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# *Modern Methods of Shadow Economy Assessment*

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***Abstract:*** *Shadow economy is an economic phenomenon and a part of economy from all the states. At present there are many persons involved in shadow economy. This has a negative influence on all the processes that take place in society: decrease in the efficiency of the economic process, distortion of the macroeconomic indicators. One of the main reasons for the existence of shadow economy is the lack of economic interest coordination and of conditions for their creation. The state has to actively oppose shadow economy, influencing, first of all, the creation of the shadow economy relations, which, in spite of their diversity, have a common base – the distortion of the economic relations of society. To highlight these processes and find effective ways to put up resistance, insofar the elimination of economic relations makes it possible, it is necessary to study the development and evolution of the economic and social relations of society.*
***Keywords:*** *shadow economy; assessment of shadow economy; shadow economy indices*

## Introduction

Shadow economy is an economic phenomenon and a part of economy from all the states. At present there are many persons involved in shadow economy. This has a negative influence on all the processes that take place in society: decrease in the efficiency of the economic process, distortion of the macroeconomic indicators. One of the main reasons for the existence of shadow economy is the lack of economic interest coordination and of conditions for their creation. The state has to actively oppose shadow economy, influencing, first of all, the creation of the shadow economy relations, which, in spite of their diversity, have a common base – the distortion of the economic relations of society. To highlight these processes and find effective ways to put up resistance, insofar the elimination of economic relations makes it possible, it is necessary to study the development and evolution of the economic and social relations of society.

This has led to the importance of deeper studies of shadow economy to find viable solutions of reducing the phenomenon of shadow economy and its impact on real economy. This paper analyzes the modern methods of shadow economy assessment and describes the advantages and disadvantages of these methods. The methods of shadow economy assessment can be direct and indirect. The direct methods are based on a survey or the observation of the participants in shadow economy. The calculations, which are used by official statisticians, refer to the indirect methods.

In the assessment, where indirect methods are applied, the data resulted from population surveys are compared with the indicators of consolidated statistics and the non-matching results are considered shadow economy. This is why, the main question for the direct methods stands – whether it is possible to find out the exact level of shadow economy using a survey.

People are not eager to recognize that they carry out illegal activities. They fear that this information will, somehow, get to authorities, as they do not believe in the confidentiality assurance. In this case, the respondents' behaviour can have two options. The first respondents refuse to answer the questions regarding their activity, the rest – "distort" the answers that, in their point of view, disclose their participation in shadow economy. In other words, some avoid the answers, others – "distort" the information. It is hard to tell which the most widespread option is. Of course, we suppose that the most of the respondents honestly answer all the questions of the survey. However, the problem is that the researcher never knows how big the share of these respondents is. The issue gets worse when the surveys are organized under the leadership of official entities. The anonymity, as a method of data collection, is just a partial solution.

This is why the direct questions about people's involvement in shadow economy, are answered in a wrong way. Nonetheless, this does not mean that the subject cannot be studied with the aid of surveys. What is important is that when filling in surveys, people refuse to respond to the direct questions regarding shadow activity. This is the reason why the measurement method of shadow economy can be based on harmless informational data in terms of communication.

## 1. Direct Methods of Shadow Economy Assessment

It is important to highlight the direct method of shadow economy measurement based on the household consumption structure, which involves the respondents as consumers, not as manufacturers or shadow goods' and services' sellers. The consumer does no trespass the law; consequently, he hardly has a reason to hide the true information. Of course, some fear to participate in surveys, to avoid "betraying" friends or relatives whose shadow economy they use. These kinds of studies are beneficial for identifying the degree of so called "social economy" (the exchange of free of charge goods and services between friends, relative and neighbours), which does not refer to shadow economy, but is part of the unofficial economy.

It is well known, that the structure of the household consumption is made up of: handmade goods and services for own purposes (household economy); the free exchange of services in close proximity (social economy or mutual exchange); the selling of the goods and services through acquaintances and unregistered entrepreneur (shadow economy).

Hence, in the structure of the total household consumption we identify those that refer to shadow economy [8, 83]. From this point of view the above described method can be considered the easiest calculation method of shadow sector. Another direct method of shadow economy calculation is the difference between household expenses and incomes, which, also, can serve as basis for the shadow economy assessment. In case of shadow economy assessment based on household expenses and incomes, the researcher is like the man of law, identifying those who live exceeding their legal financial resources.

Of course, a complete overview of unreported incomes cannot be obtained. The citizens do not report all the incomes of household budget. Furthermore, those who actively work in shadow economy are more careful during surveys, refusing to answer or giving wrong information. The shadow incomes are called "mid night incomes". Usually those who participate in surveys are persons with important incomes, while persons with small income are less prone to consider them illegal or immoral, and thus, less careful to hide them. The analysis of the difference between household incomes and expenses is based on two absolutely different research approaches.

The first approach – identifies a household group with an excess of expenses compared to incomes. Knowing the share of this households and the average difference between incomes and expenses we will get the calculation of shadow economy.

The second approach - refers to expenses of certain goods and services, but not to total household expenses. The expenses of the group of people, which are always suspected of shadow activities, but are not related to these activities. Based on the size of the expenses' surplus, self-employees, unlike employees (with the same level of official incomes), have legal trials regarding the share of hidden incomes and, hence, regarding the degree of shadow activity.

The classical realization of the first approach can be found in the papers of the British scientists A.Dilnotsi and K. Morris. They compare the expenses and incomes of the households from Great Britain, thing that allowed the assessment not only of the shadow economy, but also of the social-professional group of its representatives. The households, where the expenses exceeded the incomes with 20% during two weeks, were declared participants of shadow economy. (The criterion of 20% expenses vs incomes was chosen due to the following reasons: the bigger limit identified the households that participated in shadow economy, according to other studies, and this criterion was referred to "unofficial persons", those that, according to other data, did not prove any shadow

activity). Obviously, the number of households involved in shadow economy depends on the size of expenses that exceed incomes, which is considered enough for appearing in this sub- category.

Moreover, the volume of shadow activities, the volume of hidden incomes, is less sensitive to this numeric criterion, thing which was constantly pointed out by A. Dilnot and K. Morris, justifying an unjustified choice of numeric limits, which include the households in the group with shadow activity. But the surplus of expenses over incomes not always can be associated with shadow economy. Some households can consume their savings or live on debts wishing a decent live. There are all sorts of cases when a person earns less than spends and does not have hidden incomes. This is why the scientists highlight the "lowest" and the "highest" limit of the shadow household sub-category.

The "highest" limit is represented by the expenses that exceed the incomes with at least 20% without highlighting the causes. The "lowest" limit refers to the households, whose expenses exceed the incomes, but this thing does not have any other reason but the shadow economy [2, 66]. To determine the structure of the shadow socio-professional households were created coefficients of the participation of different professional groups (employees, full-time or part time employees) in shadow economy. This coefficient is calculated as ratio between the number of identified households and the "shadow group". There is proof that the self-employees have a higher coefficient level than the employees, but less involved in shadow economy are the full-time employees. The qualified and half-qualified activities give higher chances of participation in shadow economy than unqualified activities.

The second approach of differences between incomes and expenses, which uses the same survey data, supposes that the self-employees are more involved in shadow economy than the employees. The main issue about this approach is the comparison between the incomes and the expenses for certain groups of goods and services of self-employees and employees. Having the same level of legal incomes, the self-employees spend, for certain goods, more that the employees, thing which is considered shadow incomes. Knowing the ratio between expenditures and income of the employees, whose income is considered transparent and legal, real volume of income of auto employment can be established. This approach is named "the equality of consumption approach" and when done it has to take into account the following criteria:

- The ratio between the income and expenditure has to be separated, due to the fact that the expenditure for food products is in an increase the higher the income (in order to make these assessments it is only rational to take into account a few groups of products);
- The ratio between income and expenditure influences the number of adults and children in the family, their age, type of property etc. Also the expenditure have seasonal variations and regional particularities (these factors have to be taken into account as independent variables in the description of the model of expenditure);
- The income of the self-employees are unstable that is why the expenditure is less influenced by fluctuations in income, only following the large trajectory on long term. This means that the graphic representation of the ratio of income and expenditure for self-employees will be less steep than that of the employees.

Calculations on different groups of goods made by the M. O'Higgins have attested the under evaluated differentiation of income. Making the average of the weights of hidden income on all the product types, an estimate as of the size of the undeclared income of the self-employees has been established and as a result, the size of the shadow economy. (Self-employees from England in 1982 have not declared for taxing 18% of their income, which constituted a whole 2% of the national income) [1, 217]. In this way the second approach focuses on self-employees and points out the rate of their undeclared incomes, comparing the consumption of other groups of population, the incomes of which are to be considered true. The last declaration is taken as a "hypothesis" on which the whole model is based. The reluctance of the latter is the "choking point" of the approach.

## 2. Indirect Methods of Shadow Economy Assessment

The impossibility to determine the complete breadth of the shadow economy through the questionnaires of consumers has led to the popularity of the, so called, indirect methods. These methods have the intention to avoid the problems of "direct" assessment of the shadow economy,

through the consumption budgets, taking into account doubtful behaviour of the legal economic agents. Indirect methods are based, in large, on the use of economic indicators obtained through official statistic data and data of the fiscal authorities, but these do not exclude the use of specialized questionnaires. Indirect methods for shadow economy assessment are numerous. We will be going through only the most used, more precisely:

- *Monetary methods*, (including "a surplus of money", the circulation of large bills, the ratio between cash and bank deposits, causal methods and transactional ones);
- *Alternative assessment method of the GDP*.

The assessment of shadow economy comes out from the demand in cash, due to the fact that shadow transactions prefer it, in order to avoid inspections. In other words, the assessment of the shadow economy comes from the amount of cash, what cannot be considered the economic activity of the official sector. For the first time at the end of the 50's in the USA, to explain the dynamics of the shadow economy, the demand for cash has been used. The scientist Philip D. Cagan has explained a dire increase in cash, conditioned by need for illegal transactions on the black market. This method gave the most accurate estimates of the shadow economy.

Which of the indicators of monetary mass is used to calculate the shadow economy? Which is the evidence of justification of their correctitude? Depending on the answer to these questions an algorithm to calculate the size of the shadow sector, can be used. We are going to examine the methods, that, in full and creatively that constitute the base ideas and characteristics of monetary approach through which the shadow economy can be estimated.

The method of the phenomenon "*money surplus*" is based on the confirmation that there is too much cash in the flow. The researcher R. Gutman has noticed that the amount of cash in the flow is extremely large. From which consideration did he make this conclusion? Usually we follow the following rationality: the total sum of cash has to be corrected in descending direction (due to the fact that a part of the money is in the flow of the companies), and then it should be divided by population.

For these calculations we have to take into account the share of consumption budget that is paid in cash, and at the same time the cyclic re-supplement of the budget (accepted in the country, the period of salary payment and the cash withdrawal from the banks for current needs). The result is that for a household we have an amount that surpasses their consumption budget.[7, 94]. This shows that they are tied to the shadow economy. The underground economy "the cash lover" explains the phenomenon of "money surplus". Depending on their size and dynamic we could judge the size and modifications from the urban sector. The monetary method "*circulation of large bills*" is based on two observations: on disproportionate increase of the share of large bills and the preference of bills with large nominal for shadow cash flow. This method states that, the more "disproportionate" the increase in large bills, the higher the dynamic of the shadow economy.

The American scientist A. Ross was the first to attract attention to the increase, as compared to smaller bills, in the share of bills with a nominal of 100. In the year 1979, the scientist from Great Britain, D Freud, has sustained this idea about the bills with a nominal of 10 and 20 British Pounds. The monetary method "*ratio between cash and bank deposits*", sometimes is called the R. Gutman method, widely known as an estimate of the shadow economy of the US. In the year 1982 the shadow economy in the US, after R. Gutman, has considerably increased and reached a 15% from the GDP [7, 77].

The same calculations are due to the fact that in the year 1961 the ratio between cash and deposits has started to increase, because the amount of cash was growing faster than the total value of bank deposits. We mention that this event has taken place under financial innovation conditions, when the payment methods replaced cash. This paradox was explained by the researcher as the existence of shadow economy. The try to quantify the shadow activity was based on the assumption that in the years 1937-1941m when the ratio between cash and deposits was least and the shadow economy did not exist.

The "*causal*" method studies cash, but is more prudent in evaluating the shadow economy. The core of this method consists of trying to explain the cash flow with the help of certain factors. This

methodology supports that not all of the increases in cash are due to the shadow economy, but only the ones that are directly linked to the shadow sector. The "causal" method is applied in the form of a regression model. In which the dependent variable is represented by the ratio of cash to bank deposits, and independent variables are illustrated by a large range of parameters, some of which are considered to influence the size of the shadow economy.

The nature of the dependent variable allows considering this method as the continuation and development of R. Gutman's ideas. For the estimates from the causal method, R. Gutman has used the ratio of strict cash to a type of deposit (non-interest-bearing deposits). At the same time the researchers R. Mathews and Tanzi in their calculations, using this method have used all of the deposit types from the banking system of the USA and Great Britain. The conclusion of the researchers on the ratio of the amount of cash and deposits influences both factors of shadow economy and factors that activate the shadow economy. As the independent variables that are not linked to the shadow economy, the total volume of used transactions from the shadow economy and the deposit interest rate were used.

Evidently the first variable influences the ratio of cash over deposits, positively (the increase in transactions leads to increase in cash), and the second variable – in an inverse way (the higher the interest rates for deposits, the more the temptation to increase their volume). For independent variables, that affect the transactions from the shadow economy in the regression expression, the rate of tax, the level of social insurance, including social help (the higher the level of this social help, the lower the incentive to participate in shadow economy), were used. The inability to evaluate quantitatively the risk of detection of shadow activity and the graveness of further sanctions lead to their elimination.

Since the independent variables influence the ratio of cash to deposits only in a certain period of time, the regression equation uses data series. Depending on the regression three determining factors of shadow economy were used: income tax, tax on profit and all types of social help that activate in the field of shadow economy. In spite of the imperfections of the causal method, with its help was determined the scale and dynamics of the shadow economy of Great Britain. The result of the evaluation was impressive. In the year 1980 the shadow economy constituted 16% from GDP, meaning that the employment in the shadow economy sector was more than 1 million of official unemployed. This lead to the famous conclusion, that the unemployment from the second half of the 70s is nothing more than a "statistical illusion". Later R. Mathews with co-authors modifies this approach, using as the dependent variable the cash mass adjusted to inflation, and not the report of bank deposits [6].

The "*transactional*" method deviates from traditional approaches of assessment of shadow economy through the criterion of monetary mass. In base of this method or ideas exposed to the American economist E. Feige [3]. Namely the given method has found a high level of shadow economy in Great Britain in the 60s, which has reached 23% of GDP, decreasing in the 70s to the level of 15% [4].

The author of the method bases on the fact that the product of the monetary mass and the coefficient of rotation is equal to the product of the price index and the total volume of transactions. Basically, the idea to obtain with the help of this equation an independent evaluation of the National Income, and afterwards the result is to be compared with the registered income in the official statistics. The main problem of this approach consists of the fact that the assessment of the level of rotation is difficult. The evaluation of the rotation of money, according to E. Feige, is how many times does a bill of 1 pound, change hands before being taken out of circuit. At the same time he assumes that the speed of rotation in shadow economy is 10% higher than in the official economy.

At the same time, the researcher understands the vulnerability of his arguments, assuming that the estimate of the shadow economy in these calculations depends a lot on the hypothesis and his assumptions. Without thorough examination of these hypotheses it is difficult to accept the obtained results. We remark that the evaluation of the shadow economy through E. Feige's method surpasses the estimates made by P. Gutman almost twice [5].

It is well known that the GDP can be calculated via three different methods:

- Income method – all incomes that originated from production are added;
- Expenditure method – the expenditures of the population and of the state are added with the investment and the net surplus, resulted from external commerce;
- Value method – the value added is summed at each production process stage, from supply to the final product.

In theory using the same price scale, all these three methods should offer a value of the GDP.

The expenditures for goods and services purchase, for the economy as well as for the consumption, have to be equal to the volume of the production costs, as well as the income of the incomes implicated in the production and its realization.

But in practice, these approaches offer different quantitative estimates of the GDP. Each algorithm, takes into account, just a part of the information about income, expenditures or production. The approaches differ from the degree of approximation of the official statistics to its real value the factors that lead to the distortion of the information differ as well. Doesn't matter the approach a part of the economic activity is lost from examination. And, above all else, that part is hidden by the economic agents from the state control. In this way the shadow activity of the firms does not enter in its activity report, as a result the value of the GDP will be incomplete. At the same time each undeclared income leads to the detraction of the GDP, determined by the income method. It is important that all three methods encounter different difficulties in determining the GDP.

The evaluation of the shadow economy as a difference between the expenditure method and the income method is an estimate of the GDP that is based on the presumption that the value of the expenditures in correct, and the income one is faulty. The discrepancy between the income and expenditure assessment from GDP, shows which of these contains more detraction of the GDP. Therefore, the divergence zero or the excess of income over the expenditure estimates of the GDP are rather compatible with a high level of shadow economy.

Another method of determining the size and dynamic of the shadow economy is based on a comparison of demand that reflects the current consumption, and stocks, and supply that reflect the production of goods. In the calculation of the offer first we introduce the internal production, as well as goods imports. And as the demand we take into account the household consumption and that of the state enterprises, investments, stocks and at last the export.

In a country with a stable market system, with demand and supply in a balance, the distraught of such for the economy as a whole, usually, is rather small. And in the case of comparison of groups of goods and services, the distraught between the supply and demand can be rather significant. In this case it is possible to find both the positive and negative result of the distraught. Specifically, this distraught between the supply and demand, their sectorial diversity, tries to interpret this sectorial specific of the shadow economy. This is why this method is based on the hypothesis that the demand includes all consumption, including the ones of doubtful nature, and the supply establishes only the formal production.

## Conclusions

As a conclusion we can state that none of the described methods is perfect and does not give full information as of the size of the shadow economy. Each method has its advantages and its flaws. As an advantage of the direct method of measurement of the shadow economy basing on the structure of household consumption, we can mention that this identifies not only the absolute cost, but the relative one as well. At the same time it determines not only the global estimate of the shadow economy, but a more detailed one, according to the range of offered benefits. As a disadvantage of this method we could name that it under-evaluates the volume of shadow production, the evaluation of shadow economy on the basis of expenditure analysis is incomplete, due to it being possible to examine the budgets of different social categories. Another direct method of measurement of shadow economy –

*the distraught between expenditures and income of the households* identifies the model of the shadow economy from the socio-professional point of view.

*Indirect methods of assessment of shadow economy* have pointed out that the majority of goods and services in the shadow economy are paid cash due to the low prices for this type of transactions. The *transactional* method is based on the hypothesis that there is a strong relationship between shady transactions and cash transactions. The statistic shows us that the share of payments in cash is related to its weight. A large portion of transaction in legal economy is paid in cash, including in countries with a developed system of payments via transfer. Not to forget the fact that a large part of the population receives their salary in cash. Of course the shadow economy in payment for transactions made can manage without cash, this is well illustrated by barter type transactions. Evidently that barter is not the only mechanism of shadow transactions. Shadow economy can use payment via transfer, as well.

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