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Households' Savings in the CEE Countries

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Abstract

Submitted article is focused to monitoring of the household savings in context of macroeconomic policies in the area of Central and Eastern European countries (CEE). Household savings in the CEE countries within the period 2005–2014 were assessed and impact of selected macroeconomic factors using regression analysis was evaluated. Despite the real household incomes per capita in the whole Euro area increased by 0.2 %, the household savings rate declined to 12.8 % in 2014. Results of the analysis confirmed strong positive impact of the disposable income in all the surveyed countries. Analyses confirmed linear relationship between savings, and independent variables such as gross domestic product, disposable income, inflation rate and unemployment rate.

Keywords: *household savings, gross domestic product, disposable income, unemployment rate, inflation rate*

Introduction

Nowadays economic and financial research is concentrating on the dynamics of macroeconomic stability, economic growth and especially sustainable development concepts, including its impact in the area of household finance. As the households represent important part of every economy, their budgets and savings are in the permanent centre of interest of the scientific research. Appropriateness of sustainable development approach in explaining the necessity to flatten cycles and prevent further vulnerabilities on the financial market and the entire economy [Popescu & Rugea, 2015]. Co-integration of unemployment rate and the household consumption are the main indicator of household possible reaction to expected or observed level of family income. Results of [Mielcova, 2012] indicated that the household responses to financial crisis vary from country to country. The countries in Eastern Europe, unlike the other European states, are affected not only by the world financial crisis, but also by the transition to market economy after 45 years of hyper-centralized model of the socialist economy [Niculescu-Aron & Mihaescu, 2014].

Monitoring the household savings in the context of macroeconomic policies using saving rates approach, which places emphasis on the household saving to disposable income ratios, [Bouyon 2016] observed the absence of correlation between saving ratios and different types of saving yields suggests the poor transmission of monetary policies in the trade-off between consumption and saving. His results confirmed the prominent role played by the precautionary motives during the financial crisis of 2008-2009, which is reflected in the strong impact of unemployment rates and housing prices.

Specific part of the savings belongs to the savings for retirement. Results of [Lopez, Bua, Gonzalez, & Pazos, 2012] showed that although the percentage of savers for retirement varies widely across countries, the driving forces of the decision of saving for retirement are quite similar and positively related to the individuals' age, financial literacy, household income, employment status and saving habit.

The current rising levels of migration is a specific phenomenon, influencing the financial situation in the country of origin as well as the host countries through financial savings, migrants send back home [Ashraf et al., 2015].

Individual perceptions of one's income and material conditions are the basic factor shaping the conditions of saving and creating financial reserves [Roszkiewicz, 2014]. Less is known about consumer saving and well-being at the base of the pyramid, which includes over 3 billion people who live on less than US$2.50 per day. Research evidence suggests that financial savings, is central to well-being in impoverished societies. In high-poverty societies, saving greatly improves well-being [Martin and Hill, 2015].

Due to common part of the history, the financial situation and household saving are unique among the Visegrad Four Countries (V4). In 2004, when the V4 countries of the Visegrad Group joined to the EU, were considered more economically weaker countries but also as economies with a big potential of economic growth. With a population of over 64 million inhabitants representing 13 % of the EU28 was to the total economic output in 2003 only about 3.7 % of the EU28 [Uhrova, 2015]. The countries passed an important stage of transformation during which they reformed social system of centrally planned economy. Implementation of economic reforms has been accompanied by systemic qualitative and quantitative changes, including the factors that led to the gradual adaptation to form market environments [Gregova & Dengov, 2015].

Similar economic behaviour in the Visegrad countries (V4) and old 14 EU countries were demonstrated by numerous authors. [Streimikiene & Kasperowicz, 2016] confirmed that economic growth and other variables (energy consumption, gross fixed capital) are cointegrated for the whole panel of countries as well as for the two selected groups of countries. [E. Jasova, Cermakova, Kaderabkova, & Prochazka, 2016] described effects of selected institutional factors on structural and cyclical unemployment in V4 countries. Hanousek et al. [2007] in their analysis of financial sector of the V4 countries showed, that the households and non-financial companies are the largest creditors. In terms of debits, non-financial companies are the largest borrowers.

Understanding of households' savings and investments is important from different reasons. At the national level, domestic investments are the main source of investment funding for both the government and the corporate sector. Rapid GDP growth leads to the growth of household incomes and higher rates of savings [Geetha and Vimala, 2014; Boďa et al., 2014].

Household income, level of education, employment, ownership of long-term assets, and household size represent important factors that explain the amount of households' savings and their behaviour when choosing a portfolio of investments. Inflation increases the likelihood of investment into the capital market instruments [Temel Nalin, 2013; Šoltés and Gavurová, 2013; Filip, 2014; Michalski, 2008; Fiľa et al., 2015; Szabo et al., 2013; Glova, 2013; Bánociová and Pavliková, 2013; Jasinska-Biliczak, 2013; Lipták et al., 2015].

The aim of the paper was the evaluation of the development of household savings in the Central and Eastern European countries based on the analysis of macroeconomic factors within the observed period 2005–2014.

Material and Methods

To assess the impact of macroeconomic factors, it is necessary to determine the disposable income, household consumption, and consequently the amount of savings.

The first part of our contribution was focused on analysis of development of the indicators mentioned within the examined countries.

The term households consisted of evaluation of domestic residents, sole traders, and non-profit institutions serving to households. Consequently, macroeconomic factors were set, including gross disposable income, gross domestic product, unemployment rate, and inflation rate, and then examined using multivariate regression analysis, where:

- response (dependent) variable represented:
  - S: volume of gross savings (in the € millions)
- explanatory (independent) variables were:
  - GDP: gross domestic production (in the € millions)
  - UR: unemployment rate (in %)
  - IR: inflation rate (in %)
  - DI: gross disposable income (in the € millions)

We assumed that the change of variable S can be explained by the changes of few other variables: GDP, UR, IR, and DI, and that the relationship between the dependent variable and independent variables is linear. We wrote it as a single-equation econometric model:

$$S = \beta_0 + \beta_1 * GDP + \beta_2 * UR + \beta_3 * IR + \beta_4 * DI + u_t$$

where: $\beta 0, \beta 1, ...\beta 5$ are estimates of regression coefficients,
u_t is a random component that includes unmeasurable random factors.

Model we have used, was considered ideal, when it does not contain heteroscedasticity, autocorrelation, multicolinearity, and if residues have a normal distribution. Eurostat [2015] and OECD [2015] data have been processed using R programming [R Core Team, 2012], and analysed to determine the influence of examined factors to the volume of households' investments. For all four observed CEE countries: Czech Republic (CZ), Hungary (HU), Poland (PL) and Slovakia (SK), several models were used.

Investment creation was significantly affected by examined variables whose p-value was less than the predetermined value $\alpha = 0.05$. Appropriate choice of the model was suggested by the coefficient of determination, designating how many % of the variability in investment can be explained by the model.

Model suitability could be confirmed also by the F-test of model's statistical significance. If the p-value was less than the predetermined value ($\alpha = 0.05$), model was considered significant. In case the regression coefficients' estimates were unbiased, but the p-values were incorrect, the wrong conclusion could be made because of the heteroscedasticity load (random parts had not constant variance). If the p-value of the Jarque-Bera test was higher than determined value ($\alpha = 0.05$), it was considered as normal distribution of residuals. If the p-value was lower, the variable was eliminated from the model. Subsequently, the normality testing of residuals was carried out [Hušek, 1992].

Autocorrelation occurrence: If the p-value of Breusch-Godfrey's test was higher than $\alpha = 0.05$; we considered no autocorrelation was affecting the model. If the p-value was lower, presence of autocorrelation was treated by the Cochrane-Orcutt's method [Hušek, 1992]. In case of all four observed CEE countries, we have worked with several models. The model was considered ideal in case of no heteroscedasticity, autocorrelation, and multicolinearity, if residues had normal distribution; and if the variables were significantly affecting the model. Only the values of the resulting models are presented in the work.

Heteroscedasticity detection: If the p-value of Breusch-Pagan test was higher than $\alpha = 0.05$; it was possible to confirm that the model is free of heteroscedasticity. Otherwise, the presence of heteroscedasticity was treated by elimination of the variable [Ochotinský et al., 2012]. For identification of multicolinearity we focused to the VIF value (*Variance Inflation Factors*). If individual factors were lower than 5, or lower than 10 respectively, we could state that the model is not affected by multicolinearity. If the values were higher than 10, the presence of multicolinearity was treated by removing the variable [Obtulovič, 2010].

Results and Discussion

For the analysis of factors affecting the volume of savings we chose selected macroeconomic factors: the gross domestic product, unemployment rate, inflation rate and gross disposable income.

Development of gross domestic product *(GDP)* as an indicator of economic activity in the individual countries represents a change in comparison to the previous quarters for the period 2005–2014 (in %). The pace of change in GDP was calculated as $(t_1-t_0)/t_0$. In HU and the SK the pace of change in GDP has decreased, confirming the trend of economic slowdown from the previous year. In 2007 there was a slight increase in the CZ and PL compared to the previous year, mainly influenced by consumption and investment. Investment activity growth in all areas, and in terms of household consumption, consumption expenditure was affecting the growth in real household incomes, which grew faster than productivity. Similar results were described by Raisová [2011] and Nevima & Majerova [2015].

In 2008, decline of the pace of change in GDP in all surveyed countries was observed, (the least fall was found in SK), resulting from the financial crisis. A year later there was a revival of the economy, which affected the growth of gross disposable income. In 2011, a decline in pace of changes in GDP was recorded. Negative contribution to this decrease has the domestic demand, as investment and private consumption decreased. In late 2013, the rate of change in GDP remains almost unchanged; in PL, SK and HU a slight increase, while in the CZ a decrease was noticed. In 2014, however, the CZ recorded an increase in the rate of change in GDP, along with SK, while in PL and HU steep fall was reflected. Source of growth was household consumption and improvement in the labour market, the unemployment rate in SK decreased by 1.7 % and in the CZ by 1.2 %. Masarova [2014] in her work have found significant differences among the states of Visegrad Group but also among the regions within the same state in regard to GDP per capita, employment and unemployment. The biggest economic performance was according to her findings achieved by regions with capital within. The highest increase in performance was observed in regions of PL and SK. Analysing economic cycles by GDP, Brenova [2012] have found, that after a period of positive rates of growth follow absolute decrease of real GDP during 2009 year. The exception is PL, where was only slowdown, while the deepest decline she found in HU.

Next observed parameter, the *unemployment rate (UR)* had a fluctuating trend within the examined period. The best results were obtained by the CZ, which in spite of the recession maintain single-digit UR, the worst results were observed in the SK. The financial crisis impact has influenced also the labour market. Tendera-Wlaszczuk & Szymanski [2015] classified the CEE countries according to the welfare state models, in terms of the principal assessment criteria that include the labour market situation, as well as the reduction of poverty and social inequalities. According to their nomenclature they added the CZ to the Nordic model, HU and SK as Continental and PL as Mediterranean. The Nordic system performs the best among all the welfare state models. However, their policies have not been very cost-effective; public spending exceeds 30 % of the GDP, and the global crisis has increased it even further. Until 2008, the UR was decreasing in all observed CEE countries except HU, which recorded growth by the end of 2012. Those results were also supported by results of [Masarova, 2014]. The UR has therefore deteriorated regardless of whether the financial crisis hit the country. However, till the end of 2012 it began to decline gradually, and in 2013 and 2014 it was the second lowest value of this indicator within the CEE countries (7.8 %).

The SK showed high levels of unemployment after 2008. The emergence of the crisis has negatively impacted this area, and within two years the indicator climbed up to 14.4 %. As part of the shock wave the collective redundancies of individuals occurred. The UR remain at this level till the end of 2013, when it began to decrease and got to the level of 12.6 %. Despite of this trend showed the SK the worst results and remain the country with the highest UR within the CEE countries. The highest value over the past ten years was registered in PL in 2005 (17.1 %). Since then, UR there was decreasing until 2008, when it reached the level of 6.9 %. The crisis has increased it again, but the increase was the second lowest among the CEE countries. The UR began to decline in late 2012, and reached 8.2 % in 2014. As regards the CZ, the decline in the number of employed people showed an

increase in the number of jobseekers and the UR by 3 % in 2009. Over the last ten years all CEE countries managed to reduce the UR and this trend continues.

Another examined variable the *inflation rate (IR)*, have increased uncertainty about future incomes and thus increase the savings rate. After the adoption the euro these countries will not be able to control the potential inflation pressures under the common monetary policy performed by the European central bank [Mirdala, 2008]. This indicator is captured through the HICP (*Harmonised Index of Consumer Prices*). The IR fluctuated in all observed CEE countries alternately and irregularly. Highest value was reached in HU in 2007 (7.1 %) where also the highest level of inflation rate among the CEE countries was recorded during the surveyed period. The acceleration of price level growth between 2006 and 2007 was caused mainly by services, food and adjustments in administered prices. After the onset of financial crisis, the value of inflation rate began to decrease from 7.1 % to 4.2 % at the end of 2008. As in HU, also in other CEE countries, growth accelerated in the price level, most growth was registered in the prices of food and energies, influenced by global factors in 2007. In 2008, however, a decrease in inflation occurred, except the SK, where the value of IR increased by 1.5 %.

The negative impact of the crisis began to show since 2008. High growth of indicator was in the SK when the value climbed by 4.7 % till 2011, and in the CZ by 2.8 %. While in 2009, commodity prices have attenuated the price growth, increasing their prices, together with the gradual economic recovery in 2010 led to accelerated price growth. The analysis of Jasova [2015] has also found a rather weak effect of the demand shock in the V4 countries in the period of financial and economic recession and in the period immediately following this substantial system-level change. In 2010, the SK was considered the country with the lowest inflation growth, but in next year belongs among the countries with the fastest growing price level. PL in the long term view has a positive assessment of the development, even with the variable character. Since the end of 2012, the IR in all CEE countries gradually decreased, while in 2014 this parameter was at the level of decline (-0.1 %).

The last examined parameter, the *disposable income (DI)*, implies that richer households are saving more. A positive correlation between savings and DI was confirmed by the Friedman's theory, according to which the households begin to draw on their savings in case they consider the decline in their incomes is temporary. In case of permanent change in incomes they adjust the consumption. The development of household DI is shown in Table 1. Impact of selected macroeconomic factors on the amount of savings using regression analysis. In the following overview the results of comparison of saving models in individual CEE countries have been processed. Results of Bouyon [2016] in this context showed consistently significant β-convergence since 2007 in the EU, indicating that the need for balance sheet repair was stronger for countries with low pre-crisis saving rates. Similar results were described by Annoni & Weziak-Bialowolska [2016], suggesting the anti-poverty policies recommendations for the European Union regions.

Based on results of regression model for the CZ, it was found that a GDP and DI had the greatest impact on savings. From the basic model, which was significant only at 30.08 %; the UR variable was rejected because its p-value (0.34730) >0.05; followed by the IR variable, reaching the p-value 0.22015 (>0.05). Two independent variables (GDP and DI) remained in the model. If the DI has increased by a single unit with other variables unchanged, the savings would increase by 0.64218 units. By the given regression model we explained 81.5 % of the variability in the volume of savings (Table 1). Residuals in all examined countries had a normal distribution, model was free of heteroscedasticity, multicollinearity, and autocorrelation, as the p-values were higher than 0.05.

In case of the SK the greatest impact on savings had UR and DI. The IR variable, as it had a p-value of 0.7243 (>0.05), and the GDP variable, which had a P-value of 0.0521 (>0.05) were eliminated from the basic model with 70% significance. Two independent variables UR and DI remained. In those it have been found, that if the DI will increase by a single unit, the savings will increase by 0.75529 units and, if the UR increased by single unit, savings will increase by 106.85133 units (Table 1). Model as a whole was statistically significant and explains 83% of variability in the volume of savings.

Table 1: Values of the resulting models of investments in individual V4 countries
[Source: own processing]

Country	Coeffic. of determin.	VIF – diff(GDP) -(DI)	Diff(GDP)	Diff(DI)	Jarque Bera Test	Breusch-Pagan test	Breusch-Godfrey test	RESET test
CZ	0.815	3.955	0.00014 ***	$4.24e^{-11}$ ***	0.785	0.8111	0.1116	0.106
HU	0.5045	1.0236	0.00491 **	$1.36e^{-06}$ ***	0.43	0.2334	0.0616	0.174
PL	0.804	1.9622	0.0316 *	$1.24e^{-13}$ ***	0.952	0.5841	0.417	0.583
SK	0.833	1.0049	0.00137 **	$< 2e^{-16}$ ***	0.056	0.0872	0.6958	0.347

Table 2: Shape of the resulting models of investment in individual V4 countries
[Source: own processing]

country	modified model	estimates of regression coefficients	resulting model
CZ	$S = \beta0 + \beta1*GDP + \beta2*DI$	$\beta0 = -60.76162$ $\beta1 = 0.13799$ $\beta2 = 0.64218$	$S = -60.76162 + 0.13799*GDP + 0.64218*DI$
HU	$S = \beta0 + \beta1*UR + \beta2*DI$	$\beta0 = -13.5931$ $\beta1 = 0.5438$ $\beta2 = 2.0446$	$S = -13.5931 + 0.5438*UR + 2.0446*DI$
PL	$S = \beta0 + \beta1*GDP + \beta2*DI$	$\beta0 = -871.80973$ $\beta1 = 0.13323$ $\beta2 = 1.30282$	$S = -871.80973 + 0.13323*GDP + 1.30282*DI$
SK	$S = \beta0 + \beta1*UR + \beta2*DI$	$\beta0 = -67.83485$ $\beta1 = 106.85133$ $\beta2 = 0.75529$	$S = -67.83485 + 106.85133*UR + 0.75529*DI$

In HU and SK the greatest impact had UR and DI. The basic model of HU was the only one in which all the variables were statistically significant. Since it was necessary to logarithm the model, IR and GDP variables have been excluded, thus we got a new model, consisting of logarithmized UR and DI. If the disposable income will be increased by a single unit, savings will increase by 2.0446 units. If the UR will be increased by a single unit, savings will increase by 0.5438 units.

In PL, as well as in the CZ the biggest impact had GDP and DI. The model had 90 % significance, the IR variable with a p-value of 0.7581 (>0.05) and the UR variable, with a p-value of 0.5398 (>0.05) were excluded. Two independent variables GDP and DI remained. In those it was found that when disposable income increases by single unit, savings will increase by 1.30282 units, and if the GDP increases by a single unit, savings will increase by 0.13323 units. Just in the contrary, in the CZ the growth of this variable caused decline in savings (Table 1).

Conclusion

Main focus of study of households finance nowadays is focused to the decisions about how much of their disposable income will be used for their current or future consumption.

The growth of the Czech and Polish economy was influenced mainly by foreign demand; domestic demand declined due to lower household consumption, thus the savings has increased. On the other hand, in the Slovak Republic and Hungary it was the unemployment rate, which significantly affected the volume of the savings. Based on our results the inflation rate does not belong to important determinants of the volume of the savings in any of observed CEE countries.

In our research we used the multidimensional regression analysis, which confirmed the fact that disposable income is the most important determinant of consumption and savings. In all observed Central and Eastern European countries a strong positive impact of household disposable income to the volume of savings was confirmed, i.e. growth in disposable income caused the growth of savings. In general, wealthier households are saving more. Impact of GDP to the volume of savings was significant in the Czech Republic and Poland.

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Tax Optimisation – Slovak Approach

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Abstract

Tax planning is a perfect instrument of the financial management. The optimisation is a strong argument for the effective management and prevention in audit. It is the challenge and chance for the state, public and private sector. It is taboo, mystery and secret. Methods and procedures of tax optimisation are the original and difficult know-how. Tax optimisation is the right way to elimination of the risks and challenge to increase the profits. The prevention is always cheaper and far less „painful“ than cure.

Keywords: *tax optimisation, methods and procedures of tax optimisation, tax planning*

Introduction

Efforts to optimise processes and improve systems are the ambition of every good manager and responsible economist. The managed regulation of finances so as to pay at least the non-productive costs includes, in terms of both legal entities (company, firm and organisation) and individuals (citizen and entrepreneur n the role of small businesses), an effort to save as much taxa s possible.

Being able to organise it so that it is flawless and without violating the law is not easy, but it can be gradually learned. This process is called tax optimisation (tax planning).

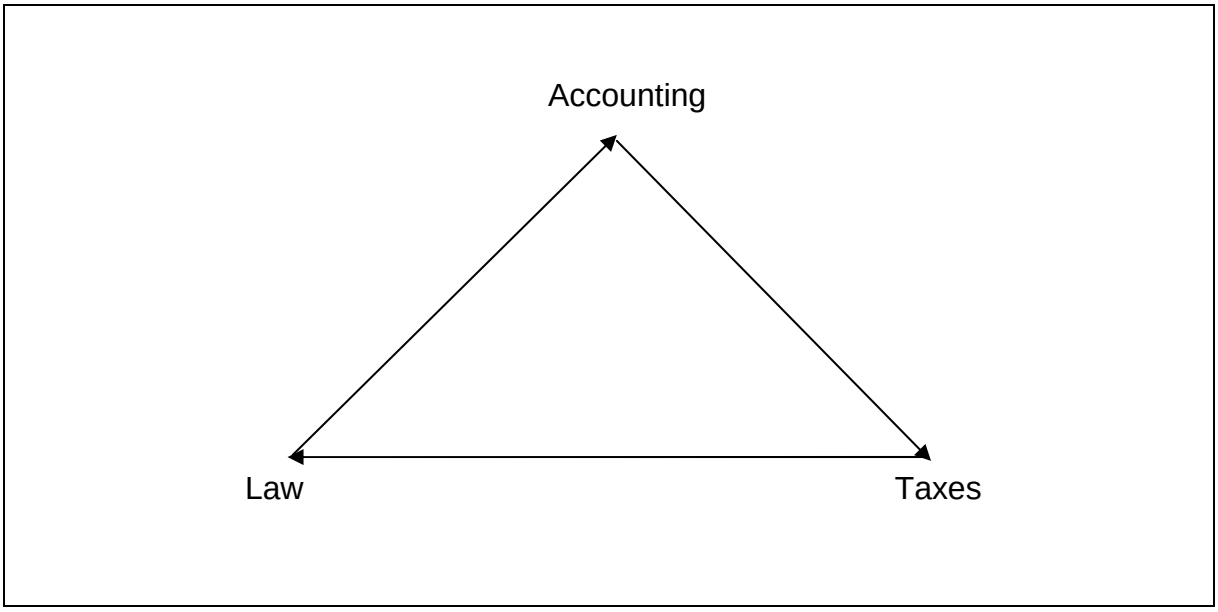
1. The base information is combination

Financial management of assets and liabilities in every standard economy around the world uses tax optimisation. However, in Slovakia even after twenty-six years (1990-2016) following an economic transformation from a central economy model to a market economy model, consuetudinary law still fails for various reasons to mention tax optimisation. Tax optimisation is balance between minimum inputs and maximum outputs first of all from the side of risk versus profit (benefit).

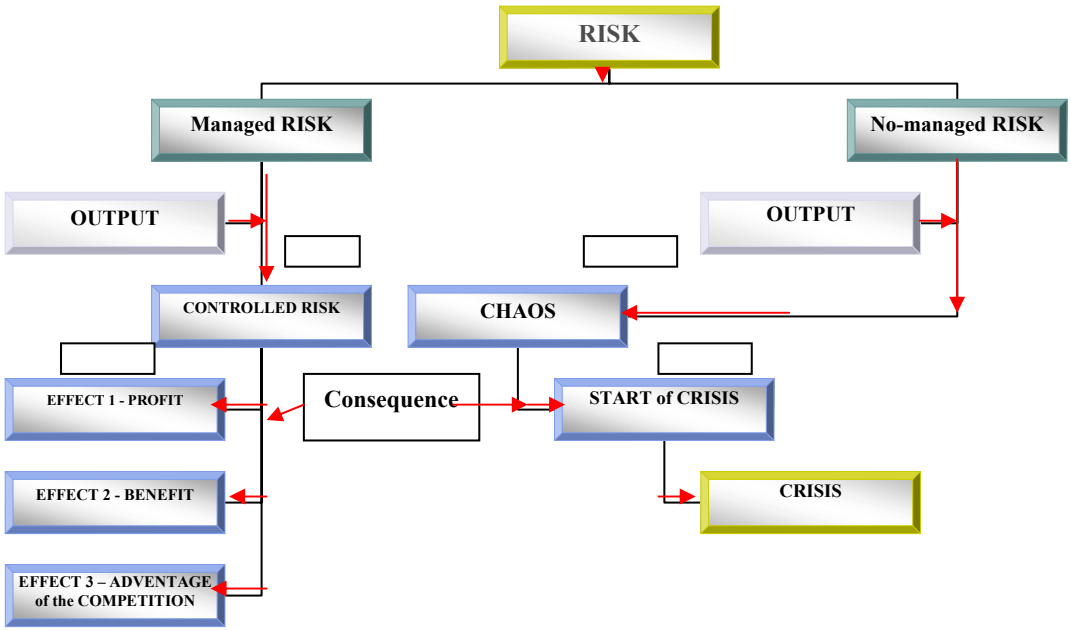
The objective of this article aims the tax optimisation, evolution of the chief trends by Slovak experience in the period of the year 1990 - 2016. The collection of aim to explore ways and summarizes the conclusions and recommendations is very difficult, because this topic is usually secret.

However, times are gradually changing and tax planning and tax optimisation are too strong an economic argument for the overall efficiency of the economy, both at a macro-level (optimisation of the State tax policy) as well as the micro-level (optimisation of corporate or individual taxation). Significant accelerators affecting change for tax optimisation have been the latest changes affecting the economy. For instance, the global economic crisis, the quantity (volume) and quality (rates,

structures) of imposed taxes and many other elements those need to be constantly corrected towards improving the quality of life and comprehensive socio-economic prosperity of the country.



Schema 1. Combination of tax optimisation
Legend: The sources of tax optimisation are accounting, taxes and law



Schema 2. Risk management of tax optimising
Legend: Controlled and managed risks aim the effective output generally, also in the tax optimising

At the macro-level, tax optimisation is, for example, a reform of the State tax policy or a corporate tax policy of a large international concern (e.g. Volkswagen, Toyota, Pepsi, Apple, Google, etc.), which has a number of branches/factories in different countries with different levels of taxation. At the micro-level, tax optimisation can be described as searching for the optimal taxation of a company, a firm or a citizen.

When the State needs to optimise the taxes (to make a decision whether to reduce them, to increase or maintain their current level of quality and quantity) then it is often called internal (when we are talking about State taxes) or external (for example, when Slovakia, after accession to the EU in May 2004, needed to align tax policy and legislation with European law) tax coordination or tax harmonisation. When a company wants to optimise their taxes, it is called a financial management, tax planning or the productive reduction of costs.

Many issues are resolved before the end of the balance-sheet period (financial year, fiscal year, taxation period) in order to identify any tax risks and to determine how companies, firms, businesses and non-professional people need not pay more taxes than is strictly necessary in accordance with the applied tax law. In principle, the procedure is always the following:

1. Standardised – i.e., traditional ways (applied during the whole year); and
2. Non-standardised (irregular) – i.e., non-traditional (for example, some seasonal fluctuations or special procedures, such as an amendment to the income tax law in a given year, which provides some transitional procedures).

This classification could continue further (legal and illegal, productive and counter-productive, low-risk and high-risk, etc.), but this is not essential.

The basic starting points for tax optimisation are tax information and knowledge. To implement tax optimisation within the legal bounds of the system, the combined knowledge of several disciplines (accounting, taxation, analysis, law and consultancy) is required. To learn and understand such techniques and practices, a person needs to know a considerable amount of informal (undocumented) and strictly guarded procedures and processes. The goal of any optimisation exercise is primarily to apply the MiniMaxrule – „With minimum cost to achieve the maximum benefit“. In terms of creativity it is interpreted more clearly – „A common way to achieve extraordinary result“. Tax know-how (knowledge) is not only difficult but takes a long time to acquire, meaning that it is not readily available to the layman. There are two specific groups of tax optimisation, the main (primary) and secondary (indirect) methods. In an environment of „friendly“ taxes, where law tax rail prevail, the basic method can be highlighted as an ideal choice for a tax process. Those who understand the tax processes can save a lot of taxes.

2. Method and Procedures for Tax Optimisation

Basic methods and procedures

The basic methods of tax optimisation in the Slovak Republic are:

- Long-term tax planning involving domestic and foreign tax policy for cross-border transactions with the use of specific tax haven legislation.
- Profit control (management of profit or loss) before taxation (i.e. rationing, effectively balancing revenues/incomes and costs/expenditures), from which arises the gross tax base.
- Knowledge of the tax process (Act 563/2009 Coll. On the administration of taxes) and the tax administration (in the Slovak Republic there are two levels of tax administrators – financial (after unification tax and customs from 2012 and local authorities).
- Effective tax communication with the tax administrator (not just during tax audits, but also regarding other tax administration issues, e.g. advance payments or application for differed payment or tax (slang calls it „maximum annual tax credit“).

Indirect methods

Indirect methods provide a number of other options:

- Knowledge and use of depreciation policy: differentiation between a uniform and an accelerated depreciation.
- Creation of reserves and provisions in relation to taxation.

- Knowledge of tax expenses (e.g., „proportional costs“), especially, those that are not directly mentioned in the law.
- Differentiation of incomes that are exempt from tax.
- Payroll optimisation: the employment relationship between the employer and employee based on the employment or special agreement (tax deductions are not applied in the case of a special agreement).
- Differentiation of certain types of contracts to reduce taxes (a choice between options provided by the Business Code and the Civil Code).
- Other specialities – optimisation of taxation on rentals, acquisition of cars without VAT, etc.).

Available knowledge in this field (techniques, procedures, calculations, practices) towards legal savings and minimisation in taxes without violating the law is never completely found in textbooks, as this know-how is considered precious, rare and fragile and is strictly guarded, as are the highly appreciated individuals who operate from case do case.

3. Available and valuable know-how

For the last 26 years of a modern taxation there have been developed in Slovakia some educational tools related to the effective taxation issue. Among others, there is a textbook „Tax Optimization“ [Burak, E., 2002] and textbook „Tax Planning” [Burak, E., 2004]. Besides the knowledge of specific tax advisors (www.skdp.sk) and other consulting firms (auditors, economic advisors, certified accountants, financial advisors, etc.) there is a vast range of information on the Internet. Simply enter the search terms „tax optimisation, tax savings, tax planning, aggressive tax planning, minimisation of taxes, etc.).

In addition to the website of the tax administration of the Slovak Republic (www. financnasprava.sk; the special-known portals on this topic include: www.danovecentrum.sk; www.investujeme.sk, www.porada.sk, www.zivnostnik.sk, www.openiazoch.sk; www.epi.sk, www.i-adviser.com, etc.

Sometimes it is possible to achieve tax savings in one big step, in other cases gradual steps and actions maybe necessary in order to achieve a desirable solution. Because tax optimisation is the work of skill and experience, these are practitioners and not theorists who benefit. Tax experts in Slovakia are unlikely to publicise their schemes for tax savings since they not wish unwelcome controversy or discussion with authorities. Especially, they do not want do disclose their strictly guarded precious knowledge. A more transparent approach to the sharing of knowledge can be found in the more developed and standardised economies.

A very good source of knowledge in tax optimisation is the collection of so-called „tax case law“, which is accepted by all tax authorities in the Slovak Republic and is the result of judicial decisions made in the Slovak Republic or in the EU on tax matters in the past.

4. Practical experience from the years 1990-2016 in Slovakia

Sometimes there is an equal or different approach towards tax optimisation, e.g., in terms of business of large entity (legal persons), in terms of a joint stock company under the double-entry bookkeeping, and in terms of small entity (natural persons), such as small business under single entry bookkeeping.

Tax specialists and time sequence

In a large (macro-level) company every accountant, financial manager, the chief economist or economic manager should have the basic knowledge of tax planning or they would need to hire an internal tax specialist. Consultation with external tax advisors, in our opinion, is not enough.

In a small (micro-level) company every citizen or a sole proprietor should already know that in November it is necessary to pre-count their income and calculate the tax, by reviewing revenues and expenditures, income and expenses to determine their tax liability and, if it is too much, what can or can not be done to legally reduce it.

Such an approach works not only in our country but world-wide. Different opportunities exist because of differences between double-entry and single-entry bookkeeping and also differences between legal entities (e.g., large organisations) and individuals (e.g., small trades).

Prevention in pre-audit

Even in the area of taxation we recognise that prevention is always cheaper and far less „painful" than cure. This axiom is not only applicable in medicine but also in the economic environment. Anyone who wants to do well in the field of taxation need to be aware of the risks involved and should study all available literature related to tax planning. Many of the procedures must be carefully prepared in advance, leaving nothing to the last minute. Taxpayers have the opportunity to contact the tax (financial) administration prior to establishing their business in order to clarify issues relating to their future potential tax liabilities.

A typical practical example based on experiences from Slovakia of tax prevention is for the taxpayer to allow the tax administration to make an audit or control prior to the start of a normal tax audit, based on a contract between the two parties. This is particularly suitable for start-up businesses. The so-called pre-audit, made by experts from non-tax authorities, can sometimes save huge amounts of money for the taxpayer because the tax Office not only assesses additional tax, but also imposes penalties for irregularities found.

Tax are planned by the State, citizen and businessman

Taxpayers in Slovakia now understand the benefits and gains to be made form correct tax planning. Tax planning is carried out not only by the tax administration, but also by the taxpayer. However, everyone is doing it at different levels of understanding, which can be in contradiction to one another, thus creating an understandable paradox.

The tax administration (in Slovakia – financial authorities /together bounded the customs and the tax authorities from 2012/, and municipalities) is looking for logical ways to establish a realistic plan of tax revenues and thus collect as much taxes as has been predicted. In contrast, the taxpayer (citizen, businessman and company) has as their main objective of tax planning to do everything possible in order to find a legitimate way not to pay a penny (euro) more than it is really necessary. Tax planning is now, after twenty-three years of building a modern market economy and tax system, already the standard for the majority of taxpayers in Slovakia.

Prudence also in case of tax advisors

Some advice, which has, in the past, proved to be of excellent strategic and tactical benefit when negotiating with the tax administration in deciding procedures and selecting their tax consultants and remain valid today are the following:

- Always ask for advice on a specific problem and address questions in writing (orally it is insufficient).
- In order to reduce the risk of errors and to secure guarantees for the services of the tax consultants (legally, members of the Slovak Chamber of Tax Advisors must be insured against errors and financial loss arising from the provision of erroneous advice to their clients).
- Sign a written contract for tax consultancy with a tax advisor.
- Check the level of insurance of a tax advisor in the context of the amount to which you will be covered.
- If you want to choose a representative permanently (according to § 9 of Act No 563/2009 Coll. on Tax Administration), first check their references to their successes and test them (for example, initially only give them a general power of attorney for a temporary power of attorney to represent you in a particular tax audit).

Even among experts and qualified professionals, it is wise to establish the accuracy of the information provided. According to the wise elders advice: „Trust, but verify!“

Difficults in coping with tax process

The most important thing for tax optimisation for all parties involved (tax administration, taxpayer or tax advisor) is to have a direct experience. It is extremely demanding to have the necessary combination of knowledge in tax law, accounting and financial analysis. The basic prerequisites for understanding the complexity, risks and opportunities in the tax optimisation process do not particularly relate to substantive standards (e.g., accounting law, income tax law, VAT law, etc.), but to the fundamental procedural tax law, in which Slovakia is represented by the law (563/2009 Coll.) on tax administration (so called „Tax Code“). This can be attributed to knowledge gained from specific examples, case studies and court decisions in tax matters (the tax case law).

Conclusions

A summary of the basic knowledge required by a taxpayer for tax optimisation is primarily a combination of the following steps:

- To summarise the background and collect examples, lessons and case studies (e.g., tax case law).
- To practice tax planning.
- To train an internal tax specialist and carefully select an external tax advisor.
- To be able to calculate taxes and not just „to talk“ about them (e.g., to be able to determine if it is effective to invest in tax optimisation or simply to pay the taxes).
- To maintain a tax calendar to ensure deadlines are met.
- To comply with the obligations of a taxpayer in accordance with the Tax Procedure (Act 563/2009 Coll.) and other taxation law (e.g., income tax, VAT law, etc.).
- To study and continuously educate themselves in this area.

Tax planning and tax optimisation are interwined. They form part of pragmatic economic and financial strategies. The financial strategy of all taxpayers who use it will benefit today, tomorrow and in the future.

However, quality and quantity of tax planning will change over time depending on the development of fiscal and economic policies and market fluctuations. Investing into a lifelong commitment to pay and optimise taxes is definitely worthwhile.

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The Implication of GVC's Participation on Labour Structure in Case of the Slovak Republic

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Abstract

The World Input–Output Database (WIOD) that provides annual time-series of world input–output tables from 1995 onwards, allows a revisit of the debate on the effects of offshoring on labour demand. This paper is focused on analysis of the labour structure changes due to growing participation of Slovak economy in global value chains during last 17 years. Particular attention will be focused on the internal qualification of labour in selected 10 industrial sectors.

Key words: *Theory of optimum currency areas, Eurozone, Exchange rates*

1. Introduction

Recent decades have seen the emergence of global supply chains in which production stages are divided and distributed across countries. The flows of value added across countries rather than goods have become an increasingly debated topic due to the rapid international integration of production processes. The questions ranking from how global supply chains influence income distribution to how they transmit shocks across borders, how fragments of value added are combined via the global supply chain to form final goods [Foster–McGregor, Stehler 2013, Johnson, Noguera 2012]. Declining coordination and transport costs, production processes increasingly fragment across borders. This fundamentally alters the nature of international trade, away from trade in goods towards trade in tasks and activities, with profound implications for the geographical location of production, the patterns of gains from trade and the functioning of labour markets [Feenstra, Hong 2007].

The World Input–Output Database (WIOD) that provides annual time-series of world input–output tables from 1995 onwards, allows a revisit of the debate on the effects of offshoring on labour demand as well [e.g. Foster-McGregor, Stehler 2013]. The WIOD provides data on the factor inputs used in production, low, medium and high-skilled workers and capital. Timmer et al. 2015 studied the German automotive industry and the effects of offshoring on labour demand. Their findings showed that the decline in domestic value added appears to reflect declining contributions from less-skilled domestic labour, in particularly medium-skilled workers. The value added by domestic capital and high-skilled workers in contrast held up well as their shares did not, or only slightly, decline. The change in the factorial distribution of foreign value added did not mirror these domestic changes. Value added by less-skilled foreign workers increased somewhat but by much less than the decrease in Germany. Obviously, this is due to lower foreign wages, which is an important driver for international production fragmentation. In addition, it might also indicate that activities carried out by these workers are increasingly automated, as they are typically routine-based. This hypothesis is buttressed by the

finding that the income share of capital abroad rapidly increased, by more than seven percentage points [Timmer et al. 2015]. Los, Timmer and de Vries analysed the impact of foreign demand on Chinese employment creation by extending the global input–output methodology. They found that between 1995 and 2001, fast growth in foreign demand was offset by strong increases in labour productivity and the net effect on employment was nil. Between 2001 and 2006, booming foreign demand added about 70 million jobs. These jobs were overriding for workers with only primary education. Since 2006 growth in domestic demand for non-tradable has become more important for job creation than foreign demand, signalling a rebalancing of the Chinese economy [Los, Timmer and de Vries, 2015].

Lábaj using WIOD investigate the effects of domestic demand on final output and employment in national economies. The small and open countries such as Ireland, Estonia, Malta, the Czech Republic and Slovakia indicated the lowest importance of domestic demand for their output creation. The collapse in international trade due to the economic recession in 2009 led to a substantial increase in domestic demand, particularly in India, Canada, Russia, China, Brazil and the rest of the world. Among the smaller economies, the Slovak Republic was affected significantly, as decline in demand for domestic products in foreign markets led to an increase of output generated by domestic demand for more than 2 percent [Lábaj, 2013, 2014]. Slušná, Balog et al. [2015] based on the WIOD analyses states that the absolute number of jobs reduced in the majority of developed countries as well as the share of labour in value added creation decrease. However, the significant changes appeared in the internal structure of the workers. For example, in Germany and France during the period of 1995-2009 the share of high skilled labour in value added creation increased and opposite the share of low-skilled labour decreased. Thus, the loss of jobs occurred mainly in case of low-skilled work positions. In Slovakia, the share of capital and labour in value added creation has unusual unbalanced ratio (capital has unusual high share and labour low share). High share of capital is typical for the electronics industry. This development is related to the massive inflow of foreign capital. In Germany and France, the share of capital in the value added creation declined in favour of work. The high share of high skilled labour on the value added creation is due to the high contribution of the service sector in production of vehicles in France and Germany and conversely, with low share of input from services in Slovakia and other CEE countries. The share of high skilled labour in value added creation in the industry of vehicles production in Slovakia was one of the lowest in the EU. Therefore Slovakia competed mainly with large stock of (foreign) capital and average high proportion of medium skilled labour. Further development of the automotive industry in Slovakia will have significant effects for the whole economy only if its participation in global value chains will increase [Slušná, Balog et al., 2015].

Habrman study showed that export of Slovakia in the examined period 1995 -2009 generates directly and indirectly approximately 40% of value added and employment in Slovakia. Despite the very high openness of the Slovak economy and regular high growth of exports, GDP and employment is not growing as the economists, politicians and the public would expect. The reason is that the Slovak exports create low value added, which is a serious problem of the Slovak economy. Despite the rising importance of export in Slovakia, most of jobs are created by domestic demand. Employment generated per unit of value added in sectors producing for export correspond with the sectors producing for the domestic demand. The extremely small proportion of manufacturers of modules and systems compared to the production of finished automobiles is the reason why the share of export on value added is low. The greater part of the value added is generally generated by manufacturers of modules and systems, including the development of those parts [Habrman 2013].

Luptáčik et al. analysed the Slovak automotive industry and states that one job in car manufacturing bring six additional jobs in the rest of the Slovak economy. In 2012, 9% of total employment in the Slovak economy, direct and indirect depends on the automotive industry. The share of value added generated by the automotive industry in total national value added is over 11%. The value added generated directly by automotive industry is 4%. The main results of the study suggest that the automobile industry generates directly and indirectly 17% of the Slovak economy gross production and create more than 200,000 jobs (9% of total employment) [Luptáčik et al., 2013]. For

comparison, the economic growth sources of Ireland are sectors like biotechnology, pharmaceuticals, financial services and IT with high and inelastic wages. Even during the crisis the salaries and labour costs in Ireland grew (the decline occurred in the public sector). Ireland helped the economic structural changes - traditional industries such as the manufacture of computers have been moved to cheaper countries. However, the loss of these jobs was offset by growth in the service sector [Brejčák 2016].

2. The development of labour and capital share in value added

As mentioned below, the vast inflow of foreign direct investments during early 2000s helped to transform economy of Slovakia, as well as created new jobs. These positives effects were unfortunately balanced by increasing demand for medium and low skilled labour and high share of capital in value added creation [Slušná, Balog et al. 2015, Habrman, 2013]. The labour and capital share in value added creation for all sectors in Slovakia during the period of 1995-2011 shown in table 1, confirm this assumption. However it is important to note, that this share did not significantly change during monitored 17 years.

Table 1. The share (%) of labour and capital in value added creation for whole industries in Slovakia during 1995-2011 [Source: WIOD, own calculations]

	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
LAB/VA	37	38	41	41	40	40	38	38	38
CAP/VA	63	62	59	59	60	60	62	62	62
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	
LAB/VA	38	39	38	38	38	40	39	39	
CAP/VA	62	61	62	62	62	60	61	61	

Note: LAB/VA = share of labour in value added creation, CAP/VA = share of capital in value added creation

The deeper look at the individual industries reveals various information. For the purpose of this article the analysis is made for 10 general sectors of industrial classification according to ISIC. The characteristic sign of Slovak industry is its main orientation on one sector. The share of manufacturing in gross output creation is more than 30% (37% in 1995 and 34% in 2011). The share of this industrial sector in value added creation is around 20%, although comparing years 1995 and 2011 the share decreased by 7% (27% in 1995 and 20% in 2011). The constructions sector has the second largest share in value added and total output creation. The share of this sector in value added creation increase (5% in 1995 and 9% in 2011).

The development in individual sectors differs from general industry values. The negative balance for labour share is the worst in the case of construction sector where during 17 years the decline in labour share is more than 20%. Looking closely at the qualification structure of this sector, we can conclude that the decrease can be observing mainly in the case of medium-skilled labour with the decline of 17% and low- skilled labour that fell from 5% in 1995 to 1% in 2009.

The sector of manufacturing including vehicle production and other 23 activities requires as for the previous mentioned sectors more capital than labour. However the capital and labour ratio did not change significantly between 1995 and 2011. The analysis of internal labour structure show better results, the proportion of high- skilled labour increased by 3% and medium-skilled labour by 9%, while the share of low-skilled labour decreased by 2%.

Although it must be noted that the share of value added creation decreased by 7% in this period. Regarding new industrial revolution the grow of high and medium skilled labour is positive, but the future will require more dynamics especially in the transition from medium to high skilled labour, which is still significantly lagging. Positive information in terms of labour share, particularly the share

of high-skilled labour in the value added creation can be noticed in the results for education, hotels and restaurants and health and social work sectors. However their share in the creation of value added is in generally very low (see Fig. 1). Furthermore, the share of labour in education sector decreased by almost 20%, but still remains the dominant (the share of capital in value added creation is only 35%). The sector of agriculture, hunting, forestry and fishing have the negative balance for labour share enlarged over 17 years, similarly for mining and quarrying sector.

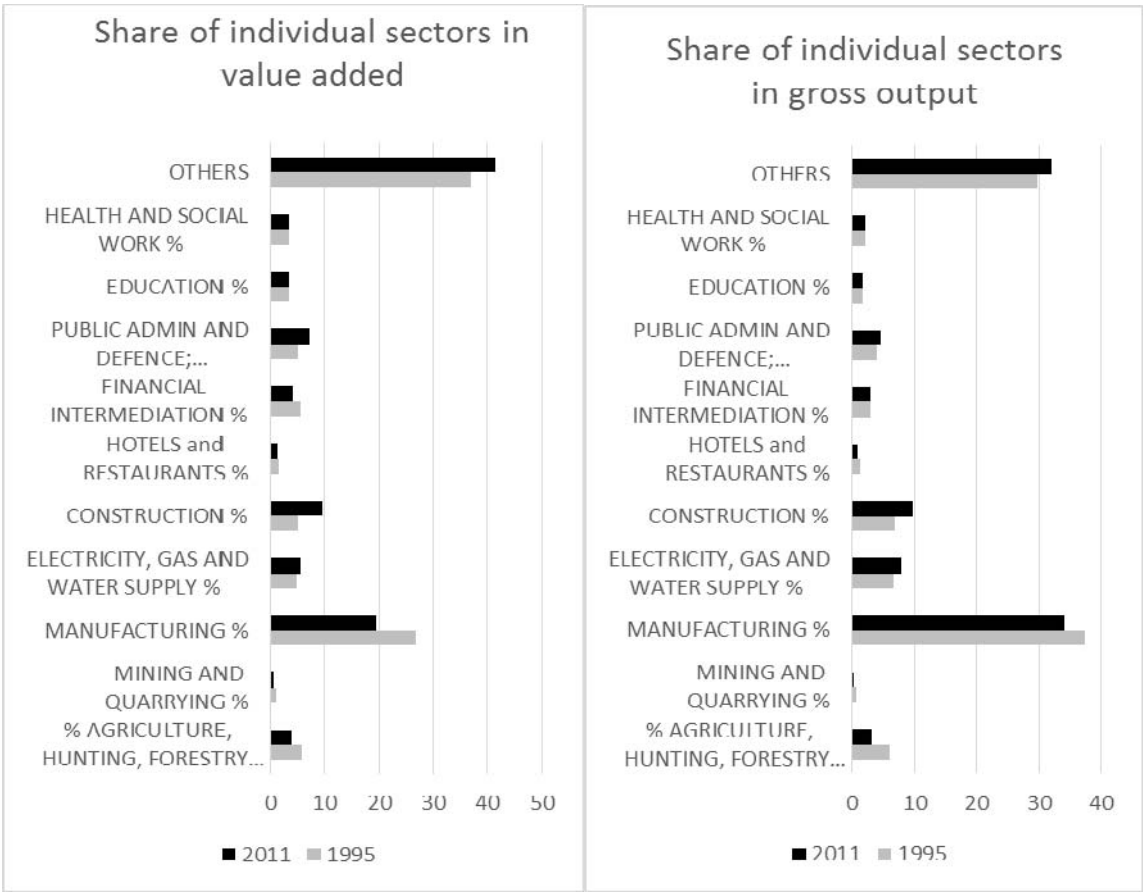

Fig. 1. The share (%) of individual industries in value added and gross output creation in Slovakia comparing 1995 and 2011 [Source: WIOD, own calculations]

Table 2. The share (%) of labour and capital in value added creation for individual industries in Slovakia in 1995 and 2011 [Source: WIOD, own calculations]

		1995	2011			1995	2011
AGRICULTURE, HUNTING, FORESTRY AND FISHING	LAB/VA	44	28	**HOTELS and RESTAURANTS**	LAB/VA	49	64
	CAP/VA	56	72		CAP/VA	51	36
MINING AND QUARRYING	LAB/VA	39	30	**FINANCIAL INTERMEDIATION**	LAB/VA	16	31
	CAP/VA	61	70		CAP/VA	84	69
MANUFACTURING	LAB/VA	37	41	**PUBLIC ADMIN AND DEFENCE**	LAB/VA	50	52
	CAP/VA	63	59		CAP/VA	50	48
ELECTRICITY, GAS AND WATER SUPPLY	LAB/VA	20	18	**EDUCATION**	LAB/VA	83	65
	CAP/VA	80	82		CAP/VA	17	35
CONSTRUCTION	LAB/VA	55	33	**HEALTH AND SOCIAL WORK**	LAB/VA	57	62
	CAP/VA	45	67		CAP/VA	43	38

Note: LAB/VA = share of labour in value added creation, CAP/VA = share of capital in value added creation

Table 3. The share (%) of high, medium and low skilled labour in value added creation for individual industries in Slovakia in 1995 and 2009 [Source: WIOD, own calculations]

		1995	2009			1995	2009
AGRICULTURE, HUNTING, FORESTRY AND FISHING	LAB HS	6%	4%	**HOTELS and RESTAURANTS**	LAB HS	4%	3%
	LAB MS	31%	23%		LAB MS	39%	51%
	LAB LS	7%	3%		LAB LS	6%	2%
MINING AND QUARRYING	LAB HS	3%	3%	**FINANCIAL INTERMEDIATION**	LAB HS	7%	16%
	LAB MS	32%	21%		LAB MS	9%	16%
	LAB LS	4%	2%		LAB LS	0%	0%
MANUFACTURING	LAB HS	4%	7%	**PUBLIC ADMIN and DEFENCE**	LAB HS	15%	24%
	LAB MS	30%	39%		LAB MS	34%	27%
	LAB LS	3%	1%		LAB LS	2%	1%
ELECTRICITY, GAS AND WATER SUPPLY	LAB HS	3%	4%	**EDUCATION**	LAB HS	42%	40%
	LAB MS	15%	12%		LAB MS	37%	25%
	LAB LS	1%	0%		LAB LS	4%	2%
CONSTRUCTION	LAB HS	4%	4%	**HEALTH AND SOCIAL WORK**	LAB HS	17%	19%
	LAB MS	46%	29%		LAB MS	38%	37%
	LAB LS	5%	1%		LAB LS	3%	3%

Note: LAB HS = share of high-skilled labour compensation in total labour compensation, LAB MS = share of medium-skilled labour compensation in total labour compensation, LAB LS = share of low-skilled labour compensation in total labour compensation. The data are available only for period 1995-2009.

Therefore it is possible to state that the rising participation of Slovak industry on global value chains did not lead to dramatically changes in labour structure during last 17 years. However the disproportionate share of industrial sectors as well as capital and labour share in value added creation still remain and rise. Value added creation by less-skilled workers decreased; it might also indicate that activities carried out by these workers are increasingly automated as they are typically routine-based. The same situation may be monitored in case of medium skilled labour except manufacturing and hotels and restaurants sectors where their share in total labour increased. Contrary, the high skilled labour demand generally increased with the largest raise in sectors of financial intermediation and public administration and defence (both 9%).

Conclusion

Accelerating participations of countries in global value chains and industrial progress caused that the absolute number of jobs reduced in the majority of developed countries as well as the share of labour in value added creation decrease. However, the significant changes appeared in the internal structure of the workers. The vast inflow of foreign direct investments during early 2000s helped to transform economy of Slovakia, as well as created new jobs. These positives effects were unfortunately balanced by decreasing labour and increasing share of capital in value added creation. Therefore it is possible to state that the rising participation of Slovak industry on global value chains did not lead to dramatically changes in labour structure during last 17 years. However the disproportionate share of industrial sectors as well as capital and labour share in value added creation still remain and rise.

The characteristic sign of Slovak industry is its main orientation on one sector. The share of manufacturing in gross output creation is more than 30% and the share in value added creation is around 20%. The capital and labour ratio in this sector did not change significantly between 1995 and 2011. The analysis of internal labour structure show better results, the proportion of high-skilled

labour increased by 3% and medium-skilled labour by 9%, while the share of low-skilled labour decreased by 2%. Regarding the approaching new industrial revolution the growing tendency of high and medium skilled labour demand is positive, but the future will require more dynamics.

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Further Steps to Harmonize the Accounting of Business Entities in the Czech Republic with the International Financial Reporting Standards - News From 2016

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Abstract

The Act No. 221/2015 Sb., published in Sbírka zákonů (Collection of Laws) on 10 September 2015 with effect from 1 January 2016, made probably the most extensive amendment of the Act No. 563/1991 Sb., on Accounting in the Czech Republic in the past few years. The reason for this amendment was the effort to properly complete the transposition of European Directive 2013/34/EU on annual financial statements, consolidated financial statements and related reports of certain types of undertakings and others. It is mainly the obligation of EU member states to transpose directive 2013/34/EU, which is devoted to the financial statements, into their national laws. Other changes follow from the recodification of private law, and we cannot fail to mention connections to other laws, which were directly affected by the accounting changes such as Act No. 586/1992 Sb., on income tax, Act No. 593/1992 Sb., on reserves for determining the income tax base and Act No. 93/2009 Sb., on auditors. The paper also lists important changes in the accounting and reporting of business entities in the Czech Republic with effect from 1 January 2016.

Key words: *accounting, IAS/IFRS, accounting entity, business entity, financial statements, events after the balance sheet date, notes, annual report, audit, disclosure*

Introduction

In 2016, many changes are happening in the accounting of business entities in the Czech Republic (hereafter "CR"). The reason is the transposition of a new EU accounting directive (2013/34/EU) and the effort to modernize the accounting procedures and bring them closer to the international financial reporting standards (hereafter "IAS/ IFRS"). The changes are based on the approved amendment to the Accounting Act No. 563/1991 Sb. (hereafter "Accounting Act") and other related accounting regulations (regulation No. 500/2002 Sb. and Czech Accounting Standards) with effect from 1 January 2016. The amendment to the Accounting Act is based on the Directive of the European Parliament and the Council No. 2013/34/EU of 26 June 2013 and represents the most important change to the Accounting Act in recent years. The change, for example, brings new categorization of accounting entities according to their size, re-introduction of single-entry accounting for some non-business accounting entities, efforts to reduce the administrative burden on smaller

accounting entities and a number of changes in accounting, reporting, auditing and disclosing of financial statements and annual reports of business entities.

1. Categorization of Accounting Entities and Consolidation Groups

The Accounting Act newly distinguishes four categories of accounting entities (hereafter AE) - micro, small, medium-sized and large accounting entity. Each accounting entity is responsible for monitoring its own categorization. The categorization of the entity is determined by achieving or exceeding at least two of the three criteria (the value of total assets - net, net turnover and average number of employees) at the balance sheet date. This also affects the requirements on accounting obligations. Notably the content of financial statements and annual reports, the preparation of consolidated financial statements, audit of financial statements, the obligation to disclose them, but also the new way of fair value measurement, filing a new report on payments to governments and others. At the same time, the amendment allows micro and small entities some simplification or direct exemption from certain obligations - provided they are not entities with statutory audit. The overview of categorization and duties of accounting entities are listed in Table 1 and 2.

Table 1. New Categorization of Accounting Entities from 1 January 2016
[Source: Act No. 563/1991 Sb., on accounting, custom processing]

AE category [1]	Turnover (m CZK)	Assets (m CZK)	Number of employees
Micro	up to 18	up to 9	up to 10
Small	up to 200	up to 100	up to 50
Medium-sized	up to 1,000	up to 500	up to 250
Large	1,000 +	500 +	250 +

Table 2. Categorization of accounting entities – approximate occurrence in the Czech Republic[2]
[Source: The Chamber of Auditors of the Czech Republic– state at 1 4. 2014, custom processing]

Legal form	Registered entities (%)	From that			
		Micro AE	Small AE	Medium-sized AE	Large AE
a.s.	6	4	12	37	47
s.r.o	92	93	87	62	51
k.s.	0,2	0,2	0,3	0,7	1
v.o.s.	2	2	0,3	0,2	0,3

A "public interest entity" and "selected accounting entity" are always considered to be a large accounting entity. The definition of "public interest entity" moves from the Act No. 93/2009 Sb., on auditors, to the Accounting Act. In accordance with the introduction of categorization of accounting entities, the categorization of consolidated groups is being introduced as well. Newly only small consolidation group will be distinguished. The classification within the consolidated group will again depend on achieving or exceeding at least two of the three specified criteria (i.e. assets, net turnover and average number of employees) at the balance sheet date. In accordance with the Section 22a Article 1 of the Accounting Act, the category of small group of accounting entities is exempt from the obligation to compile the consolidated financial statements. It is not necessary to define the category of medium and large groups because all provisions on consolidation Sec 22 to 23a apply to them.

[1] If the entity exceeds at least 2 of the 3 criteria at balance sheet date, it is included in the higher category.
[2] Representation of the individual entities in the categories is indicative only - the table does not add up, because in the context of the survey, some registered entities could not be assigned to any of the four categories.

2. Financial Statements, Annual Report, Audit and Disclosure of Financial Statements

The amendment of the Accounting Act redefines the ***purpose of financial statements***, which is to provide information for economic decision making of external users. This definition should also be a guideline for the accounting entity when selecting accounting methods and procedures.

Financial statements form an indivisible whole (according to Sec 18 - 19 of the Accounting Act) and consist of:

- balance sheet (balance),
- profit and loss statement,
- explanatory notes (which explains and supplements the information provided in the balance sheet and profit and loss statement).

According to the new categorization***, large and middle-sized accounting entities are also obliged to compile the statement of cash flows and statement of changes in equity*** (in relation to IAS 1 – Presentation of Financial Statements). This change is related to the harmonization of Czech accounting legislation and IAS/IFRS.

"Small accounting entities" and "Micro accounting entities" are not obliged to compile the statement of cash flows or the statement of changes in equity. Accounting entities prepare financial statements based on the Accounting Act in full or in an abbreviated format. The abbreviated format is used only by accounting entities, which are not required to have their financial accounts audited (see Table 3).

Table 3. Content of Financial Statements in Regulation No. 500/2002 Sb.
[Source: regulation No. 500/2002 Sb., ÚZ 1110 Vzorový účtový rozvrh 2016 (sample chart of accounts), custom processing]

BALANCE SHEET:	Prepared by:
In full format (includes all items based on the annex No. 1 of the regulation)	✓ large accounting entity ✓ middle-sized accounting entity ✓ small accounting entity which is required to have its financial statements audited ✓ micro accounting entity which is required to have its financial statements audited
In abbreviated format - extended version (includes items based on the annex No. 1 of the regulation - only items marked with letters and Roman numerals, excluding items C.II.1. Long-term receivables and C.II.2. Short-term receivables)	✓ small accounting entity which is not required to have its financial statements audited
In abbreviated format - basic version (includes all items based on the annex No. 1 of the regulation - only items marked with letters)	✓ micro accounting entity which is not required to have its financial statements audited

PROFIT AND LOSS STATEMENT:	Prepared by:
In full format (includes all items based on the annex No. 2 and 3 of the regulation)	✓ all trading companies ✓ other entities: • large accounting entity • middle-sized accounting entity • small accounting entity which is required to have its financial statements audited • micro accounting entity which is required to have its financial statements audited
In abbreviated format (includes all items based on the annex No. 2 and 3 of the regulation, only items marked with Roman numerals, letters and calculated items)	✓ small and micro accounting entity unless: • they are trading company • they are required to have their financial statements audited

Basic information of **the notes to the financial statements**, which is defined in Section 39 of the regulation No. 500/2002 Sb., must be provided by all accounting entities, regardless of their categorization. Accordingly, the information is divided to individual sections of the regulation (see Table 4.) The notes form an integral and important part of the financial statements, and accounting entities should pay enough attention to it [Hakalová, Palochová, Pšenková, Bartková, 2012].

Table 4. Content of the Notes in the Regulation No. 500/2002 Sb.
[Source: regulation No. 500/2002 Sb., custom processing]

Notes in the full format	Large accounting entities under Sec 39 + Sec 39b + Sec 39c Middle-sized accounting entities under Sec 39 + Sec 39b Small and micro accounting entities which are required to have their financial statements audited under Sec 39 + Sec 39a
Notes in the abbreviated format	Small and micro accounting entities which are not required to have their financial statements audited under Sec 39

The Accounting Act also clarifies the definition of events about which the entity obtained information between the balance sheet date and the date of the financial statements, i.e. **events after the balance sheet date**. There are two types of these events:

- events that existed at the balance sheet date, which will be reflected in the accounts for the current period,
- important events that occurred after the balance sheet date, which will be listed in the notes to the financial statements.

According to Section 21 of the Act No. 563/1991 Sb., on accounting, the **annual report** is prepared by accounting entities, which are required to have their financial statements audited pursuant to Section 20 of the Act. The annual report provides information on the performance, activity and current economic status of the accounting entity [Hakalová, 2010]. It also contains (financial and non-financial) information:

- on the facts that occurred after the balance sheet date and which are important for fulfilling the purpose of the annual report,
- on the expected development of the accounting entity,
- on activities in research and development,
- on activities in the environmental protection and employment relations,
- whether the entity has a branch or other organizational unit abroad,
- required under special legislation,
- on the acquisition of own shares since 2016.

Micro, small and middle-sized accounting entities do not have to provide any non-financial information.

The audit of financial statements applies under the section 20 of Act No. 563/1991 Sb., on accounting since 1 January 2016 to:

- large accounting entities (with the exception to selected accounting entities which are not public interest entities),
- middle-sized accounting entities,
- small accounting entities, if they are a public limited company or a trust fund and at the balance sheet date of the accounting period for which the financial statements are audited and accounting period immediately preceding reached or exceeded at least one value (i.e. total assets CZK 40,000,000; total net turnover for a period CZK 80,000,000; average number of employees during the accounting period 50),

- other small accounting entities (except for public limited companies or a trust funds) if they at the balance sheet date of the accounting period for which the financial statements are audited and accounting period immediately preceding reached or exceeded at least two values (i.e. total assets CZK 40,000,000; total net turnover for a period CZK 80,000,000; average number of employees during the accounting period 50),
- accounting entities to which applies a special legislation.

Exceptions are accounting entities, which are in bankruptcy, reorganization, or were cancelled due to a bankruptcy because the debtor's assets could not satisfy creditors.

There is also a substantial change in the **disclosure of financial statements and annual report.** If the obligation applies to them, accounting entities publish the financial statements (as well as annual report) in the collection of documents. They publish it in the extent in which it was compiled, or in the scope and wording, which was certified by an auditor. Since 1 January 2016, apart from the change in the deadline for the publication requirement, the small and micro accounting entities, which have no obligation to have their financial statements audited do not need to publish profit and loss statement, unless they are obliged by a special legislation.

3. Other Important Changes

Amendments to accounting standards from 1 January 2016 brought a number of other changes, such as:

a) **Fair value measurement** of individual components of assets and liabilities is not mandatory for micro accounting entities. Again, there are certain exceptions, for example for securities and investments.

b) **Report on payments to governments** – this obligation of compiling a report on payments to governments of EU countries or third countries applies to large accounting entities (including public interest entities). The report will show significant payments the concerned entities sent to the governments of the countries in which it operates, because of the greater transparency of these payments. Exceptions are selected accounting entities operating in the mining industry and in the logging of primary forests.

c) **Limitation to the payment of dividends** if the accounting entity reports in its balance sheet results of own research and development, the payment of the dividends will be limited. A part of retained earnings must so remain in the balance sheet, up to the amount of non-depreciated results of own research and development.

Changes in valuation, accounting and reporting (see regulation No. 500/2002 Sb. and Czech Accounting Standards) relate primarily to the following areas:

- changes in the format of financial statements (balance sheet and profit and loss statement in full and abridged format),
- changes in the structure of financial statements - numbering, line titles,
- changes in accounting methods and procedures,
- cancellation of start-up cost capitalization,
- limitations of goodwill amortization,
- changes in the method of accounting for a change in internally produced inventory (it will be newly accounted to the accounting group 58 - Change in inventory produced internally and capitalization),
- changes in method of accounting for capitalization of internally produced inventory and fixed assets (again the newly-established accounting group 58 will be used),
- valuation of inventory in operating activities (inventory will be newly valued at own costs including direct costs, and the costs may also include proportionate part of variable and fixed costs, causally attributable to a given performance),

- cancellation of extraordinary expenses and incomes (it will no longer show a profit from extraordinary activities),
- changes in the accounting for received gifts (they will be accounted for as an operating income - it concerns material donations and financial costs - as well as monetary donations),
- new line in profit and loss statement "Adjustments to values in operating activities" where all information on changes in fixed assets depreciation or amortization will be listed as well as any adjustments.

To clarify procedures and the determination of initial states of balance sheet items at 1 January, a **new Czech Accounting Standard for business entities was released: No. 024 – Comparable period** for accounting periods commenced in 2016.

Until the end of 2015, **single-entry accounting** has not been included in the current Accounting Act although some „selected accounting entities“ were allowed to use it. The amendment to the Accounting Act now clearly defines the conditions under which a single-entry accounting can be used, especially for accounting entities that were not established to make a profit. This includes VAT non-payers with total assets and total income for the last closed accounting period up to CZK 3 million and associations, trade unions, employers' organizations, churches and religious communities, as well as hunting communities.

Conclusion

In conclusion we can say that the Czech Republic has made with effect from 1 January 2016 further important steps to bring the accounting of business entities closer to the international financial reporting standards and so to the harmonization of Czech accounting with EU directives and regulations. It resulted in modernization of accounting procedures, changes in valuation, accounting and primarily in reporting so that the financial statements are prepared in a comprehensible way and give a true and fair view of the accounting and financial position of an accounting entity. Users of such undistorted information from the accounting of business entities can then make their economic decisions. The changes are based on the approved amendment to the Accounting Act No. 563/1991 Sb. and other related accounting regulations such as regulation No. 500/2002 Sb. and Czech Accounting Standards No. 001 – 024; they have influenced a number of other regulations in the Czech Republic such as the Act No. 586/1992 Sb., on income tax, Act No. 593/1992 Sb., on reserves or Act No. 93/2009 Sb., on auditors. The impact of the amendment to accounting rules has wide scope and is associated with a number of legal norms.

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Structural Changes of Economies of Slovak Republic and Czech Republic during Transformation Period

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Abstract

The paper is devoted to industrial convergence between the economies of the Slovak Republic and the Czech Republic. Economy structure of these countries is highly influenced by the former presence of the common state. The main purpose of this paper is to verify the hypothesis whether the Slovak Republic and the Czech Republic have run the structural convergence process successfully. The second objective is to evaluate the structural distortion between the both economies. The economies of the Slovak Republic and the Czech Republic were in the transformation period shortly before and rather after the dissolution of the Czech and Slovak Federative Republic. This analysis is based on the gross value added variable and covers the time span from 1995 to 2010.

Key words: *structural change intensity, structural deviation, gross value added, transformation period*

Introduction

Industrial structure has performed more interestingly in relation with emerging process of economic and political integration. The several authors of the various studies have found that integration process supports convergence between members of an integration group. Such a step was done by the Slovakia Republic's accession into the European Union. Structural convergence is a key point of the economy performance. It can be viewed from the two viewpoints and in two ways. Firstly, at inter-industrial level or at intra-industrial level within one economy and secondly, internationally between the economies of the countries. The inter-industrial convergence expresses differences of gross value added shares between three aggregate sectors of an economy – agriculture, industry and services. The intra-industrial convergence is associated with changes of industrial structures within one of the aggregate sectors [Höhenberger & Schmiedeberg, 2008]. Wacziarg [1998] explains two main reasons why to concentrate on occurrence of structural convergence. They are influence on international transmission of business cycles and initiation of alternative means in bilateral trade [Imbs & Wacziarg, 2000]. Landesmann [2000] inspected central and eastern European countries and their structural assimilation and catch-up process. Höhenberger & Schmiedeberg [2008] investigated structural convergence of fourteen European countries over the period 1970 to 2004. Their results demonstrated that some industries were intended to converge over time. Midelfart-Knarvik, Overman & Venables [2000] investigate structural convergence between European countries. They revealed some specialisation tendencies of European economies and localisation trends of industries from 1970 to 1999. Diminishing differences in terms of converging economies was analysed also by Dempster

and Isaacs [2014]. Structural changes have several patterns and each economy can be found among them [Buera, Kaboski, 2012].

The Czech Republic and the Slovak Republic were part of the communist bloc of the countries in Europe and constituted the Czechoslovak Federation. In 1993, when the Czechoslovak Federation was split into the two independent states, the Czech Republic had better economic structure than the Slovak Republic. Donnorumo [2006] expresses the Czech Republic inherited economic structure constituted mainly from medium-sized companies that effectively traded with the surrounding European markets. On the contrary, the Slovak Republic remained heavy industry such as metallurgical industry, arms industry and chemical industry. The main issue was their orientation towards international market but rather domestic market. Structural distortions were also demonstrated in technological backwardness, low performance and efficiency of the economy, poor infrastructure, undersized tertiary sector and lack of production finalisation [Fifeková, 2000]. The Slovak economy began to recover from 2001 and became one of the fastest growing economies of the European Union countries between 2005 and 2008 [Beblavý, 2010; Koyame-Marsh, 2011; Andrejovská&Buleca 2016].

Methodology

The paper methodology is based on comparison of the outcome of one of the most important economic indicators – gross value added. There are many authors applying just right this indicator for their research [Kuznets, 1973; Mélišek, 2001]. Gross value added at basic prices is defined as difference between gross production at basic price and manufacturing consumption at purchase price, while a sum of gross value added and taxes reduced by subsidies represents the gross domestic product. To make this statement clear, there is to note that manufacturing consumption is the outcome of the intermediate consumption in the manufacturing process.

To quantify gross value added, we have applied the structural change intensity indicator and the structural deviation. The indicator of structural change intensity expresses development of economic structure, extensiveness and intensity of structural changes in the particular economy and its ability to adapt to changes in time [Kadeřábková & Srholec, 2001]. Deepening specialisation causes rise of structural change intensity.

Structural change intensity is quantified according to the following equation:

$$SCI = \sqrt{\sum_{t=b}^{e} (GVA_t - GVA_{t-1})^2 . \frac{GVA_{t-1}}{100}}$$

where the comprised indicators mean:

- SCI – structural change intensity of economy;
- t – the actual period;
- b – the beginning of the explored time span;
- e – the end of the explored time span;
- GVA_t – gross value added in period t;
- GVA_{t-1} – gross value added in period t – 1.

The more expansive and the more intensive restructuring processes run, the higher value of this indicator is shown. High value of the indicator indicates the expansion in the economy. Therefore, not only final values of the indicator should be measured, but also it is needed to identify their cause. The final argument of square root is divided by number 100 because of getting per cent value instead of ratio value.

To compare industry structure across the economies the structural deviation indicator is applied. This indicator is a convenient summary measure of the structural adjustment of two or more countries.

Its formula is stated as follows:

$$SDI_{A;B;t} = \sqrt{\sum_{s=1}^{S} (OS_{A;s;t} - OS_{B;s;t})^2 \cdot \frac{OS_{B;s;t}}{100}}$$

where the included indicators express:

- $SDI_{A;B;t}$ – structural deviation of the economies A and B in the period t;
- s – the actual industrial sector;
- S – a number of industrial sectors;
- $OS_{A;s;t}$ – a share of industrial sector s output in total output of the economy A in the period t;
- $OS_{B;s;t}$ – a share of industrial sector s output in total output of the economy B in the period t.

Output of industrial sector is measured by gross value added. The structural deviation indicator distinguishes similarity of two economies [Thiessen & Gregory, 2005]. Low value expresses structural similarity and vice versa [Havlík, 2005]. A very high value is considered to be a structural gap. Such a situation means that economy moves away from the global economic trends. Additionally, deepening of structural gap presumes unsuitable adaptation of the specific industry to changing conditions in the world economy

Data

The dataset comes from the database of the Eurostat – the main statistical bureau of the European Union. It involves data about employment and gross value added at current prices. Their source lies in the national accounts of the observed countries according to the European System of Accounts composed by the ESA 95 system. The beginning of the period is set to 1995, because the Eurostat provides data for the Czech Republic only from this year.

The second restriction associated to the dataset is an aspect of appropriate comparability of the outcomes. In 2010, new version of the European System of Accounts called ESA 2010 was adopted. This makes long-term comparison impossible. Therefore, the end of the explored time span is set to 2010 – to enable suitable assessment.

Results

The outcome of the analysis is devoted the comparison of the Slovak economy and the Czech economy throughout the observed period from 1995 to 2010. Relation between the explored indicators – structural change intensity and structural deviation indicator – is a very interesting topic to discuss. If we have a look at their composition, the both are formed as ratio indicators. Therefore, it is able to find a ratio relation between them and to interpret this result.

Table 1. Quantification of the structural change indicators
[Source: own elaboration by the authors]

Year	Structural change intensity		Structural deviation indicator
	Slovak Republic	Czech Republic	
1996	0.47	0.92	0.9
1997	1.28	0.46	1
1998	0.18	0.58	1.8
1999	0.45	0.31	1.5
2000	0.3	0.16	1.1
2001	0.36	0.06	0.9
2002	0.4	0.45	1.2
2003	0.47	0.33	0.6

2004	0.45	0.86	0.8
2005	0.23	0.24	0.8
2006	0.74	0.15	0.4
2007	0.23	0.08	0.4
2008	0.38	0.23	0.4
2009	1.2	0.27	1.4
2010	0.18	0.04	1.3
mean value	0.53	0.34	0.97

There were relative big differences between the economy of the Slovak Republic and the economy of the Czech Republic in 1993. Then, the transformation period of the economies was underway to go. The specialisation process in the Slovak economy was instigated. This resulted in an alternation of the relative position of the whole economy. All the three industrial divisions – agriculture, industry and services – moved their trend to another direction than it was before the dissolution of the Czech and Slovak Federative Republic.

Figures representing the structural change intensity indicator express a considerably changing period of the economy development. Because, this indicator is based on the comparison of the two successive years, the result is assigned to the second one of this partially figured period.

From a view of the Slovak economy, the highest change happened between 1996 and 1997 when structural change intensity peaked at level of 1.28. The second highest year-to-year change occurred in 2009 towards 2008. Its value reached 1.2. These two figures are the only overstepping a limit of 1. The third highest alternation is far lower at 0.74 in 2006. All the rest of the explored period has change quantified under the indicator's mean value of 0.53. This fact is an interesting revelation of the analysis. It comes from characteristics of the transforming period occurring in the Slovak economy after the dissolution of the joint republic with the Czech Republic.

On the other hand, the Czech economy did not experience such a changing period from a view of structural change. It is understandable because its economy was prepared for the dissolution in a better state. Also, its structure was more enhanced than the one of the Slovak economy. That is why the outcome of the analysis reveals there are considerably smaller changes throughout the whole observed period. The highest change happened in the first couple of years in 1996 and peaked at 0.92. The second highest change befell in 2004 when it reached level of 0.86. All the other figures are significantly lower. Mean value stands at 0.34, and it is 35.85 % smaller then in a case of the Slovak economy. This confirms an assumption the economy of the Czech Republic was much better prepared for the state dissolution than the economy of the Slovak Republic.

Because the both republic have had own evolution of their economies after 1993, it is interesting to have a look at their mutual deviation. The structural deviation indicator demonstrates development of their nonconformity during the observed time span. Mean value of 0.97 is surrounded by seven higher figures and eight lower figures. This affirms fact that deviation fluctuates around its mean value evenly on the whole. Its values are higher at the beginning of the explored period than later. The smallest deviation between the economies occurred in the middle of the time span. But there is a rise of deviation in the latter observed years.

Although maxima perform also as the most attractive points of the analysis, there is to show also minimum values, which can be interesting to take into account. The lowest structural change intensity in the Slovak economy occurred in 2010 standing at 0.18. The Czech economy has more diverse result – there was very weak change in 2001, 2004, and 2010 – at level of 0.06, respectively 0.08, and even at 0.04. However, this outcome is caused by lower maxima too.

The lowest figures reached by the structural deviation indicator are at level of 0.4 in the three consecutive years from 2006 to 2008. This period was preceded by decreasing value of the indicator.

The next part of the analysis reveals relative year-to-year change of the structural change indicators.

Table 2. Relative change of the structural change indicators
[Source: own elaboration by the authors]

Year	Structural change intensity		Structural deviation indicator
	Slovak Republic	Czech Republic	
1997	2.72	0.5	1.11
1998	0.14	1.26	1.8
1999	2.5	0.53	0.83
2000	0.67	0.52	0.73
2001	1.2	0.38	0.82
2002	1.11	7.5	1.33
2003	1.18	0.73	0.5
2004	0.96	2.61	1.33
2005	0.51	0.28	1
2006	3.22	0.63	0.5
2007	0.31	0.53	1
2008	1.65	2.88	1
2009	3.16	1.17	3.5
2010	0.15	0.15	0.93
mean value	1.39	1.41	1.17

The previous table demonstrates a relative change of the structural change indicators. It displays multiple changes of the indicators. For instance, figure of 1 means the same figure for the two successive years.

As it is seen, the highest year-to-year change peaking 3.22 occurred in 2006 in the Slovak economy. The second highest case at level of 3.16 had appeared in 2009 and the third highest one in 1997 at level of 2.72. The very interesting fact is that all of these peaks relate to the absolute high levels of structural change intensity. Only four figures overstep mean value throughout the whole observed time span.

Year-to-year change of this indicator in the Czech economy peaked at 7.5 in 2002. Such a high number was reached because there was a very small figure of the structural change intensity indicator in 2001. The second highest value of 2.88 occurred in 2008 and the third highest one at level of 2.61 in 2004. Unlike the Slovak economy, these peaks does not relate to maxima of absolute numbers of structural change intensity at all. Only three numbers exceed mean value during the whole explored time span. This is caused by the highest point which increases overall mean value significantly.

The structural deviation indicator reached its maximum at level of 3.5 in 2009. Its source lies in a considerably high rise of structural change intensity between 2008 and 2009 in the Slovak economy, whilst there was a very tiny change in the Czech economy between these years. During the whole time span, four year-to-year changes higher than mean value occurred.

The analysis of the minima in case of relative change of the structural change indicators are highly bound with already mentioned maximum values. It is cause by the characteristics of their quantification. It is not surprising the three lowest figures are preceded by the three highest numbers in a case of the Slovak economy. These minima stand at 0.14 in 1998, 0.31 in 2007, and 0.15 in 2010. The Czech economy performs little differently. Minimum is reached in 2010 at level of 0.15 because of very small absolute change.

Conclusion

The transformation period of the both economies – the Slovak economy and the Czech economy – brought considerable structural changes to them. Its purpose can be understood after such a long

period as twenty years is at the earliest. Even, there are authors who declare the outcomes of the structural changes are still to come.

It would be appropriate to study structural changes inside the economies individually – to explore their internal changes. Such an approach would aim at the particular industrial sectors themselves. Also, the international comparison of these sectors can bring interesting results, because not all the sectors had developed throughout the transformation period equally.

Gross value added performs as a suitable indicator to demonstrate the sectorial structure of the economies of the Slovak Republic and the Czech Republic. On the one hand, there are visible several noteworthy dissimilarities between these two countries. On the other hand, there are also similarities in the sectorial structure that cause modification of a structural gap between these two economies. According to the carried out analysis, we are able to confirm that there is structural convergence between the economies of the Slovak Republic and the Czech Republic. In 1995, the Slovak economy had considerably different sectorial structure from the Czech economy. Very big advantage was revealed in joining the global economic trends, which brought structure similar to the economy of the Czech Republic. The analysis shows the presence of structural convergence throughout the period from 2003 to 2008. Its clear sign was sinking value of the structural deviation indicator. Undoubtedly, structural convergence issues also appeared but they were originated in significant deviations from the standard structural profile of the country.

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Current Changes in Fee Structure of Hedge Fund Industry

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Abstract

Hedge fund industry is unique by few specific rules, which are not commonly used in other groups of investment funds. One of the most well known rules is existence of specific fee structure called also 2/20 rule. It means that fund normally charges 2% management fee and 20% performance fee. There is also specific rule of high water mark, applied for charging of performance fee. In recent years hedge fund industry grown very fast and funds search for new ways how to attract investors. One of them is diversion from traditional 2/20 fee structure towards lower fees. In our paper, we will examine how does fee levels changed and what are the trends in this area. We will also create useful tool for evaluation of hedge fund expensiveness in the field of fees. This tool is called Fee Index and we can make via it ranking of available funds according to their management and performance fee.

Key words: *hedge fund fees, performance fee, management fee, high water mark, fee index, hedge fund ranking*

Introduction

Hedge fund is an investment fund focusing on absolute returns available to the limited group of accredited investors. Hedge fund may use a variety of investment strategies including the use of short-selling, leverage and financial derivatives [Stefanini, 2006]. Its control by regulators is limited and fund mainly acts as a limited partnership or as offshore company [Jílek, 2006]. The hedge fund has a special fee structure, called also 2/ 20. It means that fund traditionally charges 2% management fee and 20% performance fee [Gladiš, 2005]. Management fee is calculated from investment capital and performance fee is calculated from profit. Other specific rules of hedge fund investing are existence of lock-up period and high water mark. Lock up period is a period when investor's capital is locked and he cannot make any withdrawals [Lo, 2010]. High water mark rule applies after previous hedge funds' loss making period and allows charging of performance fee just after the value of funds' assets gets over the level before losses - over the high water mark [Ineichen, 2003].

In recent years, many hedge funds tried to attract investors with lower than standard fees. According to the Preqin [2010], just 38% of single manager hedge funds charge 2 % management fee and 20 % performance fee. Managers are becoming more flexible with their fee structures. They either charge lower management or performance fees or reduce both in an attempt to attract investors and retain a competitive advantage. Aim of our work will be examination of changes in hedge fund fees structure and testing of importance of specific fee in different market conditions. We will also create

useful tool for evaluation of hedge fund expensiveness in the field of fees. This tool is called Fee Index and we can make via it ranking of available funds according to their management and performance fee.

Material and methods

In our work we primarily tested assumptions about decrease of average hedge fund fees from normal level (2% management fee + 20% performance fee) to lower levels. For this purpose we used data about 360 hedge funds from Morningstar free hedge funds database. Findings were statistically and graphically evaluated.

In second part we calculated impact of specific fee level on investors' capital in specific market conditions. This approach is based on assumption that importance of performance versus management fee is changing, according to the profitability of hedge fund industry. This idea is based on different calculation method of both fees. Management fee is charging in all market conditions, but performance fee is calculated just in the case of created profit over high water mark. For testing of these assumptions we used data about profitability of hedge fund industry in different time frames. Hedge fund industry was represented by Hedge fund index from analytical company Barclayhedge.

In the last part of the paper we created easy usable tool for investors – fee index for hedge funds. This index evaluates funds based on their management and performance fees. Funds get points in the range 0 – 100 points and can be sorted into the ranking. Weight of performance and management fee in funds evaluation is based on cost simulation from previous part. At the end of chapter we demonstrate us of Fee index on our sample of funds by creation of TOP 10 ranking (ten funds with best fee structure) and Worse 6 ranking (six funds with worse fee structure).

Results and discussion

Between 360 examined hedge funds, we identified these statistical characteristics of hedge fund fees:

Table 1. Statistical characteristics of examined sample
[Source: processed by author based on data from Morningstar free hedge funds database]

Type of fee	Average value	Minimum value	Maximum value
Management fee	1.55%	0%	4.80%
Performance fee	15.89%	0%	30%

According to our research, management fee in hedge fund industry vary between 0 and 4.8 %. Average value in sample is 1.55 %. Standard 2% value was used just by 11.36 % of funds. Most common values were 1.5 % (21.59 %), 1 % (10.8 %), 1.75 % (7.95 %) and 1.25 % (7.39 %). Examined values are summarized in Fig. 1 and 2.

Also performance fees are not strictly 20 %. In our sample they vary between 0 % and 30 %. Average performance fee of whole group is 15.89 %. Traditional 20 % fee is charged by 54.32 % of funds. Other preferred values of performance fee are 10 % (25.54 % of funds), 15 % (6.83 %) and 5 % (6.47 %).

We identified significant variability of both performance and management fees and clear pressure on decrease of fees from traditional 20 % and 2 %. Average values decreased from this level by 29 % in the case of management fee and by 26 % in the case of performance fee. We found that only 11.5 % of funds charges traditional 2% management fee and 54 % of funds charges traditional 20% performance fee.

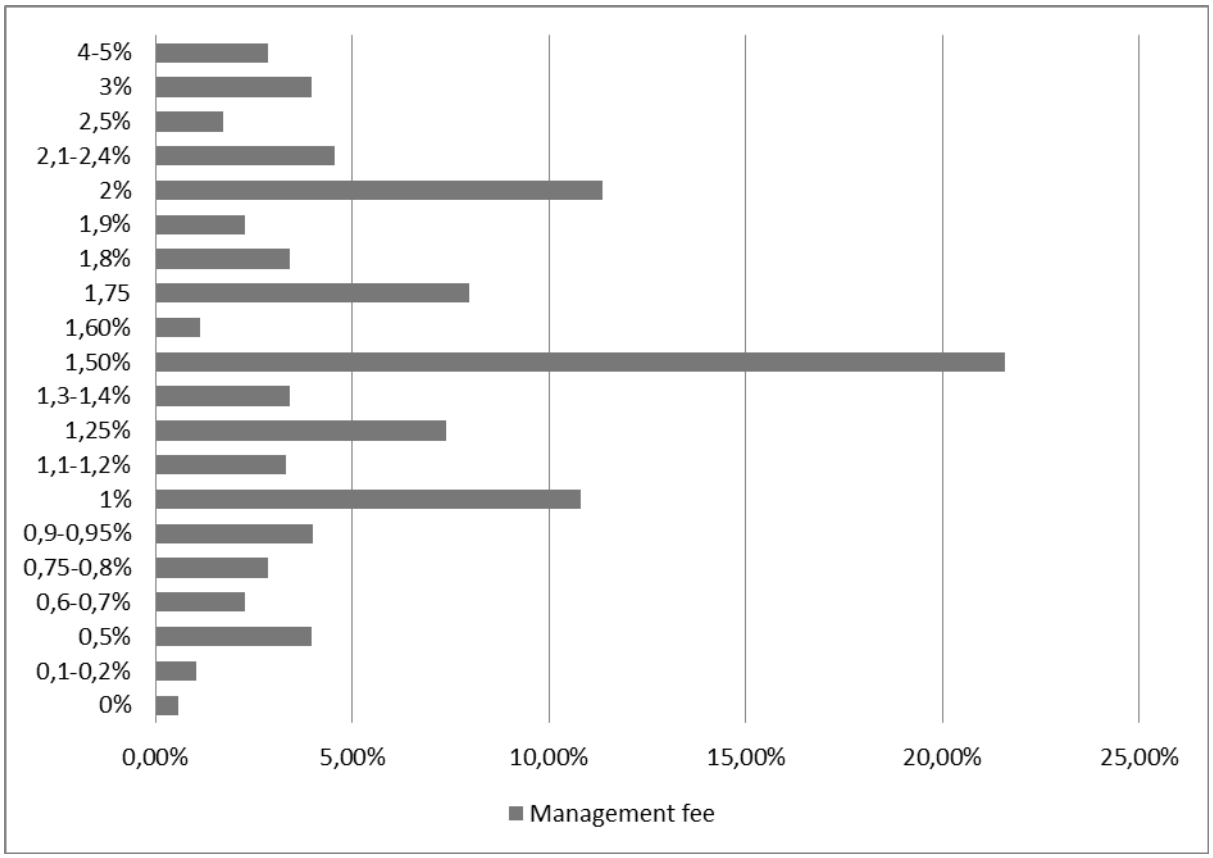

Fig. 1. Distribution of management fee in the hedge fund industry
[Source: processed by author based on data from Morningstar free hedge funds database]

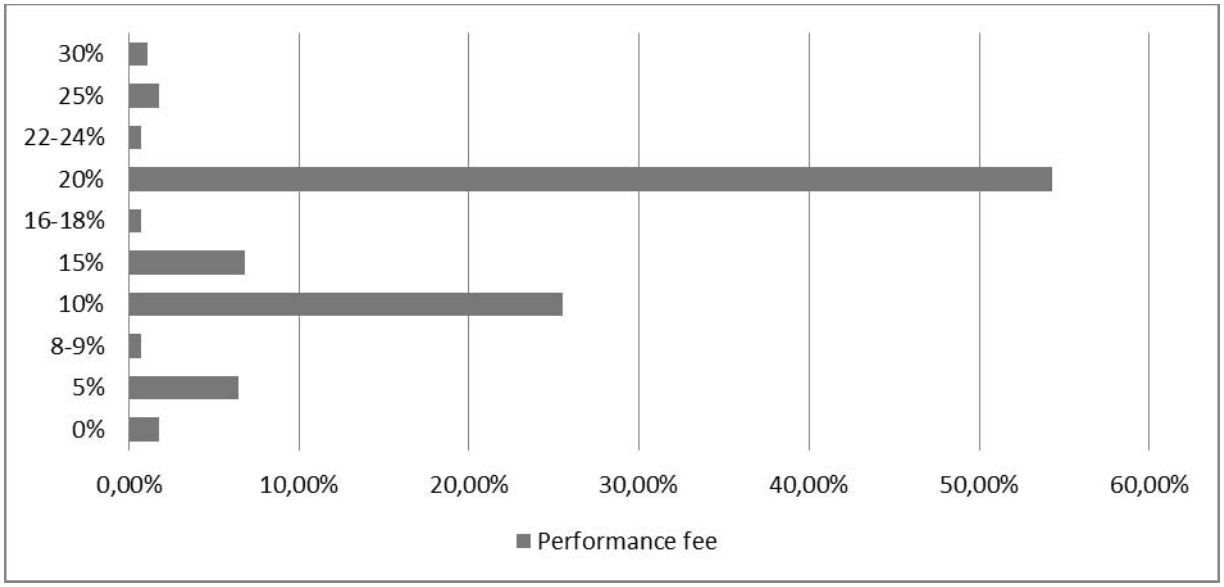

Fig. 2. Distribution of management fee in hedge fund industry
[Source: processed by author based on data from Morningstar free hedge funds database]

In next part we will examine impact of profitability of hedge fund industry on importance of specific fee. It is clear that performance fee (PF) will have bigger impact in the case of good

profitability of hedge fund industry. Management fee (MF) will have bigger impact in the case of low hedge fund returns.

We calculated costs of both fees on six different time frames and on two different levels of fees. We used time frame of 19 years, 10 years, 5 years, 3 years, 2 years and 1 year. Fees were calculated on imaginary portfolio of 10 000 USD and we calculated with traditional level of fees (2% MF and 20% PF) and current average level of fees (1.55 % MF and 16% PF). Results in next table are represented in numbers (cost in USD) and percentages.

Table 2. Comparison of specific hedge fund fees and their ratios in different time frames
[Source: processed by author based on data from Barclayhedge hedge fund indices]

HF Index hist.	Perf. p.a.	PF 16%	MF 1.55%	PF 16%	MF 1.55%	PF 20%	MF 2%	PF 20%	MF 2%
19 years	20.33%	325	155	68%	32%	407	200	67%	33%
10 years	5.59%	89	155	37%	63%	112	200	36%	64%
5 years	3.41%	55	155	26%	74%	68	200	25%	75%
3 years	4.79%	77	155	33%	67%	96	200	32%	68%
2 years	1.46%	23	155	13%	87%	29	200	13%	87%
1 year	0.04%	1	155	0%	100%	1	200	0.4%	100%
Minimum	**0.04%**	**1**	**155**	**0.45%**	**32.27%**	**1**	**200**	**0.44%**	**32.97%**
Maximum	**20.33%**	**325**	**155**	**67.73%**	**99.55%**	**407**	**200**	**67.03%**	**99.56%**
Average	**3.81%**	**61**	**155**	**27.21%**	**72.79%**	**119**	**200**	**26.61%**	**73.39%**

Based on the analyzed results we can conclude that, in current market conditions with low returns of hedge fund, importance of management fees for investors is bigger.

Information about fees is very important for investors in investment process. Although return is not known in advance, possible return will be in the case of higher fees definitely decreased by higher haircut. To help investors in decision making process, we created measure for easy evaluation of hedge fund fees. It is called Fee Index and evaluates hedge fund fees on the range between 0 and 100 points. Fund earns 100 points in the case of zero management and performance fee. Zero points earns fund in the case of management and performance fees on level, which is more than twice as big as the industry average (3.1% management fee and 32 % performance fee). Based on ratio between management fees and performance fees in last year's, calculated in Table 2., we determine weight of management fee on 70 points and weight of performance fees on 30 points. Equation for calculation of fee index for specific fund is:

$$Fee\ index = ((3.1 - management\ fee)\ /3.1)*70 + ((32 - performance\ fee)\ /32)*30$$

Ranking of ten best hedge funds (TOP 10 ranking) from our sample of 360 hedge funds, based on the hedge fund fees, is illustrated in the Table 3.

Highest ranked fund from our sample according to the fee index is Rothschild Multi Alternatif Equilibre Euro I. This fund earned 90 points from 100 (90 %) mainly because it's extremely low management fee (0.02 %) and below average performance fee (10 %).

We found in our sample also four funds with very weak values of Fee index. Therefore we created ranking of 6 worse funds according to their fee structure (Worse 6 ranking). Values of performance and management fees are of six worse funds are summarized in the Table 4.

Worse ranked fund, Alpha Strategien Triple B, with management fees above 3.1 % level (4 %) earned only 7 points for performance fee below 32 % (25 %).

Table 3. Example of TOP 10 hedge fund ranking based on fees
[Source: processed by author based on data from Morningstar free hedge funds database]

Rank	Name	Perf. fee (%)	Manag. fee (%)	Fee index
1	Rothschild Multi Alternatif Equilibre Euro I	10	0.02	90
2	Lyxor Diversified Fund Class USD	5	0.5	84
3	Rothschild Multi Alternatif Equilibre Euro C	10	0.52	79
4	La Française Allocation Volatilité PI	10	0.8	73
5	Dinvest Core Liquid FCP	15	0.6	72
6	Dynamic Global Growth Opportunities	0	1.25	72
7	ERAAM Alpha Fund	10	0.9	70
8	Danske Invest Fixed Income Strategies	20	0.5	70
9	Mutuafondo Estrategia Global	9	1	69
10	Absolute Global Alternative	10	1	68

Table 4. Worse 6 ranking of hedge funds based on fee index
[Source: processed by author based on data from Morningstar free hedge funds database]

Rank	Name	Perf. fee (%)	Manag. fee (%)	Fee index
1	Alpha Strategien Triple B	25	4	7
2	Superfund Green Q-AG	20	4,8	11
3	Man AHL Diversified Plc	20	3	14
4	Alpha Strategien Triple A	15	4	16
5	New Capital All Weather	10	3	23
6	GT Opportunités A Acc	17.94	2.39	29

Conclusion

We identified significant variability of both performance and management fees and clear pressure on decrease of fees from traditional 2 % management fee and 20 % performance fee. Only 11.5 % of funds charges traditional 2% management fee and 54 % of funds charges traditional 20% performance fee. Both, management and performance fee decreased by significant percentage (29 % in the case of management fee and by 26 % in the case of performance fee). These fees moved to new average levels of 1.55 % in the case of management fee and 16% in the case of performance fee.

Although return is not known in advance, with higher fees it will be definitely decreased by higher haircut [Taleb, 2014]. A higher fee decreases net profit (gross profit - fees) from investment. Therefore investors should choose funds with lower fees. Of course they should choose just from funds that fulfill other important decision making criteria.

Easy way how to evaluate funds expensiveness in the case of fees is Fee Index. We established it based on easy calculation, where fund can earn maximum of 100 points, in the case of zero management and performance fee. Due to the current market conditions with low returns of hedge fund industry we set weight of management fee on 70 % and weight of performance fee on 30 %. We also illustrated use of fee index on example of 360 hedge funds and created ranking of ten funds highest value of fee index. According to our opinion, these highest ranked funds have most favorable fee structure for investors.

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The Impact of Shadow Economy on Government Deficit in the EU countries

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Abstract

Since the mid-20th century, most of the developed countries have reported a fiscal imbalance, which has, due to the impact of various factors, including the last global crises, even deepened over the years. The shadow economy significantly impacts the government revenues through the amount of collected taxes and thus can be assumed that it also has a certain impact on the short-term fiscal imbalance (the government deficit). The objective of this paper is to analyse the impact of the shadow economy on a short-term fiscal imbalance by using the methods of quantitative economy. The results of the conducted analyses point out the negative impact of the shadow economy on the short-term fiscal imbalance in certain countries more than in others, which is also a subject of the overall fiscal situation of a country.

Key words: *shadow economy, tax evasion, short-term fiscal imbalance, government deficit*

1. Introduction

The consequences and results of the current development in the fiscal situation of the countries are represented in the form of massive deficits far beyond the Maastricht criteria. Formation of fiscal imbalance, which is in a given year revealed as budget deficit, occurs due to a mismatch between the amount of actually received and used funds and represents a fundamental problem of public finances.

The reduction of the expenditures has its limits and therefore it is required to seek a solution of the fiscal imbalance in the area of increased revenues, specifically in the creation of tax revenues, and their administration as well the effectiveness of their collections. The largest part of the government revenues represents the taxes and it is taxes that offer several options for raising the amount of collected revenues. The amount of collected taxes however does not represent 100% of the payable taxes and a significant share of this fact is covered by the shadow economy. Therefore, in this paper we focus on analysing the impact of the shadow economy on the government deficit of a given country or group of countries in the EU.

2. Methodology

The first part of the paper focuses on clustering the 28 EU countries into homogenous groups, based on the selected segmentation criteria, which are *gross domestic product at current prices (GDP growth), net lending (+) or net borrowing (-) excluding interest of the general government adjusted for the cyclical component (PrimaryB), general government consolidated gross debt (GDEBT), Fiscal rule index (FRI) and Shadow economy (TE)*. The stated criteria represent secondary data obtained from the AMECO database of the European Commission's "Fiscal rules database" and from the empirical research of Schneider for the period of 21 years from 1995 until 2015 for each of the 28 EU countries.

For the purpose of clustering, a mean (arithmetic average) of all data series (1995-2015) for each of the 28 EU countries and for each segmentation criterion was calculated. The obtained data were transformed in the next step to weighted averages, with the accent (weight) on the basic fiscal indicators deficit and debt, which represent the most important segmentation criteria and endogenous variables in the following regression analysis. The indicators have been assigned with the estimated weights: deficit (primary B) with 65%, debt (GDEBT) with 15%, shadow economy (TE) with 9%, GDP growth with 8% and FRI with 3%. Transformed weighted indicators represented the final segmentation criteria for clustering, which were then normalized through n1 – standardization ((x-mean)/sd) and applied into R statistic software, using the Euclidean distance and the hierarchical Ward's method. Applying the Hubert statistic and the Dindex, we have decided on the optimal number of clusters.

The second part of the paper analyses the impact of the shadow economy and other control, economic and fiscal variables on the endogenous variable primary balance through the panel regression models. The secondary data on the primary balance (net lending (+) or net borrowing (-) excluding interest of the general government adjusted for the cyclical component) expressed as a percentage of GDP, were obtained from the AMECO database for all 28 EU countries for period of 21 years, from 1995 until 2015. The data for the exogenous control variables, also for the 28 EU countries and the period 1995 – 2015, was obtained from the database The Worldwide Governance Indicators (WGI) produced by the World Bank Development Research Group and the Natural Resource Governance Institute (NRGI) and the Brookings Institution, from the Heritage Foundation database (co-published by The Wall Street Journal). The data for the economic and fiscal variables was obtained from the AMECO database.

The empirical evaluation of the impact of the shadow economy on the development of the short-term fiscal imbalance was executed in two main phases: a test for non-stationarity of time series and implementation of the panel regression analysis. In the environment of R program, we have applied the KPSS test to test the stationarity our time series. In the second step we have specified the models of regression analysis, we have quantified the model's parameters and verified the model. We have applied the F-test of the statistical significance of the individual components to select the appropriate regression model between the OLS model and Pooled Regression model and subsequently between the Pooled model and FEM model. To decide between the FEM and REM models, we have used the Hausman test, which is a methodology based on the consistency of the fixed and the random effects models. For the verification of the statistical significance of individual effects (between the time fixed effects and the country fixed effects) we have applied the Panel Lagrange Multiplier test (PLM test).

3. The Short-term Fiscal Imbalance in the Light of the Shadow Economy

Shadow economy exists and functions in parallel with the real economy of a country, however, as reflected in its name, all of its activities are performed in the shade of real economy, that is with no possibility to precisely measure its extent. Schneider and Enste [2000] point out that any attempt to measure the shadow economy faces, at the first place, the difficulty of defining it. The authors state the commonly used definition of shadow economy as "that which comprises all currently unregistered

economic activities that would contribute to the officially calculated gross national product if they were recorded." The size of the shadow economy in the EU is estimated to be nearly one fifth of its GDP, which is the first indication on the extent of this issue.

In general, shadow economy has negative implications on the economy as it hampers governmental efficiency in engaging in beneficial programs financed through budgetary revenues and results e.g. in an eroded tax base which in turn widens the national budget deficit and consequently the public debt. The shadow economy represents an overall problem faced by national governments as well as by international groups' leaders. From the macroeconomic point of view, one of the most important facts is that it negatively influences budget revenues and budget expenses and in the end it negatively impacts the country's fiscal balance, both in a short-term, as well as in a long-term horizon. There is no longer a question if the shadow economy impacts the fiscal balance of a country or group of countries, but the most recent issue is the size and extent of this effect.

The main objective of this paper is to quantify the impact of shadow economy on a short term fiscal imbalance of EU (28) countries, by using relevant econometric methods. In accordance with the stated objective, the analysis has been divided into two parts.

The first part is focused on economically transparent and meaningful categorization of the 28 EU countries, taking into consideration selected segmentation criteria. The aim is to group and segment the 28 EU countries through a form of cluster analysis and arrange them by selected clustering criteria, which represent a fiscal position of each country and whose selection is a result of empirical analysis and theoretical findings. The clusters of countries grouped by their resemblance to each other, as well as quantitative characteristics of these clusters for period 1995 – 2015, represent a starting point for the second part of the analysis, in we measure the impact of shadow economy on the short term fiscal imbalance during the period of 21 years, from 1995 until 2015. The aim is to evaluate the consequences of existing tax evasion on the development of the short term fiscal imbalance, expressed through net landing (+) or net borrowing (-) excluding interest of the general government adjusted for the cyclical component, using a panel regression analysis for the above identified clusters of the European countries. The econometric model is designed in a way so that it takes into account the relevant indicators for a correct estimation of causal connections between the deficit and tax evasion and at the same time considers the wide range of already empirically proven economic, political and fiscal determinants of the deficit.

The following cluster analysis focuses on categorization of the 28 EU countries through selected segmentation criteria for the period 1995 – 2015. Based on the theoretical knowledge and empirical research, we have considered five segmentation criteria. Selected criteria represent basic fiscal indicators, which can be used to reflect the fiscal situation in individual countries. These indicators provide a sufficient base for conducting the cluster analysis. The selected segmentation criteria include: *gross domestic product at current prices (GDP growth), net lending (+) or net borrowing (-) excluding interest of the general government adjusted for the cyclical component (PrimaryB), general government consolidated gross debt (GDEBT), Fiscal rule index (FRI) and Shadow economy (TE).*

The cluster analysis has been conducted through the hierarchical Ward's method and the results in the form of clusplot are shown in Figure 1. Applying the Hubert statistic and the Dindex, we have decided on the optimal number of 4 clusters, which do not show any joint intersections or overlapping areas between each other.

Table 1 shows the grouping of the 28 EU countries into four clusters, based on their similarities in segmentation criteria. Cluster 1 consists of three countries with the highest gross debt among all EU (28) countries (above 100% of GDP). Cluster 2 groups eight countries with the individual shadow economy above the EU (28) average, but with the highest GDP growth. Countries in Cluster 3 are characteristic by their average level of gross debt, but report high deficits and relatively high GDP growth. Cluster 4 consists of eight countries, which reported on individual basis relatively low gross debt and shadow economy and at the same time their primary balance was in the form of surplus or very small deficit.

For the purpose of further analysis, it is not as important to know the number of countries belonging to each cluster, as it is to know the quantitative characteristics of the selected segmentation criteria for each of the clusters. In Table 2 are the summarized values of segmentation criteria, calculated as median values of each variable within each cluster.

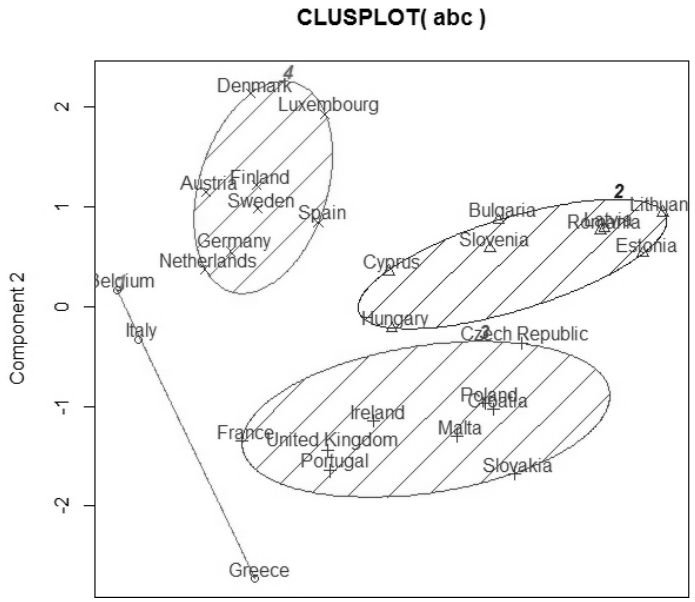

Figure 1. Ward's clusplot pf the 28 EU countries organized in 4 clusters
[Source: Authors own elaboration as output from R software]

Table 1. Overview of the 28 EU countries split into 4 clusters
[Source: Authors own elaboration]

1. cluster	2. cluster	3. cluster	4. cluster
Belgium	Bulgaria	Czech Republic	Denmark
Greece	Estonia	Ireland	Germany
Italy	Cyprus	France	Spain
	Latvia	Croatia	Luxembourg
	Lithuania	Malta	Netherlands
	Hungary	Poland	Austria
	Romania	Portugal	Finland
	Slovenia	Slovakia	Sweden
		United Kingdom	

From the point of economic interpretation of clustering results, we focus on the values of primary balance, as response variables, and values of shadow economy, which was explanatory variable, as they represent the variables that are subject to our further analysis. The primary balance with the positive (plus sign) values represents a surplus, while negative primary balance reflects a deficit. By improving the primary balance, the values are moving towards positive numbers, or in the case of positive primary balance towards higher positive values. Comparing the clusters based on their values of primary balance and shadow economy, the first cluster shows the highest surplus in primary balance (2.705%) and the third cluster reports the lowest primary balance, meaning the highest deficit (-1.325%), however both clusters report the average shadow economy extent (20.067% and 22.020%). On the other hand, the second cluster with the highest estimated shadow economy (27.120%) shows average deficit (-0.958%).

Table 2. Quantitative characteristics (medians) of clusters created by the Ward's method [Source: Authors own elaboration]

CLUSTER	GDP growth (in % GDP)	Primary B (in % GDP)	GDEBT (in % GDP)	FRI (index)	TE (in % GDP)
1	2.913	2.705	111.781	-0.342	20.067
2	8.948	-0.958	30.092	-0.200	27.120
3	6.463	-1.325	55.616	-0.353	22.020
4	4.017	1.744	53.577	1.013	17.853

It can be assumed that the countries (or clusters of countries) with the lower values of deficit, respectively with surpluses (i.e. with the positive primary balance), will report a lower impact of shadow economy, while the clusters with high deficits would show a significantly strong effect of shadow economy, caused mainly due to the fact that their deficit could be a result of their lower revenues (as a consequence of shadow economy activities, e.g. tax evasion). The results of cluster analysis shown in Table 2 provide an overview of the groups of countries, which represent a supporting base for the further regression panel analysis.

The authors [such as e.g. Sarac and Basar, 2014; Bajada and Schneider, 2005; Schneider and Enste, 2000] mainly point out the negative effects of the shadow economy in the form of destabilization of economic and social balance and damaging of macroeconomic, monetary and fiscal development.

In the second step, we carried out the panel regression analysis for the purpose of empirical assessment of the impact of the shadow economy on the development of the short-term fiscal imbalance (represented through the cyclically adjusted primary balance indicator) during the period of 21 years, from 1995 until 2015, in the 28 EU countries. Due to the differences in the fiscal position of individual countries during the monitored period, we have applied the results of the cluster analysis as the base for the realization of the panel regression analysis. We have evaluated the short-term fiscal impact of the shadow economy in the pre-identified clusters (representing the panel data), through the econometric models and the synthesis of obtained outcomes. The econometric model yet been designed the way so that it takes into account the relevant variables for a correct estimation of a causal connection between fiscal imbalance and shadow economy and at the same time it considers the impact of a wide range of other economic, political and fiscal determinants of fiscal imbalance that have already been verified.

The basic assumption of the analysis is that the short-term fiscal imbalance of a country is positively influenced by the size of the shadow economy in that country. To test the hypothesis that a larger shadow economy is associated with a larger fiscal imbalance (in the form of deficit) was set up with the following equation of econometric model *(1)*:

$$FB_{i,t} = \beta_0 + \beta_1 TE_i + \sum_{k=2}^{m} \beta_k \, COVA_{k,t} + \sum_{i=m+1}^{n} \beta_i \, ECON_{i,t} + \sum_{f=n+1}^{r} \beta_f \, FISC_{f,t} + \varepsilon_{i,t}$$

In the above equation *(1)*, *FBi,t* represents the endogenous variable "fiscal balance" in a given year. With the intention to eliminate the effect of inertia and dynamics of interest payments on the public debt when analysing the fiscal policy of a given country, as well as the effect of the cyclical component, the endogenous variable is expressed in the form of a primary balance. The coefficients β_0 and β_f represent the regression coefficients, μ_i and λ_t represent the individual error component and $\varepsilon_{i,t}$ is an idiosyncratic error independent of regressors. Then *i* represents the country and *t* the year of the data and are used for all variables.

Based on the theoretical knowledge and empirical researches [such as e.g. Maltritz and Wüste, 2015; Saraç and Basar, 2014; Manolas, Rontos, Sfakianakis and Vavouras, 2013; Çiçek and Elgin, 2011; Tujula and Wolswijk, 2004; Enste, 2003; Schneider and Enste, 2000 and others] dealing with

the issue of the shadow economy, as well as the fiscal imbalance and its determinants, were included in the models four groups of exogenous variables.

The first exogenous variable, which represents an examination object (the analysed determinant) in the econometric model *(1)* is the shadow economy $TE_{i,,}$ whose estimates for all 28 EU countries for the period 1995 – 2015 were taken from the empirical research of Schneider. Due to the incomplete data for the period 1995 – 1998 in case of some European countries, missing estimates were calculated as a moving average of three consecutive years.

The vector $COVA_{k,t,c}$ represents a vector of various control variables. As stated by Leightner and Inoue [2012], one of the regression analysis' most serious problems is the problem of omitted variables. To fix the problem of distortion of regression coefficients of analysed determinant ($TE_{i,t}$) and its statistical significance due to the impact of omitted variables, we added the control variables in the model. From the empirical point of view, the considered control variables satisfy the conditions on which the omitted variable bias problem is based, namely the existence of correlation with the analysed regressor ($TE_{i,t}$) and the existence of the relationship with the endogenous variable ($FB_{i,t}$).

Among the exogenous variables included in this group were the rule of law (RofL), government effectiveness (GovEff), control of corruption (CofC), political stability (PolStab), business freedom (BusFree), monetary freedom (MonFree), investment freedom (InvestFree), financial freedom (FinFree), social security contributions burden (BurdenSSC), tax burden (BurdenTax) and government spending (GovSpend).

The vector $ECON_{k,t,c}$ in the equation *(1)* represents a vector of economic determinants of the fiscal imbalance. In this group we included such factors, which based on the conducted empirical research are consider to be the measures of fiscal responsiveness to macroeconomic conditions: annual percentage growth of GDP (GrowthGDP), output gap (GapGDP), total consumption of general government and of private sector (Cons), investment of total economy (Invest) and the unemployment rate (Unempl). In this group was also included the determinant inflation (HCPI), the factor representing the effects of external environment on changes in the fiscal imbalance (Openness), the determinants representing the proportion of the population in the age group over 65 years (Pop65) and the population in the age group of 15-64 years (PopActive) on the total population of the country.

The third vector $FISC_{k,t,c}$ represents a vector of fiscal variables, selected through the empirical research as follows: revenue volatility (VolRev) and expenditure volatility (VolExp), the variable change in the debt ratio (GrowthDebt) captures the dynamics of debt to GDP, debt servicing costs, stock-flow adjustment (StockFlowA) and snow ball effect (SnowBall) and the long-term interest rate (LTInterest) signalises the costs associated with the debt financing in the country.

The empirical evaluation of the impact of the shadow economy on the development of the short-term fiscal imbalance was executed in two main phases: a test for non-stationarity of time series and implementation of the panel regression analysis. The experience has shown that many real time series are non-stationary. In the environment of R program, we have applied the KPSS test to test the stationarity our time series. In the second step we have specified the models of regression analysis, we have quantified the model's parameters and verified the model.

The econometric model was specified in a way so that it reflects relevant parameters for a correct estimation of causal connections and at the same time takes into account the wide range of already empirically verified economic, political and fiscal determinants of the deficit. The model quantification consists of the estimation of the specified econometric model's parameters, based on the quantitative statistical data, empirically determined through selected model techniques. The panel regression model was selected based on the character of the model's variables, which are combination of cross-sectional and time series data of the 28 EU countries. In each of the considered panels, represented by the four clusters (cluster 1 – cluster 4), we deal with four basic types of models, which are the Ordinary Least-Squares Regression Model (OLS) with dummy variables for countries and years, Pooled Regression Model, Fixed Effects Model (FEM) and Random Effects Model (REM).

The results of the model's verification and determination have shown that there are two models appropriate for examination of our data set and that is the OLS.dum1 country model and the country FEM model (the fixed effects for the country). While the first model came out as the best solution only for cluster 1, all other clusters were further modelled through the country FEM model.

The basic equation of the model, reflecting the impact of all explanatory variables on the endogenous variable (the fiscal balance represented through the primary balance indicator ($FB_{i,t}$)), was defined in form *(1)*. The interpretation of the results needs to take into account the fact that the primary balance (defined as net lending (+)/net borrowing (-) excluding interest of the general government adjusted for the cyclical component) is explained in a positive manner, which means that the positive value of the primary balance represents a surplus (+) while the negative value is a deficit (-). Based on the above, the values of the estimated regression coefficients of statistically significant exogenous variables will display the expected sign in relation to the primary balance.

The results of the panel regression, together with the corresponding estimates of the coefficients, their statistical significance and the values of Adjusted R-squared, are shown individually for each of the four clusters of the EU countries in Table 3.

The significance of all exogenous variables was tested by comparing the probability p-value with the selected level of significance $\alpha = 0.05$ for each cluster and the statistically insignificant variables were removed from the model. The statistical significance of the individual variables is marked with ***, according to their probability value (p-value) in line with the scale of significance codes (as stated at the bottom of the above mentioned Table 3).

The statistical significance of each model as a whole has been assessed based on the value of Adjusted R-squared (also shown at the bottom of Table 3). The Adjusted R-squared values describe what proportion of the total variability of the endogenous variable (primary balance) is determined by the quantified econometric model. E.g. the Adjusted R-squared coefficient for cluster 1 is 0.8929, which says that 89.29% of the variability of the primary balance is explained by the applied model, taking into consideration only the statistically significant variables. The remaining variability of primary balance (10.71%) can be explained by disturbances or other causes, such as the relationship between the variables.

Based on these results, we can summarize that all the above mentioned prerequisites of the conducted panel regression analyses are met. Due to the large extent of data, we will describe the results of the panel regression with the emphasis on the effect of the shadow economy and with only a brief description of the effects of some other significant variables, which showed unexpected or interesting results, following the trend of variables within a group of variables (control, economic and fiscal variables).

In line with the set objective, we have identified the significant determinants of the short-term fiscal imbalance, with the emphasis on the factor "the shadow economy". The expected negative effect of the shadow economy on the primary balance has been confirmed in clusters 3 and 4, where the negative sign of the regression coefficient of the shadow economy (-0.452484 and -0.257181) proves that the larger shadow economy is associated with the worsen primary balance (respectively with a larger fiscal imbalance) in the countries categorized in these two clusters. The positive sign of the regression coefficient in cluster 1 (0.87998), documents that the growth of the shadow economy leads to the improvement of the primary balance (lower government deficit), which is in contradiction to the expected assumption. The analysis showed the factor shadow economy as statistically insignificant for cluster 2.

The positive effect of the shadow economy on the primary balance, in the meaning that increased shadow economy improves the short-term fiscal imbalance, can be explained through activities impacting both, the government revenues, as well as the government expenditures. Looking for the answer to this situation in the activities of the shadow economy, we can explain it e.g. through the tax evasion, which is a part of the shadow economy. On one side, it is mainly the big corporation and high-income taxpayers that tend to engage in the tax evasion activities more easily than other

taxpayers, since they tend to generate their income from multiple sources and can afford to hire lawyers and accountants to structure their income so that they owe as little tax as possible. The resources spent on evading taxes (e.g. in the form of legal fees to lawyers and accountants, etc.) are definitely lower than expected savings (otherwise it would not be beneficial for a taxpayer), however, these resources are officially recorded and taxed and thus increase the government revenues. As the high-income taxpayers are attempting to evade high amounts of taxes, the resources spent on implementing the activities related to the tax evasion are not negligible. On the other side, the literature also provides strong evidence that the shadow economy functions as a shelter for many unemployed (e.g. during the time of crises) and thus frees the government budget from expenditures in the form of social contributions, etc.

Auerbach and Slemrod [1997] conclude that timing and other tax evasion behaviours are the behaviours most responsive to tax changes, while changes in real productive activities are actually the least responsive. These timing and other evasion behaviours also likely explain that the taxpayers change the timing of when they derive or evade income and "plan" their tax evasion based on various social, legal or fiscal circumstances. Thus, the size of the tax evasion in a given year does not necessarily reflect the shadow activities of that year and the impact on the budget might be also reflected with a delay.

Table 3 shows that the panel regression analysis evaluated also other variables as statistically significant in impacting the primary balance. There are some interesting results that need to be highlighted.

First, none of the exogenous variables (control, economic or fiscal) has been statistically significant in all 4 clusters. There are only 2 variables that were reported as statistically significant in 3 clusters and that is a control variable "Government effectiveness" (Gov Eff) and an economic variable "Unemployment rate" (diffUnempl).

Two variables, both from the group of fiscal variables, show different/opposite signs of the regression coefficients in individual clusters. The variables "Change in debt ratio"(GrowthDebt) and "Long term interest rate"(LTInterest), were present only in clusters 1 and 3, where the variable GrowthDebt was positive in cluster 1, but negative in cluster 3 and the variable LTInterest was negative in cluster 1 and positive in cluster 3. Both positive and negative effects of these two variables are in line with their expected impacts on the primary balance. A positive effect of the variable GrowthDebt on the primary balance in cluster 1 means that the growing debt improves the primary balance, while the negative sign of the regression coefficients in cluster 3 reflects the negative effect on the primary balance, which means that the growing debt makes the primary balance get worse. The growing debt will increase the efforts to decrease the deficit and motivate the country towards "smaller spending". A negative impact of the variable long-term investment rate (LTInterest) in cluster 1 deteriorates the primary balance, but a positive sign in cluster 3 improves the primary balance. Both effects are in line with the assumptions. The long-term interest rate signalises the costs related to debt financing in the country, which makes the overall level of the fiscal balance worse through the growing expenditures on the interest from the newly issued debt and rolling debt. On the other side, the higher interest rates might signalise higher opportunity costs of bond market financing and thus improve the fiscal balance.

There are 5 variables that reported the sign of their regression coefficients opposite to what is expected. The control variable "Control of corruption" (CofC) with its negative coefficient (in clusters 2 and 3) indicates that the growing control of corruption can cause a worse primary balance. This can be explained by the fact that the growing control of corruption leads to the increased government expenditures for financing the control mechanisms used as prevention and detection of the corruption. Thus, the increased control can cause a deepening government deficit.

The variable "Annual Percentage Growth of GDP "(GrowthGDP), reported for cluster 2 the negative impact on the primary balance, which indicates that the growing GDP by one unit, worsens the primary balance by 8.354 units. Although at first glance the reported relation between the GDP growth and the primary balance might seem in conflict with the expected – positive – effect, there is

an open question on what should be the expected effect. In general, the growing GDP improves the primary balance, however the GDP growth is associated with many other effects (also with the impact on other variables) so the final effect, in its expected form, might not be definite. Even the empirical literature does not provide a uniform and general explanation on the expected final effect of GDP growth on the primary balance.

Table 3. Determinants of primary balance in clusters 1 – 4
[Source: Authors own elaboration based on testing results in R software]

Independent variables	Cluster 1 OLS model	Cluster 2 PLM Fix Model	Cluster 3 PLM Fix Model	Cluster 4 PLM Fix Model
TE	0.87998 (0.005390)**	-	-0.452484 (0.0379270)*	-0.257181 (0.009623)**
RofL		-		-6.273935 (5.900e-05)***
GovEff	6.33931 (0.006970)**	-	6.890251 (0.0013102)**	3.261019 (9.784e-06)***
CofC		-1.780451 (0.0619213).	-4.549947 (0.0036627)**	
PolStab	3.86361 (0.003956)**	-	2.183879 (0.0360975)*	
BusFree	-	-	0.091590 (0.0345789)*	0.035947 (0.036392)*
MonFree	0.23517 (0.037676) *	-		
InvestFree		0.053664 (0.0116438)*		
FinFree	-0.12482 (0.000469)***			-0.020298 (0.163136)0
HCPI	0.30289 (0.004482)**			
BurdenSSC		0.843933 (0.0004520)***		
diffBurdenTax		0.443549 (0.0037719)**		0.472535 (7.294e-05)***
diffGovSpend		-0.178480 (0.0047712)**		-0.147768 (0.017826)*
GrowthGDP		-8.354601 (0.0006528)***		
GapGDP				-0.166617 (0.001311)**
Cons	-69.24211 (0.002918)**			-44.696051 (4.926e-11)***
Invest	-47.97143 (0.000644)***			
Openness			-5.987780 (0.0002830)***	
diffUnempl		-0.234324 (0.0154336)*	-0.533214 (0.0060192)**	-0.194517 (0.104253)
GrowthDebt	13.83976 (0.016593)*		-9.862550 (0.0001269)***	

LTInterest	-0.27566 (0.015225)*		0.382331 (0.0212865)*	
Pop65	-6.97216 (0.000173)***	-0.913977 (2.148e-06)***		
PopActive	-5.84175 (1.08e-05)***		-1.151761 (0.0005141)***	
	Cluster 1: OLS Model: R-squared: 0.9215; Adjusted R-squared: 0.8929			
	Cluster 2: PLM Fix Model: R-squared: 0.45639; Adjusted R-squared: 0.39894			
	Cluster 3: PLM Fix Model: R-squared: 0.56273; Adjusted R-squared: 0.48511			
	Cluster 4:PLM Fix Model: R-squared: 0.63749; Adjusted R-squared: 0.56048			
	Signif. codes: 0 ***; 0,001 **; 0,01 *; 0,05 . ; 0,1 ; 1			

Among the significant determinants with an unexpected effect on the primary balance is also the ”Consumption” (Cons) in a given country, which according to the negative regression coefficients in clusters 1 and 4 means that the growing consumption of the general government and the private sector leads toward a worse primary balance. This fact can be explained through the implicit assumption that all (or most) government expenditures are of a consumption nature (instead of investment or the optimal combination of the above) and that does not contribute to the improving primary balance.

“The investment of total economy” (Invest) variable reported the negative regression coefficient in cluster 1, meaning that the growing investments lead to worsen primary balance. This controversial result can be explained from the time perspective as understandable, as investing does not bring the funds to the government budget immediately and then depending on the structure of the investments, it might take longer to reflect the benefit of the investments in the primary balance.

The last variable reporting an unexpected sign of the regression coefficient is “Population 15-64 years” (PopActive). The negative effect of the Active population in the age 15-64 needs to be reviewed in respect of the structure and share of various age categories on the total active population, as the share of e.g. the studying population (over 15 years old) compared to the really active population, might result in the above stated adverse effect on the primary balance. In addition, also the situation on the labour market in terms of employment rates can significantly change and impact the results.

4. Conclusion

The conducted analysis allowed us to determine the statistically significant variables of the short-term fiscal imbalance and to quantify the polarity of their impact, with the focus on the factor of shadow economy. The object of investigation was the shadow economy; therefore we have verified the hypothesis that the primary balance, acting as an endogenous variable, is positively influenced by the growth of the estimated size of the shadow economy in a given country (respectively group of countries).

The above stated results of the shadow economy’s impact on the government deficit prove that the shadow economy has a significant effect on the short-term fiscal imbalance and depending on the country (group of countries), timing effect and other invisible “shadow” impacts, the extent and the consequences can vary.

The shadow economy affects the amount of collected taxes, mainly through its “component”, which is a tax evasion. Although the estimated size of the shadow economy in the EU countries gradually decreases, its size is still a big threat to the budgets, as the revenues “lost” due to the shadow economy are not insignificant. The governments are starting to realize that the shadow economy is a real part of the economy in each country and thus fighting it opens new possibilities for the governments in solving their problems with the deficit and in time, also with the debt.

The results of the cluster analysis, represented in the form of four groups of the 28 EU countries, with the median values of the basic fiscal indicators for each cluster, provide a supporting base for the further regression panel analysis.

The conducted panel regression analysis allowed us to determine the impact of the shadow economy on the short-term fiscal imbalance in the EU countries, grouped in 4 clusters.

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Local Indebtedness in Slovakia

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Abstract

Local indebtedness in Slovakia came into question after realizing the process of fiscal decentralization in the beginnings of the 2000s. The shift of responsibilities on local governments and following shift of sources was considered as inadequate from the point of view of localities after the financial crisis in 2009, when local debt as well as public debt began to increase. In this paper the fiscal shock in indebtedness, both total and local, is investigated using the VAR model. Results show approximately one year lasting hardening process as a response of local and total government debt on fiscal shock caused by local or total government debt increase. Paper is elaborated within national scientific research project VEGA 1/0559/16 Indebtedness of local municipalities of Slovakia, the Czech Republic and Hungary and its impact on financing of public services.

Key words: *indebtedness, local government, local debt, public debt, VAR model*

Introduction

Local debt is a part of public debt. Eurostat defines the public debt as sum of public sector commitments on all level of public governments and public funds [11]. Consequently, local debt is a sum of public sector commitments on local level of public government. According to [5] self-government debt is part of public administration debt made on a local level, which is a lower level of government constituted from both local and regional level of government.

The evolution of local indebtedness reacts on changes in revenue and expenditure budgetary items. Their imbalance causes the incentive to borrowing and usually is connected with two aspects. Firstly, the setting of local financial scheme is important. When local governments are mostly financed by local taxes sensitive to changes in economic reality, in case of financial crisis these sources are insufficient to cover operative needs of localities [4]. Second motive of increasing indebtedness is linked with capital budget. Localities are able to receive sources on capital markets to realize capital plans in favour of locality infrastructure. Many of capital plans are non- profit and serve to increase citizen's welfare. Additionally, drawing of EU funds to realize capital plans requires the co-financing [9]. Those are the problems of increasing local indebtedness of nowadays. The fragmented residential structure of Slovakia coincides with risky position of small villages in context of local indebtedness. While bigger localities are usually more capable to repay their debt, much smaller are in a contrary position [1]. Their budget possibilities are reduced naturally by the budget volume and tax base.

Local indebtedness in Slovakia

Local indebtedness in Slovakia is mostly linked with municipal indebtedness, whereby, local level of government in Slovakia includes beside municipalities also higher territorial self-governments and they exist in Slovakia since 2001. Local indebtedness restrictions are listed in Act on local self-governing units budget rules no 583/2004, where two types of local indebtedness indicators are described in 17§. Firstly, total local (municipal) debt does not exceed 60% of real current incomes of forms fiscal period. Second, the annual repayment of financial returnable sources (repayment of principal and interests) does not exceed 25% of real current incomes of former income period [10].

The evolution of local and public (government) debt in Slovakia is shown in Figure 1. Correlation coefficient between local debt and public debt is 0.23 using the observations 2000:1q - 2015:3q, under the null hypothesis of no correlation with 5% critical value with two-tailed p-value 0.0725. However the visual evaluation indicates the contrary evolution of two variables in the question in the 2000 - 2008, after the financial crisis disturbance (2009), the massive increase is observed and it causes the positive correlation between them. Local debt increased feebly since 2004, were the first phase of fiscal decentralization was finished and the second phase began bringing release of local autonomy in financial field [3]. The Act on budget rules of self-governing units no. 583/2004 defined frontiers of local indebtedness [10]. Public debt had to meet the Maastricht Criteria.

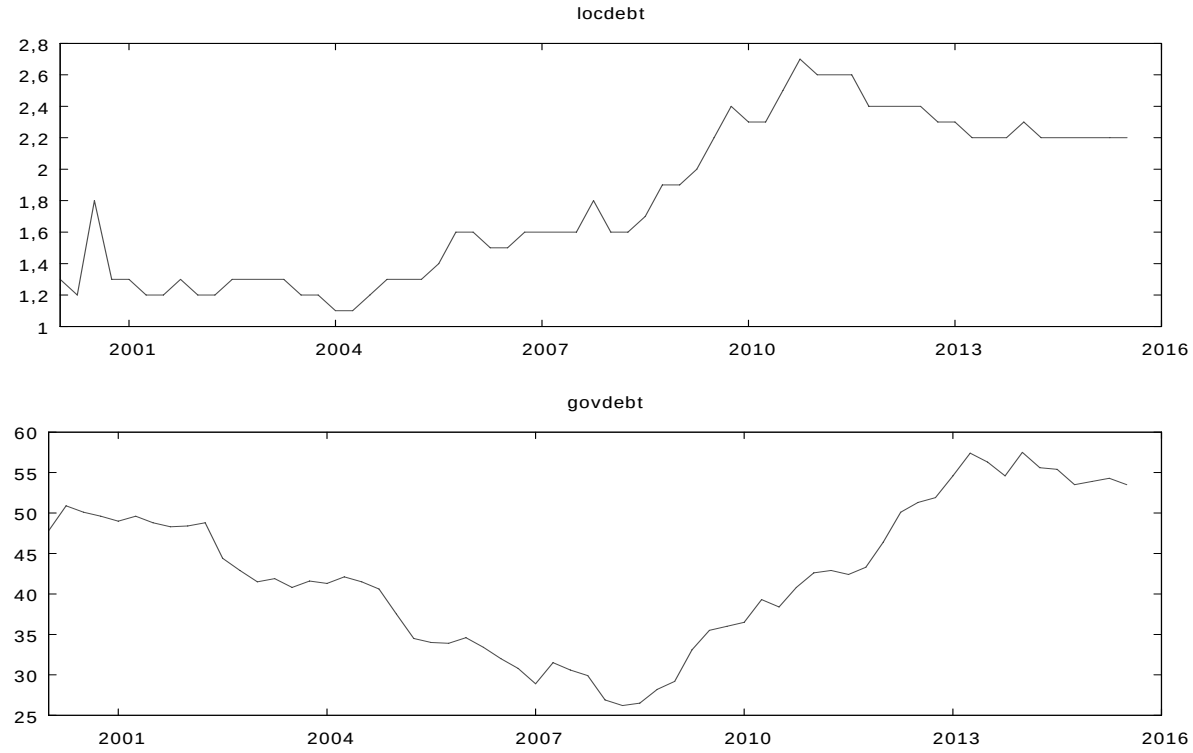

Figure 1. Local debt and public debt as % of GDP, evolution in 2000 – 2015 quarterly
[Source: author's calculation, Gretl]

Methods, data and assumptions

Vector Autoregressive Model (VAR model) is introduced by [6] and presents dynamic systems of equations, where all variables involved to a model are treated as endogenous. One of the most useful applications of the VAR estimation is calculating casual impacts of unexpected shocks to specified variables on the endogenous variables, which is summarized by the impulse response functions [8].

The data for the VAR estimation are taken under the condition of be stationary in the level or in the first differences. To test if data are stationary or not the augmented Dickey- Fuller (ADF) test or Dickey – Fuller – GLS test (DF-GLS test) is usually used [2].

VAR models are lag length sensitive. The lag structure for each country was set mostly by following the Akaike criterion (AIC), additionally the Schwarz criterion (SC) or Hannan-Quinn criterion (HQ). Results of impulse response functions are best shown by their graphical interpretation. For the econometric estimation the program Gretl was used.

In this article endogenous variables involved to the VAR model are government size and fiscal decentralization. Preliminary investigation of other variables brought only slightly important results. Therefore two - variable vector implies the two dimensional VAR model for each country, where we assume two exogenous shocks.

A *two* dimensional VAR model with *two* equations formula is:

$$y_t = \beta_{y0} + \beta_{yy1} y_{t-1} + ... + \beta_{yyp} y_{t-p} + \beta_{yx1} x_{t-1} + ... + \beta_{yxp} x_{t-p} + v_t^y \quad (1.a)$$

$$x_t = \beta_{x0} + \beta_{xy1} y_{t-1} + ... + \beta_{xyp} y_{t-p} + \beta_{xx1} x_{t-1} + ... + \beta_{xxp} x_{t-p} + v_t^x \quad (1.b)$$

where y and x are endogenous variables, p is a lag order, β_{xyp} is a coefficient of y in the equation of x at lag p and v is an error term [8].

To identify the structural shocks we need a reduced – form system:

$$y_t = \beta_{y0} + \beta_{yy1} y_{t-1} + \beta_{yx1} x_{t-1} + v_t^y \quad (2.a)$$

$$x_t = \beta_{x0} + \beta_{xy1} y_{t-1} + \beta_{xx1} x_{t-1} + v_t^x \quad (2.b)$$

$$v_t^y = \varepsilon_t^y + \delta_0 \varepsilon_t^x \quad (3.a)$$

$$v_t^x = \varepsilon_t^x \quad (3.b)$$

and estimates of exogenous structural shocks ε are reconstructed from the residuals of the VAR:

$$\hat{\varepsilon}_t^y = \hat{v}_t^y - \hat{\delta}_0 \hat{v}_t^x \quad (4.a)$$

$$\hat{\varepsilon}_t^x = \hat{v}_t^x . \quad (4.b)$$

Our assumptions about the exogenous structural shocks are following; local government debt responds to the public debt shock (fiscal shock).

Data are quarterly based, covering the period from 2000 to 2015 and are seasonally adjusted. For measuring the local government indebtedness the indicator local government debt is used. Public debt is measured by total government debt. All variables in the question are expressed as% of GDP. Source of data is Eurostat database, the Government Finance Statistics.

Results

Time series stationarity was tested using the ADF test, were the unit root null hypothesis is $\alpha=1$, there is a unit root. According to p-values (see Table 1), if p-value is more than 0,05 first differences are created and again tested for the unit root. For comparison the Dickey-Fuller GLS (DF-GLS) test is

calculated in Table 1, which could be according to [7] eventually more appropriate for time series used in this research.

Table 1. Results of Augmented Dickey Fuller (ADF) test and Dickey-Fuller –GLS (DF-GLS) test for stationarity (p – values) [Source: author's calculation, Gretl]

	In level		In first difference	
	ADF	**DF-GLS**	**ADF**	**DF-GLS**
Local debt	0.687	0.4056	0.02616	0.051
Government debt	0.53	0.3369	4.021e-006	0.1719

The lag structure reflects on lag of order two following the AIC (additionally the SC and HQ) for Slovakia. VAR model satisfies the stability condition and no unit root lies outside the unit circle as is shown at Figure 2.

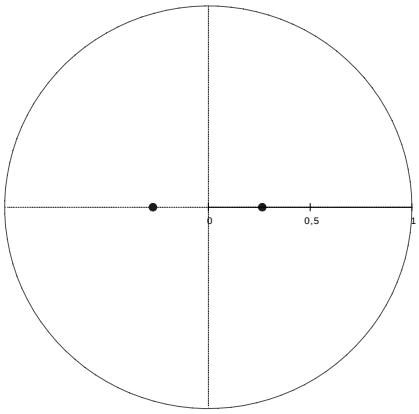

Figure 2. VAR Inverse roots in relation to the unit circle
[Source: author's calculation, Gretl]

Impulse response functions for Equation 1 are presented by the Gretl graphical device in Figure 3, where the response of local debt and public debt to a fiscal shock in local debt is illustrated. As Figure 3 shows, the shock in local debt causes fluctuations in local and public debt. The hardening of local debt comes after one year (four quarters with negative sign of lagged variable coefficient). The situation is same also in case of public (government) debt. However the hardening process (or the response) is different (positive sign of lagged variable coefficient), its end is achieved after four quarters.

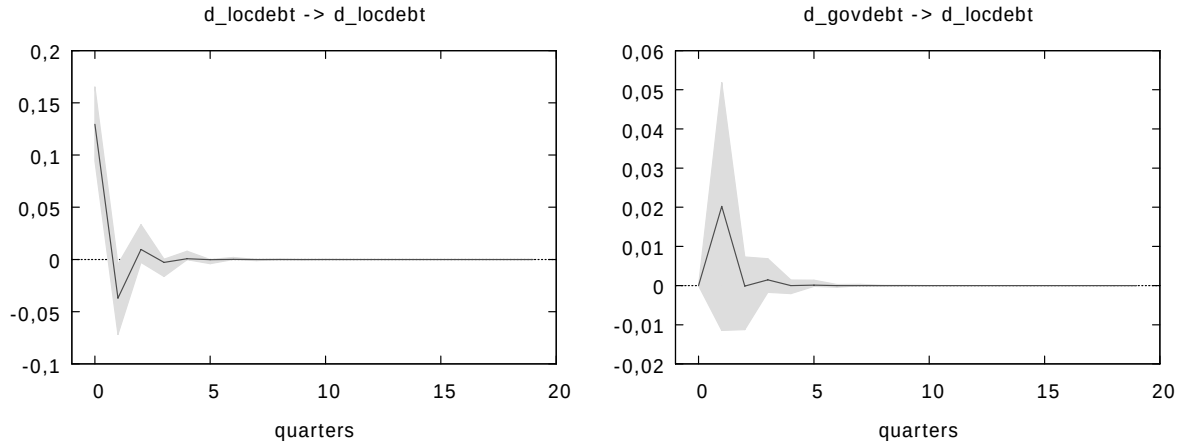

Figure 3. Response of variables to a shock in local debt with 95% bootstrap confidence interval
[Source: author's calculation, Gretl]

Impulse response functions for Equation 2 are presented in Figure 4, where the response of local debt and public debt to a fiscal shock in public debt is illustrated. The local debt reacts on shock in public debt in following three quarters with negative sign of lagged variable coefficient. The answer of public debt in fiscal shock in public debt lasts five quarters.

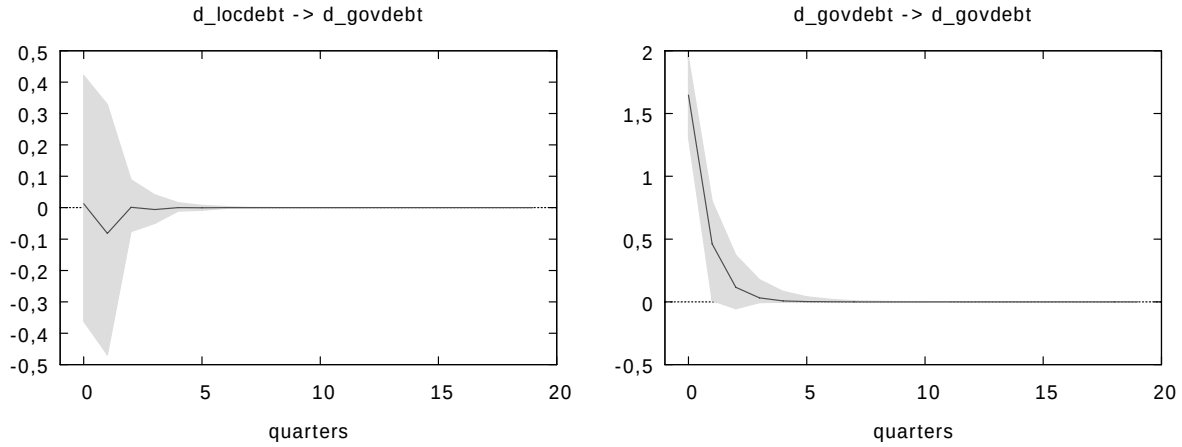

Figure 4. Response of variables to a shock in public debt with 95% bootstrap confidence interval [Source: author's calculation, Gretl]

Conclusion

Local indebtedness in Slovakia depends on evolution of the public debt and correlation between local and total government debt is positive. Indebtedness of Slovak self-governing units is falling under some economic restrictions. Its evolution till the 2004 was stable, but after the release of local financial and tax policy (fiscal decentralization implementation) it increased with dramatic and massive raise after 2009 financial crisis, what opened the question of the fiscal decentralization success. The evolution of public debt has till 2009 decreasing spirit and after, the development turns and public indebtedness increases massively in the hard period of financial crisis. VAR model reveals the behaviour of local debt and public debt after the fiscal shock in economy. In this paper the fiscal shock of local debt and government debt was investigated. The results show that the response of local debt and public debt on fiscal shock runs approximately one year. This also confirms the statement about the integral relationship between local and public debt, when change in public debt incites certain changes in behaviour of local debt and vice versa.

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Labour Factors Affecting Tax Revenues

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Abstract

The need to review the determinants that affect state budget's financial resources, especially tax revenues, is current problem under constant evaluation. The reason for that is that the government's ability to effectively predict the amount and structure of public budgets in order to ensure sufficient funding for public needs is influenced by different economic, socio-political, administrative and institutional or globalised factors. One of the major economic indicators is the labour market and its attributes development. The presented contribution shows the trends in tax revenues of the state budget of the Slovak Republic during the period 2000-2013 in connection to changes in tax policy, other downturns, and implemented measures to mitigate the impact of the crisis with a focus on measures related to the taxation of labour and the labour market in general. Contribution is through econometric analysis (OLS model) aimed at assessing the impact of selected labour market indicators as determinants of the state budget's tax revenues in the period Q1 2000-Q4 2013. Based on the analysis results is the theory on the impact of selected factors on the state budget's tax revenues verified and tax policy trends in the context of their impact on the labour market summarized.

Key words: *labour market, tax revenues, state budget of the Slovak Republic, ordinary least square regression*

Introduction

The requirements of society for financing of public needs, which are annually reviewed and are taken into consideration within the state budget creation, are continuously growing. Within the process of approving and obtaining of sufficient resources it is necessary to respond to the current economic challenges, macroeconomic development and the fiscal and political situation in the country.

Government's ability to predict the amount and structure of public budgets, mainly the state budget, effectively, can be based on the above, affected by various factors, as well as the relationship between them. The need to examine determinants affecting the amount of the state budget financial resources (in particular tax revenues, which represent a crucial part of the public budgets) and to evaluate their impacts is, based on the above, is justified and current. The issue of factors determining the amount of state budget tax revenues is analysed by a number of domestic and foreign authors such as Castro and Camarillo [2014], Bayer [2011], Klazar [2006], Musgrave and Musgrave [1994], Kubátová [2010], Vybíhal [1995], Mihóková, Andrejovská, Glova and Dráb [2015] and others. Authors focus on economic, social and political factors, as well as administrative and institutional factors, technical and globalisation factors. Authors stated, that among the important economic factors

of tax revenues can be included indicators of the labour market. As the labour market is a crucial in terms of economic and social development of the country and employment, labour productivity and wage developments do affect economic growth and directly determine the living standards of the population in the country, determine the amount of revenues of direct and indirect taxes, and can be regarded as a crucial determinant of tax revenues.

1. Aim, data and methodology

The main objective of the presented paper is, based on the impact analysis of selected labour market indicators on the tax revenues of the state budget, to define the key factors affecting the amount of tax revenues of the state budget and propose tax policy trends of the Slovak Republic in the context of its impact on the labour market.

In accordance with the objectives is the analysis designed into two parts. The first part of the paper presents the trends in the volume of the state budget tax revenues of the Slovak Republic during the years 2000-2013 in the context of changes in tax policies and the global economic crisis. Within the first part are also identified the government measures to mitigate the impact of the global economic crisis, focusing on the analysis of the measures implemented in the labour market and tax policy. Second part of the paper focuses on the analysis and quantification of the relationships between selected factors of labour market and state budget tax revenues, using econometric modelling. Based on the analysis results is the extent of the impact of individual factors on the state budget's tax revenues and direction of the tax policy development in the context of their impact on the labour market, verified.

The paper used secondary data obtained from domestic and international statistical databases such as the Statistical Office database, database of Eurostat, OECD database, database and register of the Ministry of Finance of the Slovak Republic and the database of the Slovak Tax Directorate.

The main analytical method used in the paper is an economic analysis. For the interactions between observed variables analysis economic and mathematical-statistical methods supported by software solution are used. For quantitative determination of the relationship between the state budget's tax revenues and selected exogenous variables of labour market, for estimation of observed exogenous model parameters and for confirmation of the theory on the relationship between the indicators of the labour market and tax revenues an econometric model is used.

2. Development of state budget's tax revenues within three selected time periods

Tax revenues as an important source of income for the state budget are very sensitive to economic but also non-economic changes in society (political changes, changes in legislation or changes in the economic development of the country). Within the analysed period 2000-2013 can be in the development of Slovakia's tax revenue identified three basic phases, which differ from each other by political changes, but also by changes in legislation or economic performance.

During the period 2000-2013 were the state budget's tax revenues in absolute terms growing (Fig. 1). The overall increase in tax revenues was 5,098 million euro, which in percentage terms represented an increase of 126%. When having a closer look at the interannual development of tax revenues a period of growth and the global economic crisis accompanied by a sharp drop in economic growth and a stabilization of the economy can be identified, which was reflected in the change in tax revenue.

For a more detailed analysis was the reporting period divided into several phases: the first phase: the period from 2000-2003, the second phase: the period from 2004-2008, and the third phase: the period from 2008-2013 (Fig. 2 - Fig. 4).

2.1 Analysis of development trends in state budget's tax revenues in SR

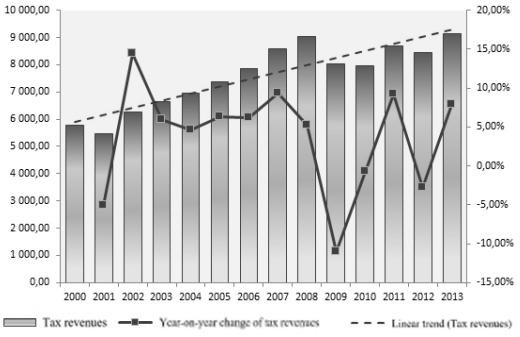
The first phase: time period 2000 - 2003

The development of tax revenues (Fig.2) had on the background of socio-political and economic changes in Slovakia (Tab. 1) in the first stage a slight upward trend without major fluctuations. The share of state budget's tax revenues on total revenues ranges from 81.42% in 2000 to 85.87% in 2003. The effective state budget's tax revenues were in this period, by more than 4% higher than budgeted. In absolute terms, the volume of tax revenues in 2001 dropped by 150 million euro, which was significantly affected by a slump in consumption taxes, income taxes, corporation taxes. Conversely, in 2002, it is possible to record an annual increase in tax revenues by 11.5%, which in absolute terms was 530 million euro. This increase was mainly driven by increased tax collection of VAT, as well as changes in personal income tax. Significant changes in the volume and structure of tax revenues were recorded as early as 2003, when on August the 1st implementation of tax reform in excise duty was performed (tax reform of other taxes was launched 1.1.2004).

Tab. 1. Selected socio-political and economic characteristics of the first phase (2000-2003)
[Source: Own processing]

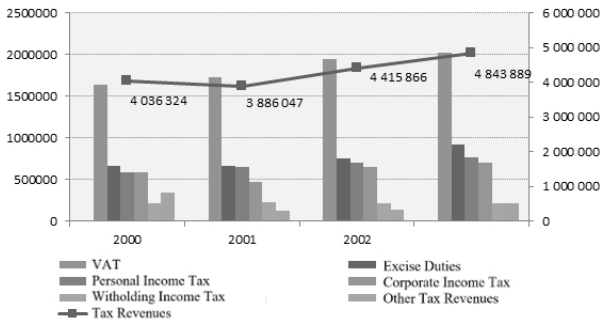
• Tax system applicable from 1.1.1993, was approved in accordance with the Act. 212/1992 Coll. the tax system, resulting in reforms in 2004.
• The Slovak economy has approached the development of advanced market economies: the weakening of political influence on the development of the economy, implementation of structural changes, replenishing of the banking sector, positive business environment: Positive perception of SR resulted in the inclusion of the Slovak Republic into the EU.
• Public administration reform adopted by Act no. 302/2001 on self-government of higher territorial units as well as the Law no. 416/2001 Coll. the transfer of some competencies from state administration to municipalities and higher territorial units: second phase of decentralization of public administration, which continued in the next period, and the decentralization of budget revenues, ie changes in the tax jurisdiction and tax determination for the different levels of government.

Fig. 1. Development of state budget's tax revenues during the period 2000-2013



[Source: Own processing based on IFP]

Fig. 2. Development of state budget's tax revenues during the first phase



[Source: Own processing based on IFP]

The second phase: time period 2004-2008

The development of state budget's tax revenues during the second period was significantly influenced by implemented tax reforms and also by socio-political changes, especially by inclusion of Slovakia into the European Union (Tab. 2). Changes in the tax system had an impact on the personal income tax, corporate income tax as well as on the value added tax. Development of total budget tax revenues during this period had a growing trend (Fig. 3). During the period 2004-2006 tax revenues increased by an average of 10% annually. Between the years 2007-2008 the growth rate of tax

revenues development increased in average for about 17.6%. The largest share on tax revenues during this period had value added tax, which share did not fall below 47% and which average share was around 51% of the state budget's total tax revenues.

From 1.1.2004 until the end of year 2006 were all consumed goods and services taxed by one 19% value added tax rate through continuous method for each taxpayer. Approximately by the same share on total state budget tax revenues, about 20%, was the share of excise duties and share of corporate taxes. The effect of the uniform tax rate (19%) for corporate taxes introduction resulted in year 2005. The revenue from corporate taxes increased in 2005 when compared to 2004, by 42.03%. This positive trend is mainly influenced by the positive development of business environment, which was supported by investments and development of foreign trade.

Tab. 2. Selected socio-political and economic characteristics of the second phase (2004-2008) [Source: Own processing]

• The inclusion of Slovakia into the European Union: the obligation to make legislative changes in the tax system: an uniform tax rate (19%), elimination of most forms of double taxation, the abolition of exceptions, exemptions and special regimes in personal income tax and corporate tax, the abolition of most special taxes and special rates for other taxes (e.g. the abolition of inheritance tax and gift tax, substitution of road tax on motor vehicles tax (which became a part of local taxes within the fiscal decentralization)).
• Public administration reform: orientation on financing process of municipalities and territorial units: changes performed in local taxes, the introduction of shared taxes (personal income tax: redistribution between municipalities (70.3% of the total tax volume), higher territorial units (23.5% of the total tax volume and state budget (6.2% of the total tax volume).
• The economy was characterized by growing dynamism and by maintaining the macroeconomic stability: GDP growth mainly supported by development of the processing industry (mainly production of motor vehicles and manufacture of machines), as well as by development of the foreign trade. Growth in disposable income of the population with a positive impact on developments in household consumption.

The third phase: time period 2009-2013

The impact of the crisis was visible first on the volume of indirect taxes revenues. Already in 2008 the total revenue from value added tax was for about 2.5 billion SKK lower than the budgeted level, which represented a 1.7% decrease. This result was affected by crisis as well as by changes in VAT rate to level of 10% for selected goods like books or selected type of medical devices. The lower real income in 2008 compared to the budgeted one was reflected in the volume of revenues within the excise taxes.

Decrease in personal income tax revenues unfavourably affects the local government budget tax revenues rather than the state budget's revenues. A very significant fall in 2009 can be seen in the corporate taxes, where the annual fall represented about 41%. In order to mitigate the impact of the economic crisis, the Slovak government adopted a wide range of measures both to employees as well as to businesses and entrepreneurship. Adopted measures have positively supported the development of state budget's tax revenues, because after the sharp decline in 2009 by 11% followed by a more moderate decrease in 2010 (annual decrease of 1%) that was followed by annual growth in tax revenues in 2011 by 9%. Despite this positive development the real volume of tax revenues was fulfilled only up to 99% of expected revenues. The largest share on the total tax revenues had particularly excise taxes, especially the tax on tobacco and tobacco products. On 1.1.2011 was the VAT rate increased from 19% to 20% and lower VAT rate was abolished for the yard sale. The economic slowdown in 2012 is also reflected in the amount of tax revenues, which decreased by 3%. The biggest fall of tax revenues, by up to 9%, is fall in value added tax revenues. The year 2013 brought an increase in tax revenues by 8%. The largest annual increase was in corporate income tax, where a change in the tax rate from 19% to 23% was implemented.

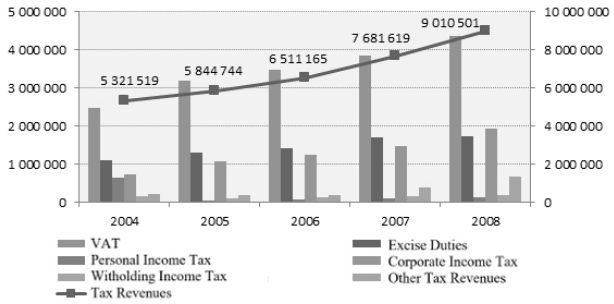
Tab. 3 Selected socio-political and economic characteristics during the third phase (2009-2013)
[Source: Own processing]

• The adoption of the European currency.
• Unfavourable development of the Slovak economy (fourth quarter 2008), effects of global economic crisis: a reduction in household consumption, a rise of unemployment. The year 2012: the second phase of the recession [Morvay, 2013], the positive developments only in foreign trade (driven by increased demand in the automotive industry from Germany and China).

In summary of analysed three phases can be generally stated that:

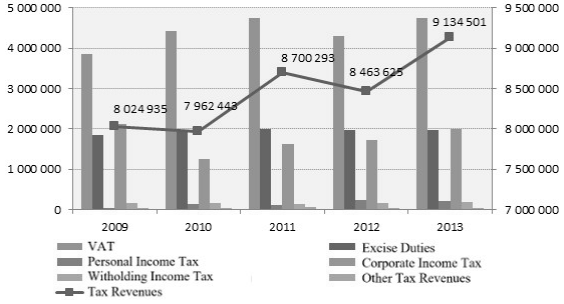
- The state budget's tax revenues during the period 2000-2013 had an upward trend and the volume and structure was affected not only by overall economic development, but also by performed tax, political and public finances reforms as well as the global economic crisis.
- The tax system leads to shifting the tax burden from direct to indirect taxation and application of a uniform tax rate.

Fig. 3. Development of state budget's tax revenues during the second phase



[Source: Own processing based on IFP]

Fig. 4. Development of state budget's tax revenues during the third phase



[Source: Own processing based on IFP]

2.2 Government measures implemented in the area of taxes and social contributions policy

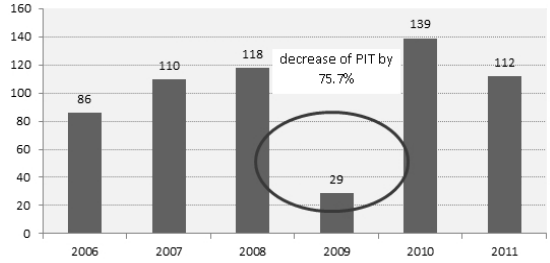
The slowdown of economic growth in the Slovak republic during the global financial crisis period had an impact on the reduction of state budget's tax revenues in comparison with the expected tax volume. The government has in its actions committed not to increase the tax burden on taxpayers to obtain the additional amount of tax revenue, which at this time would be counterproductive, and at the same time has rejected the opposition proposal for reduction tax rates as a tool to support the growth of business and entrepreneurship. Implementation of measures to mitigate the impact of the global financial crisis therefore focused mainly on partly measures within individual taxes.

Decline in employment and the stagnation of average wages, as well as legislative changes (Tab. 4) in terms of the state budget contributed to decreasing of personal income tax (Fig. 5) for about 75.7% compared to 2008. Adopted legislative changes in corporate tax (Tab. 4) effected in the amount of state budget tax revenues in 2010, when year on year revenue decreased by 40.9% (Fig. 6). This decline was influenced by settlement of the advance payment of corporate income tax in 2009 to lower advance payments in 2010 and was also affected by the deterioration in the macroeconomic situation of the country. Legislative changes in the value added tax (Tab. 4) affected revenues from value added tax in 2009, when year-on-year decline in revenues represents 17% (in absolute value 786 mil Euro). This fall was influenced mainly by government's measures focused on reduction of the period for refunding excess of VAT, which allowed an increase in repayment of excess by about 30% a month and negatively reflected on the state budget revenues.

Tab. 4. Selected measures in the area of taxes and social contributions policy
[Source: Own processing]

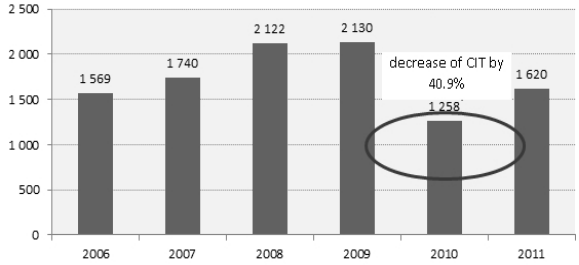
Personal income taxes	Corporate taxes	Value added tax
• Increasing the tax allowance about 17.19%, which in absolute terms is increasing to 590.43 Euro per taxpayer (support for socially disadvantaged groups). • Lowering the threshold for a gradual reduction of the tax allowance on taxpayer from the original 100-times the subsistence minimum to 86-times the subsistence minimum (for strong social group of the population). • So called millionaires' tax: taxpayers whose annual income exceeded 15 387 Euro.	• The tax evidence simplifying and extension of time for filing the tax return (support for small and medium enterprises, efforts to improve the business environment). • Changes in depreciation of assets: reclassification to a lower tax groups, accelerated depreciation, an increase in the input price of tangible assets (an increase of 71%) and intangible assets (an increase of 45%) for depreciation.	• Administrative simplifying for businesses and limiting the amount of additional tax returns: VAT group registration, the deadline for repayment of excess VAT from 60 days to 30 days and allow retrospective VAT registration.
The measures were adopted in the Act. No. 60/2009 Coll., amending and supplementing Act No. 595/2003 Coll. on income tax, as amended, and entered into force on 1.3.2009.	The measures were adopted in the Act No. 60/2009 Coll., amending and supplementing Act. No. 595/2003 Coll. On income tax, as amended and entered into force 1.3.2009.	The measures were adopted in the Act No. 83/2009 Coll., amending and supplementing Act. No. 222/2004 Coll. on value added tax, as amended and entered into force 1.4.2009.

Fig. 5. Personal income tax (PIT) revenue
(in 1,000 Euro)



[Source: Own processing based on MF SR]

Fig. 6. Corporate income tax (CIT) revenue
(in 1,000 Euro)



[Source: Own processing based on MF SR]

2.3 Government measures implemented in the area of labour market policy

The negative development of the real economy due to the economic crisis drew the attention of the government on the employment. The growth in unemployment has significantly contributed to the negative developments of tax revenues, therefore the government set the objective to prevent a sharp rise in unemployment and to stabilize the labour market. Within its measures was government focused not only on short-term counter-cyclical solutions, but also took into account long-term objectives in terms of employment in the context of building a knowledge-based economy. The field of labour market policy was among the most widely developed and approved measure within anti-crisis measures. Among the measures of labour market policy applied were:

- The support of the new jobs creation - in the form of a contribution to support new job creation expressed as percentage of labour costs in a given region under specified conditions. A job must not have been abolished within the next 12 months and it had to be accepted unemployed persons registered with the Central Office of Labour, Social Affairs and Family according to specified conditions.

- The support of entrepreneurship in the area of processing and marketing of agricultural products and the promotion of self-employment-in the form of payment of health insurance for 24 months and of the payment of social security contributions after 18 months from the commencement (for a maximum of six months).
- The support of socially oriented enterprises focusing on demand-oriented projects - in the form of refunding of labour costs and education.
- The measures focused on sustainable employment at employers, in the form of contributions for employees' (to a maximum of 60 days) while the entrepreneur preserving jobs and in the form of 60% employees' wage compensation. The financial impact of this measure Ministry of Finance of the SR quantify on 71 mil. Euro.
- The support of labour market mobility between regions – in the form of increasing the allowance for commuting to work.
- The support in finding a new job – in the form of a contribution (22% of the average wage) during the first year of employment.

The measures listed above have been incorporated in the Act. No. 49/2009 Coll., amending and supplementing Law No. 5/2004 Coll. on employment services and on amending and supplementing certain acts as amended, and amending and supplementing Law No. 311/2001 Coll. Labour Code, as amended and came into force from 1.3.2009.

3. Factors determining the tax revenues

The main objective of the analysis was to quantify the impact of selected labour market indicators as determinants of the state budget tax revenues using an econometric analysis. Using OLS (Ordinary Least Square) model to find a linear equation that describes the relationship between tax revenues of the state budget and selected exogenous variables, to estimate coefficients of surveyed exogenous parameters of the model and to confirm the theory of relationship between variables. The analysis was divided into four main parts.

1. *Seasonal adjusting of time series* - due to the fact that in the analysis were used quarterly data was to mitigate seasonal fluctuations prior to the econometric analysis carried out by seasonally adjusted time series examined Q1 2000 - Q4, 2013.

2. *Testing stationarity of time series* - since empirical research has shown that many real macroeconomic time series are non-stationary, in order to obtain reliable estimates of the model parameters, stationarity testing of investigated time series was before the econometric analysis performed.

3. *Econometric analysis* - in accordance to the main objective of the paper, econometric model was specified, the quantification and identification of the model parameters was realized and economic, statistical and econometric model verification was performed. The analysis was focused on identification of critical determinants of the labour market, on the volume of tax revenues and determines the polarity of their impact on the intended tax revenue of the state budget. As endogenous (explained) variables were selected total state budget tax revenues (Y_1), indirect taxes (Y_2) and direct taxes (Y_3). Selection of parameters to a group of exogenous (explanatory) variables was in order to include basic factors of the tax burden and the labour market. Among the factors were included: the average income tax (X_1), the average value added tax rate (X_2), tax quota I (X_3), the minimum wage (X_4), the average quarterly wage (X_5), the unemployment rate (X_6) and the number of employed persons (X_7). The factors of the labour market are: the minimum wage (X_4), the average quarterly wage expressed in%, X_4 and X_5 in thousands of euro and X_7 in person. The original designation, in some cases after the seasonal adjustment, changed to indicate the addition of $_{SA}$.

4. *Evaluation of the results of the econometric analyses and tax policy direction in SR*.

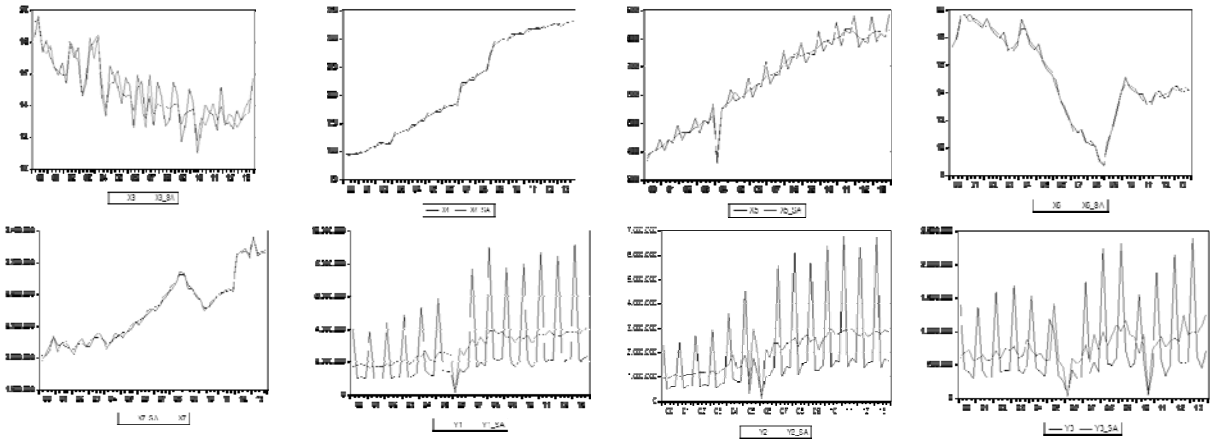
3.1 Seasonal adjusting of time series

Among the main reasons of seasonal adjusting of time series is according to Hadri and Rao [2009] or Ostertagová [2011] the necessity to create the prediction of short-term time series, necessity to use of adjusted time series for estimate of econometric models and necessity to compare parameters values in individual months (quarters). For seasonality identification and verification can be many methods used. Among these methods can be according to Huček and Doliak [2014], Arlt and Arltová [2009], Ghysels and Osborn [2001] included: graphs, periodographs, tests of seasonality using autocorrelation function, statistical tests such as Fisher test, F-test, method of exponential settlement etc. To group of more sophisticated methods that can identify the impact of special extreme and unexpected values or turning points within time series-outliers can be include the method X11 [Huček and Doliak, 2014]. Among more sophisticated methods, usually used can be included: CENSUS X-11, X-11 ARIMA, X-12 ARIMA from class X-11 a TRAMO/SEATS [Marravall, 2005] used for the model estimation with the impact of work days and other factors. For seasonal adjusting of all exogenous and endogenous time series during the period Q1 2000 – Q4 2013 in this paper CENSUS X-12 using statistical program EViews was used. The origin and transformed time series of exogenous variables: tax quota I (X_3), the minimum wage (X_4), the average quarterly wage (X_5), the unemployment rate (X_6), the number of employed persons (X_7), are illustrated in next graphs (Fig. 7). Seasonal adjusting was not realised for exogenous variables: the average income tax (X_1) and the average value added tax rate (X_2), because of mentioned variables development is mainly determining through the legislative and political decisions.

On graphs (Fig.7) the minimum wage (X_4), the average quarterly wage (X_5) is clearly seasonality visible (in fourth quarter). The seasonal fluctuations in the minimum wage development are significantly lower than fluctuation in the average wage development. The reason of this fact is that amount of minimum nominal wage, which is paid to almost one third of employees, changes very slowly and slightly. In addition, almost 60% of employees in Slovakia receive lower than the average wage. These facts are also determined by the size and structure of household consumption. In time series of explanatory variables: the tax quota I (X_3), the unemployment rate (X_6) and the number of employed (X_7) is the seasonal component hardly visible.

After realization of seasonal adjusting using selected method seasonally adjusted time series of X_3, X_6, X_7 largely copy the origin time series. The mentioned development of variables is determined by economic development, which in most countries, especially the EU countries, struggled with the recession since 2008. These, facts stated above, results have affected the result of using the method in the case of variable X_3, which is relevant only for the period Q2 2007-Q2 2009. In recent years, is the seasonal component in these time series bland and method used for adjusting could match only small seasonal fluctuations.

Fig. 7. Seasonal adjusting of time series



[Source: Own processing based on EViews output]

The original and transformed time series of endogenous variables: total tax revenues (Y_1), indirect taxes (Y_2) and direct taxes (Y_3) are illustrated in graphs (Fig. 7). After seasonal adjusting of time series is the seasonal component of original time series visible significantly. Considerable increase is observed at the end of Q4 and at the start of Q1 during the period. The sharp decreases were during the Q2 and Q3 of monitored period. Within the development of tax revenues could be predictable the existence of seasonality because of composed by its main component: income tax, value added tax and consumption taxes, which are linked to seasonality of consumption and income volumes. Almost equivalent significant seasonal fluctuations in individual quarters are visible in direct and indirect tax revenues in the form of volume increase during period Q4 and Q1 and in the form of volume decrease during the period Q2 and Q3. The main change is visible during period 2005-2006, when the volume of all above mentioned revenues dropped (Y_1, Y_2 and Y_3). The reason of this fall was the end of tax reform, which represented a change in tax determination and tax competence between government levels (fiscal decentralization). The personal income tax revenue was intended as proportionate tax with 6.2% share for state budget, and the revenues from property tax and the motor vehicle tax has become the part of municipalities' budget.

3.2 Stationarity testing of researched time series

The stationary development of time series is the basic assumption of many types of analysis and therefore is necessary to test stationarity and to transform the non-stationarity time series if required [Hančlová and Tvrdý, 2003]. The real macroeconomic time series are non-stationary. As the non-stationary data do not fulfil the minimum assumption of time invariance for median, variance and autocorrelation structure, within testing and obtaining the reliable and adequate test statistics may occur the spurious regression.

The testing of time series stationarity using Kwiatkowski test (KPSS) in statistical programme EViews was performed for all variables: exogenous and endogenous variables, for seasonal adjusted time series during the period Q1 2000-Q4 2013. The stationarity of time series in the undifferentiated form was confirmed for all exogenous variables: X_1, X_2, X_{3_SA}-X_{7_SA}. As Tab. 5 stated, KPSS test statistics for X_1 is 0.607898. This value is lower than critical value on selected level of significance 1%. Based on that result, the hypothesis H_0 about the stationarity of time series cannot be rejected. In consideration of the range of tests and number of researched variables are illustrated only tests for three exogenous variables X_{3_SA}, X_{5_SA} a X_{7_SA}. The reason of these three variables selection is the fact that represents the statistical significant determinants of tax revenues within the performed regressions.

Tab. 5. KPSS stationarity test results for statistically significant exogenous variables
[Source: Own processing based on EViews output]

NullHypothesis: x_{3_SA} **is stationary** NullHypothesis: x_{5_SA} **is stationary** Null Hypothesis: x_{7_SA} **is stationary** Exogenous: Constant			
Bandwidth: 6 (Newey-West automatic) using Bartlettkernel			
			LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic (x_{3_SA})			**0. 649907**
Kwiatkowski-Phillips-Schmidt-Shin test statistic (x_{5_SA})			**0.699615**
Kwiatkowski-Phillips-Schmidt-Shin test statistic (x_{7_SA})			**0.690282**
Asymptotic critical values*:	1% level		**0.739000**
	5% level		0.463000
	10% level		0.347000
Sample: 2000Q1 2013Q4 Included observations: 56			

3.3 Assessing the impact of factors on the tax revenues

The main objective of econometric analysis was to identify significant determinants of tax revenues and to quantify their impact on volume of state budget's tax revenues in SR. In order to fulfil stated objective three OLS models were composed, which examine the impact of selected exogenous variables on selected tax revenues: total tax revenues (Y_1), indirect tax revenues (Y_2) and direct tax revenues (Y_3). Among factors of labour market were included seasonally adjusted and stationary variables: the average income tax rate (X_1), the average value added tax rate (X_2), tax quota I (X_{3_SA}), the minimum wage (X_{4_SA}), the average quarterly wage (X_{5_SA}), the unemployment rate (X_{6_SA}) and the number of employed persons (X_{7_SA}).

The identified significant revenues of state budget are tax revenues, what is consistent with the basic function of tax and tax system in country: to ensure the sufficient revenue for public budgets, especially for state budget. In consideration of stated fact was the first endogenous variable the total tax revenues (Y_{1_SA}). One of the main goals of performed tax reform was to transfer the tax burden from direct taxes onto indirect, therefore was the second model focused on impact estimation of selected labour market indicators on endogenous variable, indirect taxes (Y_{2_SA}). The direct taxes are formed from income and property. The global trend of recent thirty years is the transfer form direct taxes to indirect taxes. But not all experts have the same scientific opinion. The third model was therefore focused on direct taxes (Y_{3_SA}). In this model was the justness in Slovak environment verified. Models, which include the impact of all considered exogenous variables on state budget tax revenues (Y_{1_SA}, Y_{2_SA}, Y_{3_SA}) were defined as following equations (1-3):

$$Y_{1\_SA} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + .\beta_3 X_{3\_SA} + \beta_4 X_{4\_SA} + \beta_5 X_{5\_SA} + \beta_6 X_{6\_SA} + \beta_7 X_{7\_SA} + u_i \quad (1)$$

$$Y_{2\_SA} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + .\beta_3 X_{3\_SA} + \beta_4 X_{4\_SA} + \beta_5 X_{5\_SA} + \beta_6 X_{6\_SA} + \beta_7 X_{7\_SA} + u_i \quad (2)$$

$$Y_{3\_SA} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + .\beta_3 X_{3\_SA} + \beta_4 X_{4\_SA} + \beta_5 X_{5\_SA} + \beta_6 X_{6\_SA} + \beta_7 X_{7\_SA} + u_i \quad (3)$$

where: Y_{1_SA}-tax revenues, Y_{2_SA}-indirect taxes, Y_{3_SA}-direct taxes, seasonally adjusted data,

X_1, X_2, X_{3_SA} - X_{7_SA} - exogenous seasonally adjusted data,

β_1, β_2, ... , β_k - regression coefficients and u_i is the random component.

OLS models were subjected to economic and statistical verification in the form of basic assumption testing: verification of statistical significance of estimated variables, verification of homoscedasticity in model, autocorrelation and specification of model. The results of regression models with the corresponding estimation of exogenous variables' coefficients and with their statistical significance, with the value of determination coefficient and other parts of regression output for all three econometric models (OLS 1, OLS 2 and OLS 3) are illustrated in Tab. 6.

Adjusted R-squared, which express what part of total variability of tax revenues (Y_1) is explained using model (what part of total variability is determined by quantified econometric model), is 0.863. Based on this result can be stated, that the model is significant, because the 86.3% of tax revenues variability is explained by the performed model. Other 13.7% of tax revenues variability can be explained by other different causes, like dependence between parameters. Among the statistically significant variables, which have impact on total tax revenues belong to: the average income tax rate (X_1), seasonally adjusted variables: tax quota I (X_{3_SA}), the average quarterly wage (X_{5_SA}) and the number of employed persons (X_{7_SA}). The number of employees and the average wage affect consumption of household directly (consumption taxes and VAT) also affect total domestic demand, whose growth stimulate the increase of aggregate supply. Therefore in the next period can be expected a rise of employment, real income and real GDP. The final equation of OLS 1 model for total tax revenues is in following form (4):

$$Y1 = -3953334 - 30727{,}53X_1 + 1129313X_{3\_SA} + 1938{,}232X_{5\_SA} + 1{,}802178X_{7\_SA} \quad (4)$$

Tab. 6. Coefficient estimates of models for tax revenues (Y_1), indirect (Y_2) and direct tax revenues (Y_3) [Source: Own processing based on model testing in Eviews]

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Coefficient estimates of model (OLS 1) for tax revenues (Y_1) in the SR				
C	-3953334.	1033988.	-3.823385	0.0004
X_1	-30727.53	6312.067	-4.868061	0.0000
X_{3_SA}	112931.3	27900.02	4.047715	0.0002
X_{5_SA}	1938.232	562.1122	3.448123	0.0011
X_{7_SA}	1.802178	0.560078	3.217726	0.0022
Coefficient estimates of model (OLS 2) for indirect tax revenues (Y_2) in the SR				
C	-269176.4	559543.5	-0.481064	0.6325
X_1	-22638.60	5657.688	-4.001387	0.0002
X_{3_SA}	63699.22	25675.33	2.480951	0.0164
X_{5_SA}	1872.685	327.4844	5.718394	0.0000
Coefficient estimates of model (OLS 3) for direct tax revenues (Y_3) in the SR				
C	-2399628.	383969.6	-6.249525	0.0000
X_{7_SA}	1.480620	0.178283	8.304871	0.0000

	Model (Y_1)	Model (Y_2)	Model (Y_3)		Model (Y_1)	Model (Y_2)	Model (Y_3)
R-squar.	0.873642	0.780334	0.560872	Meandepend.var	2132770.	1353910.	785485.3
Adjusted R-squar.	0.863731	0.767661	0.552740	S.D. depend.var	496886.4	352489.5	207053.1
S.E. of regression	183423.8	169905.4	138472.0	Akaike info crit.	27.16203	26.99262	26.54978
Sumsquaredresid	1.72E+12	1.50E+12	1.04E+12	Schwarz crit.	27.34287	27.13729	26.62212
Log likelihood	-755.5369	-751.7934	-741.3940	H-Q crit.	27.23214	27.04871	26.57783
F-statistic	88.15339	61.57436	68.97088	D-W stat.	1.500700	2.104378	2.020482
Prob(F-statistic)	0.000000	0.000000	0.000000				

Based on econometric model OLS 1 results can state:

- if we increase the X_1 (the average income tax rate) by one unit, the total tax revenue will be reduced by 30 727.53 units,
- if we increase X_{3_SA} (tax quota I) by one unit, then increase the total tax revenues of 112,931.3 units,
- if we increase X_{5_SA} (the average quarterly wage) by one unit, then increase the total tax revenues of 1,938.232 units and
- if we increase X_{7_SA} (the number of employed) by one unit, increasing the total tax revenue of 1.802178 units.

In OLS 2 model for indirect tax revenues (Y_2) is adjusted R-squared 0.767. From this results can state that almost 77% of total variability of indirect tax revenues is explained by performed model. From this result can also state that model is significant and that other 23% of indirect tax revenues variability can be explained by other causes. The final equation of OLS 2 model for indirect tax revenues is in the following form (5.)

$$Y_2 = -269176{,}4 - 22638{,}60{,}53X_1 + 63699{,}22X_{3\_SA} + 1872{,}685X_{5\_SA} \quad (5)$$

Based on econometric model OLS 2 results can state:

- if we increase the X_1 (the average income tax rate) by one unit, then reduce indirect taxes of 22,638.60 units will occur,
- if you increase X_{3_SA} (the tax quota I) by one unit, then increase indirect taxes of 63,699.22 units will occur and
- if we increase X_{5_SA} (the average quarterly wage) by one unit increase in the indirect taxes of 1,872.685 units will occur.

Results of both mentioned models (for Y_1 and Y_2) confirmed the dependence of tax revenues volume on examined variables. Results also indicate that tax burden of revenues is necessary to decrease, because the volume of tax revenues decreases with the increasing of tax rate. The average income tax rate belongs to the lowest within EU countries, for Slovak resident seems to be high and in consideration with it demotivates people to pay taxes, which usually increase volume of tax avoidance and tax evasion.

Statistically significant variables, which affect the volume of direct tax revenues (Y_3) according to OLS 3 model results, can consider only the number of employed (X_{7_SA}). The surprise is the lack of proof about dependence of the amount of tax revenues on the average tax rate on income. The explanation can be in the number of years during the reporting period in which the greater part has already formed an income tax rate and especially at a time when there were significant changes in economic growth.

$$Y_3 = -2399628 + 1{,}48062 X_{7\_SA} \tag{6}$$

Adjusted R-squared is in the third OLS 3 model for direct tax revenues (Y_3) with the only exogenous variable 0.560872, which means that 56.08% of total direct tax revenues variability is explained by this one parameter. Also the 43.92% of direct tax revenues variability can explain by other different causes. The final equation of direct taxes OLS 3 model in the form (6) and can derive that with increase of X_7 by one unit, direct taxes increase by 1.480620 units.

Conclusion

The government's ability to effectively predict the amount and structure of public budgets in order to ensure sufficient funding for public needs is influenced by different economic, socio-political, administrative and institutional or globalised factors. One of the major economic indicators of the labour market and its attributes is labour productivity, wage development, economic and social development of the countries employment. All of these aspects are reflected in the change of the direct and indirect taxes revenues. The main objective of the presented paper was, based on the impact analysis of selected labour market indicators on the tax revenues of the state budget, to define the key factors affecting the amount of the state budget's tax revenues and propose tax policy trends of the Slovak Republic in the context of its impact on the labour market.

Based on development analysis of state budget's tax revenues in SR during the period 2000-2013 divided into three phases can be generally stated that the state budget's tax revenues had an upward trend and the volume and structure was affected not only by overall economic development, but also by performed tax, political and public finances reforms as well as the global economic crisis. The growth in unemployment has significantly contributed to the negative developments of tax revenues; therefore the government set the objective to prevent a sharp rise in unemployment and to stabilize the labour market. Within its measures was government focused not only on short-term counter-cyclical solutions, but also took into account long-term objectives in terms of employment in the context of building a knowledge-based economy. The field of labour market policy was among the most widely developed and approved measure within anti-crisis measures. The tax system leads to shifting the tax burden from direct to indirect taxation and application of a uniform tax rate.

Performed econometric analysis that was focused on direct, indirect and total tax revenues, showed that among the statistically significant factors affecting tax revenues of state budget are: the average income tax rate, tax quota I, the average quarterly wage and the number of employed. Results indicate that tax burden of revenues is necessary to decrease, because the volume of tax revenues decreases with the increase of tax rate. The average income tax rate belongs to the lowest within EU countries, for Slovak resident seems to be high and in consideration with it demotivates people to pay taxes, which usually increase volume of tax avoidance and tax evasion.

In connection with the orientation of fiscal policy in the context of impact on the labour market can be stated that the legislative changes made in the form of government measures to mitigate the

impact of the crisis in negative terms affected businesses and individuals. It would therefore be appropriate to reduce the tax burden and create an environment that would be able to reach most of the taxpayers and not discouraging them in terms of work. Reduce the burden of direct taxes, as well as the reduction in contribution burden would lead to the fact that the employee's net income would have a greater share of his employer's overall cost of labour. It would be helpful to reintroduce the single tax rate for both income tax and the value added tax, which would simplify and reduce the administrative burden on both the taxpayers and to a tax administration side and improve law enforcement. To stimulate long-term economic growth and employment measures should not be focused on legislative tax changes in consumption. In addition to the revenue side interests it needs to be considered also measures towards the government expenditure side.

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The Mortgage Market in Slovakia

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Abstract

If somebody follows the mortgage market knows that mortgages are now provided on very favourable terms. 17 years ago, when the market appeared first mortgage interest rates started at the lowest level of 13.5% and we needed about one month of its equipment. Today the lowest interest will be just below 2%, mortgage solved in a few days and we need to do far less evidence than ever before. Currently, the cheapest mortgage ever and even in 2016 would not change a lot. In our market there are currently eight banks that provide mortgages.

Key words: *mortgage loan, conditions, fees, income, property price, banks offer*

Mortgage loans in Slovakia by individual purposes

Mortgage loans are long-term loans granted to real estate investments. Their repayment is secured by mortgage. The maturity period is at least four years and a maximum of 30 years.

They can be divided in several ways:

Mortgages by individual purposes

• **Conventional mortgage** loans intended for the purchase of domestic real estate or part of the construction or modification of existing structures and maintenance of domestic real estate. These include state subsidized mortgage loans for young people.

• **Building mortgage** loans granted for the construction, reconstruction and modernization of real estate. They are provided either as beforemortgage loans (if the client has no property and thereby the credit covers the period between finished and final inspection) or as mortgage loans for the construction, respectively obtaining unfinished property.

• Mortgage loan **refinancing** designed to pay off other, less favourable mortgage loans. The principle is to refinance the original mortgage early repayment new mortgage, and to ensure the loan is using the same property. The most common reason for changing provider of mortgage loan is more advantageous interest rate.

• **US mortgages,** respectively purpose loans secured by mortgage. Most often used for reconstruction, purchase of equipment, automobiles, as well as buying property that cannot use conventional mortgages. Increasingly used to consolidate debt, i.e. to pay off other, less favourable credits or loans.

Mortgages under the form of repayment

• Mortgage loans **with annuity repayments**, in which the same amount of payment for the entire period of the loan (i.e. during the same period the interest rate) and is paid in regular intervals

(usually monthly). With the gradual repayment instalment falls in the share of interest and increase the share redemption of principal.

• Mortgage loans **with repayment degressive** in which concentrates higher financial burden on initial repayment period and vice versa at the end of the credit relationship are the lowest payment. This form of repayment is rarely used. It is designed for clients whose current income situation allows realizing higher payment than they would repay with annuity repayment. Height degressive repayment is usually set for a period of one year. After the end of one year is set new instalment, which is always lower than the previous one.

• Mortgage loans **with progressive repayment**, at which the amount of the instalment for repayment gradually reduce. In the early repayment amount progressive payments lower than with annuity repayment, then the height of progressive payments greater than the amount of annuity payments. Progressive payment shall be set at one year, after which the next year will increase by a factor of growth. When changing the fixed interest rate is usually possible transition from the progressive repayment for annuity repayment.

Mortgages by type of interest rate

• Mortgage loans with **variable interest rates**, the amount for the duration of the loan changes. Vertical variable interest rate influence changes in market conditions, the most frequent changes of interest rates and changes in EURIBOR rates at which banks lend to each other sources.

• Mortgage loans with a **fixed interest rate** that banks guarantee for the selected fixation. Fixations of interest rates are typically set at 1, 2, 3, 5, 10, 15 or 20 years. Not all banks offer all fixations. The advantage of fixed interest rate is the same amount of annuity payments over a selected period of fixation [1, 2].

Purposes of using mortgages

According to the Law on Banks, mortgage loan is a loan with a maturity of at least four years and not more than 30 years, secured by a lien on domestic real estate, also under construction, funded at least at 90% through the issuance and sale of mortgage bonds by a mortgage bank which a mortgage bank provides the following purposes:

• Acquisition of domestic property, or part thereof, that is purchase of apartments, houses, land, recreational facilities, chalets, spaces for business and under.

• The construction or modification of existing structures (construction, extension, extension, completion, reconstruction, repair).

• Maintenance of domestic real estate.

• Repayment of an outstanding loan (mortgage and non-mortgage) used for the above purposes.

Mortgage loans are always secured lien on the property in favour of a domestic bank that provided the loan. Under the domestic real estate means land and buildings to the ground and a solid foundation in the territory of the Slovak Republic. Plots are always character properties, regardless of their area and destination. Construction is not part of the plot, which is why the land recorded separately [1,2].

Amount of the mortgage loan

How much can you borrow from a bank, respectively in what amount the bank will approve a mortgage loan depends on a combination of several factors:

• Experts to determine the fair price of real estate.

• LTV, i.e. Bank stipulated maximum LTV price of the property.

• Revenues and expenditures of the applicant for a mortgage loan.

The value of property is the basis

An expert nominated by the price of real estate is the basis for calculating the maximum mortgage. Expert opinion may carry any registered expert witness, not every expert opinion must also accept the bank. For example, if a bank has a bad experience with that expert may request to make a new expert report new expert. It can also happen when an already proven expert bank reduced the value of the property valuations.

State subsidies for youth in 2016

A state subsidy for youth (also referred to as a state subsidy for young people) is the percentage by which the reduced interest rate for mortgage loans. It specifies the calendar year and the current year applies to all conventional mortgage loans (apply to American mortgages).

For the year 2016, the state subsidy provides a maximum sum of € 50,000 (about 1.5 mil.), and even if co-applicant on mortgages with state bonus. State contributes in 2016 at 2% per annum. Mortgage bank, whose duties also help to reduce the interest rate, typically adds another 1%. Total interest subsidies for young applicants for a mortgage so this year is 3% [1].

For how long it is used state subsidies?

Public contribution together with the contribution from the mortgage bank shall be granted for a period of five years following the granting of remuneration and the start of the mortgage loan. The Bank for a period of five years also undertakes to allow the deferral of principal repayments of credit, implementation of extraordinary repayments of mortgage loans free of charge early repayment at the end of the fixed without charge or reduce payments in half to two years childbirth.

Who is entitled to state subsidies?

• An individual who has reached 18 years and is under 35 years of age. If the mortgagor spouses must meet the age condition both.

• An individual whose average monthly income was for the previous calendar year more than 1 € 119.30. If the applicants are married, their combined average monthly income for the last year must not exceed 2 € 238.60. This limit applies to the first quarter of 2016 (1 January to 31 March).

Bank sets ceilings for LTV

LTV (Loan to Value) stands for the share of the loan amount to the price of the property. Banks may by law provide mortgage loans up to a maximum 70% of the value of the mortgaged property. Mortgages provided over 70% of property value are essentially a combination of a mortgage (70%) and consumer loans (over 70%). At present, some banks provide loans of up to 100% of the property. The maximum LTV for mortgage loan is an important parameter when their own resources are not planning to finance at least 30% of the purchased property.

The more you earn, the more you can borrow

Difference between incomes and expenses of the applicant (possibly co-applicant) used to determine the available balance, i.e. the amount that banks can in terms of monthly pay. Calculated on the basis of the available monthly instalment of the loan, and the selected bank calculate the maximum loan possible. This approach is applicable even if you have not selected property and the need to know the price level at which you can move in its search. Some banks will, in such case, establish a mortgage certificate (in some banks referred to as a decree or document) to said pre-approved amount of the mortgage loan. Of course, the final approved amount of the mortgage will ultimately depend not only on your financial possibilities, but also the price of the pledged real estate and banking ceiling on LTV [1, 2].

Interest rates and fixation

Interest can be defined as the price for providing the loan. The interest rate is most often expressed in percentage per annum (abbreviation of per annum, per annum). Mortgage loans provided by banks bear interest at either a fixed (fixed) or floating (variable) interest rate.

Fixed interest rate

Fixed interest rate is the rate that banks guarantee for the selected fixation. After the time of fixation of the bank interest rate automatically updates and fixes for the next period. Fixed interest rate can be set at 1, 2, 3, 5, 7, 10, 15 and 20 years. Not all banks offer all fixations. The advantage of fixed interest rate is the same amount of annuity payments over a selected period of fixation.

Interest rate fixation period you choose yourself before signing the loan agreement. If you cannot estimate the changes in market interest rates and also want to be sure unchanging repayments over a longer period, you can choose to peg to five years or more. If, in future, we expect reduction of interest rates, you can use a variable interest rate and the fixed interest rate for a shorter period (1, 2, 3 years).

An important factor influencing the choice of fixation period is also planning extra payments or early repayment of the loan. Extraordinary instalment of a few percent of the outstanding loan amount (usually 20%) or the early repayment of the loan can be largely carried out without charge during the end of the period of fixation unless otherwise agreed in the loan agreement between the bank and the client.

Variable interest rate

Variable interest rate is the rate, the amount of which is not available for any period of time guaranteed. It consists of a base rate and risk premium. The variable interest rate may be changed at any time during the repayment mortgage. The change has a direct impact on the amount of monthly instalments [2].

Fees

Fees associated with the mortgage can be divided into two basic groups:

- fees for handling mortgage credit,
- fees associated with a mortgage loan.

Fees for handling mortgage

In the course of examining the application for a mortgage loan and dealing with the necessary documents you will encounter different types of fees. These fees make up your cost of equipment loan, i.e. you have to pay them even before you begin to draw the loan. In general, they can be divided into:

1. The fees associated with the land registry:
   a) fee for deed for legal purposes: 8.00 €
   b) fee for a copy of the cadastral map: € 8.00

2. The fee for an expert opinion (for valuation of real estate) tax is directly related to the value of the property valuation expert. This amount is most often ranges from 100 to 300 €. Among the documents necessary for the expert opinion is deed to the property and a copy of the cadastral map.

3. Fee for making a sales contract: if you are buying a property, you will bank on its purchase provides resources in the form of a mortgage loan, with a contract of sale is the bank guarantee that the property will eventually own.

4. Property insurance: property insurance is a necessary insurance for a mortgage loan. Banks require insurance blockage in his favour, to protect against unforeseen events damaging property (natural

disaster, fire, vandalism...) to which they pledge and which provided funding. Property insurance, respectively the amount of insurance payment should not be less than a mortgage loan.

5. The fees associated with in the Land:

the Land Register: € 66.00

the Land Register within 15 days (accelerated deposit): € 266.00

In the Land is the final step in the process of dealing with mortgages. Based on the acknowledgment of receipt of the proposal for entry and ownership certificate with seal that banks verify the Internet (via the Land Registry portal), the bank can release the money and the use of credit. However, while the bank not bring to deed to the registered lien in favour of the bank, you pay only interest on the drawn amount of the loan [2].

Fees associated with a mortgage loan

The most important fees associated with a mortgage loan are:

• Processing fee (provision) mortgage loan: the most common fee determined as % of the value of the mortgage. Due to higher labour content of the application for a mortgage bank also set a minimum value of this charge. Some banks Fixes the value of processing fees depending on the amount of a mortgage loan.

• Monthly management fee (management) Credit Account fee was an amendment to the Banking Act of June 2013 set aside.

• The fee for early repayment[1] of a mortgage loan: the fee for early repayment is usually expressed in percentage of the prepaid amount and minimum values. In the period following the time of fixation it is usually possible to repay the mortgage at no charge, outside this period the charges.

• Fee for extraordinary repayment: special payments to a certain amount of the loan can be paid free of charge at the end of the period of interest rate fixation (unless the contract between the bank and the client supports it). Some banks allow you to realize extraordinary instalment in the amount prescribed maximum 1 year, regardless of the expiration of the period of fixation [2].

Fees related to all banks

Monthly loan management fee: € 0

Extraordinary instalment at the end of fixation: € 0

Early repayment beyond the end of the fixed: € 0

Tab.1. Fees related to all banks in year 2016 [4-11]

	SLSP	**VÚB**	**UniCredit Bank**	**Tatra Banka**	**ČSOB**	**OTP Banka**	**Prima Banka**	**SBER BANK**
Mortgages granting	599 €	0.80% of loan volume max. € 1000	0.90 % of loan volume. min. 20€, max. 1000 €	0.80 % of loan volume min. 250 €, max. 950 €	0.80 % of loan volume min. 250 €. max. 1000 €	0.80 % of loan volume, min. 200 €	1.00 of loan volume min. 300 €	0 €

[1] Change in the amount of the fee for early repayment of mortgages from 21/03/2016. Amendment to the Act on Credit Institutions ordered banks to reduce the fee for early repayment of mortgages at max. 1% of the loan balance. This option is for customers who have the drawback rate mortgages and some intermediate loans and building society loans (which are not consumer loans under a special regulation) [4].

	SLSP	VÚB	UniCredit Bank	Tatra Banka	ČSOB	OTP Banka	Prima Banka	SBER BANK
Exceptional payment beyond the end of the fixation **Early repayment beyond the end of the fixed**	5.00 % of prepaid principal	5.00 % of prepaid principal, min. 166 €	5.00 % of prepaid principal, min. 166 €	5.00 % of prepaid principal	5.00 % of prepaid principal	5.00 % of prepaid principal, min. 166 €	5.00 % of prepaid principal, min. 300 €	5.00 % of prepaid princi-pal
For changing the terms and conditions	149 €	150 €	166 €	110 €	150 €	149 €	100 €	140 €

Today the lowest interest will be just below 2%, mortgage solved in a few days and we need to do far less evidence than ever before. Currently, the cheapest mortgage ever and even in 2016 would not change a lot. In our market there are currently eight banks that provide mortgages.

Year 2016 will bring several changes in the form of new legislation. Framework constraints set by the National Bank of Slovakia so that the mortgage market is not overheated, in other words the banks to provide mortgage loans prudently.

National Bank of Slovakia guards three basic areas: LTV limit on maturity and stress testing clients. The ratio of loan-to-value (LTV = loan to value). The banks are currently unable to provide hypo loans with LTV above 100%. Gradually decreasing the number of new mortgages with LTV between 90% and 100%. In practice, this means that the bank does not provide a higher mortgage than the value of real estate or mortgage, which is the same amount as property. When buying a property with a mortgage you need to have saved up about 30% of the property and the rest of the Bank. The maximum maturity of loans secured by real estate (mortgage loans, interim loans and construction loans) is 30 years. For other loans, the maximum maturity of nine years from 1.1.2016 and may even be lower, which would increase to eight years. Banks will not only assess the client from the current ability to repay the loan, but also in terms of whether it will be able to repay the loan at the interest rate increases by 2%.

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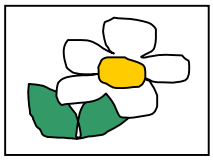

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[1] Author B.A.von, Writer J.K.L.: **Article name**. *Our J Transactions, 1999, **127**, 122-136*

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