

HIGHLIGHTS, CONCEPTS AND METHODS IN ADDRESSING THE SHADOW ECONOMY: THEORETICAL APPROACH AND SOME COUNTRIES' EXPERIENCE

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Abstract: *From ancient times the shadow economy has always found various ways and means to have its presence in any national economy in various forms. The development of this phenomenon leads to an economic activity parallel to the official one, which will eventually lead to the loss of control of the state authorities. The paper aims to make a general analysis of the theoretical aspects of shadow economy, being focused on concept approach, methodology of evaluation, as well as presentation of some countries' experience in assessing the shadow economy. Taking into account that the paper has a pronounced theoretical character, the research methods are mainly focused on bibliographic research of foreign and local articles of scholars who dedicated their work to assessing the shadow economy. At the same time, a series of other scientific research methods have been used such as: the logical-abstract method, the method of comparison, the monographic method, etc. The main results are focused on development of an own definition of shadow economy by the authors and assessment of evaluation methods through their advantages and limits.*

Keywords: *shadow economy, methods and models for measuring the shadow economy, assessment of shadow economy.*

JEL classification: *O17, B41.*

1. Introduction

In the contemporary era, the shadow economy represents a real threat both globally and nationally. It has a particular impact on all the economic phenomena and processes taking place in society, starting with the economic growth and sustainable development of the country, but also on investments, trade, entrepreneurship, etc.

Taking into account that most of countries are dealing with this phenomenon, it is becoming increasingly important to study the factual features of shadow economy, emphasizing the methods used for its assessment and how accurate they are. Therefore, the paper aims to make a general analysis of the theoretical aspects of shadow economy, being focused on concept approach, methodology of evaluation, as well as presentation of some countries' experience in assessing the shadow economy.

After the collapse of the USSR and the declaration of independence, the Republic of Moldova underwent a complex transition to a market economy. The economic crisis of that period materialized in the development of the phenomenon of the shadow economy. The need for its study results from the amplification of the effects and impact on the national budget, as well as on social life, welfare, political system, education, health system, etc. In order to carry out a reliable study and make an applied analysis, there is needed for existence of a theoretical background in order to tackle this phenomenon more accurate and to make a theoretical background for future research.

It should also be noted that the analysis of this phenomenon in most cases provides estimates and can not be performed with a great accuracy.

2. Degree of scientific approach of the topic in specialized literature

A particular interest in the assessment of the shadow economy is observed in the research of scholars from abroad, such as Schneider F., Williams C. (2013), Cobham A.

(2005), Tanzi V. (1999), Feige E. (1994), Thomas J. (1999), Schneider F., Enste D. (2000), Fleming M. (2000) and others. An important feature of studying this phenomenon is the fact that the above-mentioned authors do not only summarize the theoretical research of the phenomenon at the level of conceptualization or description of its research methodology, but are directly involved in the analysis and assessment of the shadow economy.

Generally speaking, shadow economy represents a phenomenon which is difficult to be defined, as it implies a series of components and dimensions that can vary depending on the region or country. The history of shadow economy lies back in the past. It is believed that the shadow economy emerged simultaneously with commodity and commodity-money relations. Prior to the formation of national legal systems, a major restriction of unfair business practices was a tribal moral or religious morality. Ethical standards were formed mainly on the basis of religious principles. Although the studies on the shadow economy have been going on for several decades ago, economists have still not formed a unified conceptual framework for its analysis. Most authors, who tried to assess the shadow economy, are still facing the difficulty of producing a precise definition of the phenomenon (Caurkubule, Rubanovskis, 2014).

In the specialized literature, shadow economy can be found under different approaches and notions, such as: *underground, informal, grey, illicit, parallel, hidden economy, etc.* There are various opinions on the difference and similarities among these definitions, but most of the scholars agree that they represent, basically, a part of the economy that is not found in the legal evidence - the shadow economy. Respectively, in this research, the authors address the concept of shadow economy as an eminent and risky one for countries with economies in transition.

3. Research methods

Taking into account that the paper has a pronounced theoretical character, the research methods are mainly focused on bibliographic research of foreign and local articles of scholars who dedicated their work to assessing the shadow economy. At the same time, a series of other scientific research methods have been used such as: the logical-abstract method, the method of comparison, the monographic method, etc. All of them allowed to make a synthesis of the current state of play in the field of theoretical study of the shadow economy phenomenon.

4. Conceptualization of the shadow economy phenomenon

4.1. Defining shadow economy

Defining the shadow economy aims at a better understanding of its components and causes. Several scholars and international organizations defined this concept according to their observations and research. Thus, according to Feige, the shadow economy consists of all currently unregistered economic activities that would contribute to the officially calculated gross national product, if they were registered (Feige, 1994).

As Vito Tanzi remarks, exist at least two definitions of the shadow economy. The first, is connected to the production missed in the official statistics; the other, refers to "...revenue not reported to, and not discovered by, the tax authorities" (Tanzi, 1999).

According to Fleming et al. (2000), it is possible to distinguish two approaches, in defining hidden economy:

-The definitional approach, which considers it as simply unrecorded economic activities. Thomas (1999) notes that "it is difficult to provide a formal definition" of the shadow economy and suggests that it covers those activities which are not recorded in the national income accounts; Schneider and Eneste (2000) define the shadow economy in a

similar manner as all economic activities which contribute to the officially calculated (or observed) gross national product;

- The alternative approach finds that shadow economic activities are best defined with respect to the particular behavioural characteristics of the activities in question carried out by the economic agent.

Schneider and Williams offer a wider definition, by defining it as including all market-based production of only legal goods and services that are deliberately concealed from public authorities for the following reasons: to avoid payment of income, VAT or other taxes; to avoid paying social security contributions; to avoid having to meet certain legal labor market standards, such as minimum wages, maximum working hours; to avoid complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms (Schneider, Williams, 2013).

Smith defines the underground economy as the portion of the total economy that is unobserved due to the efforts of some businesses and households to keep their activities undetected. At the same time, he gives several alternative definitions to this phenomenon that are somehow connected between them, but differ in components, as follows:

- Market-based production of legal goods and services that escapes detection in the official estimates of GDP;

- Market-based production of goods and services, whether legal or illegal, that escapes detection in the official estimates of GDP;

- Market-based production of goods and services, whether legal or illegal, that escapes detection by the tax authorities;

- Market- and non-market based production of goods and services, whether legal or illegal, that escapes detection in or is intentionally excluded from the official estimates of GDP (Smith, 1994).

In the current conditions of the Republic of Moldova, the phenomenon of shadow economy has been studied by such researchers as: Costandachi (2012), Budianschi, Lupusor, Fala, Morcotilo (2014), Ganciuco, Gutium (2018), Ceban (2016) and others. However, there is still no unambiguously acceptable concept of the shadowy economy related to the country's realities.

Therefore, under these circumstances, the authors attempt to provide a definition of the shadow economy which is related to the conditions of the Republic of Moldova. Thus, *“Shadow economy represents the total economic activities performed by a natural or legal person that generates advantages, whether executed legally or illegally, and are intended to camouflage the economic results, reduce or totally omit them under the records of the relevant public authorities in order to obtain illicit economic benefits”*.

4.2. Components of the shadow economy

In order to better understand the phenomenon of shadow economy, it should be seen through its components. According to Dell’Anno (2003), shadow economy comprises all product activities that can be classified into the following three areas: underground production, informal production and illegal production.

The underground production represents the area of production activities that are not directly observed due to:

a) Economic reasons (the activities carried out with the deliberate desire to avoid taxes, social contributions in the favour of employees or, also, to avoid observing the law provisions concerning minimum wages, the number of work hours, job safety, etc.)

b) Statistical reasons (production activities that are not registered due to:

- The failure to fill out the administrative forms or statistics questionnaires because of the lack of sensitivity to statistics of those asked to fill them out and/or shortcomings in the statistics system;
- The difficulty in grasping the changes of a rapidly evolving productive system, characterised by small productive activities which are often not detectable with the traditional survey techniques.

The informal production refers to productive institutional units characterised by:

- a) a low level of organisation;
- b) little or no division between work and capital;
- c) work relations based on occasional jobs, kinship, or personal relations. (This context comprises the activity of craftsmen, peddlers without licences, farm workers, home workers, and the unregistered activities of small merchants).

The illegal activities are all those oriented to the production of goods and services whose sale, distribution or possession is prohibited by law. Falling within this area are also the productive activities carried out by unauthorised operators. Due to the difficulty of estimation, that could be limited the international comparability, the illegal activities are excluded by the national accounts (Dell'Anno, 2003).

A little bit distinctive components can be found in the work of Budianschi et al (2014), who divide the shadow economy in four components:

- The informal sector - includes all the units that produce legal goods but are not registered or have a number of employees below the established census. As a rule, they are small businesses whose target customers are individuals, they are set up from their own resources, have a low level of organization, and the division of the production factors is not clear.

- Hidden production in the formal sector - all legal productive activities hidden by economic agents in order not to be registered by the administrative and fiscal bodies for the purpose of tax, social insurance contributions evasion, etc. This includes not only the non-registration of certain types of products and services but also the payment of wages in the envelope when the salary is registered with a minimum wage or the number of worked hours is reduced.

- Household production - all goods and services produced and consumed by households themselves for their own needs are not considered as a compartment of the shadow economy. But when households dispose of these goods in excess and start selling them to third parties (relatives, peers, etc.), there is an additional source of income that in most cases is not brought to the attention of public authorities.

- Illegal production - the production of goods and services the sale or distribution of which is contrary to law and is carried out by unauthorized persons. This includes both illegal activities (distribution of drugs, toxic substances, prostitution services) and the production of goods or the provision of services by unauthorized agents (the production of unlicensed alcoholic beverages).

4.3. Causes of the shadow economy

There are a number of factors that cause the economic agents to enter the shadow economy. In order to be able to reduce the effects and combat this phenomenon, it is necessary to identify and understand these factors. As a result of the studied literature (Budianschi, 2014; Arsik et al, 2015; Schneider, 2007), a set of systemic factors has been identified, namely:

- Tax burden, which is a complex system with high rates and fees that causes economic agents to consider them too large and to use tax evasion. Increasing the tax burden makes it more cost-effective to operate in the informal sector. Tax evasion is

typically implemented through several methods, such as unregistered entrepreneurial activity in order to avoid attention from tax authorities, incomplete declaration of goods and services, employee remuneration in the envelope.

- Intensity of regulation represents a legislative complexity and administrative barriers that negatively influence the process of launching and closing a business. Even when managing an enterprise, the fiscal agent is obliged to carry out relations with State Tax Service, Customs Service, National Social Insurance House, National Insurance House in Medicine and local tax services, not only to follow the changes that appear in the Tax Code but also different laws that appear both, at the territorial and national level.

- Taxation morality represents the lack of trust from the citizens and the economic agent in the qualitative provision of public services. It reflects the internal motivation to pay taxes. This result is due to the inefficient functioning of public institutions, the failure to solve important economic problems and the high level of corruption that leads to mistrust in the public system. According to Schneider and Buehn (2007), 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 the public goods (such as the public infrastructure) and of the administration, with the consequence of even stronger incentives to participate in the shadow economy.

5. Theoretical approach of assessing shadow economy

Measuring the level of shadow economy has represented a real challenge for a long time for the scholars around the world. Scientists have developed several methods in an attempt to assess the shadow economy in an accurate way, more closely to the reality, but a unanimous accepted method of assessment has not come to an end yet.

Thus, according to Schneider (2012), there are three methods of assessment, which are mostly used:

- Direct procedures at a micro level that aim at determining the size of the shadow economy at one particular point in time. An example is the survey method and tax audit;
- Indirect procedures that make use of macroeconomic indicators in order to proxy the development of the shadow economy over time. They include the gap method of national accounts, the labour force model, physical input method, input – output model, Cobham model, etc.
- Statistical models that use statistical tools to estimate the shadow economy as an “unobserved” variable.

By investigating each of these methodologies for estimating the shadow economy, their description will be further presented below, highlighting their advantages and limitations.

5.1. Direct methods

Direct methods refer mainly to microeconomic approaches that employ either well-designed surveys and samples based on voluntary replies, or tax auditing and other compliance methods.

Sample surveys designed to estimate the shadow economy are widely used. They mainly contribute to determine the unreported employee wages and unreported business income. It may look at the first sight as a simple method of estimation, but the results of the survey, if it has been done appropriately, can be very exhaustive.

<i>Advantages</i>	<i>Limits</i>
<ul style="list-style-type: none"> - Responses are obtained from the first source of information. - Very detailed information can be obtained about the structure of the shadow economy. 	<ul style="list-style-type: none"> - Respondents can hide information about fraudulent behaviour during the survey. - Responses can be difficult to be quantified in monetary values (estimation of losses due to the existing shadow economy). - Results from these kinds of surveys are very sensitive to the way the questionnaire is formulated. - Survey results can be inconsistent at the international level.

Tax audit method is another direct method for estimating the shadow economy. Estimates of the shadow economy can also be based on the discrepancy between income declared for tax purposes and that measured by selective checks. Fiscal auditing programs have been particularly effective in this regard. Since these programs are designed to measure the amount of undeclared taxable income, they may also be used to calculate the size of the shadow economy (Schneider, Buehn, 2016).

<i>Advantages</i>	<i>Limits</i>
<ul style="list-style-type: none"> - Results obtained from tax audit are closer to the real situation. - Results can be quantified in numbers. - Results of tax audit from several enterprises from the same branch can offer a general overview of the level of shadow economy in a certain sector. 	<ul style="list-style-type: none"> - Selection of taxpayers for tax audits is not random but based on properties of submitted (tax) returns that indicate a certain likelihood of tax fraud. Consequently, such a sample is not a random one of the whole population, and estimates of the shadow economy based upon a biased sample may not be accurate. - Estimates based on tax audits reflect only that portion of the shadow economy discovered by income tax authorities, and this is likely to be only a fraction of all hidden income (Schneider, Buehn, 2016).

5.2. Indirect methods

Refer to macroeconomics and are based on a series of economic indicators that can offer a picture about the evolution of shadow economy during a period of time.

The discrepancy between national expenditure and income statistics is based on discrepancies between income and expenditure statistics. In national accounting the income measure of GNP should be equal to the expenditure measure of GNP. Thus, if an independent estimate of the expenditure side of the national accounts is available, the gap between the expenditure measure and the income measure can be used as an indicator of the extent of the shadow economy (Schneider, Buehn, 2016).

<i>Advantages</i>	<i>Limits</i>
<ul style="list-style-type: none"> - Represents a complex model allowing identifying at what stage and what sector is more susceptible to shadow economy. 	<ul style="list-style-type: none"> - Accuracy of the statistical system can be doubted in some countries.

The discrepancy between the official and actual labor force. A decline in participation in the labor force in the official economy can be seen as an indication of

increased activity in the shadow economy. If total labor force participation is assumed to be constant, then a decreasing official rate of participation can be seen as an indicator of increased shadow economic activities (Schneider, Buehn, 2016).

<i>Advantages</i>	<i>Limits</i>
<ul style="list-style-type: none"> - Represents a very good method if used in combination with other indirect and/or statistical methods. - Allows some forecasts for the future: if the number of employees increases, then production should also increase (only if qualifications of workers remain the same). 	<ul style="list-style-type: none"> - Differences in the rate of participation may have other causes. - A part of people can work in the shadow economy and have a job in the official economy.

The physical input (electricity consumption) method. In order to measure the overall economic activity in an economy, Kaufmann and Kaliberda (1996) assume that electric power consumption is regarded as the single best physical indicator of overall (or official plus unofficial) economic activity. Thus, growth of total electricity consumption is an indicator for growth of overall GDP, either official or unofficial.

<i>Advantages</i>	<i>Limits</i>
<ul style="list-style-type: none"> - Simplicity of the method. - Precision of this method can be increased in combination with observation of indicators related to gas consumption, water, coal, etc. 	<ul style="list-style-type: none"> - Not all shadow economy activities require a considerable amount of electricity (e.g. personal services), and other energy sources can be used (gas, oil, coal, etc.). - Over time, there has been considerable technical progress so that both the production and use of electricity are more efficient than in the past, and this will apply in both official and unofficial uses (Schneider, Buehn, 2016).

The input-output model was developed by Wassily Leontief and is used to describe and analyze economic relations between industries and allocation of resources. The fundamental information used in input–output analysis concerns the flows of products from each industrial sector, considered as a producer, to each of the sectors, itself and others, considered as consumers (Miller, Blair, 2009).

	Intermediate consumption	Final consumption
Intermediate product	I	II
Gross value added, import, net taxes	III	IV

The simplified model takes the shape of a dial. Data in natural values from the 4 dials can explain the difference between resources and consumption, which helps to identify the shadow economy.

<i>Advantages</i>	<i>Limits</i>
<ul style="list-style-type: none"> - Use of the natural values allows ignoring such factors as monetary values, inflation, etc. - Can be used both, at 	<ul style="list-style-type: none"> - There may be a margin of error due to the fact that the services are not included. - Is based on statistical data which can not always be accurate.

macro and micro level of the economy.	- If the analysis is carried out for a longer period of time, technological developments within enterprises must be taken into account.
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A simple model of tax (Cobham, 2005). This method involves calculations for each type of tax and shows the difference between the potential taxes that could be collected and the losses that took place. The formula looks like this:

$$T_0 = tY \quad (1)$$

where: T_0 represent the potential taxes that could have been collected

t - the tax rate that is tax dependent.

Y - Income to be taxed specifically with this tax.

In such a case, the real value of tax will be expressed through the following formula:

$$T_1 = t_c[Y(1-s)-h-p]-U \quad (2)$$

where: T_1 - the amount of the tax received by the tax authorities

t_c - tax competition, taxes after negotiations with local authorities.

Y - Amount of income to be taxed.

s - the share of the shadow economy as a result of the activity of informal sector, the hidden production in the formal sector, the production of domestic households for self-consumption and the illegal production.

h - accumulated income in assets held in offshore areas.

p - corporate profits, which are moved to other jurisdictions if lower tax rates are applied.

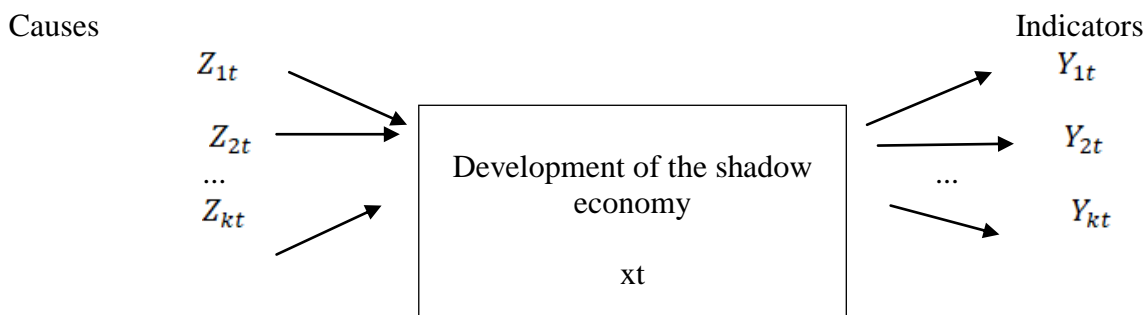
U - the sum of taxes not paid each year, which represents the payments that must be paid by the economic agents, but for various reasons are not paid.

<i>Advantages</i>	<i>Limits</i>
- Can present quite accurate the real volume of taxes that a state can receive.	- Concerns only the tax issues, which makes is limited.

The main **statistical method** of assessing the shadow economy to be studied is the *MIMIC model*, defined as multiple indicators-multiple causes. The method has its origins in the literature of factor analysis of psychometrics. In the first application of MIMIC method for estimation of the gray economy, data collected from 17 OECD countries has been reviewed (Trebicka, 2014).

The MIMIC model explains the relationship between observable variables and an unobservable variable by minimizing the distance between the sample covariance matrix and the covariance matrix predicted by the model. The observable variables are divided into causes of the latent variable and its indicators. Formally, the MIMIC model consists of two parts: the structural equation model and the measurement model (Buehn, Schneider, 2008).

Figure no. 1. The MIMIC model for assessing shadow economy



Source: Buehn, Schneider, 2013

In order to evaluate the shadow economy, a set of causes and a set of indicators are assumed, which are influenced by the size of the shadow economy, thus being found the structural dependence of the shadow economy on these variables. The interaction, over time, between the causes $Z_{it}(i=1,2,\dots,k)$, the size of the underground economy X_t and the indicators $Y_{jt}(j=1,2,\dots,p)$ is shown in Fig. 1. This dependency helps us to forecast changes in the size of the shadow economy in the future.

<i>Advantages</i>	<i>Limits</i>
<ul style="list-style-type: none"> - Makes the difference between causes and indicators. - Considers various causes and effects at the same time when estimating shadow economy. 	<ul style="list-style-type: none"> - MIMIC model estimations lead to unstable coefficients in the face of minor changes in either the data period or the group of countries studied. - The lists of causal and indicator variables are unconvincing, sometimes. - The relevance of casual and indicators variables is also questioned, sometimes. - Only relative coefficients (no absolute values) are obtained. - There are difficulties in differentiating between the selection of causes and indicators

6. Some countries' experience in assessing the shadow economy

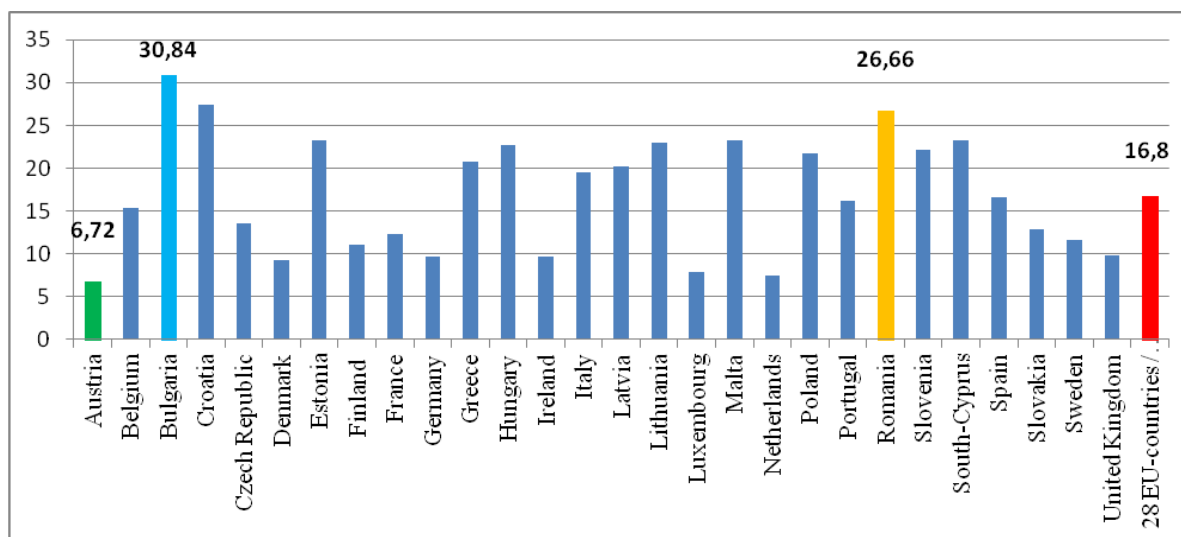
European Union represents an important actor on the international arena, from the economic point of view, as well as regarding the social aspect. The socio-economic development of the EU is hindered by the presence of the shadow economy in every member state, but at a different extent. In order to reduce the size of this phenomenon, economic, fiscal and institutional approaches appear as basic tools in the redefinition of the quantitative and qualitative coordinates of a transparent and efficient economy (Tudose, Clipa 2016).

According to the most recent researches in the field carried out by Schneider (2019), the shadow economy in EU countries has been estimated with the help of the MIMIC model for a large period of time - 2003 – 2018. The MIMIC approach explains the relationship between observable variables and an unobservable variable by minimizing the distance between the sample covariance matrix and the covariance matrix predicted by the model. The observable variables are divided into causes of the latent variable and its indicators. Formally, the MIMIC model consists of two parts: the structural equation model and the measurement model (Buehn, Schneider, 2008). At the moment, taking into account that a very accurate model of assessing the size of shadow economy still does not exist,

most of the European researchers use the MIMIC model, which according to its components, represents the most reliable way of evaluation.

Analysing the existing data, some trends in the development of shadow economy can be noted. First of all, all EU member states countries succeeded to diminish the percent of shadow economy in GDP. Thus, these figures vary between 9.8% (Luxembourg) and 35.9% (Bulgaria) in 2003 and between 6.72% (Austria) and 30.84% (Bulgaria) in 2018. The most valuable results can be noted in case of Baltic States, where Latvia during 2003 – 2018 reduced the shadow economy as % of GDP with 10.2%, Lithuania – with 9% and Estonia with 7.5%. The average share of shadow economy of EU 28 states as % of GDP decreased from 22.6% in 2003 to 16.8% in 2018. At the same time, there are states like Bulgaria, Croatia and Romania where the size of the shadow economy reaches almost one third of GDP, while in such countries like Austria, Denmark, Germany, Ireland, Luxembourg, Netherlands and United Kingdom it accounts for less than 10% see Figure 1). The geographical distribution of the high and low shares of shadow economy is also worth to be mentioned, as the Eastern and Central Europe countries have higher values of shadow economy, while the Western European countries – have the lowest ones. This fact can be also explained due to the only recent integration of Eastern and Central European countries in the EU, compared to the older member states. At the same time, the level of shadow economy in Northern countries (Denmark, Finland and Ireland) is lower than the one in the Southern part of the continent (Greece, Italy, Malta and Spain).

Figure no. 2. Size of the shadow economy in the EU member states in 2018, % of official GDP



Source: developed by author based on Schneider (2019)

Shadow economy in Romania

Romania has very good practices in measuring the shadow economy, mainly due to the fact that it is a member state of the EU, which allows for a permanent calculation of the indicator of unobserved economy, and at the same time, due to the available statistical data and their incorporation in different models, allowing the measurements to be done in a relatively accurate manner.

Since 2000, several studies have been carried out in order to estimate the shadow economy in Romania, by using different approaches and methods. A compilation of the

main attempts to assess the shadow economy has been done by Popescu, Davidescu and Huidumac (2018) and is presented below in a form of a table.

Table 1. The size of the Romanian shadow economy, % of official GDP

Authors	Approach	Size of shadow economy
Albu Albu et al.	Income discrepancy method	21.7–22.3% (2000) 20.6–21.2% (2001) 20.2–20.7% (2002) 19.3–19.6% (2003) 17.6–17.6% (2004) 17.2–17.3% (2005) 16.3–16.5% (2006) 14.6–15.0% (2007)
National Institute of Statistics	Labour input method	18.1% (2000) 15.4% (2003) 16.6% (2005) 20.0% (2007) 21.3% (2009) 23.5% (2010)
Andrei, Ștefănescu, Oancea	Monetary method	25–35% (2000–2009)
Schneider, Buehn and Montenegro Medina and Schneider	The MIMIC approach	34.4% (2000) 30.5% (2005) 26.8% (2010) 29.1% (2012) 24.0% (2013) 28.0% (2015) 27.6% (2016)
Alexandru and Dobre	Currency demand approach Vector Error Correction Models (VECM)	36.5% (2000) 34.23% (2003) 33.6% (2005) 32.1% (2008) 31.6% (2010)

Source: Popescu, Davidescu, Huidumac (2018)

After analysing the approaches used to measure the shadow economy in Romania, there can be noted discrepancies among the outcomes of the different approaches. Thus, the Currency demand approach and Vector Error Correction Models give the highest shares of shadow economy in GDP (32,1% in 2008), while the income discrepancy method presents relatively lower data of about 15% in 2007. It is worth mentioning that data after 2010 is available only from the MIMIC model.

The size of the shadow economy, together with estimations of tax evasion has been analysed in Romania for the period 2000–2017 by Dell’Anno and Davidescu (2019). The MIMIC model has been used for the estimation of the size of the shadow economy, while the currency demand approach was tackled for the assessment of tax evasion.

The most recent valuable research has been done by Popescu, Davidescu and Huidumac (2018), who have combined several methods such as surveys and MIMIC model. A random stratified sampling has been used in order to assure the national representativeness for companies with more than five employees, while 420 respondents were interviewed based on the computer-assisted web interviewing (CAWI) method. The questionnaire contained information related to the firms’ attitudes regarding the level of

satisfaction with the National Agency for Fiscal Administration, the government's tax policy, business legislation, tax evasion, bribery, government aid for entrepreneurs, tax morale, opportunities in the business environment, barriers in the business environment, and the main obstacles in starting a business. All the findings have been incorporated in the MIMIC model, with the main drivers of shadow economy being the unemployment rate, the self-employment rate, part-time employment, and government effectiveness. The shadow economy was reflected in the rise of currency ratio and the labour force participation rate. Thus, according to the researchers, at the beginning of 2000, the size of the shadow economy in Romania registered the value of 34% and followed a declining trend, attaining almost 29.4% by the end of 2008, which was considered the start of the economic crisis in Romania. As a consequence, the shadow economy increased to almost 32.3% in 2010. Until the beginning of 2011, the size of the shadow economy decreased slowly, and was at 27.7% at the end of 2016. From the beginning of 2017, due to the modifications brought to the Labour Code and Fiscal Code, and also due to the political instability and the increasing lack of trust in public officials under the perspective of a future "Tax Revolution" (implying the transfer of contributions from employer to the employee), a reversal of the trend can be highlighted: the size of the shadow economy following an ascendant evolution, registering an increase with more than 1 ppt. in the second quarter of 2017 (28.6% of official GDP) (Popescu, Davidescu, Huidumac, 2018).

Romanian experience in assessing the shadow economy can represent a good practice for the Moldovan researchers, as the most recent methods used are in line with the EU standards of evaluation of this phenomenon. Being a neighbouring country of the Republic of Moldova and due to the existence of common history and language, taking the good practices of Romania would increase the Moldovan researchers' capacities in developing a relatively accurate analysis and forecast of the shadow economy in the Republic of Moldova.

Shadow economy in Ukraine

Assessment of shadow economy in Ukraine has been done by a series of researchers like Vinnychuk and Ziukov (2013) who mentioned that a tendency of reducing the level of shadow economy has been observed in the recent years in Ukraine. The model used in assessing the phenomenon is the legal and shadow economies interaction, which is considered one of the simplest models of functioning of legal and shadow economies. They are connected with the economic structure of society, when it refers to the distribution of citizens, their families, etc., for liquid accumulation (savings) in cash and securities that are convertible into cash quickly. In the simplest case, the aggregate economy that produces a single aggregate social product can be considered. The experiments with the model show that the emergence of the shadow economy slows down the income growth of workers. The delay of this growth reflects the typical economic slowdown, and its duration is directly related to the shadow exchange. The emergence of the shadow sector in transition economies also strongly affects the financial position of highly skilled professionals, for whom there is no employment in the informal labour market. In addition, the experiments with the model show that only a complete economic revitalization reduces the shadow sector (Vinnichuk, Ziukov, 2013).

At the same time, the role of public institutions and NGOs is very obvious in assessing the size of the shadow economy in Ukraine, taking into account that there are considerable differences in terms of outcomes of both types of organizations.

Thus, according to the recent data provided by the Ministry of Economic Development and Trade of Ukraine (2019), shadow economy decreased in size during 2018 and now stands at below 30 per cent of GDP, the lowest figure in 10 years. The made

calculations are based on the model of estimating the size of shadow economy developed within the Ministry. The highest share of shadow economy, 40 per cent, was recorded in the financial services sector, although the figure decreased by 10 per cent compared to 2017. Other notable decreases were recorded in the mining sector (8%), trade (5%) and real estate (4%). At the same time, shadow economy in population expenditure and retail turnover fell by 2% to 46%, while the number of loss making enterprises showed a 4% drop (to 18%).

On the other hand, contradictory data is presented by the Kyiv International Institute of Sociology (2019). Research was carried out based on the survey method and 800 owners and top-managers of companies over all Ukraine except AR Crimea and temporary occupied NGCA of Donetsk and Luhansk oblasts have been interviewed. The main results present that the size of shadow economy in 2018 accounted for 47.2% of the total GDP and 46.8% in 2017. The most shadowed economy sectors are Retail and Construction, where shadow economy outreaches 50%, but despite other sectors, only here the size of the shadow economy decreased from 2017 to 2018. At the same time, analysing the three components of the shadow economy: underreporting of business income, underreporting of real number of employees and underreporting of real value of paid wages, or “Envelope wages”, there can be noted that the largest part in the shadow economy in 2017 and 2018 is taken by the unreported business income, though its share has diminished from 60% to 57%. The following one is unreported employees, whose share left without changes during two years 2017 and 2018, while the third component is the smallest among others but in contrast with them, its share grew significantly from 18 % in 2017 up to 21% in 2018.

Thus, Ukrainian example of assessing the size of shadow economy demonstrates that the survey method tends to present higher figures than the statistical ones, as it is based not only on statistical data, but also on direct interviews with respondents, which are the first source of information and provides data about the structure of the shadow economy. At the same time, it is worth mentioning that results from these kinds of surveys are very sensitive to the way the questionnaire is formulated.

7. Conclusions

Elements of the shadow economy, from ancient times, are present in any type of economic organization and economic activity, in different forms and with a different ratio.

As a result of the researches carried out, one can mention that most authors define the shadow economy almost identically. The difference lies in the complexity of the notion, as well as the specificity of the economy analyzed by the researchers.

Often, the lack of knowledge of the regulatory environment by the economic agent may shift its activity to the informal sector. On the other hand, a good knowledge and manipulation of legislation can cause subjects to resort to tax evasion or illegal evidence.

The estimation of the shadow economy by quantitative methods represents a major, even eminent necessity, both from a practical and scientific point of view.

From an applied point of view, the experts need to know the real potential of the economy, in order to ensure the sustainability and the economic levers to be applied for regulating the economic cycles. The existing shadow economy, on the other hand, greatly diminishes the visible potential of the economy.

From the scientific point of view, the new approaches in estimating the shadow economy are of major interest, and it becomes necessary to adapt them to the development conditions of the countries. At the same time, the research of the tools applied for estimating the shadow economy generates new methods of evaluation and identifies new factors that determine the shadow economy to be a phenomenon present in all countries.

The analysis of the specialized literature that addresses the problem of estimating the shadow economy indicates that there is not yet a precise method of evaluating this phenomenon. Each method analyzed has its own advantages and limitations. Qualitative methods of analysis, such as surveys or fiscal audit, show a fairly good accuracy at the level of the economic agent or maximum at the branch level. Due to the lack of the quantitative part, the results obtained as a result of applying these methods cannot be extrapolated to the level of the entire economy of a country. On the other hand, from a quantitative point of view, the methodology based on statistics, the discrepancy between expenses and incomes, the method of physical inputs, offers some data at the macroeconomic level, but their accuracy is not maximum, due to the existing limitations.

In order to carry out reliable research, while the result to be as close as possible to the real situation in the economic sector, it is often recommended to use several cumulative methods. Also, a series of more in-depth and comprehensive research on the methodology of evaluating the shadow economy is needed.

Despite of the numerous studies and analysis of data as a result of application of different estimation methods, and the difficult process of data quantification, the real dimensions of the shadow economy are still unknown. Being a complex phenomenon, with different components and requiring diverse approaches, it needs a set of measurement methods and instruments of estimating its size, based on relevant data and indicators, but also taking into the account the specificity of each country.

Data referring to shadow economy in EU member states vary significantly and remain a continuous concern for the national governments, public bodies and civil society. In 2018, as % of GDP, figures begin from 6.72% for Austria and end up with 30.84% for Bulgaria. The most developed EU countries have the smallest shares of shadow economy, while the newly integrated nations still have some backlogs in terms of this issue. At the same time, the continuous decrease of this phenomenon in EU countries demonstrates that diminish of the shadow economy is a task that can be achieved. Practices of EU countries in assessing the shadow economy have demonstrated that regardless of the used method, the outcomes are not accurate for 100%, mainly due to the limitations of each method used.

The Ukraine experience also demonstrates that different approaches such survey or econometric model may result in contradictory results.

Thus, based on the lessons learned from the experience of EU and neighbouring countries, the further research of the topic will be focused on fundamentation of the theory and methodology of a model estimating the shadow economy in the Republic of Moldova in the context of financial stability and taking into account the specifics of the country's economy.

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