

INSTITUTIONAL QUALITY AND SHADOW ECONOMY: AN INVESTMENT POTENTIAL EVALUATION MODEL

Oleksii Lyulyov and Bogdan Moskalenko

Abstract. The article summarizes some arguments as regards the scientific challenge on improving approaches to evaluating the country's investment potential. The main objective of the research is to identify the features and perspectives of applying the variables such as the shadow economy and the integrated institutional quality index into a model evaluating the country's investment potential. To solve this task, systematization of the related theoretical and methodological materials has been done. The methodological tools of the research are carried out in the following logical sequence: systematization of existing statistical methods for estimating the shadow economy; time data series analysis; and regression analysis. The scope of the shadow economy could be estimated as a dependent variable, with both its determinants and indicators detected and measured. The macro methods, such as Multiple Indicators Multiple Causes (MIMIC) are suitable approaches from an econometric standpoint to evaluate the shadow economy. Institutional quality is crucially an important variable for empirical studies related to evaluating the country's investment potential. The proposed approach considers significance and direction of the six Worldwide Government Indicators' (WGI) impact on foreign direct investment net inflow, eliminating the issue of their multicollinearity. However, political instability and high frequency of foreign and domestic policy changes during the last decades distort statistical significance of the results obtained. FDI inflow, as well as the quality of governance, and the shadow economy, is influenced by many other factors, both internal and external, so to build a qualitative model for evaluating the country's investment potential of the national economy it is necessary to expand the set of factors for analysis. The results of the research can be useful for a more accurate investment potential evaluation on the macroeconomic level, and forecasting foreign direct investment inflows for the following time periods.

Keywords: country investment potential, foreign direct investment, shadow economy, national economy, institutional quality

JEL Classification: E22, E29, E44, E60, G31

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1. Introduction

Foreign direct investment (FDI) has a perceptible impact on local economic development, and is widely considered within related studies as the main driver of host countries' economic growth (Mathur & Singh, 2013; Ali & Bohara, 2017; Agnihotri & Arora, 2019; Huynh et al., 2019). Economic relations are not always conducted within the framework of the bureaucratic public and private sector establishments. In this case, we consider an informal part of economy, so-called shadow, hidden or parallel economy.

Recent publications in this field proposed a wide range of the shadow economy definitions. In this study we use the definition provided by Medina & Schneider (2018), according to which the shadow economy is explained as all economic activities which are hidden from official authorities due to monetary, regulatory, and institutional reasons.

The informal economy creates various challenges for the whole society as it has a tangible reciprocal relationship among all-important macroeconomic, social, and cultural spheres.

The problem of measuring the informal or shadow economy has been discussed for the last few decades (Lackó, 1996; Lippert & Walker, 1997; Schneider & Enste, 2000; Wu & Schneider, 2019; Dell'Anno et al., 2007; Medina & Schneider, 2018; Nair-Reichert & Weinhold, 2001; Pimonenko et al., 2018; Palienko & Lyulyov, 2018; Elgin, 2019).

Empirical research of current studies which were employed to measuring the size of the shadow economy allows organizing the most common approaches into the related groups, are shown in *Table 1*.

Table 1. A Taxonomy of Approaches to Measuring the Size of the Shadow Economy

Type of approach	Definition
Direct approaches	In this group we include surveys, auditing and other expert methods. Using them, it is possible to gather detailed information about the structure of shadow economy. It should be mentioned that the received information may not be representative and may not be consistent from country to country.
Indirect approaches	These methods include the incongruity between income and expenditure measures of GDP; the difference between official salaries and consumption growth; unemployment dynamic and average income per capita. Such variables are sensitive to the given assumptions (elasticity, local currency ratio, base year of comparison, GDP or GNP measurement).
A model-based approaches	The models such as the Multiple Indicator, Multiple Causes (MIMIC) models, proposed by Frey & Week-Hanneman (1984) and improved by Schneider et al. (2010). Using those models, the size of the shadow economy could be estimated as a dependent variable (an index), with both its determinants and indicators detected and measured. The obtained equation will be estimated and the fitted values of the latent variable are used to compute an estimate of the size of the shadow economy as a share of GDP (Medina & Schneider, 2018).

Source: compiled by the authors on the basis of Medina & Schneider, 2018.

According to Medina & Schneider's (2018) estimations, within last 20 years the size of Ukrainian shadow economy was fluctuating within the range of 35-55%, see *Figure 1*. It is noticeable that the shadow economy dynamic was highly related to the political situation and the following changes in the government in this period.

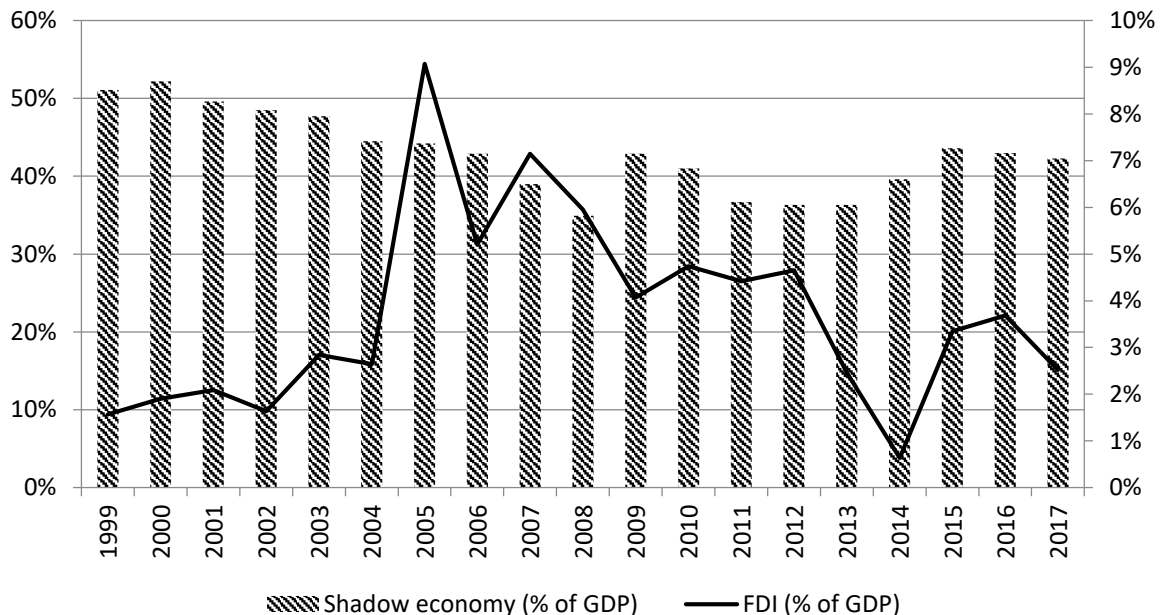


Figure 1. The Shadow Economy (% of GDP, left axis) and FDI Inflow (% of GDP, right axis) in Ukraine in the Period of 1999–2017.

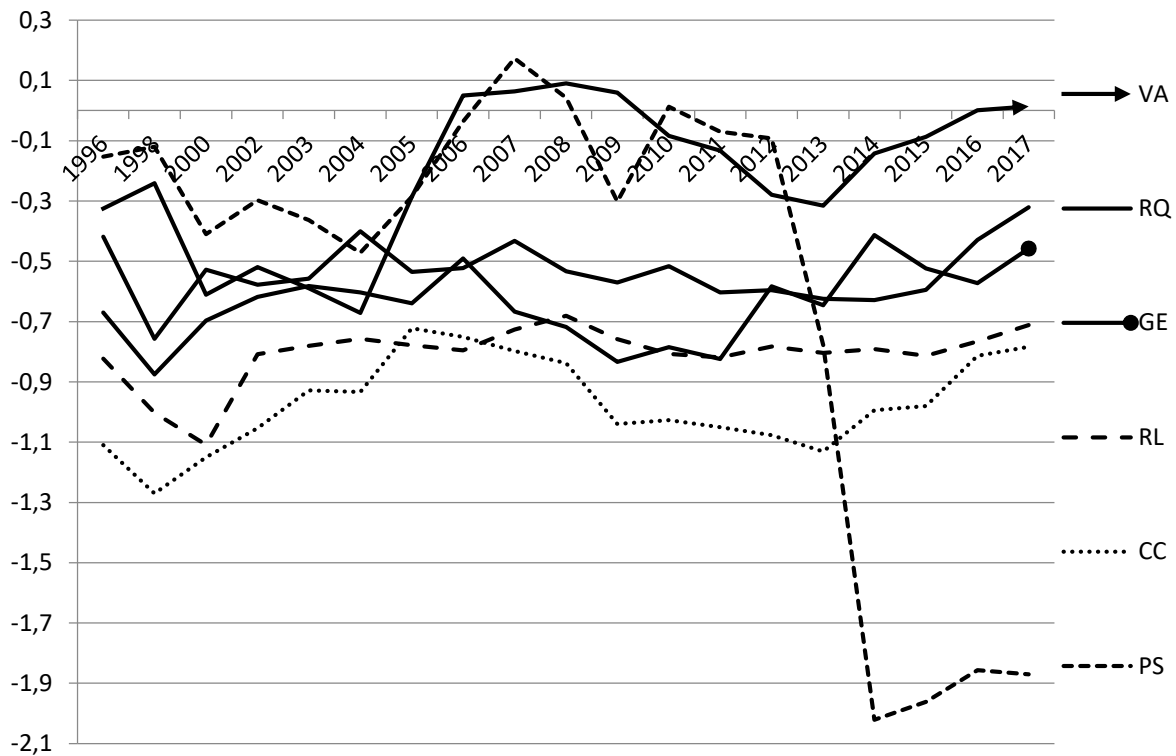
Source: World Bank (2018a), Medina & Schneider (2018).

The early surveys and econometric analyses showed inconclusive results as far as the relation between shadow economy and FDI is concerned.

Substantial research has been carried out on the relation between FDI and institutional environment of a host country economy.

The impact of FDI on the host country economy depends on the quality of the government institutions (Globerman & Shapiro, 2003; Mathur & Singh, 2013; Pimonenko & Lushyk, 2017).

Kaufmann et al. (2011) proposes a Worldwide Governance Indicators Methodology. According to this approach, six main indexes are proposed to estimate the quality of the government institutions which include the following: the process by which the governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them (World Bank, 2018b). The WGI of Ukraine is shown in *Figure 2*.



VA -Voice and Accountability, RQ - Regulatory Quality, GE - Government Effectiveness, RL - Rule of Law, CC - Control of Corruption, PS - Political Stability and Absence of Violence

Figure 2. Worldwide Governance Indicators of Ukraine in the Period of 1996–2017.

Source: World Bank (2018b).

Figure 2 depicts the fact that the institutional quality did not improve within the analysed period in Ukraine. It is noticeable that political instability, which started in 2013 and largely developed due to upcoming annexation of the Crimea and following military action in the Donbas region, has influenced the country's investment potential and economic activity.

Therefore, it is imperative to comprehensively understand the shadow economy in Ukraine in relation with other variables including FDI inflows and institutional quality.

2. The Literature Review

Some questions about the specificity of evaluating the country's investment potential considering the shadow economy and institutional quality were discussed in the papers by (Lackó, 1996; Lippert & Walker, 1997; Dell'Anno et al., 2007; Schneider et al., 2010; Elgin et al., 2019; Ali & Bohara, 2017; Prokopenko et al., 2017; Nikopour et al., 2009; Globberman & Shapiro, 2003; Mathur & Singh, 2013; Goel et al., 2019; Jöreskog & Goldberger, 1975).

Ali & Bohara (2017) and Nikopour et al. (2009) studied the cross-collinearity between FDI inflows and the size of shadow economy. They resumed that the shadow economy increase could attract FDI.

The presence of shadow economy twists the allocation of resources in the economy, transforms income distribution and reduces tax revenue (Alm & Embaye, 2013).

Some studies explored a range of the shadow economy effects: government fiscal policy (Cicek & Elgin, 2011), state employment policy (Schneider & Enste, 2000), inflation and economic growth (Asfuroglu & Elgin, 2016), and total factor productivity (D'Erasmus & Boedo, 2012).

Goel et al. (2019) discussed the influences of FDI inflows, inward development aid, and immigration on the informal sector. They found a positive correlation between FDI inflows and shadow economy.

Discrepancy between national expenditure and income statistics in the process of measuring the shadow economy was explored by Yoo & Hyun (1998).

Weak institutional quality was found to be a key determinant of the size of shadow economy (Dabla-Norris et al., 2008; Oviedo et al., 2009). They suggested that regulatory burden and weak governance can drive the evolution of the shadow economy.

Some authors (Chen, 1981; Dell'Anno et al., 2007; Posey, 2015) proposed to develop the Multiple Indicators, Multiple Causes (MIMIC) approach based on the statistical theory of unobserved variables developed in the 1970s by Zellner (1970).

Schneider et al. (2010) further expanded MIMIC approach so it allows to compare the size of shadow economy across countries and to conduct panel data analysis.

It is also necessary to note the applied nature of the work by scientists (Bogachov et al., 2020; Boiko et al., 2019; Czyżewski et al., 2019; Chygryn et al. 2020; Dalevska et al., 2019; Demytyev & Kwilinski, 2020; Drozd et al., 2019; 2020; Dzwigol, 2019a; 2019b; 2020a; 2020b; 2020c; Dzwigol & Wolniak, 2018; Dzwigol & Dźwigoł-Barosz, 2018; 2020; Dzwigol et al., 2019a; 2019b; 2019c; 2020a; Furmaniak et al., 2018; 2019a; 2019b; Kharazishvili et al., 2020; Kondratenko et al., 2020; Kuzior et al., 2020; Kwilinski, 2017; 2018a; 2018b; 2018c; 2018d; 2019; Kwilinski et al., 2019a; 2019b; 2019c; 2019d; 2019e; 2019f; 2019g; 2020a; 2020b; 2020c; 2020d; Kwilinski & Kuzior, 2020; Kyrilov et al., 2020; Lakhno et al., 2018; Miskiewicz, 2017a; 2017b; 2018; 2020a; 2020b; Miśkiewicz & Wolniak, 2020; Pająk et al., 2016; 2017; Prokopenko & Miśkiewicz, 2020; Saługa et al., 2020; Savchenko et al., 2019; Tkachenko et al., 2019a; 2019b; 2019c; 2019d; 2019e; Yelnikova & Miskiewicz, 2020), in which special attention is paid to assessing the effectiveness of economic mechanisms' functioning of various scales of activity.

The received results could be applied into other panel data model analyses such as an investment potential evaluation.

3. Methods

Despite abundance of existing approaches to measuring the size of shadow economy, there is no leading or prevailed one, each of them having some conceptual or practical strengths and weaknesses. It is suitable to choose the needed methodology based on the data available, or the research aims. Methods combination might be employed as well, in order to improve preciseness of the estimations. In this study we decided to use the shadow economy estimation results proposed by Medina & Schneider (2018).

The combination of macroeconomic, microeconomic, and institutional factors which drive the shadow economy could be presumed as the following formula:

$$SE_{i,t} = \alpha_i + \beta X_{it} + \delta_t Time_t + u_{i,t} \quad (1)$$

where $SE_{i,t}$ represents the size of the shadow economy in the country i at a time period t as a share of GDP;

α_i are the country's fixed effects;

X_{it} is a vector of macroeconomic variables and institutional indicators;

$Time_t$ are time fixed effects, which are included to control unexpected year-related variation and special events;

$u_{i,t}$ is the error term;

β, δ are individual specific effects.

Worldwide Governance Indicators methodology calculates six indexes which represent the quality of governance, as it is shown in *Figure 2*. Some of them are correlated with each other. Thus, Bilan et al. (2019) proposed the approach to integrate WGI index based on the Fishburne's method, considering the impact's power and direction of the different sub-indexes WGI on FDI inflow and eliminating the issue of multicollinearity. To calculate, it is suggested to use the formula:

$$WGI = \sum_{i=1}^n w_i \times WGI_i = \sum_{i=1}^n \frac{2(n-j+1)}{n(n+1)} \times WGI_{i,t}, \quad (2)$$

where w_i is the weight of i sub-index;

n is the quantity of sub-indexes;

j is a rank of sub-index;

$WGI_{i,t}$ are the calculated i sub-index values.

The calculated independent variables (integrated WGI, and the shadow economy rate) are supposed to be applied into an investment potential evaluation model. The general model is presumed by the formula:

$$FDI_{i,t} = \alpha_0 + \alpha_1 FDI_{i,t-1} + \alpha_2 X_{i,t} + \alpha_3 WGI_{i,t} + \alpha_4 SE_{i,t} + \varepsilon_{it} \quad (3)$$

where $FDI_{i,t}$ is the FDI net inflow in country i at a time period t as a share of GDP; $\alpha_0 - \alpha_4$ are individual specific effects.

Some of statistical data ought to be represented as their logarithmic interpretation in order to achieve a visual effect needed. The data processing was done via STATA 14.

4. Results and Discussion

As explained in the previous section, the MIMIC model assumes specific effects and determinants that are used to measure the size of the shadow economy. *Table 2* shows the regression results for the models from *Equations (1) – (3)*. Empirical results of the shadow economy influence on FDI are provided in the studies by Medina & Schneider (2018). The source of calculating integrated WGI index is the World Bank (2018b).

Table 2. The Regression Analysis of the Shadow Economy and the Quality of Governance Impact on FDI Net Inflows.

Source	SS	df	MS	Number of obs	=	19
Model	2.86323374	1	1.43161687	F (1, 18)	=	29.04
Residual	0.788767185	16	0.049297949	Prob > F	=	0.0000
Total	3.65200092	18		R-squared	=	0.7840
				Adj R-squared	=	0.7570
				Root MSE	=	0.22203
InFDI	Coef.	Std. Err.	t	P> t	[95% Conf.	Interval]
SE	-0.0731997	0.0129622	-5.65	0.000	-0.1006784	-0.0457211
WGI	1.26816	0.4443008	2.85	0.011	0.3262838	2.210035
_cons	11.39487	0.5331893	25.12	0.000	12.26456	14.52518

Sources: developed by the authors.

The analysis results showed that the impact of the shadow economy and the institutional quality on FDI inflow is considerable, and could be applied on the country investment evaluation model, see *Table 2*.

The regression analysis has shown that $R^2 = 0.78$, which means a significant impact of the shadow economy rate and institution quality on FDI net inflows, although P-value ($P > |t|$) is less than 0.05, which indicates a high level of statistical significance of the whole model.

Following the results shown in *Table 2*, the change in FDI inflow can be characterized by a regression model:

$$Y = 11.39487 + 1.26816 WGI - 0.0731997SE \quad (4)$$

where Y is $\ln(\text{FDI net inflows, USD})$;

WGI is an integrated WGI index based on the Fishburne's method;

SE is the shadow economy rate (% of GDP).

The main result obtained from the regression model shows that one unit increase in shadow economy rate (% of GDP) decreases FDI inflows by 0.073 (at logarithmic scale). At the same time, the quality of governance has a positive and significant impact on FDI inflow. This means that multinational companies look for opportunities to evade taxes when making investment decisions, but consider investing in the countries with a reasonably good governance infrastructure.

It should be noted that the dynamics of FDI inflow, as well as the quality of governance, and the shadow economy, are influenced by many other factors, both internal and external, so to build a qualitative model evaluating a country's investment potential of the national economy it is necessary to expand the set of factors for analysis. The concluding section follows.

5. Conclusions

Adding to the literature on the investment potential evaluation approaches, this paper studies the problems and prospective of applying independent variables such as the size of shadow economy and an integrated index of institutional quality.

The obtained results show that the shadow economy rate, calculated by MIMIC methodology, is suitable for applying into an investment potential evaluation model. It should be noticed that the shadow economy itself could be measured by FDI as an indicator.

An institutional quality creates the environment for economic activity in a country. Thus, evaluation of this variable is crucially important for each related empirical study. At the same time, a relatively high frequency of foreign and domestic policy changes during the last decades distorts the statistical significance of the obtained results.

Nevertheless, there is still significant room for improving as well as for expanding the evaluation approach discussed in the current study. First, the used dataset can be further expanded provided the data are available for several countries. Second, the empirical analysis, which is conducted after the evaluation, should be deepened, with more data series applied.

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