Evaluation of the Shadow Economy Influencing Factors: Comparative Analysis of the Baltic States

Assoc. Prof. Dr. Rita Remeikiene

Prof. Dr. Ligita Gaspareniene

Mykolas Romeris University, Banking and Investment Department
E-mails: rita.remeikiene@mruni.eu; ligitagaspareniene@mruni.eu

Abstract

Numerous scientific and publicist articles consider the Baltic States as a single economic unit, particularly from the geopolitical point of view. However, evaluating the scope and spread of shadow economy, significant differences among the States emerge (Putniņiš and Sauka, 2015; Schneider, 2014). With reference to Putniņiš and Sauka (2015), the level of shadow economy in Latvia reached 23.5 percent of GDP in 2014 while that in Estonia and Lithuania respectively accounted 12.5 and 13.2 percent of GDP in the same year. The study carried out by Schneider (2014) proposes different results: in 2014, shadow economy in Lithuania and Estonia reached 27.7 percent of GDP while in Latvia it accounted 24.7 percent of GDP. The differences in the results are determined by the different methods engaged for the evaluation of the level of shadow economy. Nevertheless, it is obvious that the scope of shadow economy in the Baltic States far exceeds the average of the EU (18.5 percent of GDP). Thus, this article is aimed at the identification of the factors that have the biggest impact on the scope of shadow economy in all three Baltic States and performance of the comparative analysis of the identified factors. The methods of the research include systematic and comparative analysis of the scientific literature, regression, multiregression analysis and statistical data analysis.

Keywords: shadow economy, factors influencing shadow economy, Baltic States.

1. Introduction

Relevance of the topic. In general sense, the level of shadow economy is influenced by the following causal factors, inherent to the biggest part of industrial countries (Enste, 2015): tax burden and excessive contributions of social insurance; frequency and intensity of the regulation of officially recorder economy, extremely strict regulation of the labour market with untimely retirement, growing unemployment rate and limitation of possible work hours per week, which determine the search of illegal job. The countries with high scope of shadow economy usually show low degrees of tax paying morale (willingness to pay taxes), which is determined by the corruption, tolerated in authorities, as well as by low respect and loyalty to public organisations. Analysing the countries of Central and Eastern Europe, including the Baltic States, scholars point out slightly different reasons that determine the scope of shadow economy emergence and growth in these countries (Schneider, 2007). The reasons include lack of competence of official institutions (legal acts, bureaucracy, court practice); corruption, undermining trust in authorities; weak enforcement of legislation, inability or reluctance to protect property rights; high costs of business development and the burden of business administration; low probability to be caught as the one who avoids paying taxes or does an illegal work (this way, illegal activities are promoted); extremely high bureaucracy that determines "shadow business" while establishing or surviving in the market, and, finally, public tolerance of shadow economy, which determines complicated implementation of the measures designed to stamp out the "shadow".

Although the Baltic States are often considered as a single unit assessing from the geopolitical point of view, the scope of shadow economy is significantly different among the States. With reference to Putniņiš and Sauka (2015), the level of shadow economy in Latvia reached 23.5 percent of GDP in 2014 while that in Estonia and Lithuania respectively accounted 12.5 and 13.2 percent of GDP in the same year. The study carried out by Schneider (2014) proposes different results: in 2014, shadow economy in Lithuania and Estonia reached 27.7 percent of GDP while in Latvia it accounted 24.7 percent of GDP. The differences in the results are determined by the different methods engaged for the evaluation of the level of shadow economy. Nevertheless, it is obvious that the scope of shadow economy in the Baltic States far exceeds the average of the EU (18.5 percent of GDP).

This has determined the following formulation of *the scientific problem:* which factors had the biggest impact on the scope of shadow economy in the Baltic States during the period of 2000-2011?

The article is **aimed at** identification of the factors that have the biggest impact on the scope of shadow economy in all three Baltic States and performance of the comparative analysis of the identified factors.

Limitation of the research: statistical databases (Statistical Database of the United Nations, International Labour Organization, World Bank) do not present the newest data on the political and economic factors of shadow economy. Thus, the research covers only the data within the period of 2000-2011.

In the first section of the article, on the basis of the scientific literature analysis, the determinants of shadow economy have been identified; in the second section, the methodology of the research has been presented; finally, the results of the research have been introduced. The article has been finished with conclusions.

2. Determinants of Shadow Economy: Theoretical Aspects

For a few decades, high tax burden has been considered to be the main factor of shadow economy formation. The impact of this factor is based on Laffer curve, which shows that a relatively low tax burden determines low scopes of shadow economy whereas the increase of tax burden over the optimal level determines high volumes of shadow economy, which, in turn, decreases the collection of tax revenues to the state budget (Schneider, Enste 2002a; 2002b; Rosser 2006).

With reference to Kanniainen et al. (2004), shadow economy rises basically due to governmental intervention, i.e. regulation and taxation. Such interference causes a side effect, which emerges as higher scope of shadow economy. According to (Giles, 1990), the scope of shadow economy is associated not only with tax burden for business or inhabitants, but it also depends on the degree of economic regulation. Thomas (1990) is of the opinion that growing scopes of shadow economy might be the attributes of high taxation and overregulation. Krumplyte (2008) leans on the examples of foreign experience, revealing that the countries with high tax burden, i.e. nearly 52-55 percent (e.g. Sweden, Denmark, Finland), taking positions among top ten leading countries, are considered to be the most competitive with low scope of shadow economy. On the contrary, the countries with relatively low tax burden, i.e. up to 20 percent of GDP (e.g. Georgia, Mexico), have shadow economies composing more than 60 percent of GDP.

The analysis of the scientific literature has revealed that political factors such as taxation and frequency of regulation intensity are treated as the determinants having the biggest impact on the growth of the scope of shadow economy. With reference to Krumplyte (2008), the determinants of shadow economy can be classified into three following groups: economic, legal administrational and social psychological. The determinants attributable to all of these groups have the complex effect on the trends of shadow economy in the country. What is more, the significance of particular determinants on existence and spread of shadow economy might differ depending on the situation in a particular country. Thus, seeking to establish which determinants have the biggest impact on the trends of shadow economy, it is necessary to consider political and economic conditions as well as existing business environment in the particular country. Following the theoretical findings, the empirical research has been performed. In the further sections of the article, the methodology and the results of the empirical research have been presented.

3. The Methodology of the Research

Before selecting the method of the research, the aim of the empirical research was formulated – to establish the impact of the shadow economy factors on the scope of Baltic States shadow economy during the period of 2000 – 2011. In order to fulfil the defined aim of the empirical research, mathematical methods (correlation analysis, Pearson correlation coefficient and multiregression analysis) were engaged to identify the factors that influence the scope of the shadow economy in Lithuania.

Quantitative methods of **correlation analysis** and **multiregression analysis** enabled to identify what economic and political factors with numerical values have the most significant impact on the scope of shadow economy in the Baltic States. After identification of the factors that have the most significant impact on the scope of shadow economy, the comparative analysis of Lithuania, Latvia and Estonia was performed. The correlation analysis revealed whether the variables are dependent (i.e. whether the increase of a particular factor causes the increase of another one, and vice versa), what the strength of the link is and whether correlation is statistically significant (not coincidental).

With a view to ensuring purposefulness of the calculations, the existence of the correlation between such factors as *corruption freedom index, business freedom index, government final consumption expenditure, households consumption expenditure, export of goods and services, import of goods and services, workforce participation rate,*

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unemployment rate, the number of the population beyond the labour market, crediting of private sector, tax income, tax payments, inflation, GDP growth, electric energy consumption, final consumption expenditure, household consumption expenditure and *the scope of shadow economy* in all the three countries during the period of 2000 – 2011 was verified. Verification of the hypotheses on the normality of the factors describing the political, economic environment and unrecorded economy revealed positive results, i.e. the normality condition was satisfied (value $p < 0.05$). The detailed description of the factors that influence shadow economy and that were included in the correlation analysis has been presented in Table 1.

Table 1. Description of the influential factors that were included in the correlation analysis (source: compiled by the authors with references to World Bank; International Labour Organization; Heritage Foundation)

Independent variable, x	The concept of independent variable
Political factors	
Business freedom index	Business freedom is a general index of governmental business regulation efficiency. Quantitative grade of the index is calculated assessing business start-up, development and closing barriers. The value of business freedom index for a particular country varies from 0 to 100 points, where 100 points stands for the absolutely free business environment (Source: Heritage Foundation).
Corruption freedom index	Corruption destroys economic freedom and induces the feelings of unsafety and uncertainty into economic relations. This index is obtained from *Transparency International* Corruption Perception Index. The value of the index falls into the scale of 10 points, where 10 points stand for very low corruption rate, and 0 points – for a highly-corrupted government of the country (Source: Heritage Foundation).
Total government consumption expenditure, in value added, current prices	Total government consumption expenditure (government final consumption) includes the total value of the current governmental expenditure for goods and services (including compensations for employees). They also include the expenditure of national security and defence, but governmental military expenditure, which is a part of the governmental capital formation, is excluded (Source: Statistical Database of the United Nations).
Tax income (percent of GDP)	Tax income means mandatory transfers to the central government for public purposes. Particular transfers such as fines, interest, most payments of social insurance are not included. Returned payments as well as the corrections of the erroneously collected taxes are treated as negative income (Source: World Bank).
Economic factors	
GDP growth (annual), percent.	It stands for the percentage growth of annual GDP in local currency, market prices. Aggregate indicators are based on the comparative prices of 2005, in dollars (Source: World Bank).
Labour force rate, percent	All employed and unemployed population (Source: International Labour Organisation)
Unemployment rate, thousands	The index is expressed as the ratio between the number of the unemployed and the labour force (Source: International Labour Organisation)
Number of the population beyond the labour market	Population beyond the labour market includes all the working population that was not included in the labour force as the employed or the unemployed during the researched period. The working-age population is defined as 15-year-old and older population, but the definition can differ depending on the term formulation in a particular country (Source: International Labour Organisation).
Inflation, in consumer prices (annual), percent	Inflation is measured by consumer price index which reflects annual percentage cost changes for an average consumer obtaining the set of goods and services at defined or changed intervals, for instance annually. It is commonly calculated by Laspeyres formula. (Source: World Bank).
Export of goods and services (percent of GDP)	Export of goods and services means the value of all goods and market services, including transportation, insurance, royalties, licence fees, construction, communications, finance, information and others, provided for businesses, individuals or governments in foreign countries. Export of goods and services does not include compensations for employees, investment income and transfers (Source: World Bank).
Import of goods and services (percent of GDP)	Import of goods and services means the value of all goods and market services, including transportation, insurance, royalties, licence fees, construction, communications, finance, information and others, obtained for businesses, individuals or governments from foreign countries. Import of goods and services does not include compensations for employees, investment income and transfers (Source: World Bank).
Crediting of private sector, percent of GDP	Crediting of private sector means funding of the private sector with financial resources provided by financial corporations, engaging such funding forms as loans, equities, trade credits, etc. In particular countries, crediting also includes the governmental sector. Financial corporations include money managing institutions and banks as well as other financial corporations whose data is available (i.e. corporations that do not accept transferable deposits, but accept such obligations as savings deposit or fixed-term deposits). Finance and leasing enterprises, money creditors, insurance companies, pension funds and currency exchange companies are other examples of a financial corporation. (Source: World Bank).

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Tax payments (numbers)	Tax payments made by business companies refer to a number of the paid taxes, including the payments by e-banking. Taxes are calculated as paid once a year, even if in practice they are paid more frequently (Source: World Bank).
Energy consumption (in the equivalent of a kg of petroleum per capita)	Energy consumption means the initial energy consumption before the transformation of energy to any other fuel of final consumption. It is equal to local production plus imports and fluctuations of resources and minus exports and the fuels supplied to ships and aircrafts engaged in international trade (Source: World Bank).
Household consumption expenditure, percent of GDP	Household monetary and subsistence expenditure for consumption goods and services (Source: Lithuanian Department of Statistics)
Final consumption expenditure, percent of GDP	General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defence and security, but excludes government military expenditures that are part of government capital formation (Source: World Bank).

After the calculations of correlation with SSPS (*Statistical Package for the Social Sciences*) software, multiregression analysis was carried out, performing the calculations only for the factors with value *r* higher than 0.6. Leaning on the correlation coefficient values higher than 0.6, the factors that influence the scope of shadow economy in separate Baltic States were selected (see Table 2).

Table 2. The results of the empirical research: the factors that influenced the scope of shadow economy in the Baltic States during the period of 2000 – 2011 (compiled by the authors)

Independent variable, x	*r (correlations)* and *p (probabilities)* values
Lithuania	
Labour force rate, percent	*r = 0.703820; p = 0.0106*
Export of goods and services, percent of GDP	*r = -0.787391; p = 0.0024*
Import of goods and services, percent of GDP	*r = -0.786529; p = 0.0024*
Corruption Freedom Index	*r = -0.697001; p = 0.0118*
Business Freedom Index	**r = -0.820409**; *p = 0.0011*
Crediting of private sector, percent of GDP	**r = -0.912220**; *p = 0.0000*
Latvia	
Business Freedom Index	**r = -0.845927**; *p = 0.0005*
Total government consumption expenditure in value added, current prices	*r = 0.671665; p = 0.0168*
Tax payment, numbers	**r = 0.901241**; *p = 0.0001*
Crediting of private sector, percent of GDP	**r = -0.945784**;*p = 0.0000*
Corruption Perception Index	**r = -0.921276**; *p = 0.0000*
Energy consumption (in the equivalent of a kg of petroleum per capita)	**r = -0.920967**; *p = 0.0000*
Labour force rate, percent	**r = -0.841726**; *p = 0.0006*
Number of the population beyond the labour market, thousand	**r = 0.931187**; *p = 0.0000*
Estonia	
Household consumption expenditure, percent of GDB	**r = 0.931187**; *p = 0.0000*
Crediting of private sector, percent of GDP	*r = -0.746129; p = 0.0053*
Corruption Perception Index	**r = -0.835539**; *p = 0.0007*
Final consumption expenditure, percent of GDP	*r = 0.619170; p = 0.0318*
Energy consumption (in the equivalent of a kg of petroleum per capita)	**r = -0.808040**; *p = 0.0015*
Labour force rate, percent	**r = -0.891395**; *p = 0.0001*
Number of the population beyond the labour market, thousand	**r = 0.922240**; *p = 0.0000*

The results of the calculations have enabled to establish the common regularities and differences while evaluating the determinants of shadow economy. Crediting of private sector strongly correlated with the scope of shadow economy in all the three States, which proposes that poorer terms of crediting determined the increase of shadow economy during the researched period. The other determinants of shadow economy in the Baltic States include Corruption Freedom Index and Labour force rate. Comparing the situation of the three countries, it can be seen that number of the population beyond the labour market as well as energy consumption indexes strongly correlated with the scope of shadow economy in Latvia and Estonia whereas in Lithuania they did not have any significant impact of the scope of shadow economy

during the researched period.

4.   The Results of the Empirical Research

Multiregression analysis has enabled to establish to what extent the identified influential factors explain fluctuations of the scope of shadow economy. Analysing the results, the value of determination coefficient (R^2), p (probability) value (<0.05) as well as verification and elimination of multicollinearity were considered. Statisticians propose the solution to the problem of multicollinearity by eliminating the variables that show the strongest correlation, but value R^2 has to remain the same or can change insignificantly. The other parameters of the regression model have to show an improvement.
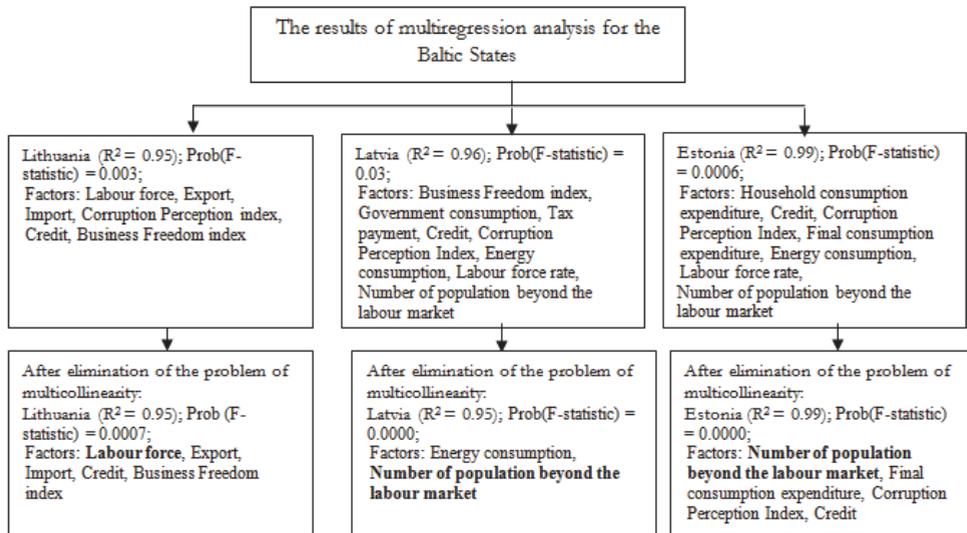

Figure 1. The results of multiregression modelling for evaluation of the impact of determinants on the scope of shadow economy in the Baltic States

The analysis of the results for Lithuania propose that the identified influential factors (determinants) of shadow economy explain the changes of independent variables by 95 percent, as it was revealed by the multiple regression analysis. After identification of the problem of multicollinearity and elimination from the model Corruption Perception Index, value p improved whereas value R^2 remained unchanged. Thus, the scope of shadow economy in Lithuania during the period of 2000 - 2011 was explained by such influential factors as labour force rate, the volumes of international trade, crediting of private sector and Business Freedom Index.

After elimination of the problem of multicollinearity, it was established that 95 percent of the scope of shadow economy in Latvia was determined by energy consumption volumes and the number of the population operating beyond the labour market. In Estonia, the identified influential factors explain the scope of shadow economy during the analysed period even by 99 percent. After elimination of the problem of multicollinearity, it was established that such factors as the number of the population operating beyond the labour market, final consumption expenditure, Corruption Perception Index and crediting terms determined the scope of shadow economy in the country during the period of 2000-2011.

The results of the research have revealed that the factors influencing the scope of shadow economy in the Baltic States differ, although some commonalities such as labour market and the population operating beyond the labour market can also be observed. Some scientists (Krumplyte, 2010), who have analysed the spread of shadow economy, state that, in the context of tax evasion, illegal work emerges as a permanent unregistered economic activity, which is performed without declaration of income, temporary economic activity (working under copyright agreements), which is performed without declaration of the overall income, unofficial work, i.e. officially undeclared labour relations – work in a company without making a labour contract with an employer, and official work with a labour contract without declaration of the overall wages, recording only a part of the wages or keeping of the false work time records. Such forms of shadow

economy that emerge in the labour market are widely spread in all the three states researched in this article. Thus, selecting the measures for fighting with shadow economy, the governments of the states should consider the problems of labour relations.

In Estonia and Lithuania, the obstacles of private sector crediting are the determinants that have the significant impact on the scope of shadow economy since they induce business owners and entrepreneurs to select the illegal ways of operation without official registration of their activities. Among all the three Baltic States, only in Latvia the factor of energy consumption can be treated as one of the determinants of shadow economy whereas in the other two states its significant impact on the scope of shadow economy has not been established.

Summarising the results of the research, it can be stated that imperfections of the labour market, which induce illegal activities, are the determinants that have the most significant impact on the scope of shadow economy in all the three Baltic States. The other determinants are specific for a particular state. In Latvia, the scope of shadow economy is positively influenced by more intensive energy consumption, in Lithuania – by unfavourable crediting policies and business conditions, and in Estonia – by corruption, crediting terms and final consumption expenditure.

5. Conclusions

1. The analysis of the scientific literature on shadow economy situation in the countries of Central and Eastern Europe, including the Baltic States, it has revealed that the determinants of shadow economy in these countries include lack of competence of official institutions (legal acts, bureaucracy, court practice) corruption that undermines trust in authorities, weak enforcement of legislation, inability or reluctance to protect property rights, high costs of business development and the burden of business administration and low probability to be caught as the one who avoids paying taxes or does an illegal work.

2. The empirical research has enabled to identify commonalities and differences while evaluating the causes of shadow economy in the Baltic States. It has been established that crediting of private sector strongly correlated with the scope of shadow economy, which proposes that poorer crediting alongside with corruption freedom index and labour force rate were the determinants of shadow economy in all the States during the researched period. Assessing the differences among the States, it should be noted that the number of the population beyond the labour market as well as energy consumption strongly correlated with the scope of shadow economy in Latvia and Estonia whereas they did not have any significant impact on the scope of shadow economy in Lithuania.

3. The results of the research for Lithuania have revealed that the identified determinants explain the changes of independent variables by 95 percent. After detection of the problem of multicollinearity and elimination the determinant of corruption perception index, value p improved whereas value R2 remained unchanged, which proposes that during the period of 2000-2011, the scope of shadow economy in Lithuania is explained by such determinants as labour force rate, the volumes of international trade, crediting of private sector and business freedom index.

4. After the elimination of the problem of multicollinearity, it has been established that the trends of shadow economy in Latvia by 95 percent were determined by energy consumption and the population operating beyond the labour market.

5. In Estonia, the identified determinants explain the scope of shadow economy by 99 percent during the researched period. After the elimination of the problem of multicollinearity, it has been established that the population operating beyond the labour market, final consumption expenditure, corruption perception index and crediting determined the changes of the scope of shadow economy during the period of 2000-2011.

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