to limit expenses. You can see the exact questions and survey data below in Table 1.

Table 1 Results of the surveys conducted among social enterprises in Slovakia and Ukraine

	Slovak Republic		Ukraine	
		%		%
Does your organization face competition?	Yes, tough one	89	Yes, tough one	78
	No, not really	11	No, not really	22
In your opinion, what is social enterprise, which you represent, have been mainly competing for? <i>(pick all that apply)</i>	Clients	56	o Clients	45
	Corporate donation/sponsorship	43	o Corporate donation / sponsorship	35
	Government/EU funds/support	68	o Government funds / support	15
	Local or international grants	72	o Local or international grants	91
	Private donations	61	o Private donations	63
	Publicity / Media attention	40	o Publicity / Media attention	30
	Service fees / price of goods	59	o Service fees / price of goods	48
	Volunteers	20	o Volunteers	72
	Other	8	o Other	10
Which sources of finance were used to form your seed capital? <i>(pick all that apply)</i>	Corporate donations / CSR	18	o Corporate donations / CSR	13
	Government / EU funding	28	o Government funding	11
	Grant from local foundation	19	o Grant from local foundation	16
	International organisation	13	o International organisation	79
	Venture philanthropy	0	o Venture philanthropy	2
	Other (crowd-funding etc)	48	o Other (crowd-funding, etc)	68
Which growth financing options you are using / considering to use in the nearest future? <i>(pick all that apply)</i>	Debt financing (bank or any alternative lending institution)	48	Debt financing (bank or an alternative lending institution)	39
	Direct public offerings	0	Direct public offerings	0
	Equity investment	11	Equity investment	5
	Integrated capital	15	Integrated capital	11
	Program-related investment	53	Program-related investment	19
Are you using charitable support as financing tool?	Yes	0	Yes	0
	No	58	No	94
Who, in your opinion, have helped most in developing social entrepreneurship?	No, but considering/planning	42	No, but considering/planning	6
	Civil society	36	Civil society	38
	International aid	15	International aid	42
	Business / Market	24	Business / Market	16
	State / EU	29	State	4

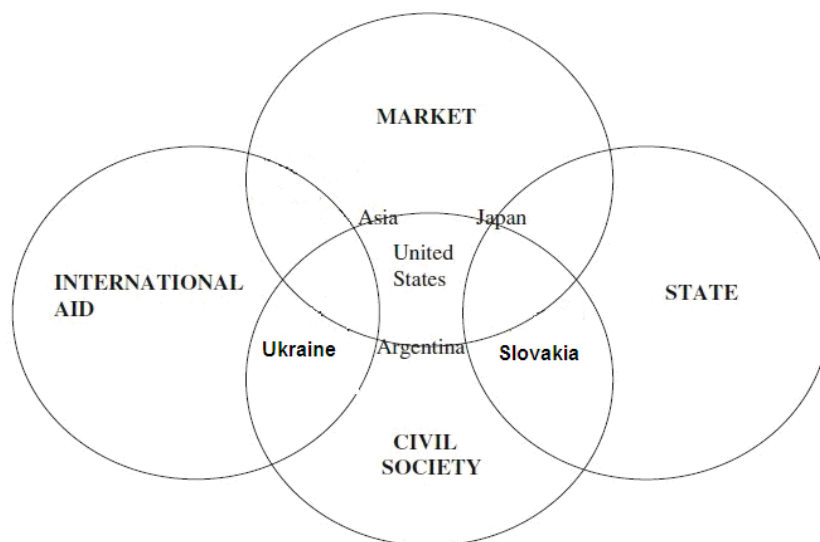
Source: results of surveys; Burkett, Shaffer, Kickul and Lyons

Seed capital and growth finance option were formulated based those listed in publications by Burkett, Shaffer, Kickul and Lyons [4, 16, 10]. For the better understanding we did offer additional explanations. For instance, (a) that debt financing can be in a variety of forms: working capital lines of credit; asset-based loans secured by account receivables, inventory or other assets; equipment loans; mortgages etc; (b) that program-related investment is provided by foundations to financially support (by lower interest rates and greater risk tolerance) mission-related enterprises while maintaining their principal and earning some profit; (c) that direct-public offering is an investment opportunity for the community, implemented without an investment bank and minimum asset requirements for investors, in form of equity shares,

debt financing, revenue shares or other types; (d) that integrated capital is the coordinated use of different forms of capital (equity investments, loans, gifts, loan guarantees and etc), often from different funders, to support developing enterprise that solves complex social problems.

Both Slovakia and Ukraine demonstrate significant role of the nonprofit sector supported by international aid organizations or charitable foundations in case of Ukraine, and state EU support in case of Slovakia. For a cleared understanding of this critical difference in social enterprises, please see Figure 1 adopted from Kerlin [9].

Figure 1 Relative placement of social enterprise with regard to market, state, civil society, and international aid



Source: results of the study and Kerlin, 2010

Indeed, international aid agencies and private foundations have dedicated significant attention and financial resources to the development of social entrepreneurship in Ukraine. The websites of Centers for Social Entrepreneurship existing today in the country inform that they all have been supported with grants from various European and American organizations, such as USAID, British Council, International Renaissance Foundation, and Eastern Europe Foundation. In 2010, these organizations have united their efforts, and, in collaboration with private players such as Erste Bank and PWC, have launched a major long-term project called “Social Enterprise Development in Ukraine”. The exact budget was to exceed million euros per year, a significant amount for Ukraine. The schedule for 2012 included dozens activities, with numerous trainings, business plan competitions, conferences and even a program of low-interest financed by Erste Bank. However by 2013 Erste left Ukrainian market and majority of international aid organizations have either limited their budgets or redirected their attention to project focusing on critical situation on Ukrainian eastern border. Thus social enterprises in Ukraine are forced to look for new ways of seed capital and support. Need of market orientation and developments of alternative finance options is also true for social enterprises in Slovakia. Thus now we will discuss achievement of other countries and applicability of those tools and approached in Slovakia and Ukraine.

4 Discussion and Recommendations

Finance today is rarely associated with socially-conscious activity. However it can and it should be treated as practice of creating not only economic but also social value through sustainable financial models, products and markets [13]. By establishing new instruments and

mechanisms to leverage capital markets expertise, developing social finance partnerships and collaborative funding models for social enterprises we can strengthen communities in need.

One of suggested approach is pretty much financial restructuring problem which requires looking at charitable donation as an investment, just as debt and equity are investments. The difference is that the return on the donation is social benefit. With donor-investor playing the role of equity holder, social enterprise becomes less risky and more profitable in terms of expected returns to conventional investors. While looking for the seed capital, social enterprises in Slovakia and Ukraine can differentiate risks and returns for different kinds of investors. This way getting necessary funding will be easier at least due to the increase of the pool of possible investors to the level of conventional sources of capital: venture capital firms, banks, mutual funds, bond funds, and so on.

Emerging capital market for social enterprises differs not only in terms of approach but also in use of tools and mechanisms. Later include loan quarantines, quasi-equity debt, pooling, and social-impact bonds etc (Table 2). Examples are well explained by Bugg-Levine et al [3].

Table 2 Financing Social Enterprises

Types of Financing	Payment Structure	Claim on Assets	Type of Return
<i>Charitable</i>	None	None	Social good
<i>Equity</i>	Variable	Residual	High financial risk and return
<i>Quasi-Equity Debt</i>	Tied to revenue	Subordinated	Medium financial risk and return
<i>Convertible Debt</i>	Fixed with conversion	Preferred	Medium financial risk and return
<i>Debt</i>	Fixed	First	Low financial risk and return
<i>Securitized Debt</i>	Fixed	Off the balance sheet	Tailored to investor types

Source: Bugg-Levine, Kogut, Kulatilaka

For all these tools to work, social enterprises have to use transparent measuring, reporting, and monitoring of both social and financial outcomes. Some social enterprises in the world are already applying SROI (Social Return on Investment) or IRIS (Impact Reporting and Investment Standards, 4.0 version is scheduled for release in early 2016). Social enterprises in Slovakia and Ukraine should also seeks to establish criteria for double-bottom-line investing.

Investors which will require such measurements include venture philanthropists. They have strong links to the private equity and their practical experience from developed economies can be used to stimulate development of social enterprises in Ukraine and Slovakia.

While it will be difficult to create fully functioning capital markets and legal frameworks to serve social enterprises but with the right institutional infrastructure everyone will win. Donors will be able to better assess effectiveness of their donations and to support more activities by leveraging. Social enterprises will have access to the capital they need for growth consistent with their social missions. Financial investors will expand the range of investment opportunities and diversify their portfolios.

Currently this type capital market does not exist neither in Slovakia nor in Ukraine. However with the increasing demand from social enterprises, which we have observed thought our surveys, and help from the state they can be established during the upcoming decade.

5 Conclusions

Cooperatives, third sector, and some firms actively practicing CSR, while not associating themselves with the concept of social entrepreneurship, played major role in both Ukraine and Slovakia by forming proper cultural background and reintroducing the concept of trust which is mandatory for social enterprises that aim to create a greener, healthier, and more equitable world.

Slovakia and Ukraine adopted different approaches while introducing the concept of social entrepreneurship: through the international organisation in case of Ukraine and through the state in case of Slovakia. In both cases civil society played major role and in both cases, unfortunately, there are relatively few success stories.

Social entrepreneurship, as type of innovation, initially needs to be nurtured and promoted before it can start providing societal benefits. This, in turn, requires investments not only from international organisations and governments, but from businesses. Effective financial market tailored for social enterprises could unlock power of charity endowments and attract funds from mainstream portfolios. Our study shows that so far finance structure of social enterprises mainly resembles non-profit sector. By adopting tools, mechanism, and approach developed for social enterprises in other countries both Slovakia and Ukraine can get better results.

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THE IMPACT OF AN ECONOMIC SECTOR ON CAPITAL STRUCTURE DETERMINANTS OF AUSTRIAN BUSINESS ENTITIES

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ABSTRACT

The paper investigates internal and external capital structure determinants of Austrian business entities according to the economic sectors. As a data source we have employed an e-database of annual accounts of Austrian companies Sabina and statistics of the Eurostat. To quantify an influence of statistically significant factors for each economic sector we have determined four econometric models. We have confirmed our hypothesis that each economic sector has different capital structure determinants and partially we have confirmed our hypotheses concerning influences of particular factors.

Keywords: Capital Structure Determinants, Business Entities, Economic Sectors, Regression Model

JEL codes: G 32

1 Introduction

In our paper “*The Determinants of Capital Structure: Evidence from Austria*” [4] we have investigated internal and external determinants of business entities’ capital structure in Austria. Research showed that from 15 selected factors only 6 are statistically significant – 5 internal factors and 1 external factor – and not all predicted and computed influences were corresponding. The conclusion was that next research is necessary.

In our paper “*The Impact of an Economic Sector on Capital Structure Determinants of Slovak Business Entities*” [6] we have fully confirmed a hypothesis that each economic sector in Slovakia has different capital structure determinants.

In this paper we will examine possible capital structure determinants of Austrian companies divided according to an economic sector. We will find out whether determinants of capital structure are the same or different for business entities conducting business in different economic sectors in Austria.

As we have mentioned [4], capital structure determinants of business entities and their influence on indebtedness had become a subject of empirical research in Austria (e.g. [1], [2], [3]).

2 Hypothesis

To keep the investigation consistent and comparable with our previous research we have to work on the similar assumptions. We examine an influence of selected internal and external factors on companies’ indebtedness. We have chosen 11 internal factors (size, profitability, tangibility, growth opportunities, non-debt tax shield, liquidity, volatility of profitability, product uniqueness, effective tax rate, effective interest rate, interest tax shield) and 4 external

factors (real gross domestic product growth rate, EURIBOR rate with a maturity of 3 months, inflation rate, unemployment rate). These factors can be measured by one or more indicators, so we have defined 21 regressors.

Assumptions [5] about positive or negative influence are based on the trade-off model of the optimal capital structure. Supposing managers make rational decisions about capital structure of companies, they make a trade-off between advantages and disadvantages of debt financing.

Size of a company – we assume a positive correlation with indebtedness because big companies have diversified production and are important employers in a country, so a bankruptcy risk is lower and allows higher level of debt financing.

Profitability of a company – we assume a positive correlation with indebtedness because companies with high profits search opportunities to lower their tax base and interest expenses are tax deductible.

Tangibility of assets – we assume a positive correlation with indebtedness because fixed tangible assets can be used as a collateral for debt financing.

Growth opportunities of a company – we assume a negative correlation with indebtedness because it is possible that companies with a high level of debt are not able to utilize a potential effective investment opportunity.

Non-debt tax shield – we assume a negative correlation with indebtedness because depreciation and amortization are tax deductible expenses and are substitutes of an interest tax shield. For a company with a high non-debt tax shield it is not necessary to use a high level of debt.

Liquidity of a company – we assume a positive correlation with indebtedness because a bankruptcy risk is lower and allows a higher level of debt financing. Interest payments can lower a possibility of wasting money by managers, who have enough cash at their disposal.

Volatility of profitability – we assume a negative correlation with indebtedness because a high volatility, as a measure of a bankruptcy risk, can lead to higher carefulness of banks.

Product uniqueness – we assume a negative correlation with indebtedness because higher product uniqueness means higher bankruptcy costs.

Effective tax rate – we assume a positive correlation with indebtedness because higher tax rate means higher tax shield.

Effective interest rate – we assume a negative correlation with indebtedness because high interest rates cause less incentive of companies to utilize debt financing.

Real gross domestic product growth rate – we assume a positive correlation with indebtedness because growth of real GDP means that companies produce more and their profitability increases. It means they are able to utilize more debt.

EURIBOR rate with a maturity of 3 months – we assume a negative correlation with indebtedness because 3M EURIBOR is usually used as a reference interest rate for commercial credits.

Inflation rate – we assume a positive correlation with indebtedness because inflation favours debtors over creditors.

Unemployment rate – we assume a positive correlation with indebtedness because we expect that a general increase of bankruptcy probability in a country is accompanied by primary insolvency of companies and an increase of unemployment.

Interest tax shield – we assume a positive correlation with indebtedness because with higher tax rate companies prefer more debt.

According our research conducted in Slovakia we assume that capital structure determinants of Austrian businesses also vary among the economic sectors and the aim of this paper is also to find out determinants influencing capital structure of Austrian companies conducting business in different economic sectors.

3 Data and Methodology

Since we have chosen hypotheses with assumptions similar to our previous study [4], we also need to utilize exactly the same database of Austrian business entities. Main source of data employed is an e-database of annual accounts of Austrian companies *Sabina* and the *Eurostat*. We have exported only financial statements of companies with sales higher than € 10,000 in at least one year from 2006 to 2012. After this selection we have obtained a database containing 8,008 Austrian companies during 7 years. In Table 1 a composition of the dataset is stated.

Table 1 Composition of the dataset

Economic sector	No. of companies
primary sector	224
secondary sector	1,876
tertiary sector	4,337
quaternary sector	1,571

Source: Author

In our model we can use only 6 time periods because growth opportunities and volatility of profitability are expressed as a difference of values between two years. As a dependent variable we have chosen an extended Debt Ratio (DR) indicator stated in the equation 1.

$$\text{Debt Ratio} = \frac{\text{Liabilities} + \text{Accruals \& Deferrals}}{\text{Total Assets}} \quad (1)$$

An econometric model containing all expected independent variables that can determine capital structure of business entities expressed by debt ratio is written down in the equation 2:

$$\begin{aligned} DR_{it} = & \beta_0 + \beta_1 \times \ln(S_{it}) + \beta_2 \times \ln(A_{it}) + \beta_3 \times \frac{EBIT_{it}}{A_{it}} + \beta_4 \times \frac{EBIT_{it}}{S_{it}} + \beta_5 \times \frac{FTA_{it}}{A_{it}} + \\ & \times \frac{FIA_{it}}{A_{it}} + \beta_7 \times \frac{A_{it} - A_{it-1}}{A_{it-1}} + \beta_8 \times \frac{S_{it} - S_{it-1}}{S_{it-1}} + \beta_9 \times \frac{D\&A_{it}}{A_{it}} + \beta_{10} \\ & \times \frac{CR_{it} + FA_{it}}{CL_{it}} + \beta_{11} \times \frac{CA_{it}}{CL_{it}} + \beta_{12} \times \sigma_t \\ & + \beta_{13} \times \frac{EBIT_{it} - EBIT_{it-1}}{EBIT_{it-1}} + \beta_{14} \times \frac{CGS_{it}}{S_{it}} + \beta_{15} \times \frac{EBT_{it} - EAT_{it}}{EBT_{it}} + \beta_{16} \\ & + \beta_{17} \times GDP_t + \beta_{18} \times EB_t + \beta_{19} \times HICP_t + \beta_{20} \times UR_t + \beta_{21} \times \ln(ITS) \\ & + a_{it} \end{aligned} \quad (2)$$

where DR_{it} is Debt Ratio of a company i ($i = 1, \dots$, number of companies conducting business in an appropriate economic sector) in year t ($t = 2007, \dots, 2012$), $\beta_0 - \beta_{21}$ are coefficients, ε is a residual and independent variables are explained in the Table 2. This econometric model will be applied to companies conducting business in primary, secondary, tertiary and also quaternary economic sector – so we will obtain 4 different equations.

Table 2 Variables

variable	definition	expected sign
$\ln(S)$	size of a company measured by a natural logarithm of total sales of goods, products and services	+
$\ln(A)$	size of a company measured by a natural logarithm of total assets	+
$\frac{EBIT}{A}$	profitability measured by a ratio: earnings before interest and tax to total assets (ROA)	+
$\frac{EBIT}{S}$	profitability measured by a ratio: earnings before interest and tax to total sales (ROS)	+
$\frac{FTA}{A}$	tangibility measured by a ratio: share of fixed tangible assets on total assets	+
$\frac{FIA}{A}$	intangibility measured by a ratio: share of fixed intangible assets on total assets	-
$\frac{A_t - A_{t-1}}{A_{t-1}}$	growth opportunities expressed as an annual percentage change of total assets	-
$\frac{S_t - S_{t-1}}{S_{t-1}}$	growth opportunities expressed as an annual percentage change of total sales	-
$\frac{D\&A}{A}$	non-debt tax shield measured by a ratio: depreciation and amortisation to total assets	-
$\frac{CR + FA}{CL}$	quick ratio (liquidity) measured by a ratio: current receivables and financial accounts to current liabilities	+
$\frac{CA}{CL}$	current ratio (liquidity) measured by a ratio: current assets to current liabilities	+
σ	volatility of profitability expressed as a standard deviation of earnings before interest and tax	-
$\frac{EBIT_t - EBIT_{t-1}}{EBIT_{t-1}}$	volatility of profitability expressed as an annual percentage change of earnings before interest and tax	-
$\frac{CGS}{S}$	product uniqueness expressed as a share of cost of goods sold, consumed raw materials, energy consumption, consumption of other non-inventory supplies, and services on total sales	-
$\frac{EBT - EAT}{EBT}$	effective tax rate measured by a ratio: difference between earnings before tax and earnings after tax to earnings before tax	+

$\frac{I}{C}$	effective interest rate measured by a ratio: interest expense to bank loans and short-term financial assistance	-
<i>GDP</i>	real gross domestic product growth rate	+
<i>ER</i>	EURIBOR rate with a maturity of 3 months at the beginning of a year	-
<i>HICP</i>	inflation rate expressed by Harmonised Index of Consumer Prices	+
<i>UR</i>	unemployment rate	+
$\ln(ITS)$	interest tax shield measured by a natural logarithm of interest expense to bank loans and short-term financial assistance multiplied by an income tax rate	+

Source: Author

Firstly, for each economic sector we have estimated parameters of independent variables by ordinary least squares method. In the second step we have examined which model is the most appropriate – pooled regression model, fixed effects model or random effects model. In the third step we have conducted tests for the presence of heteroskedasticity, multicollinearity and autocorrelation (tests were positive). And in the last step we have used robust standard errors in order to select the best model.

4 Results

According the tests the most adequate model for primary, secondary, tertiary and also quaternary sector businesses is fixed effect model. This model will be used for further examination.

Computed significant coefficients with their significance and regression statistics of the model are stated for each economic sector in the Table 3, 4, 5 and 6. Neither heteroskedasticity, multicollinearity nor autocorrelation are present in the models.

Table 3 Significant variables representing capital structure determinants of **primary** sector businesses using robust standard errors

Model 1: Fixed-effects, using 1,344 observations Included 224 cross-sectional units Time-series length = 6 Dependent variable: DR Robust (HAC) standard errors					
	<i>Coefficient</i>	<i>Robust Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const.	0.101425	0.0403334	2.5147	0.01205	**
$\ln(A)$	0.0441128	0.00442402	9.9712	<0.00001	***
$(A_t - A_{t-1})/A_{t-1}$	-2.40932e-05	9.50908e-06	-2.5337	0.01142	**
FTA/A	-0.211998	0.0937485	-2.2614	0.02393	**
$(CR+FA)/CL$	-0.000168783	3.85707e-05	-4.3759	0.00001	***
CGS/S	0.0388208	0.0117563	3.3021	0.00099	***
D&A/A	0.991174	0.320015	3.0973	0.00200	***
EBIT/A	-0.280217	0.0947355	-2.9579	0.00316	***

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Mean dependent var	0.690505	S.D. dependent var	0.590056
Sum squared resid.	108.9055	S.E. of regression	0.312808
R-squared	0.767090	Adjusted R-squared	0.718960
F(230; 1,113)	15.93771	P-value(F)	1.3e-234
Log-likelihood	-218.3675	Akaike criterion	898.7351
Schwarz criterion	2,100.722	Hannan-Quinn	1,348.979
rho	0.383135	Durbin-Watson	1.025008

Test for differing group intercepts -

Null hypothesis: The groups have a common intercept

Test statistic: F(223; 1,113) = 13.1094

with p-value = P(F(223; 1,113) > 13.1094) = 7.21967e-199

Source: Author, computed by Gretl software.

In the Table 3 it is shown that for primary sector businesses variables representing size, liquidity, product uniqueness, non-debt tax shield and profitability are statistically significant at the significance level of 0.01 and variables representing growth opportunities and tangibility are statistically significant at the significance level of 0.05. The computed R-squared indicator means that 76.71 % of dependent variable variability is explained by the linear regression model. According p-value, R-squared is statistically significant at the significance level of 0.01. It means that the model as a whole is statistically significant.

Based on the calculations we can write down the econometric model for primary sector businesses as follows:

$$\begin{aligned} \widehat{DR}_{it} = & 0.101425 + 0.0441128 \times \ln(A_{it}) - 0.0000240932 \times \frac{A_{it} - A_{it-1}}{A_{it-1}} - 0.211998 \\ & \times \frac{FTA_{it}}{A_{it}} - 0.000168783 \times \frac{CR_{it} + FA_{it}}{CL_{it}} + 0.0388208 \times \frac{CGS_{it}}{S_{it}} + 0.991174 \\ & \times \frac{D\&A_{it}}{A_{it}} - 0.280217 \times \frac{EBIT_{it}}{A_{it}} \end{aligned}$$

Table 4 Significant variables representing capital structure determinants of **secondary** sector businesses using robust standard errors

Model 2: Fixed-effects, using 11,256 observations

Included 1,876 cross-sectional units

Time-series length = 6

Dependent variable: DR

Robust (HAC) standard errors

	Coefficient	Robust Std. Error	t-ratio	p-value	
const.	0.055507	0.0109976	5.0472	<0.00001	***
ln(A)	0.0336655	0.00154432	21.7995	<0.00001	***
(A _t -A _{t-1})/A _{t-1}	1.63338e-06	1.33939e-07	12.1950	<0.00001	***
FTA/A	0.218971	0.0400351	5.4695	<0.00001	***
D&A/A	0.0173019	0.00697422	2.4808	0.01312	**
EBIT/S	0.000106739	6.80416e-06	15.6874	<0.00001	***
(EBIT _t -EBIT _{t-1})/EBIT _{t-1}	-3.64764e-06	6.04154e-07	-6.0376	<0.00001	***
ln(ITS)	0.00382506	0.0016291	2.3480	0.01890	**

GDP	0.147046	0.0832573	1.7662	0.07740	*
* p < 0.1; ** p < 0.05; *** p < 0.01					
Mean dependent var	0.633825	S.D. dependent var	0.508726		
Sum squared resid.	589.1277	S.E. of regression	0.250720		
R-squared	0.797746	Adjusted R-squared	0.757110		
F(1,883; 9,372)	19.63136	P-value(F)	0.000000		
Log-likelihood	631.1042	Akaike criterion	2,505.792		
Schwarz criterion	16,312.98	Hannan-Quinn	7,152.078		
rho	0.158184	Durbin-Watson	1.289475		

Test for differing group intercepts -

Null hypothesis: The groups have a common intercept

Test statistic: $F(1,875; 9,372) = 16.1898$

with p-value = $P(F(1,875; 9,372) > 16.1898) = 0$

Source: Author, computed by Gretl software.

In the Table 4 it is shown that for secondary sector businesses variables representing size, growth opportunities, tangibility, profitability and volatility of profitability are statistically significant at the significance level of 0.01, variables representing non-debt tax shield and interest tax shield are statistically significant at the significance level of 0.05 and variable representing real GDP growth rate is statistically significant at the significance level of 0.1. The computed R-squared indicator means that 79.77 % of dependent variable variability is explained by the linear regression model. According p-value, R-squared is statistically significant at the significance level of 0.01. It means that the model as a whole is statistically significant.

Based on the calculations we can write down the econometric model for secondary sector businesses as follows:

$$\begin{aligned} \overline{DR}_{it} = & 0.055507 + 0.0336655 \times \ln(A_{it}) + 0.00000163338 \times \frac{A_{it} - A_{it-1}}{A_{it-1}} + 0.218971 \\ & \times \frac{FTA_{it}}{A_{it}} + 0.0173019 \times \frac{D\&A_{it}}{A_{it}} + 0.000106739 \times \frac{EBIT_{it-1}}{S_{it}} \\ & - 0.00000364764 \times \frac{EBIT_{it} - EBIT_{it-1}}{EBIT_{it-1}} + 0.00382506 \times \ln(ITS)_{it} \\ & + 0.147046 \times GDP_t \end{aligned}$$

Table 5 Significant variables representing capital structure determinants of tertiary sector businesses using robust standard errors

Model 3: Fixed-effects, using 26,022 observations
 Included 4,337 cross-sectional units
 Time-series length = 6
 Dependent variable: DR
 Robust (HAC) standard errors

	<i>Coefficient</i>	<i>Robust Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const.	0.143276	0.040252	3.5595	0.00037	***
ln(A)	0.0412071	0.00111795	36.8595	<0.00001	***
FTA/A	0.133827	0.0380172	3.5202	0.00043	***
(CR+FA)/CL	-1.32267e-07	1.45142e-08	-9.1130	<0.00001	***

CGS/S	0.000817572	0.000411406	1.9873	0.04691	**
EBIT/S	0.000143092	6.45271e-05	2.2176	0.02660	**
(EBIT _t -EBIT _{t-1})/EBIT _{t-1}	2.53113e-07	1.05817e-08	23.9198	<0.00001	***
ln(ITS)	0.00171377	0.00101591	1.6869	0.09163	*
UR	-2.15828	0.925512	-2.3320	0.01971	**

* p < 0.1; ** p < 0.05; *** p < 0.01

Mean dependent var	0.658273	S.D. dependent var	0.660566
Sum squared resid.	4,067.996	S.E. of regression	0.433202
R-squared	0.641719	Adjusted R-squared	0.569921
F(4,344; 21,677)	8.937794	P-value(F)	0.000000
Log-likelihood	-12,777.91	Akaike criterion	34,245.82
Schwarz criterion	69,730.12	Hannan-Quinn	45,708.95
rho	0.105603	Durbin-Watson	1.455712

Test for differing group intercepts -

Null hypothesis: The groups have a common intercept

Test statistic: F(4,336; 21,677) = 7.57177

with p-value = P(F(4,336; 21,677) > 7.57177) = 0

Source: Author, computed by Gretl software.

In the Table 5 it is shown that for tertiary sector businesses variables representing size, tangibility, liquidity and volatility of profitability are statistically significant at the significance level of 0.01, variables representing product uniqueness, profitability and unemployment rate are statistically significant at the significance level of 0.05 and variable representing interest tax shield is statistically significant at the significance level of 0.1. The computed R-squared indicator means that 64.17 % of dependent variable variability is explained by linear regression model. According p-value, R-squared is statistically significant at the significance level of 0.01. It means that the model as a whole is statistically significant.

Based on the calculations we can write down the econometric model for tertiary sector businesses as follows:

$$\begin{aligned} \widehat{DR}_{it} = & 0.143276 + 0.0412071 \times \ln(A_{it}) + 0.133827 \times \frac{FTA_{it}}{A_{it}} - 0.000000132267 \\ & \times \frac{CR_{it} + FA_{it}}{CL_{it}} + 0.000817572 \times \frac{CGS_{it}}{S_{it}} + 0.000143092 \times \frac{EBIT_{it}}{S_{it}} \\ & + 0.000000253113 \times \frac{EBIT_{it} - EBIT_{it-1}}{EBIT_{it-1}} + 0.00171377 \times \ln(ITS)_{it} \\ & - 2.15828 \times UR_t \end{aligned}$$

Table 6 Significant variables representing capital structure determinants of **quaternary** sector businesses using robust standard errors

Model 4: Fixed-effects, using 9,426 observations
 Included 1,571 cross-sectional units
 Time-series length = 6
 Dependent variable: DR
 Robust (HAC) standard errors

	<i>Coefficient</i>	<i>Robust Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const.	0.0874182	0.0177636	4.9212	<0.00001	***
ln(A)	0.0374792	0.00203898	18.3813	<0.00001	***
FTA/A	0.402879	0.118831	3.3904	0.00070	***
(CR+FA)/CL	-1.03323e-05	6.00969e-06	-1.7193	0.08560	*
CGS/S	0.000158781	7.64551e-05	2.0768	0.03785	**
(EBIT _t -EBIT _{t-1})/EBIT _{t-1}	8.14127e-06	1.52306e-06	5.3453	<0.00001	***
I/C	-4.4058e-08	2.04405e-08	-2.1554	0.03116	**
GDP	0.378795	0.202549	1.8701	0.06150	*

* p < 0.1; ** p < 0.05; *** p < 0.01

Mean dependent var	0.649416	S.D. dependent var	0.844075
Sum squared resid.	2,415.415	S.E. of regression	0.554774
R-squared	0.640293	Adjusted R-squared	0.568013
F(1,577; 7,848)	8.858453	P-value(F)	0.000000
Log-likelihood	-6,957.690	Akaike criterion	17,071.38
Schwarz criterion	28,356.02	Hannan-Quinn	20,902.41
rho	0.073391	Durbin-Watson	1.524831

Test for differing group intercepts -

Null hypothesis: The groups have a common intercept

Test statistic: F(1,570; 7,848) = 8.06468

with p-value = P(F(1,570; 7,848) > 8.06468) = 0

Source: Author, computed by Gretl software.

In the Table 6 it is shown that for quaternary sector businesses variables representing size, tangibility and volatility of profitability are statistically significant at the significance level of 0.01, variables representing product uniqueness and effective interest rate are statistically significant at the significance level of 0.05 and variables representing liquidity and real GDP growth rate are statistically significant at the significance level of 0.1. The computed R-squared indicator means that 64.03 % of dependent variable variability is explained by linear regression model. According p-value, R-squared is statistically significant at the significance level of 0.01. It means that the model as a whole is statistically significant.

Based on the calculations we can write down the econometric model for quaternary sector businesses as follows:

$$\begin{aligned} \overline{DR}_{it} = & 0.0874182 + 0.0374792 \times \ln(A_{it}) + 0.402879 \times \frac{FTA_{it}}{A_{it}} - 0.0000103323 \\ & \times \frac{CR_{it} + FA_{it}}{CL_{it}} + 0.000158781 \times \frac{CGS_{it}}{S_{it}} + 0.00000814127 \\ & \times \frac{EBIT_{it} - EBIT_{it-1}}{EBIT_{it-1}} - 0.000000044058 \times \frac{I_{it}}{C_{it}} + 0.378795 \times GDP_t \end{aligned}$$

5 Conclusions

We have confirmed our hypothesis that capital structure determinants of Austrian businesses vary among the economic sectors. Only one factor determines capital structure of all sectors'

companies according the trade-off theory – size of a company with positive correlation. Tangibility also influences indebtedness of all sectors but the correlation is positive (according trade-off theory) only for secondary, tertiary and quaternary sectors and negative for primary sector (pecking order theory). Liquidity and product uniqueness also influence primary, tertiary and quaternary sector according pecking order theory. Volatility of profitability influences secondary (according trade-off theory), tertiary and quaternary sector (according pecking order theory). Growth opportunities, non-debt tax shield, profitability, effective interest rate, interest tax shield, real gross domestic product growth rate and unemployment rate were statistically significant once or twice respectively. It means that our hypotheses about an influence of particular determinants was confirmed only partially. We can observe that capital structure determinants of not a single Austrian economic sector is the same as capital structure determinants of any Slovak economic sector.

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INCREASING THE EFFICIENCY OF PUBLIC EXPENDITURES THROUGH THE COMPLEX SYSTEM OF LABOUR MARKET FORECASTING

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ABSTRACT

Slovak education system is working inefficiently which is manifested by high youth unemployment rate (one of the highest in EU) and unsuitable structure and quality of high school and university graduates. Among the most listed causes of this inefficiency are usually insufficient funding of schooling system and compensations of teachers resulting in falling standards of education on all levels of education; information asymmetry causing surplus of humanities students and lack of students of natural sciences and excessive number of universities resulting in “crowding out” of employees without university degree and overall depreciation of degrees. Labour market forecasting is one of the ways to significantly reduce information asymmetry that is the primary cause of irrational behaviour of subjects on the education market and poor governance of education. We estimate that these forecasts can reduce significant portion of approximately 252 million USD/year spent inefficiently on education system and 64.5 million EUR/year associated with the unemployment of the graduates.

Keywords: public expenditures, education, forecasting, labour market

JEL codes: H52, I21, J20

1 Introduction

In Slovakia, the publicly funded education system from preschool to university education, together with liberalization of education and normative principle of financing introduced by education reform, where school funding depends mostly on number of students, led to fierce competition between schools. However, this was not the type of competition that was desired on the education market. Schools were competing for students by lowering entry requirements and increasing the number of classes in desired fields (mostly academically oriented general secondary education) which, together with national standardized testing methodology not suited for annual comparisons, led to easy to observe but hard to measure decline in education outcomes over time.

On the other side of the education market parents chose mostly academic path for their children, expecting them to have better chances in labour market in the future with a university degree, and high school graduates (with their parents) chose field of study on a university based on its image[8] rather than the rational evaluation of employability in given field in the future. Some also chose, with accordance to microeconomic theory, the path of least resistance when making this choice, in belief that any degree is sufficient for higher wages and this was true at the beginning of the economic transformation in the Slovak

Republic when university degrees were relatively scarce.[6] With high scarcity, university degrees served as an indicator of more capable employee (signalling theory) with higher productivity (as a result of human capital accumulation), but as scarcity and quality of university education decreased the degrees became continually less important in a recruitment process of employees. Labour market was and still is being flooded with university graduates without required skillset and education and on the other side, there is constant demand for skilled workers with technical or vocational secondary education. This is the result of strong preference of university education and resulting decline and disintegration of vocational education during last 25 years, which is especially problematic in the current state of economy of the Slovak Republic, which is strongly oriented towards automotive industry¹.

These decisions both in education reforms by government and study and career paths by parents and their children were not fundamentally wrong, but they were largely based on wrong information and false assumptions, that were a result of non-existence of crucial information. National Project of Labour Market Forecasting is aimed at providing these information for both the government and its institutions in order to implement better policies and strategies and parents with their children to enable them to make rational decisions about education and career paths.

2 Literature Review

Public expenditures on education can be used for both promoting growth and reduction of poverty, in fact Green (2012) states that: “outlays for education that support well-designed and effective schooling can be among the most productive expenditures governments undertake.”[4] It doesn't matter if it is one of the least or most developed countries, although the structure of these expenditures significantly differs, the importance of outlays for education stays roughly the same. In low income economies, spending is mostly focused on primary education aimed at achieving literacy, considered to be most effective type of public expenditures on education because it is believed to produce the biggest positive externalities compared with higher forms of education. More developed countries focus their expenditures on secondary and vocational education at first and then creating suitable tertiary education and specific program elements aimed at underperforming students. Secondary vocational education programs provide excellent opportunity for academically underperforming students to obtain employable skills. Different perspective can justify even expenditures on secondary and tertiary education, because through these higher employment and more sophisticated production can be achieved, resulting in lower social expenditures and more competitive economy. Higher levels of education are also associated with increased likelihood of participation in political process and more awareness of current policy debates, lower likelihood of criminal activity, improved health of educated people and their children and also higher level of education of their children and higher rate of productivity of educated workers and productivity of their co-workers. These results demonstrate clear positive externalities generated by higher levels of education and a major argument for public sector involvement in funding of education.[3]

Specific program elements aimed at increasing the quality of education are also widely discussed in developed countries because of their mixed results. For example, if a reduction of class size is followed by hiring less experienced teachers with fewer credentials the outcome of this quality enhancement measure could be the reduction of quality measured by standardized tests. Studies also found mixed results concerning changes in quality of

¹ [9] Automotive industry has 43 % share on GDP and 26 % share on export of the Slovak Republic.

education induced by changes in funding. The key conclusions of these studies are that more funds per pupil does not necessarily translate to better education outcomes, different schools use the same amount of funds with different effectivity resulting in different changes in quality of education and most benefits from increases seem to have underfunded schools and underprivileged pupils. Peer pressure is also an important factor of education outcomes of students from difficult social environment, sometimes more important than the amount of public funds. High-quality of teachers and focusing resources on the neediest students are therefore preferred to reduction of class size and more equal distribution of resources among students. **Accountability** of schools for the results of students (in standardised testing) is another way of increasing the quality of education through creating self-improvement incentives to schools and teachers. Studies found that these incentives have to have form of financial rewards or sanctions in order to be effective. The most common criticism of school accountability is that it focuses too much on standardized testing (in reading, mathematics and science), which leads to neglecting subjects developing social skills, creativity and emotional development. Some studies also found evidence of cheating the accountability system by excluding the low-performing students from testing or directly changing answers in the tests.[5]

The case against **public spending on tertiary education** mostly involves the argument that tertiary educated employees have significantly higher incomes compared and thus the private benefit of university degree should create strong enough incentive for individuals to fund their education on this level themselves. The problem with privately funded education is the amount of funds required from individuals by this system, which excludes the lower-income part of a population from this system and private student loans are also not very viable because the investments to the human capital, which are long term (income of university graduates can outperform income of other employees with lower education with certain lag due to lack of work experience), high risk (university graduation is not certain) and with uncertain outcomes (graduates' incomes don't have to outperform others at all). Because of these reasons, public sector has to be involved by either providing the student loans or through stipend programs. Privately funded tertiary education would also lead to decrease in demand for study programs that provide relatively low private benefit but high external benefits such as arts.

There is a wide array of public finance literature concerning public and private benefits of higher levels of education and various models of financing with cost-benefit analysis, but very few of these publications mention the existing link between education system and labour market in other terms than productivity, which is insufficient in recent economic reality of high youth unemployment rates in many developed countries.[1] Attention should be focused on effective management of schooling towards the occupations and skills that will be demanded in the future.

The education of an individual is a long term process and once the desirable education path has been chosen by an individual at the age of 15, there is a delay from 2 to more than 10 years. There is even longer delay between planning and implementation of educational reform and observing its effects on the economy. During this time, the economic conditions can significantly change and the decisions made based on the previous state of things could not only be less effective but even harmful in the new environment. Then need for complex forecast of labour market conditions arises from the existence of this delay and the need to eliminate it in order to effectively link the needs of the labour market to the education system.

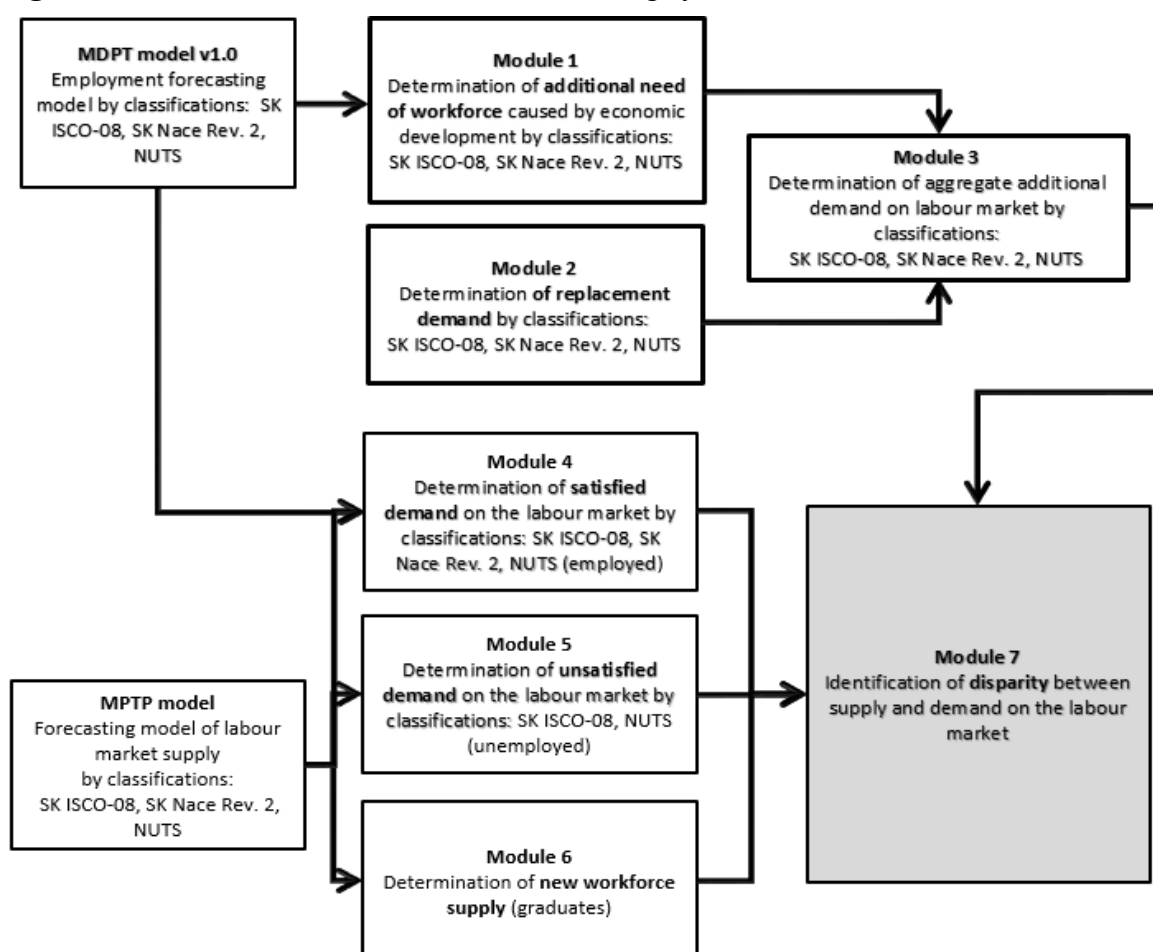
3 Data and Methodology

Determination of optimal methodology for National Project was extremely difficult because forecasting of labour market needs disaggregated to such great detail² was never attempted in the Slovak Republic or most other countries. New unique forecasting models had to be created in order to achieve set goals. They are an extremely sophisticated **combination of system of quantitative and stochastic equations on panel data, qualitative data provided through survey by employers and industry experts and also macroeconomic models and official forecasts**. Accuracy and relevance of models were verified ex-post by new data published throughout the project that also served for further fine-tuning these models.[12]

The **main components** of Labour Market Forecasting system are:

- retrospective analysis of employment trends disaggregated by occupation, industry, education, wages, workforce mobility, fluctuation and qualification;
- analysis of employer needs identified by representative questionnaire survey in key sectors of the economy;
- analysis of demographic trends of workforce (focused also on older people and seniors on the labour market);
- comprehensive analysis of success rate of graduates on labour market.

Figure 1 Schematics of Labour Market Forecasting system



Source: ÚPSVaR, Metodika a sústava modelov pre tvorbu a verifikáciu prognóz vývoja na trhu práce.

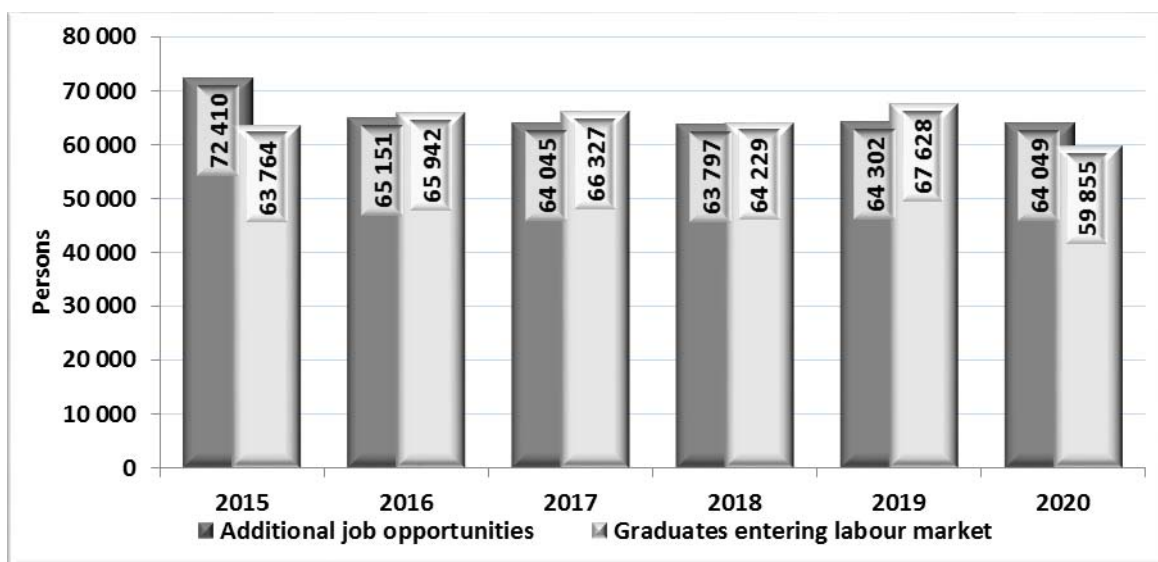
² Data and forecasts were broken down by these classifications: 2-digit SK NACE Rev.2 (industries), 4-digit SK ISCO-08 (occupations), 4-digit KOV (qualifications), NUTS 3 (regions).

Forecasting system used wide variety of data from databases of Statistical Office of the Slovak Republic; EUROSTAT, Institute of Information and Prognoses of Education; Central Office of Labour, Social Affairs and Family; Demographic Research Centre, Slovak Centre of Scientific and Technical Information; TREXIMA Bratislava and specialised survey.

4 Results and Discussion

According to the results of the forecasting system, the education system does not meet quantitative and qualitative requirements of the labour market and this situation will continue in the future. There would be an opportunity to reverse this situation from aggregate quantitative perspective because the number of graduates entering the labour market will be roughly the same as the number of additional job opportunities. The most important part of meeting the needs of the labour market is however, the preparation of these graduates in needed qualification structure and with the right skillset. That is why very detailed structure of forecasts is required because the quantities of graduates and free jobs only matter on highly disaggregated level.[13]

Figure 2 Aggregate supply of graduates entering labour market and demand for their work



Source: ÚPSVaR, Prognóza očakávaných budúcich potrieb zamestnancov do roku 2020.

From aggregate perspective **almost very 4th university graduate works at job that requires lower than tertiary education** and **almost 60 % high school and university graduates work on working position that does not correspond to the qualification attained during education process**. This represents a huge inefficiency of public funds allocated towards education and creates additional costs related to unemployment of these graduates and also huge opportunity costs of suboptimal utilization of economic potential of the national economy.

This can also be seen when these numbers are broken down by attained education of graduates only on secondary and tertiary education. Cumulative amount of graduates with secondary education needed by labour market, in the period from 2015 to 2020, will be lower by 55 thousand compared to the real number of graduates exiting high schools. On the other hand, there will be an **excessive amount of university graduates in cumulative amount of 50 thousand** to 2020. This huge disparity will probably cause further crowding out of high-school graduates by expectedly more capable university graduates that will in turn cause higher demand for university education which will be viewed as a requirement even for jobs

with optimal secondary education. In that regard, **this crowding out effect is to a certain degree self-sustaining.**

Despite the significant forecasted shortage of secondary educated graduates, a lot of disparities can be found among them. Forecasted cumulative amount of high-school graduates till 2020 is approximately 232 thousand. Most high-school students till 2020 will graduate in the field of economics, commerce and service with 33 % (76 633 graduates) share of all graduates, followed by machinery (11.7 %), general secondary education (11.7 %), electrical engineering (8.3 %) and construction, surveying, cartography (7.9 %). Out of these almost 77 thousand graduates, most prefer to work in occupations belonging to major group 5 – Service and sales workers and according to forecasts approximately 52 thousand should be able to find employment in these occupations.

If we further disaggregate these students by education programs according to 4-digit code of KOV³ classification, the ones with the most graduates are General Secondary Education, Business Academy, Hotel Academy, Electrical Engineering - Electrical Machinery and Equipment, Car Mechanic and Cook. Among these, Business Academy graduates usually work in the fields most closely related to their education programs. Most frequent occupation of these graduates varies significantly between regions, for example on national level, 4.1 % of general secondary education work as 5223 – Salesmen, but in Bratislava region the most frequent occupation of these graduates is 3343 – Professional Administrative Assistants (4.7 %) and in Košice region it is 2522 – System administrators (5.6 %). Those are 3 vastly different occupations with different education and skillset requirements employing graduates from education program focused mainly on general preparation for university studies. The curriculum of this education program is mostly the same in all the regions so the main differentiating factor is the structure of labour market demand, which the graduates have to adapt to. This indicates the **high level of flexibility of students and graduates of the general secondary education**, which is desirable and expected given the high variety of education and career paths ahead of them after graduation.

The highest unemployment rate of high-school graduates in 2014 was in the education programs 4336 – Veterinary Obstetrics and Gynecology with 66.7 % of graduates that have not continued their study on university unemployed, 6494 – Services and Housework with 58.1 % unemployment, 7235 – Information and Digital Technology (57.1 %), 6486 – Nursing Care in Healthcare Facilities (55.3 %) and 4236 – Agriculture economy (54.26 %). Although it has to be noted that education programs 4336 – Veterinary Obstetrics and Gynecology and 7235 – Information and Digital Technology are the programs with one of the highest shares of graduates continuing their education on university (with 58 % and 72 % share respectively) and therefore these high relative values are affected by significantly reduced pool of (probably less capable) graduates. High absolute number of unemployed graduates have programs 3650 – Construction (approximately 160 graduates – 46.8 %) and 6352 - Business and Entrepreneurship (180 graduates – 43.4 %).

Structure of university graduates till 2020 is strongly oriented towards humanities with top 3 places taken by study programs in fields of Economic Sciences (approximately 27 thousand graduates), Pedagogy (9.9 thous.) and Social and Behavioural Sciences (8.4 thous.), followed by Mechanical Engineering (8.3 thous.), Law (7.2 thous.) and Medical Sciences (7.1 thous.).

High unemployment rates among university graduates in 2014 among study programs with more than 100 graduates were observed in programs 7110 – History (21.9 %), 1536 – Biology

³ Classification of Education Programs

(20.5 %), 8136 – Cultural Science (20.1 %), 6292 – Economic Informatics (17.8 %) and 6703 – Politology (16.8 %).

After disaggregation of university programs by 4-digit code of KOV classification, the program with most graduates is 6835 – Law, which has relatively high share of graduates employed as Lawyers (22.1 %) and dispersion of Law graduates among other occupations is relatively low compared to other study programs, excluding Pedagogy and Medical Sciences programs that have one of the lowest levels of entropy. Social Work is another program that has high number of graduates but their dispersion is one of the highest and only 9 % of them work in the most frequent occupation, which is Government social benefits officials. Despite the high number of graduates of Social Work, most of them were and still are studying as external students and therefore by set methodology were not included in analyses concerning employment. Programs 6284 – Economics and Business Management and 6289 – Management have even higher dispersion of graduates on the labour market than social work, which is caused by more occupations suitable for these graduates. Most of them work as Accounting associate professionals (7.7 % and 5.5% respectively).

Demographic analysis that is integral part of forecasting system also tracked and analysed the process and probability of retirement of employees by occupation, education and industry. The key findings are that employees with highest and lowest education levels tend to stay longer on the labour market, although they do it for different reasons. Workers with lowest education and low wages stay on the labour market to ensure existential funds and most skilled employees can extend their working life usually because of the intellectual nature of their work.

The highest share of employees aged over 70 are in occupations 2212 – Specialist medical practitioners, 2310 – University and higher education teachers, 9629 – Elementary workers not elsewhere classified and 9112 – Cleaners and helpers in offices, hotels and other establishments. The industry with the highest average age of employees is A – Agriculture, forestry and fishing, with the average age of employee of 48 years.[10]

Table 1 Education programs that are most and least successful on the labour market

Programs with high success rate of graduates on the labour market		Programs with low success rate of graduates on the labour market	
Secondary education	Tertiary education	Secondary education	Tertiary education
Qualified Nurse	Software Engineering	Firefighting Equip. Mechanic	Hunting
International Business	General Medicine	Services and housework	Wood Processing
Orthopedic Technician	Dental Medicine	Nursing Care in Social Care Facilities	Culturology
Finance	Information Systems	Energy Equipment Technician	Logistics
Medical Laboratory Technician	Surgery	Utility Painter	Teaching of Art (+other subject)
Paramedic	Computer Engineering	Wood Design and Shaping	Museology
Preschool Teacher	Nursing	Tailor	Human Resources and Personnel Management
Pharmacy Technician	Pharmacy	Agricultural Production	History
Protection of People and Property	Normal and Pathological Physiology	Textile Production	Acquisition and Processing of Earth Resources
Healthcare Assistant	Criminal Law	Confectionery Production	Horticulture

Source: ÚPSVaR, Komplexná analýza uplatniteľnosti absolventov na trhu práce.

Above table lists the secondary and tertiary education programs based on the value of composite indicator expressing the success rate of graduates of these programs on the labour market. This composite indicator consists of 11 individual variables with different assigned weights. These variables are: wage of graduates up to 5 years after graduation, wage of graduates 5 and more years after graduation, indicator of qualification usage, indicator of qualification usage potential, indicator of suitability of occupation, indicator of potential suitability of occupation, average major occupation class and short-term unemployment rate when work experience is absent.[11]

5 Conclusions

Education system of the Slovak Republic suffers from exactly the opposite problem as is mentioned in academic literature when private financing of education is discussed. Students do not choose courses with highest private benefits because until now, comprehensive information enabling the calculation of these private benefits was not available to them. Instead, they usually choose according to other criteria because with private funding they do not have to do the usual cost-benefit assessment as when purchasing other goods. This resulted in a situation in which a lot of people who are graduating from university courses with low chance of being employed in the field corresponding with their field of study or being employed at all. Government and municipality institutions responsible for either directly managing or guiding the schools and universities towards desired education outcomes have also been making decisions based on the incomplete information about current state of things and possible future development instead of a robust forecasts that would enable them to precisely target future needs of a labour market.

Huge costs are associated with these bad decisions. They can be easily calculated using the data from forecasting models and OECD data on private and public expenses on education. According to these data the annual amount of expenditures in tertiary education system in 2011 was 8 177 USD/student/year on average and for each student in non-tertiary education this amount is 5 105 USD/student/year.[7] If we apply these figures on the forecasted number of graduates in 2016, with the structure of graduates and qualification to occupation suitability (where the match between the two is assessed as either optimal, related or unrelated) from 2014, we can calculate the amount of funds that are inefficiently spent on education for both non-tertiary and tertiary graduates. **The total amount of these lost funds is over 252 million USD per year**, split almost evenly between secondary and tertiary education graduates. Expenditures on almost 61 % of graduates have been spent inefficiently by the conservative estimate, which does not take dropouts or unemployed graduates with work experience into consideration.

These figures take into account only finances used directly on education process of graduates, but for full assessment, the costs associated with unemployment and also opportunity costs, which for the government means the lower revenue from direct and indirect taxes, social and healthcare contributions and costs of benefit in material need and Active labour market policy. Domonkos and König (2015) evaluated these costs of unemployment of individual on 569.7 EUR per month.[2] Based on the estimated number of unemployed among 2016 graduates (approximately 9 440), **the costs associated with their unemployment status would be 5.4 million EUR per month.**

These huge costs are the result of the process that started 25 years ago with the end of central planning of the economy. The processes of liberalization of economy and liberalization of

education were not properly managed and there was no instrument that would translate the needs of the labour market to the education system. Labour Market Forecasting system provides the information in the needed structure and detail to enable successful communication between the employers and education system in order to meet the labour market demands by providing graduates with the required skillset and in required structure in order to minimize unemployment, need for requalification and all the costs associated with the low success rate of graduates on the labour market.

Alternative approach to this problem would be better entrepreneurship education and stronger support of business incubators on high-schools and universities in order to reduce the reliance of graduates on the labour market conditions and turn potential job seekers into entrepreneurs creating jobs. This approach could be also applied to the seniors on the labour market that sometimes contribute to job shortage in certain industries. Entrepreneurship of seniors could utilize their acquired knowledge and different perspective and together with job sharing enabling them to pass this knowledge to younger employees would result not only in more job opportunities on the labour market but also better transfer of human capital.

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IMPLEMENTATION TRENDS OF THE CREDIT INCOME TAX INTO THE PERSONAL INCOME TAXATION IN OECD COUNTRIES

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ABSTRACT

The last decade is associated with the trend of an increased use of both social and solidarity factors in taxing personal income. While in the past, more emphasis was put on the use of tax allowances, currently in OECD countries we are faced with a significant existence and increased use tax credits. The most commonly used form of tax credits are employee tax credit and child tax credit and their equivalents implemented under different names. The aim of this paper is to highlight tax credits as a tool for reducing unemployment and increasing the willingness to work amongst primarily low-income or less qualified individuals and families. Furthermore, the paper seeks to summarize the current forms of tax credits being used in the tax systems of OECD countries.

Keywords: credit income tax, employee tax credit, child tax credit, tax relief, personal allowance

JEL codes: H21, D03, G28

1 Introduction

The aim of the economic policy of every country is to create the conditions for the accelerating and sustainable economic growth, which is the necessary tool for improving the quality of life and increasing of their standard of living. Based on the mentioned, the existence of the social and solidarity aspects in the personal income taxation is justified.

In a broader sense, the solidarity means the sense for a companionship of the member of the particular social group. [1] In the context of the personal income taxation, it belongs to an redistribution process from the richer ones to the poorer ones, from the healthy ones to the disabled ones, from the individuals to the families with children. As a solidarity element we consider that one, which affects the tax burden of a particular taxpayer's group only. On the one hand, it can decrease the tax burden of the low-income groups, on the other hand, it can increase the tax burden of the high-income groups. We do not perceive solidarity only as a difference between the groups with different income only, but also the different social status, different health conditions, different ages. The social element is an element of the tax system, which in generally decreases the tax burden of the taxpayer. A typical example is a tax-allowance. The special factor, which affects the final taxation of an individual (according to international institutions, including OECD) is a child benefit for families.

2 Literature Review

The issue of negative tax in relation to its origin, nature and its possible practical applications is elaborated upon in numerous professional publications. Its origin is attributed to Milton Friedman, who devoted his work Capitalism and Freedom [2] to this topic. Due to the

controversial nature of negative taxation there exists an abundance of work on the issue, some of these works are: Many unhappy returns The history of the income tax, the biggest golden egg of them all by William Ecenbarger; The negative income tax: An idea whose time has gone by Michael James; A Retrospective on the Negative Income Tax Experiments: Looking Back at the Most Innovate Field Studies in Social Policy by Robert Levine and many others.

The emphasis in this paper, is placed on the application of negative tax, which aims to point out the extent to which individual OECD countries apply negative taxes on personal incomes. The data for the subsequent analysis was gathered mainly from official OECD [4] [5] [6] [9] [10] and Eurostat sources [7], which are issued on an annual.

3 Data and Methodology

For the identification of all the social and solidarity elements of the tax on personal income in the report, we primarily used the method of comparison in the processing of official materials and OECD studies. The outcome was outlined in tables. The results and the evaluation have been reached through a deductive method based on the acquired information in relation to the theoretical basis.

4 Results and Discussion

Within the use of the social and solidarity elements in the personal income taxation we may say, that while in the past the more emphasis was put on the use of the tax allowances, currently the emphasis is put on the use of the tax credits. They contribute to an increase of the solidarity and sociability of the tax systems significantly and they have also motivational effect on taxpayers participation in the labor market, and they are related to the acceptance of the tax fairness.

4.1 The use of the social and solidarity elements in the personal income taxation in OECD countries

Table 1 shows tax reliefs in the personal income taxation in OECD countries. All OECD countries do not tax a certain initial level of income. The reason is just the existence of tax exemptions – social and solidarity factors in taxation, among which we include: tax allowances, tax credits (in contrast to the tax allowances, they decrease the final tax obligation), and zero tax band. The exemption in the form of non-taxable amounts is in some of the OECD countries, Slovakia included, limited by the level of income (non-taxable amounts degressivity). Within the following period of time, the number of countries using tax credits and tax allowances (as % of average wage) has increased.

In OECD countries within the basic groups of households there is still a persisting trend to impose the lowest tax burden upon a low income taxpayer with two children. We can say that other groups of households have “solidarity” with this type of taxpayer. In three countries thanks to the existence of different forms of negative tax the resulting tax burden is even negative. This fact is the most palpable in Ireland. The only country where an individual with two children does not have any tax advantages over a childless person is Mexico. In twelve countries the tax burden of such families is less than half of the tax burden of single individuals without children. Among these countries, there are Czech Republic, Slovenia, Switzerland, Germany, Hungary, Ireland, Korea, Luxembourg, Poland, Portugal, Slovak Republic and the USA.[8] [10].

Table 1 The basic exemptions in taxation, generally applicable to all taxpayers (zero tax rate, tax allowance, tax credit)

Country	2000		2010	
	Basic exemption form	% z AW	Basic exemption form	% z AW
Australia	Zero tax rate	15	Zero tax rate	9
	Tax credit	2	Tax allowance	13
Austria	Tax credit	12	Zero tax rate	29
Belgium	Tax allowance	16	Tax allowance	15
Canada	Tax credit	19	Tax credit	23
Chile	Tax allowance	120	Tax allowance	111
Czech Republic	Tax allowance	22	Tax credit	43
Denmark	Tax credit	12	Tax credit	11
Estonia	Tax allowance	16	Tax allowance	18
Finland	Zero tax rate	30	Zero tax rate	38
France	Zero tax rate	15	Zero tax rate	17
Germany	Zero tax rate	20	Zero tax rate	19
Greece	Zero tax rate	71	Zero tax rate	59
Hungary				
Iceland	Tax credit	41	Tax credit	42
Ireland	Tax credit	21	Tax credit	23
			Tax allowance	13
Israel	Tax credit	49	Tax credit	49
Italy			Tax credit	28
Japan	Tax allowance	8	Tax allowance	8
Korea	Tax allowance	3	Tax allowance	4
Luxembourg	Zero tax rate	19	Zero tax rate	23
Mexico				
Netherlands	Tax allowance	13	Tax credit	13
New Zealand				
Norway	Tax allowance	20	Tax allowance	16
Poland	Tax credit (DB)	10	Tax credit	9
Portugal			Tax allowance	24
	Tax credit		Tax credit	14
Slovakia	Tax allowance	25	Tax allowance	43
Slovenia	Tax allowance	12	Tax allowance	36
Spain	Tax allowance	19	Tax allowance	21
Sweden	Zero tax rate	88	Zero tax rate	101
	Tax allowance	3	Tax allowance	5
	Negative income tax (DB)	3		
Switzerland	Zero tax rate	25	Zero tax rate	18
Turkey	Tax allowance	4		
Great Britain	Tax allowance	18	Tax allowance	19
USA	Tax allowance	22	Tax allowance	13

Source: [5]

The table provides an overview of both, the social elements in personal income taxation (tax allowance) and the solidarity elements (tax credits).

4.2 Tax credits used in the OECD countries

In the following text of this article we will focus attention only on the use of tax credits (tax bonuses) that have the character of negative tax, or more precisely on some of its forms. As we have already mentioned, its basic property is that it decreases the final tax obligation and in case of not reaching the set minimum income limit (or in case of zero tax obligation) taxpayers can claim a subsidy from state sources.

Table 2 provides an overview about the using of different tax credits in the OECD countries. Besides the personal income tax credits the most frequently used are the employment tax credits and child tax credits.

Table 2 Tax credits used in the OECD countries (2010)

OECD country	Name of the item of negative taxation
Belgium	Reduced social security contributions
Denmark	Earned Income Tax Credit (operates as allowance)
Finland	Earned Income Tax Credit (operates as allowance)
France	Labour Income Tax Credit (central income taxation) Prime pour l'emploi
Netherlands	Labour Credit Income Dependent Combination Credit
Ireland	Family Income Supplement
Canada	Working Income Tax benefit
Korea	Earned Income Tax credit
Luxembourg	Employee tax credit
Hungary	Employee tax credit
New Zealand	In-work tax credit
Italy	Labour Income Tax credit
Slovak republic	Child tax credit Employee tax credit
Spain	Earned income deduction Earned income credit
Sweden	Earned Income Tax Credit
USA	Earned Income Tax Credit
United Kingdom	Working tax credit

Source: [9]

Among the countries, which use mostly the forms of tax credits (as it's resulted in the OECD study 2010) [4], belong Germany, Great Britain, Mexico, Canada, Czech Republic and Slovak Republic. The OECD study from 2014, aimed at personal income taxation declared that up to 25 countries use the tax credit, which can be classified as an element of the negative income taxation. It represents 73% share of all OECD countries. Based on this, we can conclude, that there is increasing share of the countries, which implement the solidarity elements in their personal income taxation. More than 50 % of the OECD countries use at least one element of negative income taxation.

4.3 Classification of OECD countries based on share of using forms of negative income tax

The extent to which different OECD countries consider forms of negative tax essential for the personal income tax is shown in the Table 3.

Table 3 Classification of the OECD countries based on the forms of NIT's importance in tax their tax systems

A: Initial position of NIT	Hard to say, if A or B	B: Not significant position of NIT	C: Without NIT
Australia	Germany	Finland	Hungary
Czech republic	Belgium	Japan	Korea
Greece	France	Luxembourg	Denmark
Ireland	Netherlands	Spain	Turky
Iceland	Mexico	Switzerland	Slovenia
Israel	New Zealand		Norway
Canada	Portugal		Chille
Poland	Austria		Estonia
	Slovak republic		Italy
	Sweden		
	USA		
	Great Britain		

Source: [6]

All analyzed OECD countries can be divided into four groups, in terms of the position respectively importance of NIT in taxation of personal incomes:

The group A is formed of countries which primarily use forms of negative tax in personal income taxation. Other items decreasing tax base or exemptions from income taxation, are either additional or not used at all. This enables such countries on the one hand targeted action on selected groups of taxpayers, and on the other hand the support of their income in the form of subsidies.

This group of countries (B) also uses some forms of negative tax to decrease the tax burden of selected groups of taxpayers but it is typically only an additional element in personal income taxation.

These countries (in group C) do not use any forms of negative tax in personal income taxation.

The countries, where both systems - system of NIT/ tax credits and system of tax allowances, exemptions and deductions decreasing the tax base – are working in parallel. For these countries, it's not possible to clearly determine which of the systems is dominant. It includes Belgium, France, Netherlands, Mexico, Germany, New Zealand, Portugal, Slovak republic, Sweden, USA, Great Britain (12). [3]

Setting the optimal amount of tax burden (also in connection with implementing social and solidarity items in personal income taxation) which secures economic growth and ensures that an individual is still willing to work and thus create income flow into the state budget, is the primary task of every government. The obligation of each government, in its relationship to an individual, is to provide room for the improvement of the quality of life and the growth of life standard. In connection with this task it is necessary to consider social and solidarity factors in personal income taxation. Above mentioned results also from the fact that direct

taxes are among taxes with the most negative influence on economic growth as they directly impact activities of taxpayers. The incorrect set-up of personal income taxation can have a negative impact on future economic development of the given country. Therefore it is absolutely necessary to know individual factors and aspects influencing the sociability and solidarity of personal income taxation and are motivational for taxpayers.

5 Conclusions

The theorists, professionals, but also general public are faced with a frequently asked question in connection with the use of social and solidarity elements of the personal income taxation:

The extent to which the existence of them is appropriate or the extent to which the acceptance of them is needed in tax systems? The conclusions of the presented article more or less clearly demonstrate that in recent years, the trend of using tax credits in tax systems in OECD countries increases and the tax credits replace the tax allowances or the other guaranteed incomes.

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EVALUATION OF ECONOMIC EFFICIENCY IN THE ENERGETIC SECTOR

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ABSTRACT

The aim of this paper is to demonstrate the effectiveness of investment projects. When evaluating economic efficiency we can use many methods. For the purposes of this paper, we selected dynamic methods. In calculations, we used an example of the construction of energy units in the defined territory of the natural monopoly that operates in the electricity industry. The data used are real with only two projects, B1 and B2, which simulate the real project. These projects are appropriately adapted to meet the purpose of the paper, which is to analyze how the investment influences the payback period. We do not mention the analyzed company since it is required to keep it anonymous. The main methods used were the observation method, the method of collecting information, and paired methods; analysis and synthesis, induction and deduction, method of comparison and subsequently related graphical methods, as well as mathematical methods, which were used to create graphs and tables.

Keywords: efficiency of the investments, the payback period, the dynamic methods, the price of electricity, the discount rate

JEL codes: G11

1 Introduction

Before the calculation of the economic efficiency itself, it is necessary to define the basic parameters which enter into the calculations and to state individual rates of selected indicators. In addition to the data such as the number of the newly constructed energetic units in the defined territory, it is necessary to mention costs for the construction of individual power lines, transformer stations, as well as operating costs. [5] Below is the discount rate, which, in this case, represents the expected inflation for this particular project and is defined as 8%. The purchase price of electricity will be denoted as the XY rate, and the calculation indicates the actual rate, but after we have consulted the analyzed company, we decided to designate the rate XY as stated. This rate indicates the price the consumers pay for electricity from the natural "monopolist". The category XY is the purchase price for the individual energetic units for the period of construction, which is €0.1392/kWh. Monthly fixed rate is the rate that each customer, that is, each energetic unit, pays every month. This rate is €5.7738 per month per customer.

2 Calculation of financial flows of the project

In this part, we calculate the discount factor which is then used to calculate the discounted cash flow [2]. The discount factor is calculated with the following formula:

$$\frac{1}{(1 + DS)^{(Year-1)}} \quad (1)$$

DS = discount rate (8%)

Year = given year of the project(1-10).

Cash flow is calculated when the revenues are subtracted from the operating costs. The discounted cash flow will be calculated by means of the above mentioned discount factor, so that the net cash flow will be multiplied by the discount factor. [1] The penultimate part of the calculation itself of the payback period of the investment consists of the calculation of the cumulative discount cash flow. In this case, the amount of the initial investment in the year "zero", which amounted to €52,555.00, must also be taken into account.

Table 1 Input data needed to calculate the payback period

		1	2	3	4	5	6	7	8	9	10
Realization		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Investment	€	52 555,00									
Construction progress											
Energetic Units(EU)											
Number of EU	piece	0	32	48	48	48	48	48	48	48	48
Average consumption for one EU	kWh/year	0	2200	2200	2200	2200	2200	2200	2200	2200	2200
Costs											
Operating costs	€/year	0,00	0,00	2281,00	2281,00	2281,00	2281,00	2281,00	2281,00	2281,00	2281,00
Operating costs for cable networks	€/year	0,00	0,00	1904,00	1904,00	1904,00	1904,00	1904,00	1904,00	1904,00	1904,00
Operating costs without depreciation	€/year	0,00	0,00	3704,00	3704,00	3704,00	3704,00	3704,00	3704,00	3704,00	3704,00
Operating costs together	€/year	0,00	0,00	7889,00	7889,00	7889,00	7889,00	7889,00	7889,00	7889,00	7889,00
Revenues											
Fixed rate for one EU	€/year	0,00	69,29	69,29	69,29	69,29	69,29	69,29	69,29	69,29	69,29
Fixed rate -all EU	€/year	0,00	2217,14	3325,71	3325,71	3325,71	3325,71	3325,71	3325,71	3325,71	3325,71
Costs for one EU	€/year	0,00	306,24	306,24	306,24	306,24	306,24	306,24	306,24	306,24	306,24
Costs -all EU	€/year	0,00	9799,68	14699,52	14699,52	14699,52	14699,52	14699,52	14699,52	14699,52	14699,52
Revenues	€/year	0,00	12016,82	18025,23	18025,23	18025,23	18025,23	18025,23	18025,23	18025,23	18025,23
Calculation											
Cash-Flow(CF)		1	1	2	3	4	5	6	7	8	9
Discount factor		1	1	0,925926	0,85734	0,793832	0,735030	0,680583	0,630170	0,583490	0,540269

Discount factor		1,0000	0,9259	0,8573	0,7938	0,7350	0,6806	0,6302	0,5835	0,5403	0,5002
CF	€	-52 555,00	0,00	12016,82	10136,23	10136,23	10136,23	10136,23	10136,23	10136,23	10136,23
Discounted CF(DCF)	€	-52 555,00	0,00	11126,68	8690,18	8046,47	7450,43	6898,55	6387,54	5914,39	5476,29
Cumulated DCF(CDCF)	€	-52 555,00	-52555,00	-41428,32	-32738,13	-24691,67	-17241,24	-10342,69	-3955,15	1959,25	7435,53
NPV in (n+1) year after PBP	€	12 506,17									
Return on investment (PBP)	year		8	years							

Source: [6]

The first column with the cumulative discount cash flow contains the value € -52,555.00 (the value of the initial investment). The minus sign indicates that the company is in loss. [3] We will determine when the company will achieve the pure profit from the investment, that is, when it covers all its initial as well as operating costs. We add the value from the second column "DCF", i.e. the value of the discount cash flow, to the amount in the first column. The "DCF" value equals 0 since the company had no revenues or expenditures apart from the initial investment in the first year.

Subsequently, to the value from the second column and the row of the cumulated discounted cash flow we add again the sum from the row DCF from the third column (-52,555.00 + 11,126.68). In the same way, we continue until the tenth year, we get the final value of the cumulated discounted cash flow, which is € 12,506.17. The net present value of the project in the 10th year equals the last the cumulated discounted cash flow (€ 12,506.17). To determine the exact payback period of the project, we must identify the moment when the negative results change to positive results in the calculation of the cumulated discounted cash flows. In our case, it is the eight year.

The company needs to identify this moment more precisely, and that at least to matter of months. For this purpose, we will use the methods of the linear interpolation between the positive and the negative cumulated discount cash flow. We can use the following formula:

$$\frac{KDCF1}{(KDCF1 - KDCF2)} \quad (2)$$

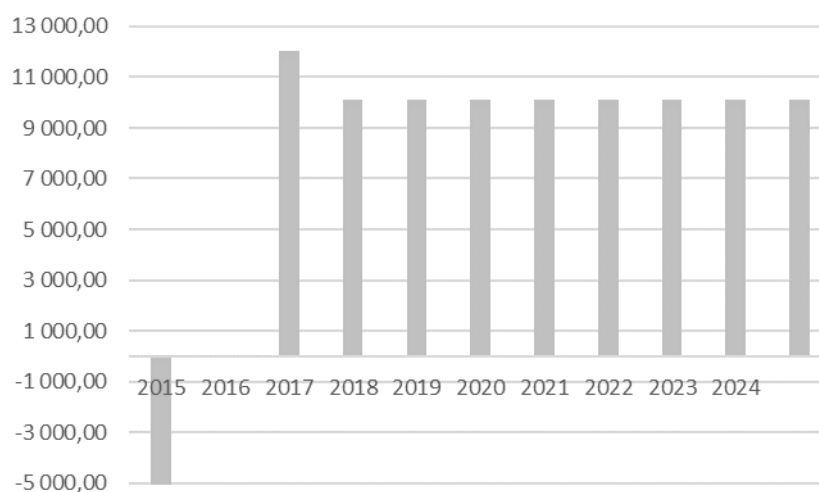
CDCF1 = cumulated discounted CF with the negative value (absolute value)

CDCF2 = cumulated discounted CF with the positive value

$$\frac{3955.15}{(3955.15 - 1959.25)} = 0.6687 \quad (3)$$

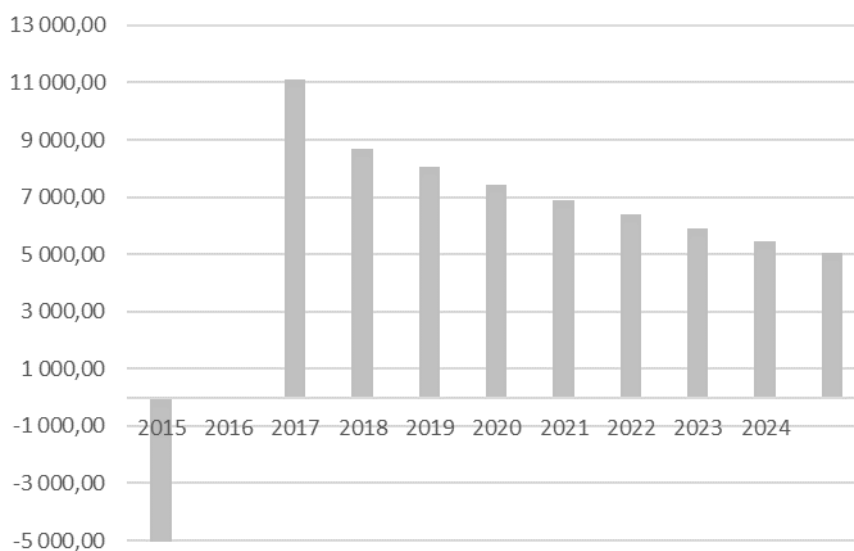
Then we multiply the value by the number of months in the year, i.e. $0.6687 * 12$ and we acquire the exact payback time, that is, 8.023. This means that the investment will return to the company after eight years and 0.23 months, that is, by the beginning of January.

Figure 1 Development of CF



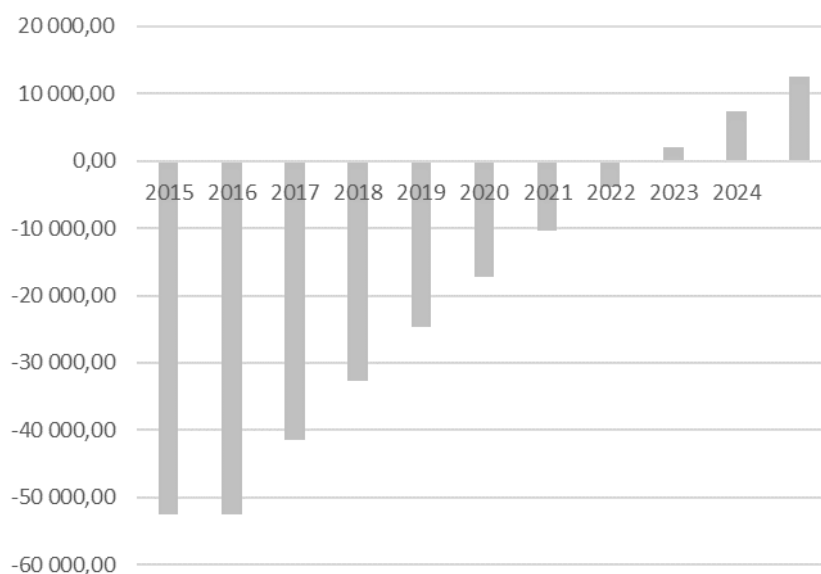
Source: own processing

Figure 2 Development of DCF



Source: own processing

Figure 3 Development of cumulated DCF



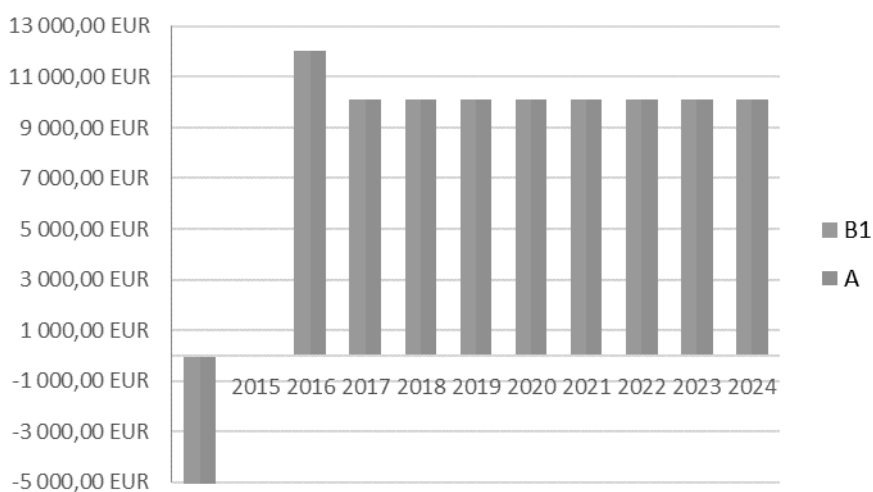
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3 Evaluation of economic efficiency by means of criteria of the cash flow – Project B1 (the lower investment costs): simulated calculation

We are using the same data as in the previous real project. The sole value that has changed, is the value of the initial investment. In this case, the investment is by €10,000.00 less, that is, it represents the amount of €42 555.00.

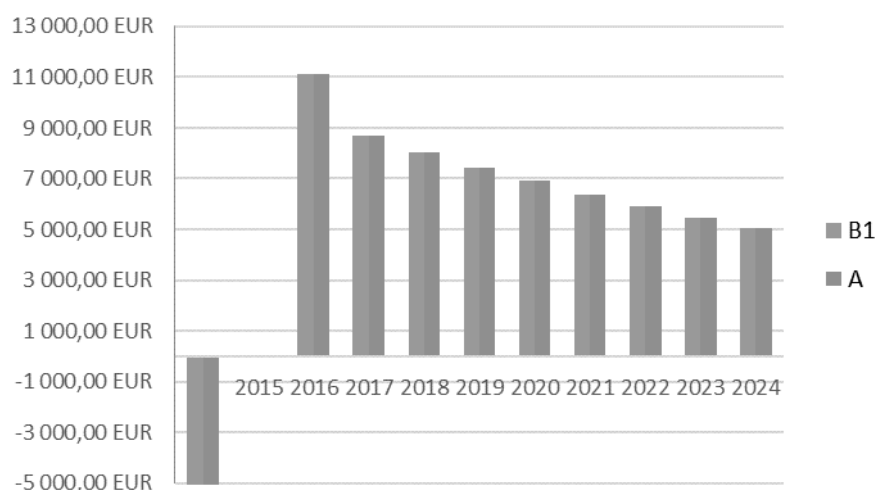
The aim of these fictitious calculations is to show, how the change of the initial investment (in this case a decrease and in the later calculation, an increase) affects the total time of the payback period. Since we are using the same value of the discount rate, the purchase price of electricity, the monthly fixed rates and operating costs, the value of the cash flow and the discounted cash flows are identical to the real projects.

Figure 4 Development of CF in the simulated calculation



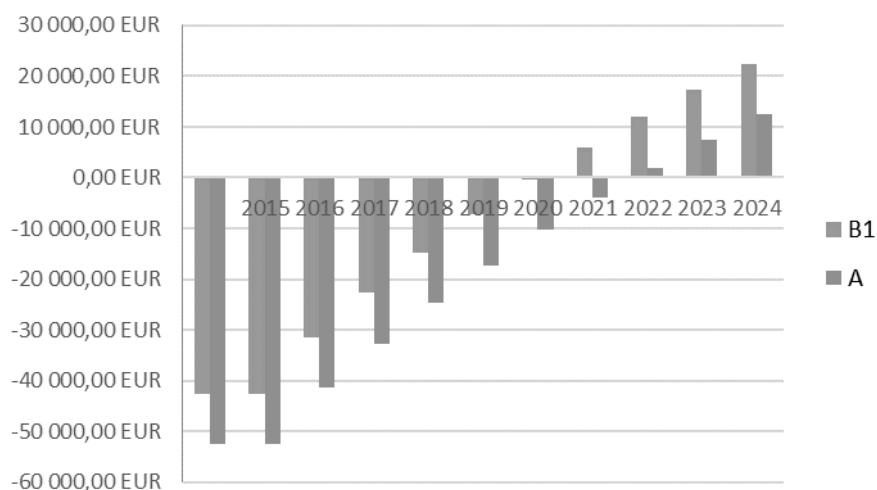
Source: own processing

Figure 5 Development of DCF in the simulated calculation



Source: own processing

Figure 6 Development of CDCF in the simulated calculation



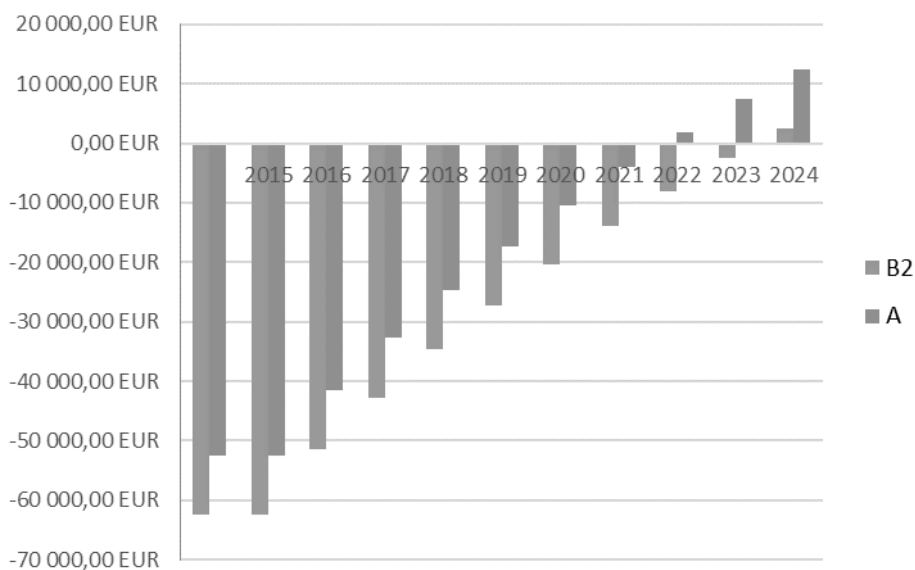
Source: own processing

The change can only be seen in the cumulated discounted cash flow. While in the real project "A", the change from the negative values to positive values occurred in the year 2021, i.e. in the 8th year of the project life, the change in the investment projects with the lower investment cost occurred a year earlier, that is, in the seventh year. [4] This calculation confirms our assumption, that is, that the company has the lower investment costs, while the other values remain unchanged, and thus, the payback period is shorter.

4 Evaluation of economic efficiency by means of the criteria of the cash flow – Project B2 (higher investment costs): simulated calculation

A significant change is observed when we compare the cumulated discounted cash flows with its related payback period. The initial investment costs were, compared to the real project, whose initial investment was €52,555.00, in project B2 by €10,000 higher, so their value represented €62,555.00. In this case, the negative values of the cumulated discounted cash flow changed to positive values in the 10th year of the project's life. And again, our assumption that the greater the initial investment, the longer the payback period is confirmed.

Figure 7 Development of CDCF in the simulated calculation

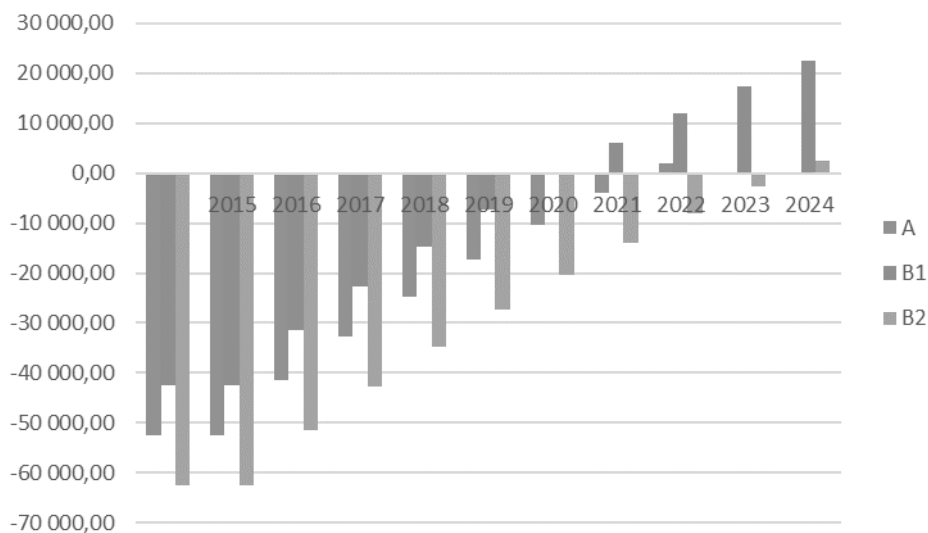


Source: own processing

Final comparison of projects A, B1 and B2

When comparing projects A, B1, and B2, we confirm that the change in the investment costs changes the payback period. The project with lower investment costs has a shorter payback period than the second project with higher investment costs. This change can be seen only in cumulated discounted cash flow (CDCF) in the figure below.

Figure 8 Development of CDCF in the simulated calculation



Source: own processing

5 Results and discussion

The most important comparison is the calculation of cumulated discounted cash flow. Project "A" (€52,555.00) represents a real project; project "B1" is the first fictional project with the lower value of the initial investment (€42,555.00) and "B2" is the project with the higher

initial investment (€62,555.00). From the calculation, it is evident that in the real project the return of the investment will take place in 2022 (the 8th year), while in project "B1" it will be in the year 2020 (the seventh year); project "B2" will reach its investment return in 2024 (10 years and six months).

6 Conclusion

In this paper, we analyzed the payback period for the investment according to the real course of construction and we compared it to two simulated projects using the dynamic method of comparison. While calculating, the payback period is reflected in the cumulative discounted cash flow. We confirmed our assumption: In projects will lower investment costs, the payback period was shorter and vice versa: The higher the investment costs, the longer the payback period (if assuming the same involved values).

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EVALUATION OF THE NATURAL GAS INDUSTRY AND ITS CHANGES IN THE CURRENT REGULATORY PERIOD

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ABSTRACT

Nowadays, the gas industry is going through changes. In the context of these changes, the European Commission is preparing the winter gas package with the aim to unify the rules for creating the gas price. Regulated prices for the sector of households are still used in the fifteen member countries of the European Union. The main methods we use are the observation method, the method of collecting informations, and paired methods, analysis and synthesis, induction and deduction, method of comparison and subsequently mathematical methods, which we used to populate the tables with the relevant data.

Keywords: gas sector, regulated prices, liberalization package, price cap, scenario

JEL codes: D04, D42

1 Introduction

Currently, the natural gas market in Slovakia can be considered a stagnant market, and hence a market with declining consumption of gas (gas consumption in 2013 was 58.5 billion m³, while in 2014 it was 46.5 billion m³). [1] An important priority of the current Slovak energy policy is to protect socially vulnerable consumers and fight against the energy poverty. [2] The evidence is also exemption of households from taxation, which, according to the Slovak legislation is reflected in the final prices. [3] From the data published on the web site of the Regulatory Office for Network Industries (hereinafter "Office") the gas is supplied to households by twenty suppliers, from which seventeen suppliers apply in the prices of the gas delivery the same fixed price items as the dominant gas supplier, the Slovak Gas Industry with minimal differences in the payment for the consumed gas, which is reflected in a variable component of the price. However, this is valid only if the gas supply contract is valid for a fixed period of time and that in duration of two to five years. In the future, it will be important to explore new sustainable and more precise measures to help Member States with the deregulation of prices for end consumers [4]. The price regulation of the gas supply for households is necessary in order to protect the vulnerable gas customers due to their weak economic position in the gas market and because they have a low bargaining power. The most recent monitoring of the gas markets by the Agency for the Cooperation of the regulatory authorities has shown that, the regulation of final prices for households is currently applied in fifteen member countries. In this paper, we focus on the method of the price formation of gas supply for households in the first year of the regulatory period and in the following year. The prices will change because of external factors, such as change of the purchase price of natural gas or change of transport costs; respectively. The distribution of gas could affect the final price of gas supply for households. The price regulation of the gas supply is carried out pursuant to Paragraph 2, Section 11, Paragraph 2, Letter e) Act no.250/2012 about regulation network industries and the Decree of the Regulatory Office for Network Industries no.193/2013 Coll., establishing a price regulation in the gas industry, as amended by Decree

no. 187/2014. The price regulation is determined for the entire regulatory period, which is usually five years.

2 Creation of gas price for households

The year 2016 will be the last year of the current regulation period in Slovakia. In this regulation period, the price cap regulation is used. The aim of this paper is to introduce the factors, which can influence the price of the gas in the household sector. In the household sector is essential security of gas supply. When defining energetic security, we should consider at least the levels of consumers, producers and transit countries:

- Consuming countries consider energetic security an available and reliable energy for reasonable costs.
- Producer countries consider energetic security require security of demand and the respective access to the market so as to secure their investments as well as government resources.[8]
- Transit countries, including the Slovak Republic, energy security involves the effort for preserving their position and status of a transit countries.

Securing of gas supplies or any other energy supply is tightly connected to energy security. It is rather difficult to exactly define what energy security is and what it involves. One of the less complex definition provides Daniel Yergin: he defines energy security as “sufficient supply for reasonable costs”. However, he himself extends this confining definition and adds further concepts so as to react to the tension in the global market with energy, natural disasters, technical failures, political instability, and other internal and external factors.

Yergin mentions four key principles that comprise energy safety:

The first principle is diversification. Access to alternative energy resources decreases the risk of fallouts of supply when relying on a sole resource and hence represents the very basic principle of fluent energy supply. However, as Yergin states, diversification is not sufficient by itself and brings up the adaptability and reliability of the system of energy supplies. Such a system should be able to resist various shocks and provide for an easy restoring of supplies. According to Yergin, creating such adaptable systems involves multiple factors on the side of producers as well as on the side of importing countries, and along the entire supply chain. He emphasizes the necessity of strategic reserves, sufficient production capacity, backup systems in the production and distribution chain as well as careful planning of reactions to fallouts in supplies. The third principle is the realization of the integration reality. The fourth principle is the need and importance of information. This principle is based on experience. Yergin identified the following four principles:

- Diversification of energy resources,
- Adaptability of power systems,
- Adaptation to the current integration needs,
- Information impact.

Based on the methodology defined in the decree [7], the supplier will submit a price offer for gas supply to households in the first year of the regulatory period.

Table 1 The price of delivery of gas for households in the year t

Price for delivery of gas for household	Year t
CKP-gas	0.0257 €/kWh
CPS-transport	0.0006 €/kWh
CDS-distribution	0.0151 €/kWh
DSP-storage	0.0001 €/kWh
CDD-delivery	0.0001 €/kWh
CPZ-profit	0.0015 €/kWh
Sum:	0.0431 €/kWh

Source: [6]

Conditions for gas-price calculation are the following:

- Costs of the purchased gas from long-term contracts (A) = 0.0260 (appropriately chosen)
- The arithmetic average of the daily prices are published by EEX for the year t (B) = € 0.0249 / kWh (available on the Internet).

Subsequently, we entered the price for delivery of the rates in the table below.

Table 2 The price of delivery in the year t according to the rates

Tariff	Subscribers	Consumption (kWh)	Fixed monthly rate (€/month)	Offtaken gas	Planned sales in the year t (€)	Average prices (€/kWh)
D1	100 000	50 000 000	2,50	0,0685	6 425 000	0,1285
D2	50 000	500 000 000	5,50	0,0365	21 550 000	0,0431
D3	45 000	1 100 000 000	7,00	0,0355	42 830 000	0,0389
Total:	195 000	1 650 000 000			70 805 000	0,0429

Source: [4]

3 Analysis of alternations in the change of gas price

In the first scenario, we show how the price for delivery of gas is changed. If we change the cost of purchased gas from the original 0.0257 in the year t to the reduced costs 0.0239 in year t+1.

The purchased costs from long term contracts (A) = 0,0250 euro/kWh originally 0.0260.

The arithmetic average of the daily prices is published by EEX for the year t (B) = 0.0212 EUR/kWh originally 0.0249.

The purchased costs of gas according sec. 19 par. 2 Decree equals $C = 0.7 \cdot A + 0.3 \cdot B = 0.0239$ EUR/kWh.

Table 3 The price for delivery of gas in the year t+1

The price for delivery of gas	Year t+1
CKP-gas	0.0239 €/kWh
CPS-transport	0.0006 €/kWh
CDS-distribution	0.0151 €/kWh
DSP-storage	0.0001 €/kWh
CDD-delivery	0.0001 €/kWh
CPZ-profit	0.0015 €/kWh
Sum:	0.0431 €/kWh

Source: own processing

With the reduced costs of purchased costs, the price of the delivery of the gas for households will be reduced in the year t+1. This change will be reflected in rates of the consumed gas, which is the variable part of the price. The calculation is as follows:

$$D1: 0.0685 - 0.0018 = 0.0667$$

$$D2: 0.0365 - 0.0018 = 0.0347$$

$$D3: 0.0355 - 0.0018 = 0.0337$$

Table 4 The price of delivery of gas in the year t+1 with changed rates

Tariff	Subscribers	Consumption (kWh)	Fixed monthly rate (€/month)	Offtaken gas	Planned sales in the year t (€)	Average prices (€/kWh)	Percentage loss
D1	100 000	50 000 000	2,50	0,0667	6 335 000	0,1267	-1,40 %
D2	50 000	500 000 000	5,50	0,0347	20 650 000	0,0413	-4,18 %
D3	45 000	1 100 000 000	7,00	0,0337	40 850 000	0,0371	-4,62 %
Total:	195 000	1 650 000 000			67 835 000	0,0411	-4,19 %

Source: own processing

From these changes we can conclude that reducing the planned price of gas will cause reduction of the final price of delivery to household customers.

4 Impact analysis of changes by transport-cost reduction

In this second scenario, we change the transport price. We reduce the reserved capacity from the original 250,000 MWh to 240,000 MWh and make calculations for the change. The change causes other changes in the variable rates of the consumed gas in year t+1.

The assumption for calculation of the price in the year t

- The transport costs in the year t
- The input point: Veľké Kapušany
- The output point: domestic point
- Reserved daily capacity: 250 000MWh
- The annual consumption of gas: 80 mil. MWh

Table 5 Assumption for calculation of the price in the year t

Point	Ordered Capacity		Unit Price		Total Price	
	MWh/day		€ / MWh / day /period		€	
	Input	Output	Input	Output	Input	Output
Veľké Kapušany	250 000	0	131,2	0	32 800 000	0
Domestic point	0	250 000	0	66,91	0	16 727 500
					32 800 000	16 727 500
			Sum:			49 527 500

Assumption of the annual gas consumption - 80 mil. MWh

Payment (1 kWh) 0,0006

Source: own processing

Payment for 1 kWh: $49\,527\,500 / 80\,000\,000\,000 = 0.0006$ EUR/kWh

Table 6 shows the changes in the year t+1, due to changes on the input point and reserved daily capacity.

- The transport costs in year t+1
- The input point: Baumgarten
- The output point: domestic point
- Reserved daily capacity:240 000 MWh
- The annual consumption of gas: 80 mil. MWh

Table 6 Changes of the price in the year t+1

Point	Ordered Capacity		Unit Price		Total Price	
	MWh/day		€ / MWh / day /period		€	

	Input	Output	Input	Output	Input	Output
Baumgarten	240 000	0	65,58	0	15 739 200	0
Domestic point	0	240 000	0	67,63	0	16 231 200
					15 739 200	16 231 200
				Sum:	31 970 400	

Assumption of the annual gas consumption - 80 mil. MWh

Payment (1 kWh) 0,0004

Source: own processing

The table below shows the change in the row CPS-transport.

Table 7 Price for delivery of gas for households in the year t+1

Price for delivery of gas for households	Year t+1
CKP-gas	0.0257 €/kWh
CPS-transport	0.0004 €/kWh
CDS-distribution	0.0151 €/kWh
DSP-storage	0.0001 €/kWh
CDD-delivery	0.0001 €/kWh
CPZ-profit	0.0015 €/kWh
Sum:	0.0429 €/kWh

Source: own processing

The difference of the planned price in the year t compared to the year t+1 is 0.0002 EUR/kWh, caused a change in the variable section price (the rate of the offtaken gas).

Table 8 Delivery price of gas with the rates in year t+1 with the change in the transport costs

Tariff	Subscribers	Consumption (kWh)	Fixed monthly rate (€/month)	Offtaken gas	Planned sales in the year t (€)	Average prices (€/kWh)	Percentage loss
D1	100 000	50 000 000	2,50	0,0683	6 415 000	0,1283	-0,16 %
D2	50 000	500 000 000	5,50	0,0363	21 450 000	0,0429	-0,46 %
D3	45 000	1 100 000 000	7,00	0,0353	42 610 000	0,0387	-0,51 %
Total:	195 000	1 650 000 000			70 475 000	0,0427	-0,47 %

Source: own processing

Calculation of rates is as follows:

$$D1 = 0.0658 - 0.0002 = 0.0683$$

$$D2 = 0.0365 - 0.0002 = 0.0368$$

$$D3 = 0.0355 - 0.0002 = 0.0353$$

The impact of the reduced transported costs caused a change in the input point from the transport network from Veľké Kapušany to Baumgarten. In this calculation, we changed reserved capacity from 250,000 MWh to 240,000MWh, which caused a price drop of delivery of the gas for households in the year t+1.

5 Impact analysis of the change by distribution

For the first time, an external change causes a change of fixed rates. This change of the price of gas distribution have to be approved by a new priced decision of the Regulatory Office for Network Industries.

Table 9 Price for delivery of gas for households in the year t+1

Price for delivery of gas for household	Year t+1
CKP-gas	0.0257 €/kWh
CPS-transport	0.0004 €/kWh
CDS-distribution	0.0157 €/kWh
DSP-storage	0.0001 €/kWh
CDD-delivery	0.0001 €/kWh
CPZ-profit	0.0015 €/kWh
Sum:	0.0437 €/kWh

Source: own processing

The planned price for distribution in the year t+1 will increase by 0.0006 EUR/kWh (originally 0.0157 to 0.0151) and this difference will affect all fixed parts of the new prices. The calculation of these changes is as follows:

$$D1 = 2.50 + 0.333 = 2.83$$

$$D2 = 5.5 + 0.695 = 6.20$$

$$D3 = 7.00 + 0.318 = 7.32$$

Table 10 Delivery price of gas in the year t+1

Tariff	Subscribers	Consumption (kWh)	Fixed monthly rate (€/month)	Offtaken gas	Planned sales in the year t (€)	Average prices (€/kWh)	Percentage growth
D1	100 000	50 000 000	2,83	0,0685	6 825 000	0,1365	+ 6,23 %
D2	50 000	500 000 000	6,20	0,0365	21 967 000	0,0439	+ 1,94 %
D3	45 000	1 100 000 000	7,32	0,0355	43 001 900	0,0391	+ 0,40 %
Total:	195 000	1 650 000 000			71 793 900	0,0435	+ 1,40 %

Source: own processing

The reason for this change is induced by a change in the Slovak legislation. Because the operator of distribution network must ensure security standard of gas delivery, and that not only for households, but for customers of the other categories as well. The company SPP – distribucia, a.s. must reserve additional capacity in the underground storage for this purpose, which increases its operating costs. The significant change appears in the fixed part of the price. As we can see in Table 10, the final price increases in several percent points according to the rate key. In rate D1, the price increases by 6.23%. In D2, the price increases by 1.94% and in D3 rate, the price increases by 0.40%.

6 Results and Discussion

We consider three scenarios and analyse how changes of input parameters influence the gas price and where the changes are reflected. From the changes mentioned in the first scenario, we can conclude that by reducing the planned price of gas, the final price of delivery to customers in category households will drop by 4.19%. This change resulted from a change in the Pursuant costs (A) because in the market is excess gas, a price based on long-term contracts also had to be reduced by 0.001 (0.0260 to 0.0250). More significant changes were in part B, the price is the arithmetic average of the daily prices is published by EEX for the year t (B) = 0.0212 EUR / kWh originally 0.0249, ie the difference was 0.0037. The first scenario pointed to the fact that reducing the pursuant cost caused lowering the prices for customers in the household, the change has been converted by the tariffs. In the second scenario, we changed the transportation price. In the calculation we changed the input point Veľké Kapušany on input point Baumgarten. We reduced the reserved capacity from the original 250,000 MWh to 240,000 MWh and we calculated the changes that occurred in the variable rates of the gas consumed in year t +1. Payment for 1 kWh in Veľké Kapušany was 0.0006 and payment for one kWh in Baumgarten was 0.0004, as shown by Table no. 7. The most significant change appears in the third scenario: A change in the distribution fee causes changes in the fix rates, which caused an increase in the final price of the delivery by 1.40% on average for the first time in our calculation. All these changes are presented in Table 10. This change causes a change of fixed rates of the price of gas distribution and in such cases have to be approved by a new priced decision of the Regulatory Office for Network Industries.

7 Conclusion

The energy policy should be an integral part of the economic policy and includes a long-term strategic framework. The conditions for liberalization of the Slovak energy sector and creating the new energy policy were created by the adoption of the third energy liberalization package. The competition arise only in some parts of the energy sector, and that, in the delivery and in the sales of natural gas. The distribution and the transportation of gas are the natural monopolies and the creation of the competition in these sectors is not possible, because it would cause growth of social costs. The regulated final prices of gas are used for protection of households and small companies from increasing costs of energy prices.[5] The simulated calculations shows how changes in input data can affect the price of the delivery for households. Nowadays, in the gas market, the demand is greater than offer. This is the reason, why the Regulatory Office for Network Industries forced only price drop of gas for households.

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FINANCIAL STABILITY IN SLOVAKIA IN LOW INTEREST RATES ENVIRONMENT

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ABSTRACT

Over the last few years, Slovakia has been witnessing an unprecedented credit growth in household sector translating into increasing indebtedness. Although starting from low levels, soaring household debt became a financial stability concern. In our article we analyse the nature of this risk and its interaction with residential real estate market against a background of low interest rates. As this is a typical macroprudential issue, we analyse the reaction of National bank of Slovakia in terms of choice and calibration of macroprudential measures taken to address these risks.

Keywords: Financial stability, interest rates, household debt

JEL codes: G21, R21

1 Introduction

Actual expansionary monetary policy in the euro area is very much influenced by deflationary pressures. However, recent experience revealed possible negative spillovers of accommodative monetary stance to the area of financial stability. In our paper we examine potential negative impacts of low interest rate environment on household indebtedness and housing market in Slovakia. Consequently, we analyse appropriateness of macroprudential measures recently taken by National bank of Slovakia in this respect. We find that prolonged period of low interest rates can contribute to a build-up of system-wide imbalances in banking sectors with traditional business model, even if macroprudential authorities decide to implement available instruments.

2 Literature overview

In the period of low interest rates, specific risks are to be examined and addressed by relevant supervisory and macroprudential institution. Lintner [9] says that the environment of low interest rates create negative incentives in the credit supply, when banks increase the total amount of credit to compensate the lower margins. This is in line with opinion of Banque de France [1], which stresses that investors are pushed towards the assets with more attractive risk and return ratio. The effects of the low interest environment is also in the centre of interest of many other central banks in Europe, like De Nederlandsche Bank [4], which questions the sustainability of business models in the financial sector, or Sveriges Riksbank [14] that indicates the low interest rates as a cause of increasing debt and increasingly rapid

real estate prices. European Central Bank [5] admits that some side effects of accommodative monetary policy need to be addressed by effective macroprudential policy.

Lintner [9] states that the most dominant trend in Slovak financial sector is intensive growth of household credit. Čeh Časni [3] stresses the importance of housing in the non-financial wealth of population, particularly in the post-transition economies in Europe. Jurča [6] further specifies that this segment is exceptionally important in Slovakia, due to high share on the balance sheet and high ownership ratio in the population, both in the international comparison. Relevance of the household sector for financial stability in general is emphasized by authors who include retail indicators in the calculation of various composite indices, among them Plašil, Seidler, Hlaváč and Konečný [13], or into the macro stress testing, e.g. Klacso [7]. Against this background, proactive policies have been adopted in many countries. According to Cerutti, Claessens and Laeven [2], institution-based instruments (leverage ratio, dynamic provisioning) and borrower-based instruments (loan-to-value, debt-to-income) seem to be the most effective. While the first kind is rather common for large number of different countries, the latter are used mainly in the advanced economies. Along with the choice of the right instruments, says Milne [10], it is of utmost importance to react in timely manner to future materialization of risks in excessive credit growth or asset prices.

2 Different effects of low interest rates

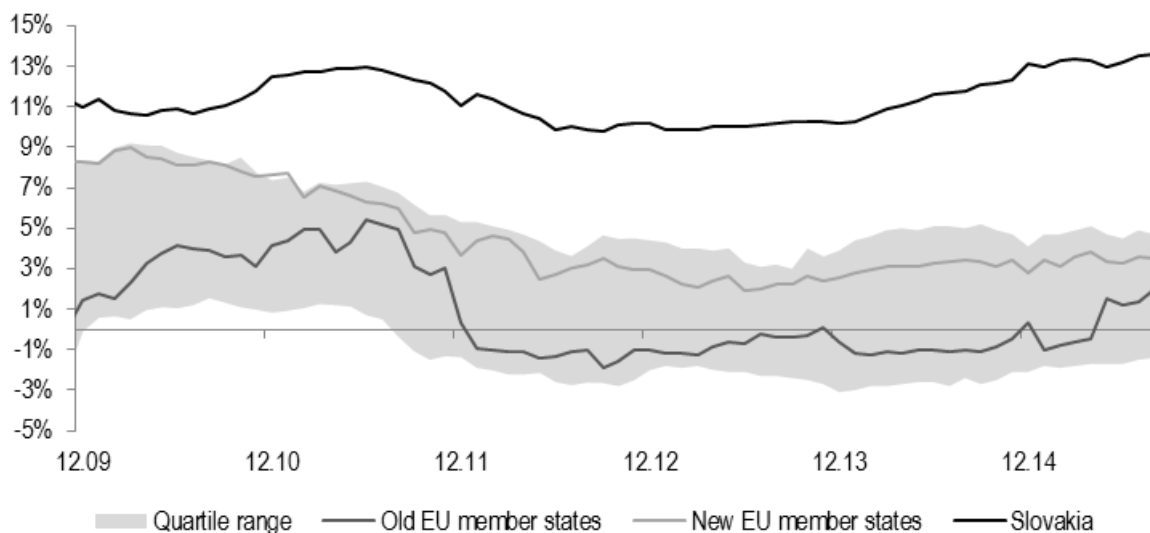
Financial stability questions are often linked to interest rates. More precisely, changes in interest rate environment can interact with cyclical systemic risks. However, nature of this interaction changes over time and depends on many different factors. Depending on circumstances low interest rates can either help to reduce imminent financial stability threats or contribute to building up of systemic imbalances. Similarly, an increase in interest rates can help to prevent emergence of imbalances or trigger a financial crisis. This contrast can be showed on example of Slovakia. During 2009 Slovakia faced a financial and economic crisis. As unemployment was on the rise, households struggled to repay their debts. In such circumstances, decrease in interest rates reduced monthly instalments and helped households to service their debts. Therefore, low interest rates can be considered to be a stabiliser in terms of financial stability. By contrast, during 2015 Slovak labour market has been improving and households have not felt any pressures like in 2009. Yet, the interest rates were much lower and incentivised household to increase their debt burden while keeping monthly instalments constant. In such case, when low interest rates act like a catalyst to lever up in a procyclical way, they act against financial stability. As a result, during 2015, low interest rates in Slovakia counted among the most prominent factors contributing to accumulation of imbalances in the household sector.

3 Household debt

Since the financial and economic crisis outbreak in 2008, Slovakia has been a country with the fastest growing bank credit to households. The difference in household debt dynamics between Slovakia and its regional peers has been widening. Positive macroeconomic developments including labour market, affordability of housing, positive expectations, initially low level of household's indebtedness, relatively viable demographic situation and falling interest rates count among the most prominent factors of remarkable credit growth. But most of these factors were present in many other countries without leading to similar dynamics in bank credit. Consequently, the supply side should be taken into account as well. Business model of the Slovak banking sector is very traditional and simple. Contribution of

interest income to banking sector profitability is one of the highest in the EU. As a result, interest margins in retail business constitute a crucial part of the overall income in the Slovak banking sector. Therefore, banks in Slovakia are more incentivised to extend lending activities in retail sector. With shrinking interest margins, the motivation to increase the volume of loans is ever stronger.

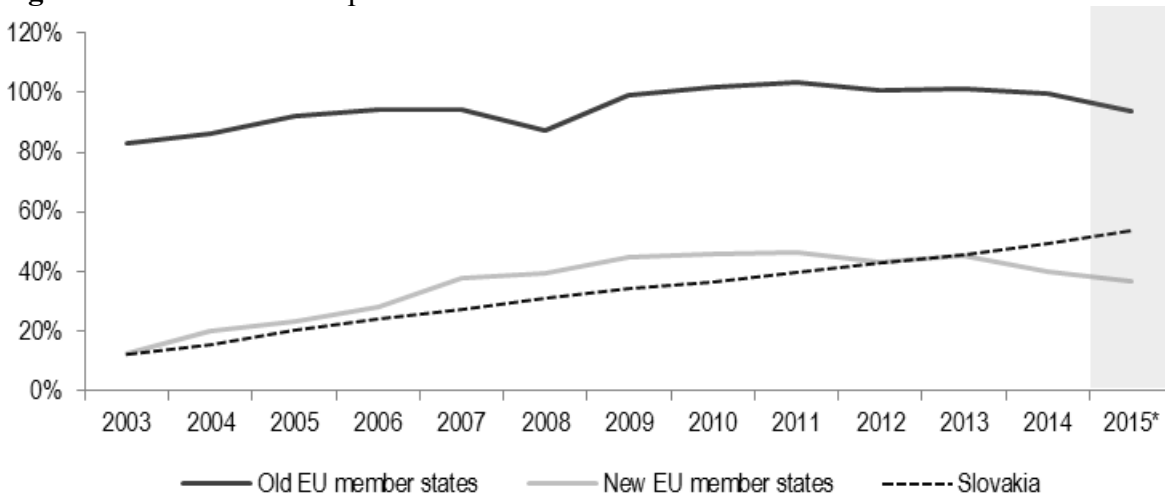
Figure 1 Y-o-Y household credit growth in the EU



Source: ECB

Increasing volumes of loans in household sector might be positive from both banks' point of view and macroeconomic perspective. However, these new banks' assets appear as liabilities in balance sheets of households. With surging credit, the indebtedness is soaring. Slovakia has been traditionally a country with very low indebtedness of households, for a long time below the median values of central and eastern European countries. In the last two years, indebtedness of Slovak households outperformed most of the countries in Central and Eastern Europe, while the gap between Slovakia and heavily indebted old EU member states has been narrowing. Slovak household became more vulnerable to possible adverse scenarios not only because of the size of their debts, but also due to the fact, that important part of this debt was originated at historically low interest rates.

Figure 2 Bank credit to disposable income in household sector

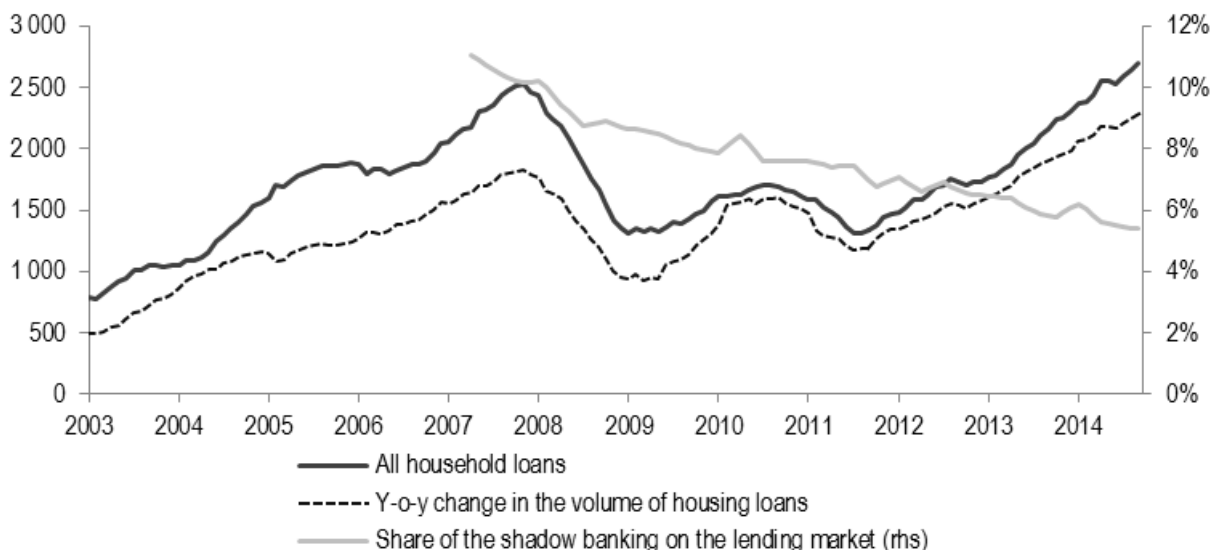


Source: ECB, Eurostat, NBS

Note: *Value for 2015 is an estimate based on 2013 and 2014 trends.

But there is also some good news about the indebtedness of Slovak households. Unlike in many mature economies, the structure of debt is dominated by housing loans. Even if housing loans are usually debts with extended maturities and thus slow amortisation plans, they can still account among debts with sounder basis. There is always some rational and some collateral behind. Moreover, the share of non-bank originated debt is not only very limited, but also decreasing over time. Also, such structure of debt, not based on consumer credit or credit cards, is usually more favourable in terms of servicing costs.

Figure 3 Nominal y-o-y changes in the outstanding volume of loans (mil. EUR)

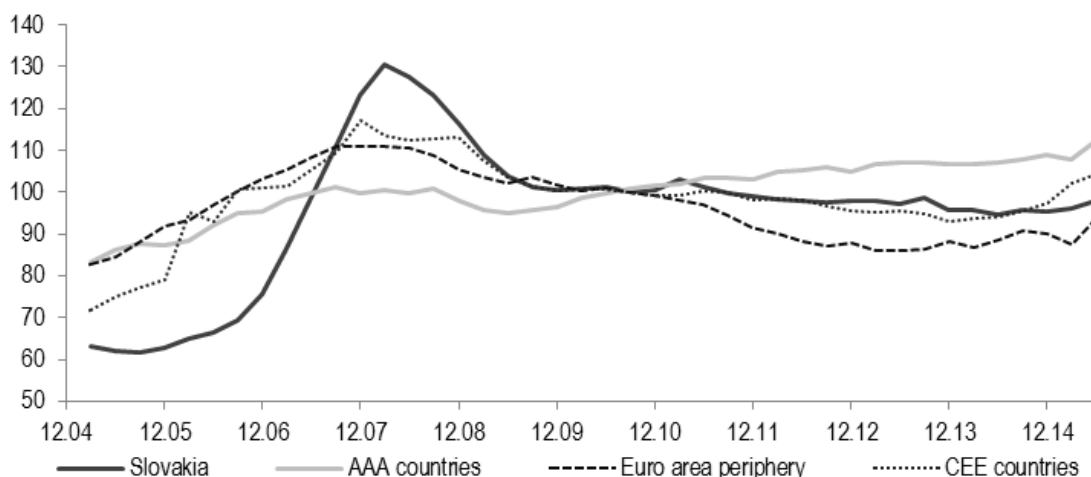


Source: NBS

4 Residential property market

Developments on residential property markets are extremely important for financial stability analysis. Its importance is even higher in traditional banking sectors exposed to retail sector. This is the first reason why residential property market is increasingly important to Slovak banking sector. The share of housing loans to total assets and to total loans is the highest among the Euro area countries. Secondly, historical volatility in residential real estate prices appears to be high compared to other EU countries. Similar swings in prices were observed only in some Baltic countries and Bulgaria. Part of the explanation can be in the high penetration of home ownership in Slovakia. Compared with many other countries there is no adequate renting market. If prices start to rise and there is no real option to rent and apartment, households tend to frontload purchases before the prices would become too elevated. This contributes to the spiral of expectation on all sides.

Figure 4 Residential property prices (2007=100)

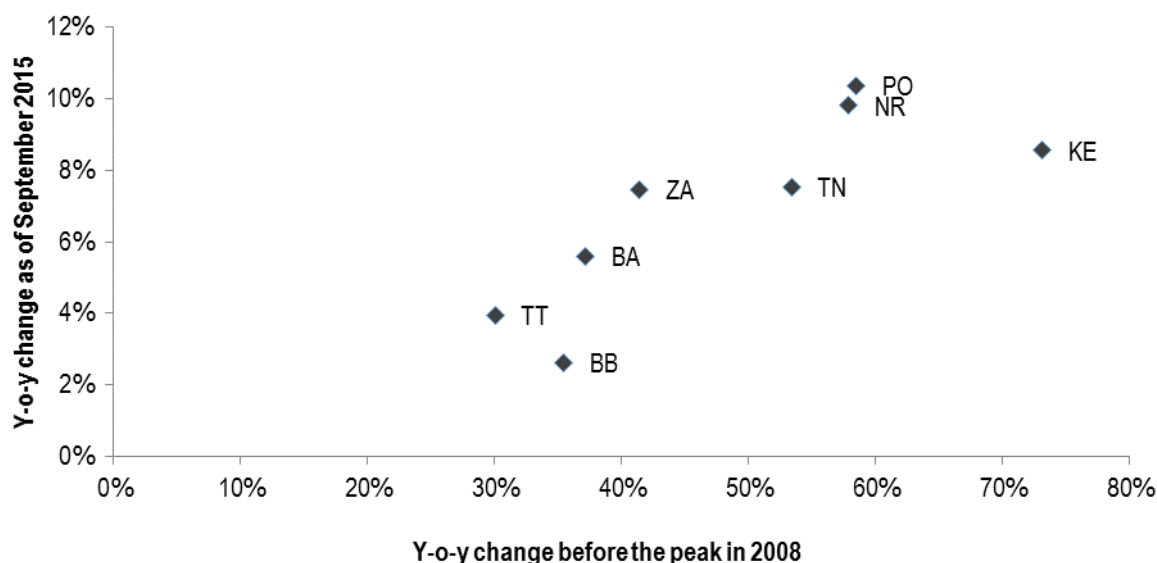


Source: ECB, Eurostat

Thirdly, the size of risk of individual housing loans is also determined by loan-to-value ratio. In this case, this ratio is a proxy of loss given default; the higher the ratio, the more severe the loss. During 2015 average loan-to-value ratio in Slovakia ranged between 71% and 75%, while more than one third of housing loans were provided with loan-to-value over 85%. Combination of above-mentioned risk factors (i.e. price volatility, concentration and loan-to-value), calls for more thorough analysis of developments on residential real estate market.

Between October 2014 and October 2015 Slovak residential property market witnessed a first increase in average prices since the burst of the 2008 bubble. On a year-to-year basis, prices jumped by some 8% on average, which is not too worrisome. However this increase occurred in deflationary environment and it was rather robust: prices rose in all regions, both large cities and countryside, it was observed in both marketing prices and transactional prices. This increase was not influenced by changes in average square meters of apartments and it was observed in average, median and different quartiles. More importantly, there seem to be a similar pattern in pre-bubble developments in 2007/2008 and current trends. Regions, where the imbalance in 2007/2008 was more pronounced tended to have a relatively more important increase in 2015. It is worth mentioning, that it is not Bratislava region, as one could expect.

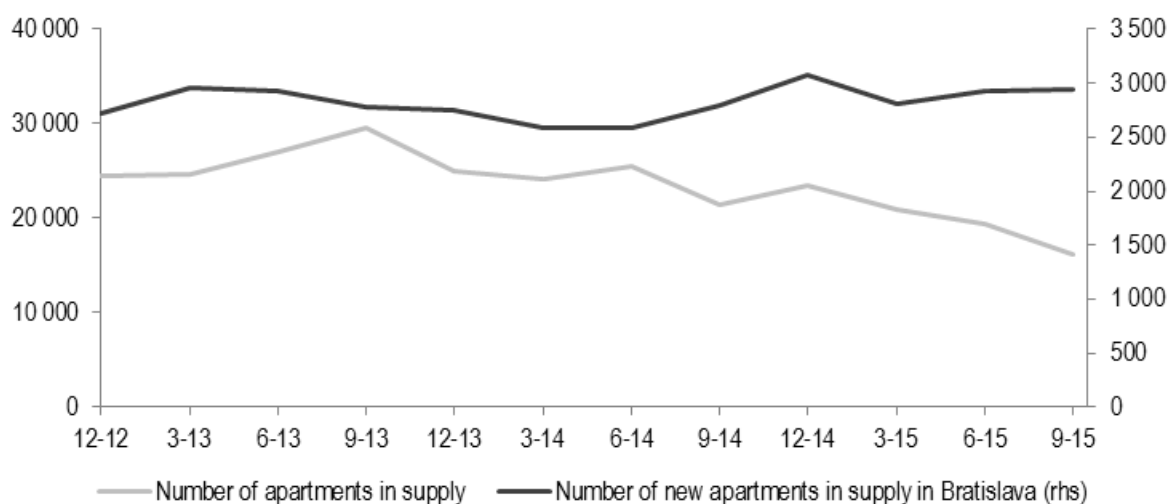
Figure 5 Dynamics of residential property prices in Slovakia regions



Source: CMN

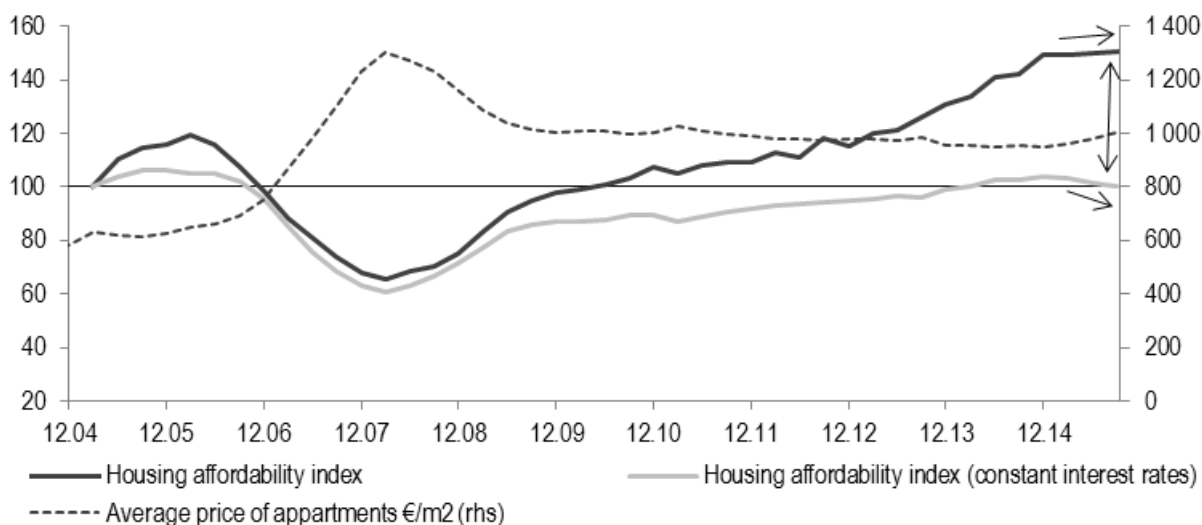
The second financial stability concern is related to the speed of sales. By the end of 2014, in period when prices began to go up, situation on the market has changed as well. As for primary market in Bratislava, households became more willing to purchase unfinished apartments, including apartments where the construction was only planned. On secondary market the demand became stronger as well. As a result, the number of sold apartment in respective quarters started to rise. As suggested, it was the case of both secondary market and primary market in Bratislava. The number of transaction has increased also relative to the number of apartment in supply. Also the structure of primary market has changed. Over last 4 years, the share of finished apartments in the supply fell from four fifths to one fifth. Increasing speed of sales, shift of the supply to unfinished apartments, growing expectations of developers, banks and households related to labour market improvements and augmented pressure on property appraisal bear the flavour of pre-bubble behaviour of the same parties. Of course there is a long list of dissimilarities as well, e.g. absence of foreign investors, different level of housing affordability index or demographic prospects. But there is also a very new strong but unexplored factor: extremely low interest rates.

Figure 6 Residential property: Supply side



Source: CMN

The importance of interest rates lies in the fact that most of the transactions on the residential property market is funded by housing loans. Consequently households also perceive the price of apartments and houses expressed in monthly instalments. In other words, the fundamental relationship between the price of an apartment and household income is blurred by interest rates. On the one hand, with a help of low interest rates, households can afford to by a bigger and newer apartment. On the other hand, low interest rates deform households' understanding of the size of debt their will have to service. The magnitude of this difference is expressed by the housing affordability index [8].

Figure 7 Housing affordability index

Source: CMN, NBS, authors' calculations

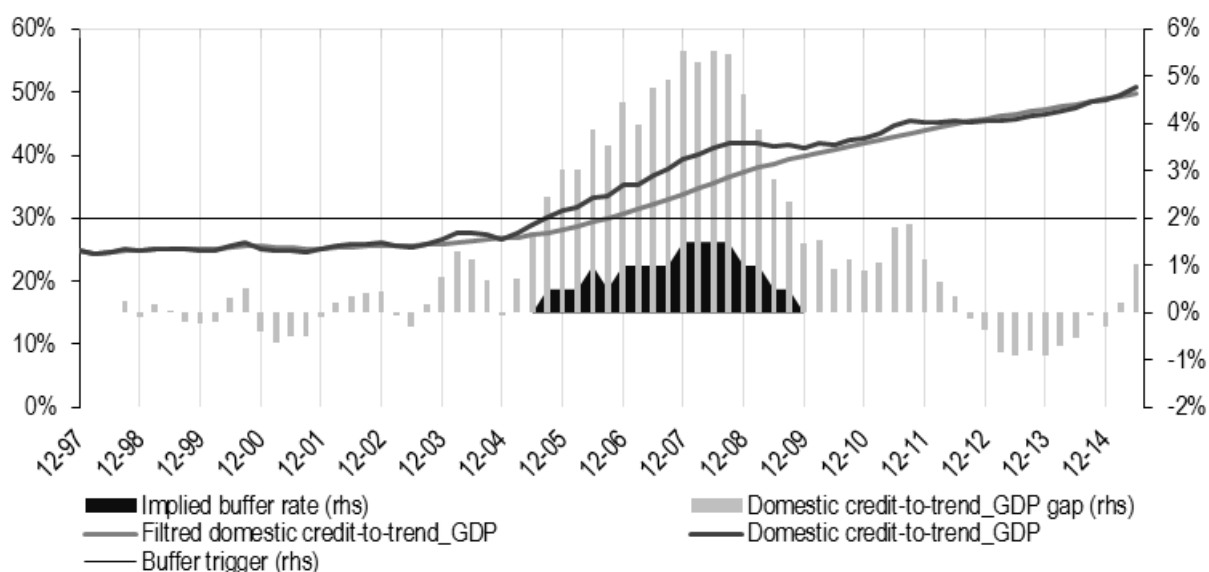
5 Macprudential measures taken by the NBS

Macroprudential authority in Slovakia, i.e. Národná banka Slovenska perpetually communicates its attitude to the risks present in the financial sector. In addition, it has already adopted some macroprudential measures also in the retail segment.

Firstly, a Recommendation especially focused on the retail segment was issued [12]. It comprises of several parts

- Loan to value ratio should not exceed 100 %, while the share of new loans above 90 % should be limited to 10 %, with regressive phase-in until 2017.
- Debt service to income ratio should be limited to 100 %, but the banks have the liberty to define their own DSTI ratio. NBS only set some features that must be incorporated in the calculation. As DSTI ratio is affected by falling interest rates, banks are recommended to account for potential 2 % rise in interest rate, unless it is fixed until maturity. Customer's income should be verified.
- Portfolio stress testing should be performed on yearly basis. The focus should be particularly on potential interest rates or unemployment increases.
- Maturity of new loans is limited to 30 years for housing loans, 10 % of new production might go up to 40 years. Consumer loans should not be provided with maturity longer than 8 years, phase-in was set until the end of 2015 with 9 year limit.
- All the rules applied to new loans should be applied on refinancing with substantial topping-up.
- Cooperation with mortgage brokers should be prudently managed.

NBS indicated an interest to implement the Recommendation into the legislation. Parts that are linked to housing loans have already been anchored in the Mortgage Credit Directive transposition [15].

Figure 8 Domestic credit-to-GDP_{trend} gap


Source: NBS, authors' calculations

Secondly, Národná banka Slovenska issued some forward guidance [11] about possible increase in counter-cyclical capital buffer rate. This instrument has however a very wide scope as it would impact all local exposures without differentiating between overheated household lending market and just recovering loans to enterprises. Moreover, due to higher average risk weights in enterprises than in households, potential impact could be asymmetric in a negative way. Nevertheless, some leading indicators confirm, that a non-zero counter-cyclical capital buffer rate could be envisaged during 2016.

6 Conclusions

Prolonged low interest rate environment can have some negative impact on financial stability. There are two major concerns. Firstly, booming household debt reaching all-time high is threatening financial position of households. Low interest rates do not lead to lower debt service of households, but to important increases in overall debts. Second, housing market is under the influence of low interest rates as well. Housing affordability index shows the extreme difference stemming from low rates. Consequently, analysis of equilibrium housing prices is very much dependent on interpretation of interest rates.

Against this backdrop, active approach of NBS seems to be appropriate both in content and timing. Even though the run up towards a new housing bubble cannot be entirely excluded, adopted macroprudential measures have the potential to mitigate such increase and subsequent negative impact on financial sector and whole economy. However, there is room for strengthening the financial stability by other instruments, namely by using countercyclical capital buffer. Another, even more effective capital measure directly focused on retail segment would be elevation of respective risk weights. Finally, even if such measures can improve overall resilience of banks, they have a very limited impact on formation of potential imbalances in this segment

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