Economic Crisis on the Thai Automotive Industry: From the Perspective of the Interplay between Shocks and the Industrial Structure / N. Haraguchi. – Vienna : United Nations Industrial Development Organization, 2010. – P. 50. 6. Kojima M. Can the Organic Recycling Industry Contribute to the Recovery of the Manufacturing Sector in Asia? / M. Kojima. – Vienna : United Nations Industrial Development Organization, 2011. – P. 61. 7. The Global Economic Crisis: Sectoral Coverage: Trends in Employment and Working Conditions by Economic Activity: Statistical Update, Third Quarter 2009 // Working Paper. – No. 271. – Geneva : ILO, 2010. 8. Lucas R. Monetary neutrality [Electronic resource] / R. Lucas // Lecture to the memory of Alfred Nobel, December 7, 1995. – Access mode : http://www.nobelprize.org/nobel_prizes/economics/laureates/1995/lucas-lecture.pdf. 9. Levine R. Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development, (with Asli Demirguc-Kunt) [Electronic resource] / R. Levine. – MIT Press, 2001. – Access mode : https://openknowledge.worldbank.org/bitstream/handle /10986/4154/WPS4943.pdf. 10. Klein L. Some Economic Scenarios for the 1980's / L. Klein // Nobel Prize in Economics documents 1980-1. – S. l. : Nobel Prize Committee, 1980. 11. Benchmarking Financial Development Around the World / Č. Martin, A. Demirgüç-Kunt, E. Feyen et al. // Policy Research Working Paper 6175. – Washington, DC : World Bank, 2012.

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THE SIZE AND DEVELOPMENT OF THE SHADOW ECONOMIES OF UKRAINE AND SIX OTHER EASTERN COUNTRIES OVER THE PERIOD OF 1999 – 2015

F. Schneider

Estimations of the size of the shadow economies of Ukraine, Armenia, Kazakhstan, the Kyrgyz Republic, the Russian Federation, Tajikistan and Turkey are presented over the period from 1999 to 2015. According to the author's estimation the average size of the shadow economy (in 1999 – 2015) was 44.6 % in Ukraine, 42.3 % in Armenia, 35.8 % in Kazakhstan, 37.4 % in the Kyrgyz Republic, 39.7 % in the Russian Federation, 41.5 % in Tajikistan and 30.1 % in Turkey. The author has proved that an increase in the burden of indirect taxation, the unemployment rate and corruption and less business freedom are the driving forces of the shadow economies of these countries.

Keywords: shadow economies of Ukraine, Armenia, Kazakhstan, the Kyrgyz Republic, the Russian Federation, Tajikistan and Turkey; tax burden; quality of state institutions; corruption; regulation; MIMIC model.

РОЗМІР І РОЗВИТОК ТІНЬОВОЇ ЕКОНОМІКИ УКРАЇНИ ТА ШЕСТИ ІНШИХ КРАЇН СХОДУ ЗА ПЕРІОД 1999 – 2015 РР.

Шнайдер Ф. Г.

Наведено оцінку розмірів тіньової економіки України, Вірменії, Казахстану, Киргизької Республіки, Російської Федерації, Таджикистану й Туреччини за період із 1999 до 2015 року. За оцінками автора, середній розмір (із 1999 до 2015 року) тіньової економіки України

становить 44,6 %, Вірменії – 42,3 %, Казахстану – 35,8 %, Киргизької Республіки – 37,4 %, Російської Федерації – 39, 7 %, Таджикистану – 41,5 % і Туреччини – 30,1 %. Автором доведено, що збільшення тягаря непрямих податків, рівень безробіття й корупції, обмеження свободи бізнесу є рушійними силами тіньової економіки аналізованих країн.

Ключові слова: тіньова економіка України, Вірменії, Казахстану, Киргизької Республіки, Російської Федерації, Таджикистану й Туреччини, податковий тягар, якість державних інститутів, корупція, регулювання, модель мнемосхеми.

РАЗМЕР И РАЗВИТИЕ ТЕНЕВОЙ ЭКОНОМИКИ УКРАИНЫ И ШЕСТИ ДРУГИХ СТРАН ВОСТОКА ЗА ПЕРИОД 1999 – 2015 ГГ.

Шнайдер Ф. Г.

Приведена оценка размеров теневой экономики Украины, Армении, Казахстана, Кыргызской Республики, Российской Федерации, Таджикистана и Турции за период с 1999 по 2015 год. По оценкам автора, средний размер (с 1999 до 2015 года) теневой экономики Украины составляет 44,6 %, Армении – 42,3 %, Казахстана – 35,8 %, Кыргызской Республики – 37,4 %, Российской Федерации – 39,7 %, Таджикистана – 41,5 % и Турции – 30,1 %. Автором доказано, что увеличение бремени косвенных налогов, уровень безработицы и коррупции, ограничение свободы бизнеса являются движущими силами теневой экономики этих стран.

Ключевые слова: теневая экономика Украины, Армении, Казахстана, Кыргызской Республики, Российской Федерации, Таджикистана и Турции; налоговое бремя; качество государственных институтов; коррупция; регулирование; модель мнемосхемы.

Information about the extent of the shadow economy, who is engaged, the frequency of these activities, and their magnitude is crucial for making effective and efficient decisions regarding the allocations of a country's resources in this area. Unfortunately, it is very difficult to get accurate information about shadow economy activities on the goods and labour market, because all individuals engaged in these activities do not wish to be identified. Hence, doing research in this area can be considered as a scientific passion for knowing the unknown.

Hence, the goal of this paper is threefold: (i) to undertake the challenging task of estimating the shadow economy for the six countries: Ukraine, Armenia, Kazakhstan, the Kyrgyz Republic, the Russian Federation, Tajikistan and Turkey over the period from 1999 to 2015; (ii) to provide some preliminary insights into the main causes of the shadow economy; and (iii) to provide some remarks about corruption. Some theoretical considerations about the shadow economy have been made and the size of the shadow economy of seven countries, namely, Ukraine, Armenia, Kazakhstan, the Kyrgyz Republic, the Russian Federation, Tajikistan and Turkey has been estimated in the research. A summary and policy conclusions have been given.

There are numerous papers trying to estimate the size and development of the shadow economy of Eastern countries. In this short literature review some of the more recent studies are shown. In the paper by Schneider, Buehn and Montenegro the authors present estimates of the shadow economies for 162 countries including developing, East Europe, Central Asia and high income OECD countries over the years 1999 – 2007 [1]. According to their estimates of the average size and development of the shadow economies over the years 1999 – 2007, the shadow economy made up 44.0 % in Armenia, 39.9 % of official GDP in Kazakhstan, 40.4 % in the Kyrgyz Republic, 43.8 % in the Russian Federation, 42.2 % in Tajikistan and 37.2 % in Turkey. Similar results of these countries are presented in [2] by Schneider and Williams. The size and development of the shadow economy in the Caucasus and Central Asia, is empirically investigated in the study of Abdih and Medina [3]. Their study estimates the size of the informal economy and the relative contribution of each causal factor for the Caucasus and Central Asia countries (for Armenia, Aserbaidzhan, Georgia, Kazakhstan, the Kyrgyz Republic and Tajikistan) for the year 2008. Again, using the MIMIC estimation approach they found that the tax system, rigid labour market are determinant factors explaining the size of the informal economy in these countries which ranges from 26.0 % of GDP in the Kyrgyz Republic, 32,8 % in Tajikistan, 33.0 % in Kazakhstan to 35.0 % of GDP in Armenia. They also concluded that a high shadow economy increases the level of self-employment and the percentage of currency held outside the banking system.

One commonly used working definition of the shadow economy is all currently unregistered economic activities that contribute to the officially calculated (or observed) Gross National Product [1; 2; 4 – 11]. Smith [12] defines it as "market-based production of goods and services, whether legal or illegal, that escapes detection in the official estimates of GDP".

In this paper, the following more narrow definition of the shadow economy is used: the shadow economy includes all market-based legal production of goods and services that are deliberately concealed from public authorities to avoid payment of income, value added or other taxes; to avoid payment of social security contributions; having to meet certain legal labour market standards, such as minimum wages, maximum working hours, safety standards, etc, and complying with certain administrative procedures, such as completing statistical questionnaires or administrative forms.

Given this definition, the most important causal determinants of the shadow economy are as follows:

• Tax and social security contribution burdens.

It has been ascertained that the overall tax and social security contribution burdens are among the main causes for the existence of the shadow economy [1; 2; 6 – 10; 14 – 18]. The bigger the difference between the total cost of labour in the official economy and the after-tax earnings (from work), the greater is the incentive to avoid this difference and to work in the shadow economy. Since this difference depends broadly on the social security burden/payments and the overall tax burden, the latter are key features of the existence and the increase of the shadow economy.

The concrete measurement of the tax and social security contribution burdens is not easy to define, because the tax and social security systems are vastly different among the countries. In order to have some general comparable proxies, the author uses the following causal variables: (1) indirect taxes as a proportion of GDP (a positive sign expected); and (2) the share of direct taxes including social security payments: direct taxes and social security payments as proportion of GDP (a positive sign expected).

• Intensity of regulations.

Increased intensity of regulations is another important factor that reduces the freedom (of choice) for individuals engaged in the official economy. One can think of labour market regulations such as minimum wages or dismissal protections, trade barriers such as import quotas, and labour market restrictions for foreigners such as restrictions regarding the free movement of foreign workers. Johnson et al. [15] find significant overall empirical evidence of the influence of (labour) regulations on the shadow economy; and the impact is clearly described and theoretically derived in other studies, e.g. in Schneider and Williams [2]. Regulations lead to a substantial increase in labour costs in the official economy. But since most of these costs can be shifted to the employees, these costs provide another incentive to work in the shadow economy, where they can be avoided. Their empirical evidence supports the model of Johnson et al. [15], which predicts, inter alia, that countries with more general regulation of their economies tend to have a higher share of the unofficial economy in total GDP.

To measure the intensity of regulation or the impact of regulation on the decision of whether to work in the official or unofficial economy is a difficult task, and the author has tried to model this by using the following two causal variables: (1) business freedom: it is a subcomponent of the Heritage Foundation's economic freedom index; it measures the time and efforts of business activity. It ranges from 0 to 100, where 0 is least business freedom and 100 maximum business freedom (a negative sign expected); and (2) regulatory quality: World Bank's regulatory quality index including measures of the incidents of market-unfriendly policies, such as price controls or inadequate bank supervision, as well as perceptions of the burdens imposed by excessive regulation in areas, such as foreign trade and business development. It scores between −2.5 and +2.5 with higher scores corresponding to better outcomes (a negative sign expected).

• Public sector services.

An increase of the shadow economy can lead to reduced state revenues, which in turn reduce the quality and quantity of publicly provided goods and services. Ultimately, this can lead to an increase in the tax rates for firms and individuals in the official sector, quite often combined with a deterioration in the quality of public goods (such as the public infrastructure) and of the administration, with the consequence of even stronger incentives to participate in the shadow economy. The provision and especially the quality of the public sector services is thus also a crucial causal variable for people's decision to work or not work in the shadow economy. To capture this effect, the author uses the following variable: Government Effectiveness from the World Bank's Worldwide Governance Indicators. It captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of government's commitment to such policies. The scores of this index lie between −2.5 and +2.5 with higher scores corresponding to better outcomes (a negative sign expected).

• Quality of public institutions.

The quality of public institutions is another key factor for the development of the informal sector. Especially the efficient and discretionary application of the tax code and regulations by the government plays a crucial role in the decision to work underground, even a more important role than the actual burden of taxes and regulations. In particular, bureaucracy with high corrupt government officials seems to be associated with larger unofficial activity while a good rule of law by securing property rights and stability increases the benefits of being formal. A certain level of taxation, mostly spent in productive public services, characterizes efficient policies. In fact, the production in the formal sector benefits from higher provision of productive public services and is negatively affected by taxation, while the shadow economy reacts in the opposite way. An informal sector developing as a consequence of the failure of political institutions in promoting an efficient market economy and entrepreneurs going underground as there is an inefficient public goods provision may reduce if institutions can be strengthened and fiscal policy gets closer to the median voter preferences [2; 8; 10; 20 – 23]. The quality of public institutions are captured by two variables; the first is the control of corruption (percentile rank among all countries; 0 = lowest, 200 = highest) and the second is the rule of law (percentile rank among all countries; 0 = lowest, 200 = highest).

• Official economy.

As has been shown in a number of studies [9; 24], the situation of the official economy also plays a crucial role in people's decision to work or not to work in the shadow economy. In a booming official economy, people have many opportunities to earn a good salary and "extra money" in the official economy. This is not the case in an economy facing a recession, and more people try to compensate their losses of income from the official economy through additional shadow economy activities. In order to capture this, the author uses the following two variables: (1) unemployment rate defined as total unemployment in percentage of total labour force (a positive sign expected); and (2) inflation rate: GDP deflator (annual rate in percent); inflation is measured by the annual growth rate of the GDP implicit deflator, it shows the rate of price changes in the economy as a whole (a positive sign expected).

Contribution of some cause variables to the size of the informal economy of six countries over the period of 1999 – 2013 is given in Fig. 1.

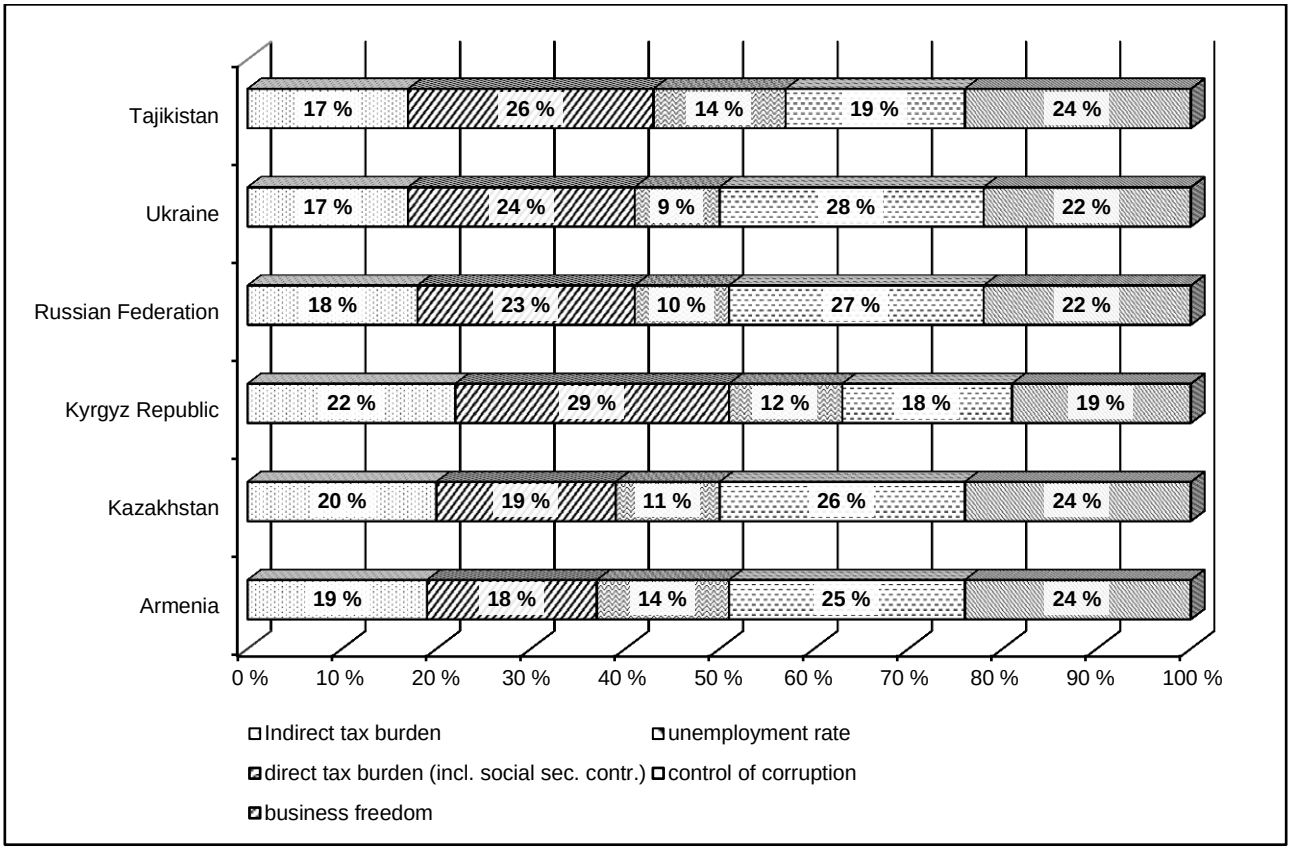

Fig. 1. **Contribution of some cause variables to the size of the informal economy of Ukraine, Armenia, Kazakhstan, the Kyrgyz Republic, the Russian Federation and Tajikistan, average over 1999 – 2013, only statistically significant variables** (author's calculations)

Because the shadow economy cannot be directly measured, the author has to use indicators in which shadow economy activities are reflected. Thus, the following indicators have been used:

• Monetary indicators.

Given that people who engage in shadow economy transactions do not want to leave traces, they conduct these activities in cash. Hence, most shadow economy activities are reflected in an additional use of cash (or currency). To take this into account, the author uses the following indicator: M0/M1. M0 corresponds to the currency outside the banks; the usual definition for M1 is M0 plus deposits.

• Labour market indicators.

Shadow economy activities are also reflected in labour market indicators. The author uses the following one: labour force participation rate: this is a proportion of the population that is economically active, supplying labour for the production of goods and services during a specified period.

• The state of the official economy.

In addition, shadow economy activities are reflected in the state of the official economy. For this reason, the author includes the following indicator: growth rate of GDP per capita, i.e. the annual growth rate of the GDP per capita.

Estimating the size and trend of a shadow economy is a difficult and challenging task. Methods – designed to estimate the size and trend of the shadow economy – such as the currency demand approach or the electricity approach consider just one indicator that "must" capture all effects of the shadow economy [2; 9; 25; 26]. However, it is obvious that shadow economy effects show up simultaneously in the production, labour, and money markets. The empirical method used in this paper is based on the statistical theory of unobserved variables, which considers multiple causes and multiple indicators of the phenomenon to be measured, i.e. it explicitly considers multiple causes leading to the existence and growth of the shadow economy, as well as the multiple effects of the shadow economy over time. In particular, the author uses a Multiple Indicators Multiple Causes (MIMIC) model – a Structural Equation Model (SEM) with one latent variable – for the empirical analysis [27]. The main idea behind a SEM is to examine the relationships between unobserved variables in terms of the relationships between a set of observed variables by using the covariance information of the latter. In particular, a SEM compares a sample covariance matrix, i.e. the covariance matrix of the observed variables, with the parametric structure imposed on it by a hypothesized model. The relationships between the observed variables are described in terms of their covariances and it is assumed that they are generated by (a usually smaller number of) unobserved variables. In the MIMIC model presented in this paper, the shadow economy is the unobserved variable and is analysed with respect to its relationship to the observed variables using the covariance matrix of the latter. For this purpose, the unobserved variable is, in a first step, linked to the observed indicator variables in a factor analytical model, also called a measurement model. Second, the relationships between the unobserved variable and the observed explanatory (causal) variables are specified through a structural model. Thus, a MIMIC model is the simultaneous specification of a factor model and a structural model. In this sense, the MIMIC model tests the consistency of a "structural" theory through data and has two goals: (i) estimating the parameters (coefficients, variances, etc) and (ii) assessing the fit of the model. Applying this to the shadow economy research, these two goals mean (i) measuring the relation-

ships of a set of observed causes and indicators to the shadow economy (latent variable), and (ii) testing if the researcher's theory or the derived hypotheses, as a whole, fit the data used.

Table 1 presents four different specifications of estimating the size and development of the Armenian, Kazakhstan, Kyrgyz, Russian, Tajikistani and Turkish size of the shadow economy. The author uses a MIMIC estimation procedure over the period of 1999 – 2013 (yearly data). When considering the cause variables, one can realise that the variable of indirect taxes has the expected sign and the estimated coefficient is highly statistically significant for all four specifications. The variable of direct taxes and social security contributions has the theoretically expected positive sign and is statistically significant, too. Again, the unemployment rate is highly statistically significant and has the expected positive sign in all four specifications. The estimated coefficients of regulatory quality are not statistically significant and have switching signs. The estimated coefficients of government effectiveness have the expected negative sign but are not statistically significant except for some causes. Control of corruption has the expected negative sign and is statistically significant. The estimated coefficients of the variable "business freedom" have the expected negative sign and are statistically significant. If one turns to the indicator variables, the variables M0 to M1, GDP growth and labour force participation have all the theoretically expected signs and GDP growth and labour force participation are statistically significant (Fig. 1).

Table 1

MIMIC model estimations for 6 East Europe countries (standardized solution), Armenia, Kazakhstan, the Kyrgyz Republic, the Russian Federation, Tajikistan and Turkey, the period from 1999 to 2014

Specification	1	2	3	4
Cause Variables				
Indirect taxes (% of GDP)	+0.40*** (4.24)	+0.49*** (3.23)	+0.56** (2.43)	+0.56*** (2.72)
Direct taxes and social security contributions (% of GDP)	0.26** (2.04)	0.28** (2.00)	-	-
Unemployment rate	0.30** (2.16)	0.31** (2.05)	0.48** (2.36)	0.49*** (2.57)
Regulatory quality	-0.08 (0.99)	-	-	0.14 (1.59)
Government effectiveness	-	-0.13 (1.49)	-0.40** (2.40)	-0.13 (1.50)
Control of corruption	-0.38* (1.75)	-	-0.15** (1.96)	-0.23** (2.14)
Rule of law	0.05 (0.35)	-0.15* (1.73)	-	-
Business freedom	-	-0.18** (2.16)	-0.19** (2.12)	-0.16** (2.03)
Indicator Variables				
Ratio M0 to M1	1.00	1.00	1.00	1.00
GDP growth	-0.36** (2.33)	-0.21* (1.64)	-0.22* (1.69)	-0.16 (1.56)
Labour force participation rate	-1.07*** (3.51)	-1.05*** (3.46)	-1.23*** (2.62)	-1.17*** (2.93)
Observations	112	112	112	112
Degrees Freedom	42	42	42	42
Chi-square	58.40	35.35	47.49	49.55
RMSEA	0.15	0.11	0.15	0.12

Note. Absolute z-statistics in parentheses. *, **, *** indicate significance at the 10 %, 5 %, and 1 % level, respectively.

The estimated MIMIC coefficients allow the author to determine only relatively estimated sizes of the shadow economy, which describe the pattern of the shadow economy in a particular country over time. In order to calculate the size and trend of the shadow economy, one must convert the MIMIC index into "real world" figures measured in percentage of official GDP or in currency units. This final step requires an additional procedure: so-called benchmarking or calibration. Unfortunately, no consensus exists in the literature of which benchmarking procedure to use. The methodology used by the author was promoted by Dell'Anno [28] and Dell'Anno and Solomon [29]. In the first step, the MIMIC model index of the shadow economies is calculated using the structural equation (1), i.e. by multiplying the coefficients of the significant causal variables with the respective time series.

Secondly, this index is converted into absolute values of the shadow economies, taking the base values in a particular base year. The base values necessary for this final step of the calibration procedure are from the year 2007 and are taken from Schneider, Buehn and Montenegro [1] who estimated the shadow economies in 162 countries around the world using the MIMIC and the currency demand approach. Thus, the size of the shadow economy $\hat{\eta}_t$ at time t is given as:

$$\hat{\eta}_t = \frac{\eta_t}{\tilde{\eta}_{2000}} \eta^*_{2000}, \qquad (1)$$

where $\tilde{\eta}_t$ denotes the value of the MIMIC index at t according to equation (1), $\tilde{\eta}_{2000}$ is the value of this index in the base year 2007, and η^*_{2007} is the exogenous estimate (base value)

of the shadow economies in 2007. Applying this benchmarking procedure, the final estimates of the shadow economies of these countries can be calculated.

The size and development of the shadow economies of Armenia, Kazakhstan, the Kyrgyz Republic, the Russian Federation, Tajikistan and Turkey are shown in Table 2 and Fig. 2.

Table 2

Preliminary estimates of the size of the shadow economy (on the basis of specification 4 of the regression equation) of seven countries (author's calculations)

Country	Years																	Country Av.
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Armenia	46.6	46.3	45.4	44.5	43.9	43.6	42.7	42.1	41.1	40.6	41.5	41.1	40.4	40.0	39.5	39.8	40.1	42.3
Kazakhstan	42.6	41.9	41.0	41.2	39.6	39.1	38.4	38.0	37.4	36.8	37.3	36.7	35.9	35.2	34.4	34.0	33.8	35.8
Kyrgyz Republic	41.0	41.2	41.6	41.0	41.9	41.6	40.4	39.2	38.8	36.2	35.4	34.4	33.2	32.4	32.0	32.5	33.1	37.4
Russian Federation	35.1	36.1	37.0	37.8	38.8	39.5	40.1	40.8	41.6	41.7	41.6	41.1	41.0	40.7	40.4	40.8	41.2	39.7
Tajikistan	39.9	40.2	40.5	40.8	41.3	41.8	42.0	42.3	41.0	41.1	41.9	42.0	42.8	41.3	41.9	42.4	43.1	41.5
Turkey	35.0	34.2	33.6	33.0	32.2	31.5	30.7	30.4	29.3	28.5	28.9	28.3	27.7	27.2	26.5	27.2	27.8	30.1
Ukraine	49.2	48.7	47.9	47.6	47.3	47.0	46.8	46.6	41.1	40.6	41.5	41.1	40.4	40.0	39.5	46.5	47.1	44.6

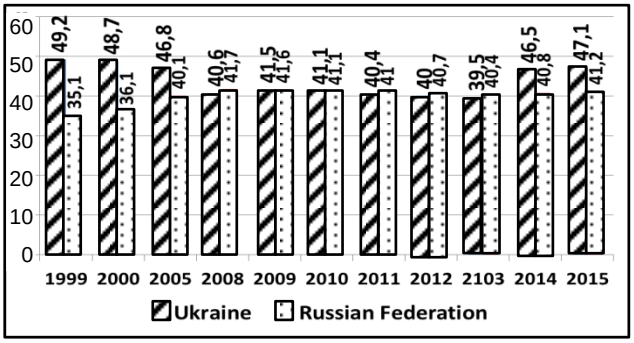

Fig. 2. **The size of the shadow economy for Ukraine and the Russian Federation in % of GDP from 1999 to 2015** (author's calculations)

These are preliminary results and the MIMIC estimations shown in Table 1 are the first ones to be used for the calculations. If one discusses the size of the shadow economy of Kazakhstan, it has a value of 42.6 % in the year 1999 which more or less decreases up to the year 2013 to 34.4 %. In the Kyrgyz Republic (Armenia) the value is 41.0 % (46.6 %) in the year 1999, which slightly increases to 41.9 % (decreases to 43.9 %) in 2003 and then more or less continuously falls to 32.0 % (39.5 %) in the year 2013. The Russian Federation has a size and development of the shadow economy of 35.1 % in the year 1999, which increases to 41.7% in 2008 and then falls slightly back to 40.4 % in 2013. In Tajikistan (Turkey) the size of the shadow economy in the year 1999 is 39.9 % (35.0 %) which increases to 42.3 % (decreases to 30.4 %) in 2006 and then decreases to 41.9 % (26.5 %) in 2013. Hence, a somewhat similar development can be observed for Armenia, Kazakhstan, the Kyrgyz Republic and Turkey and a quite different one is seen in the Russian Federation and Tajikistan. As these are preliminary results, no further interpretation will be given here.

In Fig. 3 further results for the shadow economies of 18 European and these six countries in 2015 and in Fig. 4 the shadow economies of 25 former transition countries for the year 2007 are shown.

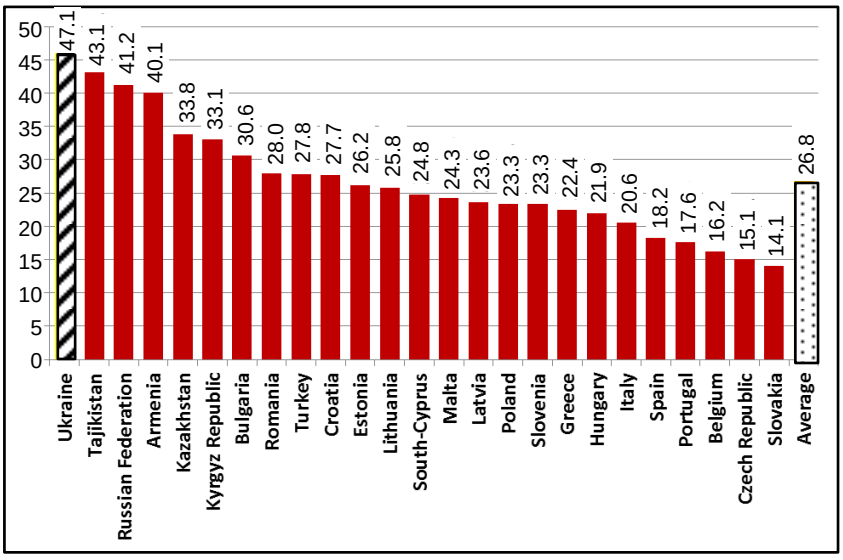

Fig. 3. **A comparison of the shadow economies of 18 European + 6 Eastern countries in 2015,** in % of official GDP (author's calculations)

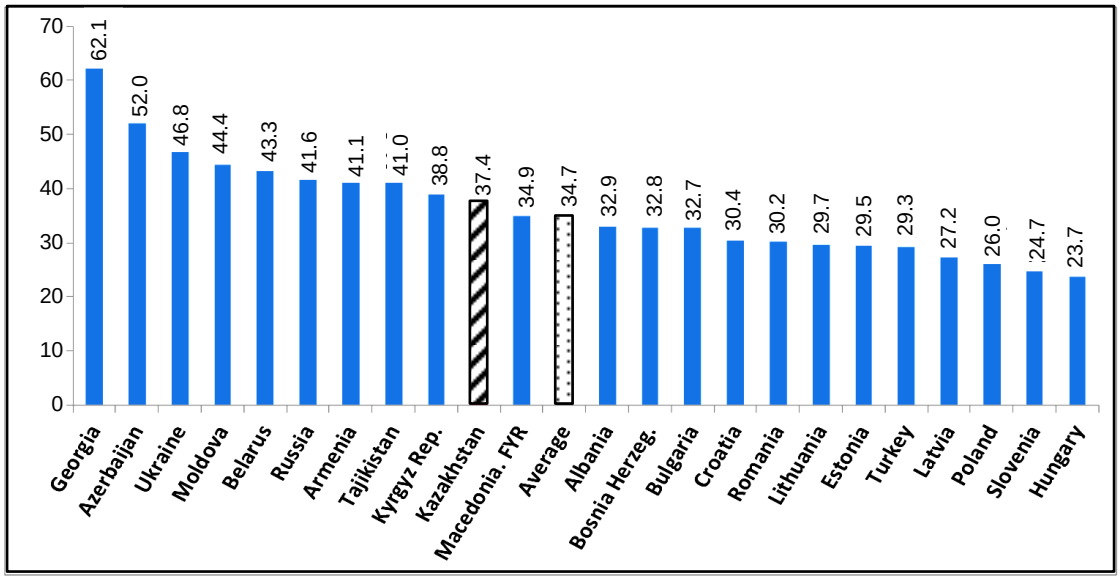

Fig. 4. **Size of the shadow economy of the 25 former transition countries in 2007,** in % of GDP ([10] and the author's calculations)

As has been discussed in the literature review, Abdih and Medina [3] have also undertaken an estimate of the size and development of the shadow economy of 26 countries from Eastern Europe, the Caucasus and Central Asia including Kazakhstan, Kyrgyz Republic and Tajikistan. As they did not estimate the size and development of the Russian Federation shadow economy, no comparison can be made between these two completely independent estimates. The results are shown in Table 3. Comparing these results, one clearly realize that the size and development of the shadow economy by the study of Abdih and Medina are to some extent lower than the author's estimates. The smallest difference is in the case of Kazakhstan where Abdih and Medina estimate 33.0 % and the author estimates 36.8 %. The largest difference is in the case of the Kyrgyz Republic (Armenia) where they estimate 26.3 % (35.0 %) in 2008 and the author measures 36.2 % (40.6 %) in 2008. As in these two studies different causal factors and a quite different country sample are used and as Abdih and Medina make a pure gross section analyses whereas the author undertook a small panel estimation for the four countries over the period from 1999 to 2013, the estimation differences should not astonish. So far, this is the only other study which allows a comparison between the author's and their estimates.

Table 3

A comparison of the size of the informal economies of Kazakhstan, the Kyrgyz Republic and Tajikistan in the studies by Abdih and Medina and Schneider for 2008 [3; 26]

Country	Size of the shadow economy (absolute value in % of GDP) in the year 2008	
	Study of Abdih and Medina (2013)	Study of Schneider (2015)
Armenia	35.0	40.6
Kyrgyz Republic	26.3	36.2
Tajikistan	32.8	41.1
Kazakhstan	33.0	36.8
Mean	27.4	–
Standard Deviation	3.0	–

Writing this paper the author had many obstacles to overcome when measuring the size of the shadow economy of these six countries – Armenia, Kazakhstan, the Kyrgyz Republic, the Russian Federation, Tajikistan and Turkey. However, this preliminary paper shows that the author has made some progress. Estimates of the size of the shadow economy, of these four countries over the period 1999 – 2013 have been provided using the MIMIC procedure for the econometric estimation and the benchmarking procedure for calibrating the estimated MIMIC into absolute values of the size of the shadow economy of these countries.

This new knowledge/insights gained with respect to the size and trend of the shadow economies for six countries has lead to the following three conclusions:

The *first* conclusion from these results is that for all six countries investigated the size of the shadow economy is quite large with an average value of 42.6 % for Armenia, 38.4 % for Kazakhstan, 38.0 % for the Kyrgyz Republic, 39.6 % for the Russian Federation, 41.4 % for Tajikistan and 30.5 % for Turkey.

The *second* conclusion is that the shadow economies are a complex phenomenon that is present to an important extent in these six countries. People engage in shadow economy activities for a variety of reasons. Among the most important are government actions, most notably taxation, regulations and the quality of public (government) services.

The *third* conclusion is that there are country disparities in the level of informality and its development.

Considering these three conclusions, it is obvious that one of the big challenges for every government is to undertake efficient and incentive orientated policy measures in order to make work in the shadow economy less attractive. And, hence, to make work in the official economy more attractive, successful implementation of such a policy may lead to a stabilization or even reduction of the size of the shadow economy, as can be seen in these countries.

Finally, ten examples of incentive-oriented policy measures to reduce shadow economy activities are given:

(1) reduction of direct and indirect tax rates;

(2) exemption of the value-added tax on labor-intensive economic activities, like reconstruction of old houses;

(3) mini-job regulation like in Germany;

(4) labor-intensive services could be tax-deductible per household up to a certain amount per year;

(5) those firms, who do demand or supply shadow economy activities, should be expelled for 4 to 5 years from all public contracts;

(6) abolishment of cash: this would increase the transaction costs for shadow economy activities and, hence, reduce them. However, this is quite a severe interference into individuals' behavior as people have been used to pay in cash for centuries;

(7) incentives to use credit cards for transactions (e.g. reduced fees or taxes);

(8) strong punishment if shadow economy activities are linked to organized crime (like prostitution);

(9) introduction of a lottery: people submit their bills from supermarkets with all taxes on it and win a prize;

(10) good governance and a deregulation of the "official" economy.

References: 1. Schneider F. New estimates for the shadow economies all over the world / F. Schneider, A. Buehn, C. E. Montenegro // International Economic Journal. – 2010. – No. 24 (4). – P. 443–461. 2. Schneider F. The shadow economy / F. Schneider, C. C. Williams. – London : IEA, 2013. 3. Abdih J. Measuring the Informal Economy in the Caucasus and Central Asia / J. Abdih, L. Medina // IMF (International Monetary Fund) Working Paper. – Washington, 2013. – No. 137 (May). 4. Feige E. L. The Underground Economies. Tax Evasion and Information Distortion / E. L. Feige. – Cambridge : Cambridge University Press, 1989. – 392 p. 5. Feige E. L. The underground economy and the currency enigma. Supplement to Public Finance / E. L. Feige // Finances Publiques. – 1994. – No. 49. – P. 119–136. 6. Schneider F. Shadow economies around the world: what do we really know? / F. Schneider // European Journal of Political Economy. – 2005. – No. 21 (3). – P. 598–642. 7. Schneider F. Shadow economies and corruption all over the world: new estimates for 145 countries / F. Schneider // Economics. – 2007. – No. 9 (July). – P. 215–238. 8. Schneider F. The influence of public institutions on the shadow economy: An empirical investigation for OECD countries / F. Schneider // European Journal of Law and Economics. – 2010. – No. 6 (3). – P. 441–468. 9. Feld L. Survey on the shadow economy and undeclared earnings in OECD countries / L. Feld, F. Schneider // German Economic Review. – 2010. – No. 11 (2). – P. 109–149. 10. Buehn A. Shadow economies around the world: Novel insights, accepted knowledge and new estimates / A. Buehn, F. Schneider // International Tax and Public Finance. – 2012. – No. 19 (1). – P. 139–171. 11. Buehn A. Shadow economy and do-it-yourself activities: the German case / A. Buehn, A. Karmann, F. Schneider // Journal of Institutional and Theoretical Economics. – 2009. – No. 164 (4). – P. 701–722. 12. Smith P. Assessing the size of the underground economy: the Statistics Canada perspectives / P. Smith // Canadian Economic Observer. – 1994. – No. 7. – P. 3.16–3.33. 13. Schneider F. Estimating the size of the Danish shadow economy using the currency demand approach: an attempt / F. Schneider // The Scandinavian Journal of Economics. – 1986. – No. 88 (4). – P. 643–668. 14. Johnson S. Regulatory discretion and the unofficial economy / S. Johnson, D. Kaufmann, P. Zoido-Lobatoìn // The American Economic Review. – 1998. – No. 88 (2). – P. 387–392. 15. Johnson S. Corruption, Public Finances and the Unofficial Economy / S. Johnson, D. Kaufmann, P. Zoido-Lobatoin // World Bank Policy Research. Working Paper Series No. 2169. – Washington D.C. : The World Bank, 1998. 16. Tanzi V. Uses and abuses of estimates of the underground economy / V. Tanzi // The Economic Journal. – 1999. – No. 109 (456). – P. 338–340. 17. Giles D. E. A. Measuring the hidden economy: implications for econometric modelling / D. E. A. Giles // The Economic Journal. – 1999. – No. 109 (456). – P. 370–380. 18. Giles D. E. A. Taxes and the Canadian Underground Economy / D. E. A. Giles, L. M. Tedds. – Toronto : Canadian Tax Foundation, 2002. 19. Johnson S. The unofficial economy in transition / S. Johnson, D. Kaufmann, A. Shleifer // Brookings Papers on Economic Activity. – 1997. – No. 2. – P. 159–221. 20. Friedman E. Dodging the grabbing hand: The determinants of unofficial activity in 69 countries / E. Friedman, S. Johnson, D. Kaufmann et al. // Journal of Public Economics. – 2000. – No. 76 (4). – P. 459–493. 21. Dreher A. Corruption and the shadow economy: An empirical analysis / A Dreher, F. Schneider // Public Choice. – 2009. – No. 144 (2). – P. 215–277. 22. Teobaldelli D. Federalism and the shadow economy / D. Teobaldelli // Public Choice. – 2011. – No. 146 (3). – P. 269–279. 23. Teobaldelli D. Beyond the veil of ignorance: The influence of direct democracy on the shadow economy / D. Teobaldelli, F. Schneider // CESifo Working Paper, MO3749. – Munich : University of Munich, 2012. 24. Enste D. Wie groß ist die Schattenwirtschaft? Des Rätsels Lösung / D. Enste, F. Schneider // Wirtschaftsdienst – Zeitschrift für Wirtschaftspolitik. – 2006. – No. 86 (2). – P. 185–191. 25. Schneider F. Shadow economies: size, causes, and consequences / F. Schneider, D. Enste // The Journal of Economic Literature. – 2000. – No. 38 (1). – P. 77–114. 26. Schneider F. Estimating the size of the shadow economy: Methods, problems and open questions / F. Schneider, A. Buehn // forthcoming in Review of Behavioral Economics. – 2015. 27. Frey B. S. The hidden economy as an unobserved variable / B. S. Frey, H. Weck-Hannemann // European Economic Review. – 1984. – No. 26 (1). – P. 33–53. 28. Dell'Anno R. The shadow economy in Portugal: an analysis with the MIMIC approach / R. Dell'Anno // Journal of Applied Economics. – 2007. – No. 10. – P. 253–277. 29. Dell'Anno R. Shadow economy and unemployment rate in USA: Is there a structural relationship? An empirical analysis / R. Dell'Anno, O. H. Solomon // Applied Economics. – 2008. – No. 40. – P. 2537–2555. 30. Ahumada H. The monetary method and the size of the shadow economy: a critical assessment / H. Ahumada, F. Alvaredo, A. Canavese // Review of Income and Wealth. – 2007. – No. 53 (2). – P. 363–371. 31. Amendola A. Institutions and human development in Latin American shadow economy / A. Amendola, R. Dell'Anno // Estudios en Derecho y gobirno. – 2010. – No. 3 (1). – P. 9–25. 32. Bollen K. A. Structural Equations with Latent Variables / K. A. Bollen. – N. Y. : Wiley, 1989. – 528 p. 33. Breusch T. The Canadian underground economy: an examination of Giles and Tedds / T. Breusch // Canadian Tax Journal, 2005. – No. 53 (2). – P. 367–391. 34. Opening of Markets and Competition / Deregulation Commission // Report presented to the German Federal Goverment. – Bonn, 1991. 35. Dreher A. How do institutions affect corruption and the shadow economy / A. Dreher, C. Kotsogiannis, S. McCorriston // International Tax and Public Finan. – 2009. – No. 16 (4). – P. 773–796. 36. Frey B. S. The hidden economy: state and prospect for measurement / B. S Frey, W. Pommerehne // Review of Income and Wealth. – 1984. – No. 30 (1). – P. 1–23. 37. Giles D. E. A. Modelling the hidden economy in the tax-gap in New Zealand / D. E. A. Giles // Empirical Economics. – 1999. – No. 24 (4). – P. 621–640. 38. Losby J. L. Informal economic literature review / J. L. Losby, J. F. Else, M. E. Kingslow. – Washington, D.C. : The Aspen Institute: Microenterprise Fund for Innovation, Effectiveness, Learning and Dissemination, 2002. 39. Pedersen S. The Shadow Economy in Germany, Great Britain and Scandinavia: A Measurement Based on Questionnaire Survey / S. Pedersen. – Copenhagen : The Rockwoll Foundation Research Unit, 2003. 40. Schneider F. The shadow economies of Western Europe / F. Schneider // Journal of the Institute of Economic Affairs. – 1997. – No. 17 (3). – P. 42–48. 41. Thomas J. J. Quantifying the black economy: measurement without theory yet again? / J. J. Thomas // The Economic Journal. – 1999. – No. 109 (456). – P. 381–389.

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ПОСТРОЕНИЕ ЭЛЕКТРОННОГО УПРАВЛЕНИЯ ПУТЕМ РЕФОРМ: ОПЫТ БОЛГАРИИ

Петрова М. М.

Электронное управление является одним из приоритетов политики болгарского правительства. Это один из способов выхода из экономического кризиса, снижения уровня коррупции, уменьшения затрат на администрирование и повышения его прозрачности. Использование информационно-коммуникационных технологий в демократической практике рассматривается как новая возможность для реализации прозрачности учреждений, улучшения связи с государственной администрацией и обогащения содержания и масштаба диалога с ними. Важным является существенное закрепление этой темы в политическом процессе с помощью соответствующих рекламных кампаний или лоббирования, а также помощь в виде субсидий и стимулирующих программ. Информатизация государственного управления является процессом, требующим больших административных ресурсов. Поэтому необходимо создание комплексной системы показателей для оценки стадий развития электронного управления в Болгарии и методологии ее практического применения. Проанализированы проблемы и перспективы развития информатизации органов государственной власти в Болгарии, раскрыты основные тенденции формирования эффективных систем предоставления электронных услуг. Достигнутые результаты в области внедрения электронного управления в Болгарии значительны, но недостаточны. Существует базовая инфраструктура, но на сегодняшний день выполнена только часть необходимой работы для предоставления электронных услуг. Основополагающие комплексные услуги отсутствуют, есть недостаточное понимание сложных правовых вопросов и не четко сформулированы требования к разработчикам систем и услуг. Общая оценка развития электронного развития местных органов власти является низкой, но обнадеживает то, что анализ выявил много хороших примеров, которые могли бы стать образцом и для других стран.

Ключевые слова: информационно-коммуникационные технологии, электронное правительство, информатизация органов государственной власти, электронные коммуникации, электронные услуги.