

Determinants of Shadow Economy in Eastern European Countries

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Abstract

In this article the relationship between shadow economy and its' determinants has been examined. Ten Eastern countries from European Union were chosen due to specific particularities, which may cause higher shadow economy levels in the investigated countries compared with the EU average. Time span of 2003-2016 was selected, as 2017 data has yet to be released at the time of the analysis. Article consists of examination of the current situation and shadow economy trends in Eastern European countries; overview of shadow economy scientific literature followed by hypothesis, which are examined by constructing regression models. Models aim to distinguish the relationship between selected determinants and shadow economy size. Scientific literature analysis revealed that increase of tax burden on labor is seen as a primary reason for the increase of shadow economy, however, such relation has not been identified. Furthermore, results show that unemployment and self-employed people ratio affect shadow economy insignificantly. This suggests that further analysis is needed. Nonetheless, regression model has not rejected the hypotheses of corruption level, income inequality, business freedom and GDP per capita effect on shadow economy. Thus, it can be stated that these variables are determinants of shadow economy in Eastern European countries.

Keywords: shadow economy; Eastern European countries; MIMIC methodology; tax burden; government regulation.

JEL classification: O11, O17, C12, G18

1. INTRODUCTION

Shadow economy in scientific literature is treated ambiguously, as scientists and shadow economy experts use various definitions and theories. However, in general case shadow economy is referred as multiple effects of various phenomena (Krumplytė, 2009), which are a part of unofficial country economy. As mentioned by J. Krumplytė concept of „shadow economy” and „officially unreported economy” are often used as synonyms or part

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of other definitions. For this analysis, shadow economy concept is defined as unregistered economy at a given period of time, which would increase official economy size if were to be registered (Schneider and Williams, 2013). Shadow economy forms in all of the countries where economic activities are taxed and regulated, but its size can differ significantly. Therefore, it is necessary to evaluate what determines the size of shadow economy in a particular country (Žukauskas, 2016). Main determinants for shadow economy usually are considered to be tax burden, low tax morale (Enste, 2015), high unemployment (Mara and Sabau-Popa, 2013) and other determinants which are examined later in the article.

The novelty of the study: shadow economy is considered as a significant problem not only in theoretical studies, but also in practice. It is present in all countries and has direct negative impact to economy and general country development. As European countries were significantly affected by financial and economic crises in 2008, they were required to borrow more, which has led to budget deficits and large debt rates. In this context ES countries' governments put more attention into the fact that decreasing shadow economy can help to eliminate budget deficits by increasing level of collected taxes (Mara and Sabau-Popa, 2013).

Unofficial economy decreases countries growth potential, distorts statistical data, as well as competitive environment and other economic factors. On the other hand, shadow economy is a consequence of ineffective goods and labor market (Dell'anno, 2007). Also, shadow economy can also have positive effect on total country economy, because it creates added value, which usually later is spent in official economy (Schneider and Enste, 2000). Shadow economy can also create a cycle, when country tax income is decreasing, therefore governments increase tax rates, which in turn leads to more people moving to shadow economy and thus further decreasing total tax revenues for country (Schneider and Enste, 2002).

According to various reports (AT Kearney, 2013; Schneider, 2017 and others) shadow economy size in European Union currently is around 15-20% from total GDP level, while in Eastern Europe this size is around 25%, therefore further analysis is needed to understand what determines higher shadow economy size in Eastern Europe than Western Europe.

The goal of the study is to identify the determinants of shadow economy in Eastern European countries.

The objectives of the study are:

1. To review the size of shadow economy and its tendencies in the world, Europe as a whole and Eastern European countries.
2. To reveal economic impact of shadow economy.
3. To define a concept of shadow economy.
4. To carry out the analysis of scientific literature and research, which reviews shadow economy determinants.
5. To make hypotheses about the factors determining the size of the shadow economy.
6. To study the factors determining the shadow economy in Eastern European countries by carrying out regression analysis.

2. LITERATURE REVIEW – DETERMINANTS OF SHADOW ECONOMY SIZE

In a broad sense, shadow economy is described the best in definition as an activity and income gained from it, which is hidden from government authorities in order to avoid regulation, taxation or any other type of attention to the activity (Smith, 1994).

However, in this article shadow economy is analyzed based on a definition, that it is not registered, but in itself legal economic activity, which would increase official economy if were legal (Schneider and Williams, 2013). Therefore, shadow economy can be legal or illegal, but usually related with making financial transaction (Lipper and Walker, 1997; Schneider, 2006, 2015, 2017). However, this article, same as most of other scientists work, does not include criminal activities to shadow economy definition, because such activities cannot increase country GDP. Usual shadow economy classification example is provided below (see Table no. 1).

Table no. 1 – Shadow economy activities and their examples

Activity	Included or not in shadow economy size in this article	Reason if not included
Child-minding with income not declared	Included	
Selling drugs	Not included	Illegal
Building work done by homeowner	Not included	Do-it-yourself activity not subject to tax or regulation
Purchase and / or production of contraband or counterfeit products	Included	

Source: Schneider and Williams, 2013

In scientific literature, shadow economy is usually split to types, which were defined by O. Lipper and W. Walker (1997) and later filled by F. Schneider (2006). This shadow economy classification divides it to legal or illegal and also relates it to monetary transactions (see Table no. 2).

Table no. 2 – Classification of shadow economy types

Type of activity	Monetary transactions		Non-monetary transactions	
Illegal activity	Trade with stolen goods; drug dealing and manufacturing; prostitution; gambling; smuggling; fraud; etc.		Barter of drugs, stolen goods, smuggling etc. Producing or growing drugs for own use. Theft for own use.	
Legal activity	Tax Evasion	Tax Avoidance	Tax Evasion	Tax Avoidance
	Unreported income from self-employment; wages, salaries and assets from unreported work related to legal services and goods	Employee discounts, fringe benefits	Barter of legal services and goods	All do-it-yourself work and neighbor help

Source: Lipper and Walker (1997), extended by Schneider (2006). Schneider and Buehn (2018)

Usually shadow economy is analyzed while trying to understand why businesses engage in it. Much rarely it is analyzed to understand motives of consumer or hired worker. Therefore, in order to understand shadow economy, it is crucial to understand why people engage in shadow activities. Scientists Schneider *et al.* (2010) identifies following factors and mentions that people might hide income from governmental institutions:

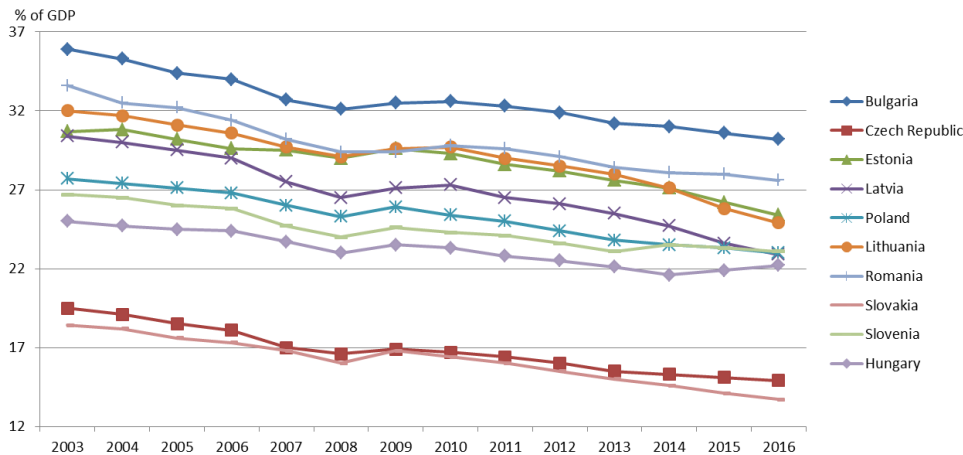
1. to avoid payment of income, value added or other taxes,
2. to avoid payment of social security contributions,

3. to avoid having to meet certain legal labor market standards, such as minimum wages, maximum working hours, safety standards, etc.,

4. to avoid complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms.

The Organization for Economic Cooperation and Development (hereinafter – OECD) in its report in 2009 analyzed that 1,8 billion people in 2009 were related with shadow economy activities, while only 1,2 billion people had formal job, based on the contract (OECD, 2009). This phenomenon is called „system D”, which means that world economy is moving towards „do-it-yourself” economy. If shadow economy at 2009 were separate country, it would have been second largest in the world. Unfortunately, due to scale of such analysis, it was not made again, however it is guessed, that current numbers are slightly improved.

As previously mentioned, most experts and shadow economy analysts forecast, that current European shadow economy is around 20-25%. However, in this article, only 10 European countries are analyzed: Lithuania, Latvia, Estonia, Slovakia, Poland, Slovenia, Czech Republic, Hungary, Romania and Bulgaria. Exact reasoning for following countries are provided in third paragraph of the article. Sizes of shadow economy are provided in Figure no. 1 (at the time of analysis 2017 forecasts were yet to be released).



Source: prepared by authors, according to data of Schneider (2016)

Figure no. 1 – Historical shadow economy size in Eastern European countries

As seen in Figure no. 1, historically shadow economy is forecasted to be lowest in Slovakia, while highest in Bulgaria from analyzed 10 Eastern European countries. While from provided data in can be seen that shadow economy has a tendency to decrease with time, however, it is important to understand what leads to different sizes of shadow economy in particular countries and why in some countries it is decreasing faster than in others. Therefore potential shadow economy determinants analysis is provided in the following section of an article.

2.1 Tax burden

Tax burden is calculated as difference between brutto and netto salary by percentage of income taken for taxes. It can be stated that desire to avoid paying taxes can be an instinct of people, by not sharing money, which they have made by working (Laukaitis and Navickas, 2003). Therefore, when tax burden increases, individuals tend to eliminate interests of the public and endeavor to meet their needs in shadow economy. Due to this factor tax burden in scientific literature is seen as the most important factor, regarding the size of shadow economy in a particular country, with multiple scientists who identified tax burden as a key variable (Kanniainen *et al.*, 2004; Schneider, 2006; Dell'anno, 2007; Mara and Sabau-Popa, 2013) and others.

2.2 Unemployment

Scientific literature analysis of unemployment impact on shadow economy size shows that impact can be ambiguous (Tanzi, 1999). It can be the case, since some of shadow economy participants can also have official job or be officially working part-time just to keep their social benefits (Bajada and Schneider, 2009; Schneider and Williams, 2013). Therefore, usual argument follows the notion that unemployment correlates with shadow economy. It can also be backed by various empirical evidence made by (Ruge, 2010) and (Schneider and Williams, 2013), which show that if unemployment increases by 1 %, shadow economy will increase by ~0.32%. Such relationship can be explained by low salaries, meaning, people who earn little, tend to look for other ways of making money, which might be easier to reach in shadow economy. Therefore, when analyzing shadow economy determinants, following hypothesis is raised: increase in unemployment leads to increase of shadow economy size. However, full summary of hypothesis is provided in Figure no. 2.

2.3 Level of corruption

High level of corruption in a country creates good conditions for shadow economy and its expansion. Usually governmental institution officials are bribed more easily if overall corruption levels in a country are high, therefore possibility to be caught, while operating in shadow economy is lower (Žukauskas, 2014). Also, if fines are relatively low and do not outweigh gains from participating in shadow economy, then individuals tend to be more related to shadow economy. Authors of the article suggest that geographical country location might have an impact on corruption as well, which is supported by Transparency International corruption index data, showing that 10 of Eastern European countries corruption index is 54, while in remaining EU countries 71, meaning, corruption levels in Eastern Europe countries are around 17 units higher, with some exceptions, i.e. Estonia. Western Europe scientists do not identify levels of corruption as statistically significant factor as determinant of shadow economy (Schneider and Beuhn, 2012). However, there is no empirical evidence for Eastern Europe, therefore it is included for analysis in this article, with hypothesis stated in Figure no. 2.

2.4 Income inequality

Income inequality is usually understood as individuals, groups or countries differences in income levels. It usually forms due to different capabilities by mentioned groups to gain income or assets. People with lower participation levels in labor market due to age, health or other reasons usually has lower income (including welfare programs) than those, who have all opportunities to gain income, therefore in the long-run income inequality forms (Krumplytė, 2008). Empirical evidence confirms this relation, by identifying 70% correlation between Gini coefficient, which defines income inequality and shadow economy level (Rosser *et al.*, 2000, 2003). However, worth mentioning, that due to level of analysis complexity it was not repeated.

2.5 Level of self-employed workers

In an emerging country most of its workforce is self-employed, meaning the work alone or own small companies (OECD, 2009). In Eastern Europe, most of self-employed workers are usually in service industry, as well as various kinds of artists and other. It could be in these people interests to hide part of their income, due to the fact that probability to catch them is low. Some historical statistical evidence proves the point, while multiple scientists mention, that in various developed markets such as United Kingdom, Sweden and Canada, between 10-35% of self employed did not declare their income to official authorities (Pissarides and Weber, 1989; Apel, 1994; Mirus and Smith, 1997). Correlation between these variables is also seen in more recent researches, based in Europe (Dell'Anno *et al.*, 2007; Dell'anno, 2007) and others. However, with improving economic conditions these levels can improved significantly, but there is no data about new evidence. Another reason why self-employed people tend to join shadow economy – it is easier for them to inflate costs by adding personal costs to business costs, which usually are taxed by lower levels than personal expenditure.

2.6 Business freedom

Business freedom is closely related to level of business regulation in a country. It combines three levels of a business lifecycle – opening, operating and closing the business, in terms of 10 various measures, which are provided in [Heritage International \(2017\)](#) database.

If people want to create a business and later successfully expand it and they do not have such regulatory environment, then they might tend not to fully declare their income, whilst leading to increasing level of shadow economy and decreasing country tax income. In more extreme cases, these people move to shadow economy completely. Countries that have a tendency to regulate businesses with various bans, usually have higher shadow economy share from total economy (Schneider and Beuhn, 2012). Therefore, low level of business freedom in scientific literature is seen as significant impact on increases of shadow economy, therefore such hypothesis is tested in the later paragraphs on the article.

2.7 Tax morale

Tax morale in scientific literature is defined as people perception towards country and its policies, social security, meeting public needs and other (Schneider, 2007). If a person is happy about his benefits, which he receives for paying taxes, as well as, its quality (education for kids, infrastructure such as roads, health insurance, pension system, etc.), then it is more likely that he will be motivated to pay taxes, therefore his tax morale will be considered high (Feld and Schneider, 2010). However, if quality of these services is low, then people are disappointed in government services, thus their tax morale can be seen as low. Some scientists see tax morale as the most important factor, determining shadow economy size in particular country (Togler, 2003). Despite such theories in scientific literature, in practice, very little empirical evidence has been provided (Feld and Schneider, 2010). However, for very difficult and complicated research, as well as, low reliability of the data, tax morale is not included in the research as potential impact with regards to shadow economy size.

2.8 Shadow economy determinant hypothesis

Key shadow economy determinants have been identified, based on scientific literature analysis. Figure no. 2 summarizes these potential determinants and raises hypothesis, what will happen to shadow economy size in a particular country, when its potential determinant increases by one measurable unit.

Determinant	Hypothesis
Tax burden	<ul style="list-style-type: none"> ⬆ Tax burden ⬆ Shadow economy (SE)
Unemployment	<ul style="list-style-type: none"> ⬆ Unemployment level ⬆ SE
Corruption	<ul style="list-style-type: none"> ⬆ Corruption level ⬆ SE
Income inequality	<ul style="list-style-type: none"> ⬆ Income inequality ⬆ SE
Self-employed workers	<ul style="list-style-type: none"> ⬆ Level of self-employed workers ⬆ SE
Business freedom	<ul style="list-style-type: none"> ⬆ Business freedom ⬆ SE
Tax morale	Due to difficulties in tax morale evaluation and lack of data reliability, tax morale is not included into modelling of shadow economy determinants

Source: made by the authors

Figure no. 2 – Summary of hypothesis with regards to shadow economy determinants

3. METHODOLOGY AND RESEARCH

In scientific literature, scientists usually define three main shadow economy evaluation methods: direct, indirect and the model approach (Schneider, 2011, 2016, 2017; Schneider and Buehn, 2018). According to F. Schneider, direct shadow economy evaluation includes micro level analysis, which intends to answer what is shadow level in particular market at particular moment. One of the examples of direct approach – survey of country residents.

Indirect approach includes various macroeconomic researches and aims to evaluate shadow economy changes over time and tendencies in the future. Few examples include The Physical Input (Electricity Consumption) Method, also known as Kaufmann – Kaliberda (Kaufmann and Kaliberda, 1996) Method or The Discrepancy between the Official and Actual Labor Force (Schneider, 2017). First example, Kaufmann – Kaliberda model assumes that economy growth is highly correlated with electric energy consumption. Therefore, when electric energy consumption dramatically increases, but does not transfer to economy growth it can be assumed that shadow economy is prevalent. The model evaluates what are the income and expenditure in a particular country and when adjusted for external factors, looks at discrepancies between income and expenditure. However, indirect approaches are open to criticism, because usually only identifies few inputs to shadow economy.

Third methodology is used by employing statistical models and is called model approach. This particular method is used the most, when analyzing shadow economy and is called MIMIC (Multiple indicators multiple causes). During last decades it used by multiple authors, who tried to determine size of shadow economy, such as (Dell'Anno *et al.*, 2007; Dell'anno, 2007; Elgin and Oztunali, 2012; Kanninen *et al.*, 2004; Mara and Sabau-Popa, 2013), as well as most of F. Schneider works (2006, 2007, 2011, 2015, 2016, 2017; 2018) and others. According to the fact that MIMIC methodology is used the most for shadow economy analysis, it was taken as a base for research for this article scope.

However, it should be noted that shadow economy analytic models are usually seen as ambiguous, as all of them have both pros and cons.

Eastern European countries were taken as a group of post-Soviet countries: Lithuania, Latvia, Estonia, Poland, Slovenia, Slovakia, Czech Republic, Hungary, Romania and Bulgaria (hereinafter-Eastern European countries). In some classifications, Baltic countries are already seen as Nordic countries, however, this group of countries is used as a same group, because communist regimes fell apart in these countries at relatively similar time, therefore countries were developing open economies, had similar processes and later were preparing to joint European Union. These countries accepted shadow economy as a wide spread phenomenon and started to fight it. It should be noted that only countries in European Union are included due to limited data on other countries (i.e. Croatia, which joined European Union later or Serbia, Bosnia and Herzegovina which are still not in European Union). Analysis takes time span of 2003-2016 has been selected, as 2017 data has yet to be released at the time of analysis.

Hypothesis raised in the previous section are tested by using panel data regression analysis, where dependent variable – size of shadow economy, calculated by using MIMIC methodology (Schneider, 2015, 2016, 2017 and other). It is calculated as % from gross domestic product in particular country. Regression model equation is provided below:

$$\begin{aligned} \text{Shadow economy} = & \beta_0 + \beta_1 \text{Tax burden on income} + \beta_2 \text{Unemployment level} \\ & + \beta_3 \text{Corruption level} + \beta_4 \text{Income inequality} + \beta_5 \text{Self employed workers} \\ & + \beta_6 \text{Business freedom} + \beta_7 \text{Tax burden on consumption} \\ & + \beta_8 \text{GDP per capita} + \varepsilon \end{aligned}$$

Regression analysis also includes two controlling variables: tax burden on consumption and GDP per capita. Despite the fact that scientific literature stresses less attention on these variables, there are, some scientists who are analyzing potential effects of

tax burden on consumption (Stankevičius and Vasiliauskaite, 2014; Vousinas, 2017 and others), as well as, GDP per capita (Medina and Schneider, 2018; Gaspareniene *et al.*, 2016 and other) as potential determinants of shadow economy.

Authors of the article believe, that when goods are taxed high (i.e. cigarettes, alcohol, etc.), people may tend to move to shadow activities to purchase them, therefore tax burden on consumption should be included to the regression model. Also, as historical data shows, GDP per capita is constantly increasing in analyzed countries, while at the same time shadow economy is decreasing. Therefore, authors believe some correlation may be prevalent and therefore relation should be tested.

Data for the analysis is taken from publicly available sources: mainly Eurostat, but also Heritage International and other databases. Regression types regression analysis were taken according to the most used regression analysis types and include the following: pooled OLS; fixed-effects; random-effects and WLS. Multiple authors that use these regression analysis types, when calculating shadow economy determinants, such as Elgin and Oztunali (2012), Alm and Embaye (2013) and multiple others.

Also, these and other authors usually determine the most appropriate model by using multiple statistical theory tests: multicollinearity, normal residual distribution, data homoscedasticity and autocorrelation tests. The aim of these tests is to answer whether dataset is reliable for the analysis. Multicollinearity test answers whether correlation between independent variables is present, as in such case, one of the variables could not be used. Normal residual distribution shows whether residual are distributed normally, meaning there are no significant externalities, which may falsify the model results. Data homoscedasticity tests whether different samples have the same variance (even if they came from different populations). Autocorrelation test identifies similarity between observations as a function of the time lag between them in order to answer whether data does not follow repeating patterns.

Table no. 3 – Results of made regression analysis

	Dependent variable: SE (Shadow economy size as % from GDP)			
	(1) Pooled OLS	(2) Fixed effect	(3) Random effect	(4) WLS
Constant	16.64***	41.94***	41.59***	22.9***
TAX_I	-0.38***	-0.0049	-0.0131	-0.4296***
UNP	-0.16*	-0.0430*	-0.0415**	0.0329
COR	0.23***	-0.0626***	-0.0559***	0.2054***
INQ	0.15**	-0.1037***	-0.0949***	0.1510**
SELF	0.11**	0.0355	0.0374	0.0554
BFR	0.17***	-0.0403***	-0.0394***	-0.1342***
TAX_C	0.24***	-0.098***	-0.0938***	0.1511**
GDP_C	-0.00116***	-0.000522***	-0.000539***	-0.001098***
Observations	140	140	140	140
Adjusted R ²	0.7069	0.9910	-	0.8256
Residual normality	0.13	0.002	0.000	0.11
Durbin-Watson	0.196	0.813	-	-

Note: * significance with 90 % likelihood; ** significance with 95 % likelihood; *** significance with 99 % likelihood.

Source: authors' analysis

The results of made regression analysis shows that 6 out of 8 determinants, analyzed by the authors makes a significant impact on shadow economy. Due to aforementioned reasons, article analyzes results of WLS model.

By performing scientific literature research, a hypothesis was raised that tax burden on income (TAX_I) makes the largest impact on shadow economy size. Hypothesis was raised that when tax on income increase, shadow economy will increase as well. However, WLS model shows opposite results. Authors believe that this maybe due to effect of other variables on regression analysis, therefore interpretation of this hypothesis-testing outcome is not discussed in further detail.

Second variable affecting shadow economy is unemployment; hypothesis raised – when unemployment increases, shadow economy increases as well. The model shows that it can be stated that when unemployment increases by 1% in a particular country in particular year, shadow economy increases by 0.033 %. By analyzing this statement in more depth it can be stated that this relation is insignificant.

Empirical analysis shows that countries with high corruption (COR) in most cases has high shadow economy as well, therefore, scientists and researchers have a consensus that decreasing shadow economy in public sector should in turn decrease contraband and shadow economy. This assumption is confirmed by the research and therefore it can be stated that corruption is a determinant of shadow economy. According to WLS model, when corruption level increases by 1 unit, shadow economy will increase by 0.2054% with 99% significance.

Following tested hypothesis is an established assumption in scientific literature and states that when income inequality (INQ) increases, people tend to move towards shadow activities, since they are unhappy with their current status in the community, thus shadow economy increases. According to WLS model, authors cannot reject the hypothesis and therefore it can be stated that income inequality is a determinant of shadow economy and when income inequality increases by 1 unit, shadow economy will increase by 0.1510 % with 99 % significance.

Another variable, tested for determining size of shadow economy – level of self-employed people (SELF) in a country. Due to easier accounting and more difficult supervision procedures, this part of people can hide their income relatively easy. Therefore, scientists believe that if tax morale is not high in country, its self-employed citizens will have an incentive to hide their income, thus increasing shadow economy. According to WLS model results, such hypothesis accepts the relation and shows that if independent variable increases by 1 unit, shadow economy will increase by 0.055%. However, by interpreting p-value it can be stated that the relationship is insignificant.

Further, business freedom (BFR) in another variable that may affect size of shadow economy. It is believed that if business owners have good conditions to operate in particular country, they would tend to pay taxes and legalize their activities in shadow economy. Three out of four made regression analysis methods shows that hypothesis cannot be rejected with 99 % significance, while WLS model shows that increase of business freedom by 1 unit will lead to decrease of shadow economy by 0.1342 %.

After thoroughly analyzing current situation in Eastern European countries, authors also included control variable to the analysis: tax burden on consumption (TAX_C). It is believed that increase in excise fees or other consumption taxes, will shift part of a society to buy cheaper goods in shadow market, thus increasing shadow economy. According to WLS model results, such hypothesis cannot be rejected with 95% significance, therefore it

can be stated to be shadow economy determinant. With tax burden on consumption increasing by 1%, shadow economy will increase by 0.1510%.

Last variable that authors included to the regression is GDP per capita (GDP_C). Hypothesis was raised that when GDP increases, people tend to move from shadow economy to official economy. This relation is seen in all four regression models with 99% significance, therefore hypothesis cannot be rejected. WLS method identifies that when GDP per capita increases by one euro, shadow economy on average will decrease by 0.001098%. However, it should be noted that during reviewing time period, GDP per capita increased by 143 euro on average. Therefore it can be stated that increasing GDP per capita by 143 euro leads to decrease of shadow economy by 0.1570%.

4. CONCLUSION

This article has analyzed what are the determinants of shadow economy in Eastern European Countries in 2003-2016 and how significantly they affect size of shadow economy. Article also describes shadow economy tendencies in time, as well as various theories, described in scientific literature and shadow economy evaluation methods. Based on scientific literature as well as logical deduction, authors have identified key potential shadow economy determinants. After performing regression analysis, authors were able to identify their influence and significance.

Historical trend analysis determined that shadow economy has a tendency to decrease across the world, which might be related to increasing GDP and overall quality of life. However, more than a billion people still are related to shadow economy in one way or another, thus, it is necessary to increase work conditions, life quality and regulation in order to fasten the decrease of shadow economy. Worldwide trend is present in analyzed geographical area as well, as shadow economy in Eastern European countries is decreasing during analyzed 2003-2016 period with the exception of economic downturn in 2009-2010. However, Eastern Europe countries still have significantly higher shadow economy in terms of % from GDP, when comparing with Western Europe.

Analysis of scientific literature showed that shadow economy is treated ambiguously. However, most scientists use the definition that shadow economy is not registered, but in itself legal economic activity, which would increase official economy if were legal. It should be noted that informal household economy is not included in shadow economy definition. Scientific literature analysis also shows that scientists and experts use three methods to determine size of shadow economy: direct, indirect and model approaches. In this article, authors have chosen MIMIC approach method in order to determine shadow economy determinants in Eastern European countries.

After carrying regression analysis and testing raised hypothesis authors have revealed that during chosen time period unemployment and level of self-employed people variables do not make a significant impact on shadow economy and cannot be called determinants in Eastern Europe. Worth mentioning, that this rejects the hypothesis raised in the article, which is based on scientific literature analysis.

In scientific literature, scientists argue that when tax burden on income increases, more people could move to shadow activities in order to save money, however, empirical evidence shows reverse results. Authors believe that it could be seen as a drawback of a model and most likely is determined by other dependent variables. Thus, tax burden on

income results are not interpreted. Whilst, other 5 raised hypothesis about factors, determining size of shadow economy, cannot be rejected and it could be stated that: when corruption, income inequality or tax burden on consumption increases in Eastern European country, shadow economy will increase as well. Also, if business freedom or GDP per capita increases, shadow economy will decrease in Eastern European country.

Authors believe that in order to fasten the decrease of shadow economy, responsible governmental institutions, scientists and experts must carry out surveys of different society groups. This will allow identifying “optimal” tax level, which would allow maximizing government income from taxes by decreasing size of shadow economy. Authors believe that such actions will help to identify tax morale and willingness to pay taxes by the society, which may explain other factors, such as why people engage in shadow economy, i.e. they are unhappy with their current income and/or services provided by government; governmental procedures for legal business are too difficult or other.

Also, authors would suggest governments to look in more depth to other variables, which influence high shadow economy levels – corruption and income inequality. Unfortunately, solving these issues needs to undertake complex solutions, such as progressive taxes, reforming education system (to increase tax morale) and other. Scientists agree that in order to decrease corruption, one of the most productive ways is to increase probability of being caught when engaging in illegal activities, also, increasing fines. Worth noting, that larger resources for fighting corruption would be needed as well.

Since shadow economy decreases when business freedom or GDP per capita increases, therefore governments must continue to develop conditions for businesses, especially small and medium size, starting from its opening. GDP per capita is seen as one of the most important factors determining shift from shadow to legal economy, which is also backed by empirical research evidence provided in this article. Authors understand the complexity of increasing GDP per capita, but it is worth mentioning the impact that in may make on shadow economy decrease, thus further-increasing GDP per capita.

Authors believe that in order to better understand tendencies of shadow economy, governments, experts and scientists must evaluate tax morale of the public, which may provide more information about incentives to join informal economy and what may help to move from it to legal economy. Therefore, public opinion surveys and further analysis by using its results may be necessary to identify clear actions plans and therefore fasten the decrease of shadow economy.

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