

International Experience of Statistical Assessment of the Shadow Economy

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Abstract

The article analyzes the basic approaches to the definition of the shadow economy and deals with the statistical approach as the most suitable for exploration of the international experience of evaluation of the shadow economy. According to the methodical specifications of the study of the shadow economy, three large groups of countries are defined and the main features of the international statistical assessment of the shadow economy are investigated. In obedience to these features, the priority ways of modernization of international assessment of the shadow economy is proposed

Keywords: Eurostat, illegal economy, informal economic activity, international comparison, shadow economy, underground economy

Introduction

The important factor of successful formation of economic strategy is complete and accurate assessment of the macroeconomic indicators. But the part of economic activity is non-observed for official statistical services. This problem leads to misreporting of main macroeconomic indicators that characterize countries' economic activity. The large part of this non-observed activity is the shadow economy. So the important problem for official statistical services is the creation of fundamental organizational and methodical principles for effective assessment and international comparison of the shadow economy's sizes as well.

The amount of literature about the international comparison and quantitative measurement of shadow economy's sizes all over the world is increasing. Among the various publications the most significant researches should be mentioned. I. Mazur in (Mazur, 2006) traced the main ways of development of shadow economy's measurement in different countries; Y. Shyriaeva in (Shyriaeva, 2009) systematized international experience of evaluation of illegal economic activities; F. Schneider in (Schneider F., 2004) and (Schneider, 2011) analyzed the sizes of shadow economy in various countries using alternative methods. The theoretical and methodical aspects of the assessments of shadow economy all over the world is highlighted in (Measuring the Non-observed economy, 2002) and (Non-observed economy in national accounts, 2008). Although these publications have significant influence on development of statistical estimation of shadow economy across countries, there is no system approach to the research of this problematic.

Despite the difficulties in quantity measurement of

this phenomenon, there are many methodologies and approaches to solving the problem in various countries of the world. But the problem lies not only in the sphere of methodology but even in terminological area. Thus, there are more than 40 denominations of the term "shadow economy" such as "unofficial", "unrecorded", "unreported", "hidden", "concealed", "invisible", "submerged" (Mazur, 2006, p.30) "subterranean", "second", "secondary", "alternative", "clandestine" (Van Eck, 1987, p.4), "non-observed" (Measuring the Non-observed economy, 2002, p.44). Such situation is explained by the geographical reasons and research goals of the scientists. Thus, such term as "subterranean economy" is used by French researchers, Italian scientists prefer application of such denominations as "clandestine" and "underwater" economy, German - "shadow economy". According to the goals of the research, scientists use three main approaches to the definition of the shadow economy: legal approach (A.Dilnot, C.Morris, F.Leeuw) defines the shadow economy as illegitimate type of economic activity (Dilnot & Morris, 1981), (Leeuw, 1985); by economic approach, (V.Patrizi, J.Arvey, A.Vertes, F.Schneider, I.Mazur) the shadow economy includes all market-based legal production of goods and services that are deliberately concealed from public authorities (Arvey J., 1994), (Patrizi, 1990, p.14), (Schneider F., 2004, p.8), (Mazur, 2006, p.43); statistical approach (D.Blades, P.Gutmann, E.Feige, B.Contini) studies the shadow economy as all types of economic activities that are not included in Gross Domestic Product (GDP). (Blades, 1982, p.10), (Contini, 1993, p.21), (Feige, 1979), (Gutmann, 1977) To sum up, the study and systematization of world experience of the shadow economy's statistical assessment is necessary conditions for creation unified

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quantitative measurement of this phenomenon.

The main purpose of the article is to analyze international experience of quantitative evaluations of shadow economy's sizes and define priority tendencies of modernization of statistical methodology in various countries.

The main task of the following research is:

- to define and justify the most suitable denomination of the shadow economic activities;
- to study, analyze and resume the international experience of statistical assessment of the shadow economy;
- to determine the priority ways of modernization of international statistical assessment of the shadow economy.

Results of Research

Firstly, we should define the denomination of the object of our research used in the article. The activity that we study is carried out on the similar basis and principles as the official economic activity. The main differences between these two spheres are occurrence of an effort of the non-official economy's agents to avoid state control. "The great explanatory dictionary of the contemporary Ukrainian language" treats the term "shadow" as "the place covered by something from sun beams, moonlight or other source of light". Based on this definition, we can identify state administration as light source and light as state control. So, in our opinion, "the shadow economy" is the most suitable denomination for our research object. We should also mention that in our research, we use the statistical approach to the definition of the shadow economy, as this approach reflects the substance of the shadow economy more

completely than other approaches.

Countries used a variety of data sources for the estimation of shadow activities. Several sources are quite common amongst countries, such as agricultural census, business statistics, household surveys, demographic data census, Labour Force Survey, taxation and fiscal data, police records, social security records and foreign trade statistics. Some sources are used only in one or a few countries; particularly, they capture a specific activity (e.g. smuggling of tobacco). Other sources like Labour Force Survey and employment data, structural business surveys, household budget surveys, and taxation data are widely used by countries. Countries also used a wide variety of methods to estimate the shadow economy. The following methods can be mentioned: the labour input method, commodity flow method, balancing input-output and supply-and-use tables, other reconciliation methods (e.g. comparison of theoretical VAT and actual VAT, theoretical income tax and actual income tax), comparison with norms, use of fiscal data and special surveys.

To address the differences in concepts, definitions and methods employed in accounting for shadow economy in the countries' statistical service of European Union (Eurostat), two rounds of Pilot Projects on Exhaustiveness (PPE) have been carried out. The term "non-observed economy" is used in both Projects. The first one was conducted in 1998-1999. A tabular framework that relates to the shadow economy areas with statistical problems encountered by national accountants was designed by Eurostat to facilitate comparison across countries and to improve exhaustiveness. In this PEight types of non-observed economy (T1-T8) were identified (figure 1).

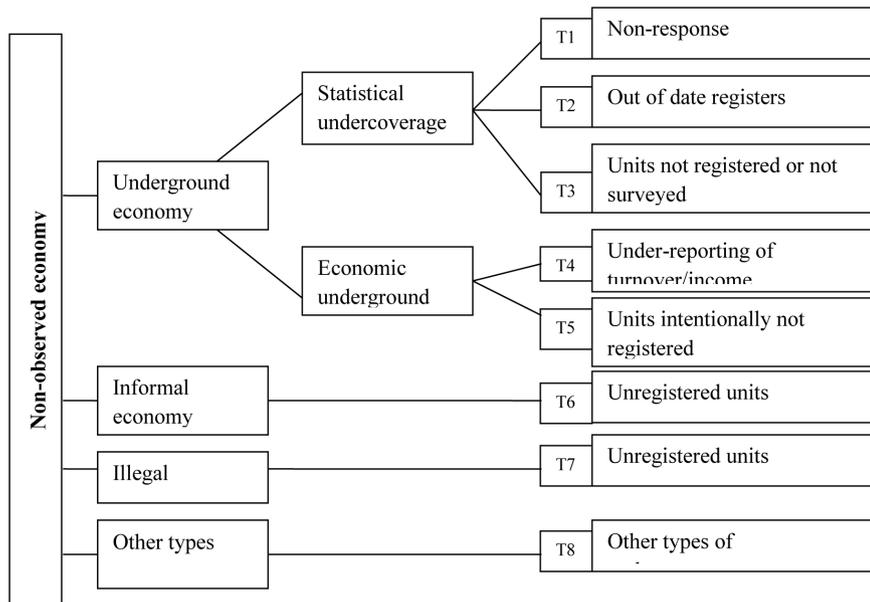


Figure 1. The T1-T8 Framework Source: Created by the author on the basis of (Measuring the Non-observed economy, 2002, p.84)

The T1-T8 framework broadly categorizes the shadow economy problem areas as statistical undercoverage, economic underground, illegal production, informal sector and other types of deficiencies. The eight categories under this broader framework are of the following types:

T1 - Non-response – undercoverage arises due to non-response to statistical questionnaires or non coverage of active units in administrative files. This may be attributable to the time required to complete questionnaires, belief that information will be used for other than statistical reasons and poorly designed questionnaires.

T2 – Out of date registers – undercoverage occurs due to units missing from statistical registers or out of date registers that may contain incorrect information.

T3 – Units not registered or not surveyed - undercoverage results from non-coverage because of established thresholds for registration, non-coverage of certain activities, exclusion of newly created units and due to the disappearance of units in the course of the year.

T4-Under-reporting of turnover/income - enterprise owners may intentionally under-report gross output or over report intermediate consumption to evade income tax, value added tax or other such taxes or to avoid meeting social

security obligations.

T5 - Units intentionally not registered - units may not be covered because they are intentionally not registered to avoid tax payments or social security obligations. This could apply to both the entire enterprise or parts of it.

T6 - Unregistered units - units may not be required to register due to their small-scale in production (typically household units) such as agricultural production for own use in non-agricultural households, non-agricultural production in households for own use, own account construction, occasional and temporary activities and work on service contracts.

T7-Unregistered units - production units do not report or register their illegal activities.

T8-Other types of undercoverage - undercoverage in this residual category can arise due to several reasons but frequently stem from production for own final use, tips, and wages and salaries paid in kind. (Measuring the Non-observed economy, 2002, p.85), (Prylyko&Kharazishvili, 2011, p.41)

A second Pilot Project was conducted in 2002-2003. The classification was modified to clarify the boundaries between the different types. Seven types of non-exhaustiveness were identified (N1-N7) (figure 2).

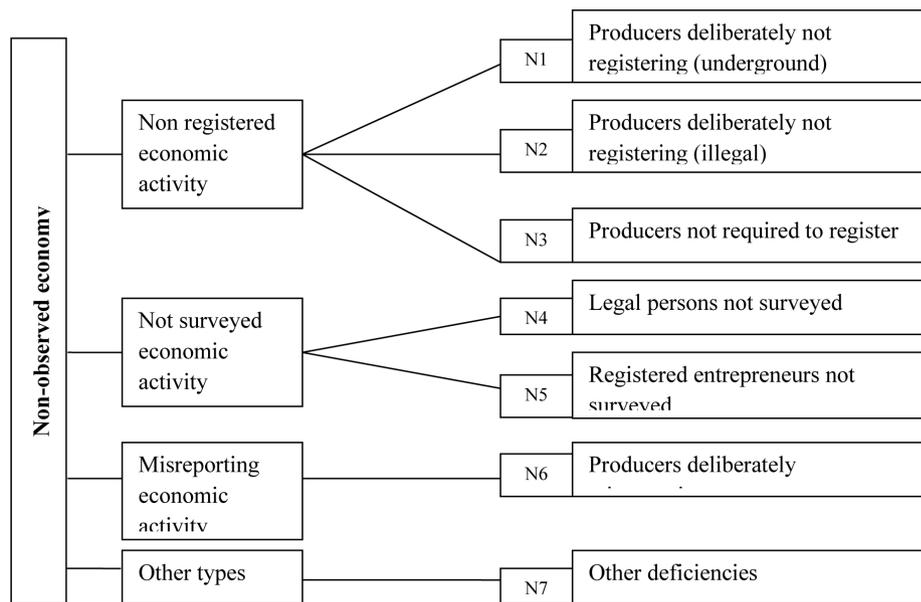


Figure 2. The N1-N7 framework. Source: Created by the author on the basis of (Non-observed economy in national accounts, 2008, p.7).

The main difference between the two classifications is that while the T1-T8 framework relates the non-exhaustiveness types to the shadow economy problem areas, the N1-N7 framework is based on subdividing the producers according to their potential for non-exhaustiveness. The seven types under this new framework can be broadly classified into the four categories of: not registered, not surveyed, misreporting and other deficiencies.

N1 - Producer deliberately not registering – underground - producer deliberately does not register to avoid tax and social security obligations. Most often this refers to small producers with turnovers that exceed threshold levels above which they should register. Producers that do not register because they are engaged in illegal activities fall under type N2. Type N1 does not include all underground activities, some of which are associated with type N6.

N2 - Producers deliberately not registering – illegal - producer deliberately does not register as a legal entity or as an entrepreneur because it is involved in illegal activities. Type N2 excludes illegal activities by registered legal entities or entrepreneurs that report (or misreport) their activities under legal activity codes.

N3 - Producers not required to register - producer is not required to register because it has no market output. Typically these are non-market household producers that are engaged in the production of goods for own consumption, for own fixed capital formation, and construction of and repairs to dwellings. Or, producer has some market output but it is below the level at which the producer is obliged to register as an entrepreneur.

N4 - Legal persons not surveyed - legal persons are not surveyed due to several reasons such as: the business register is out of date or updating procedures are inadequate; the classification data (activity, size or geographic codes) are incorrect; the legal person is excluded from the survey frame because its size is below a certain threshold etc. This leads to (systematic) exclusion of the legal person from surveys when in principle they should be included.

N5 - Registered entrepreneurs not surveyed - registered entrepreneurs may not be surveyed due to a variety of reasons: the statistical office does not conduct a survey of registered entrepreneurs; the registered entrepreneur is not in the list of registered entrepreneurs available to the statistical office, or if available, is systematically excluded from it; the registered entrepreneur is not in the survey frame because the classification data (activity code, size code, geographic code) are incorrect.

N6 - Producers deliberately misreporting - gross output is under-reported and/or intermediate consumption is overstated, in order to evade income tax, value added tax (VAT), other taxes, or social security contributions. Misreporting often involves maintenance of two sets of books, payments of envelope salaries which are recorded as inter-

mediate consumption; payments in cash without receipts, and VAT fraud.

N7 - Other statistical deficiencies - type N7 is subdivided into N7a - data that are incomplete, not collected or not directly collectable, and N7b - data that are incorrectly handled, processed or compiled by statisticians. The following areas should be investigated: handling of non-response; production for own final use by market producers; tips; wages and salaries in kind; and secondary activities. (Shyraieva, 2009)

The main aim of the two frameworks was not to provide a definitive classification of types of non-observed economy but to ensure that the shadow economy is measured systematically, all potential areas are covered and no activities are double counted. When countries use the same framework, comparison of the shadow economy can be made at a more detailed level. It is also easier to ensure the exhaustiveness of methods and to exchange experience in their implementation. But only several countries in the world use the frameworks recommended by Eurostat. In general, three major groups of countries can be identified in respect to their approach towards measuring the shadow economy:

- the countries rigorously following the Eurostat Tabular Framework (e.g., Bulgaria, Turkmenistan, Czech Republic, Croatia, Ukraine);

- the countries that have a thorough and systematic approach to ensuring exhaustiveness of National Accounts but do not (regularly) measure the shadow economy as such (e.g., USA, Canada, Lithuania);

- the remaining countries have different approaches:
 - using its own framework and methods: Italy (Italy is a pioneer in measuring shadow economy and a lot of methods and approaches used in other countries are based on the so-called Italian approach);

- focusing on measuring the non-observed activities in specific branches (often via special surveys) but not using a comprehensive framework; the measurement is not often linked to ensuring exhaustiveness of national accounts (e.g., Mexico, Turkey, Georgia);

- focusing on informal sector and informal labour, mainly using the labour input method (e.g. Albania, Brazil).

Bulgaria, Turkmenistan, Czech Republic, Croatia, Ukraine are related to the first group of countries. Since the evaluation methods of the shadow economy of these countries are very similar, it makes no sense to characterize each country. The best example for description of estimation methods of the shadow economy of this group of countries is Turkmenistan's experience in this sphere.

By 2002, the National Institute of Statistics and Forecasting of Turkmenistan included only informal and illegal economic activities in shadow economy. But today according to Eurostat recommendations, seven groups of shadow

economy are studied. The first group (N1) - underground economic activity of unregistered entities is measured by comparing household survey data, transport, trade, investment, social and demographic statistics, market research and labor surveys. Illegal production of alcoholic beverages, illegal fishing and illegal medical services belong to the second group (N2) - illegal economic activities of entities are unregistered. Assessment of the illegal production of alcoholic beverages and fishing is based on the balance method. The difference between the consumption of these products (according to household surveys) and their official production (according to surveys of enterprises) is estimation of sizes of these activities. Cost of illegal medical services is estimated on the basis of special anonymous surveys. The third group (N3) - economic activities of entities that is not necessary to register, including the production of households for own final use and for sale (costumes, carpets, bakery). Measurements of this type of economic activity are based on data from special surveys, statistics of households, prices, and socio-demographic statistics. The fourth (N4) and fifth (N5) groups - activities of legal persons, which are not surveyed by the official statistics, and economic activity of registered entrepreneurs, which is not surveyed by the official statistics and doesn't exist in Turkmenistan because the whole totality of legal persons and entrepreneurs is covered by statistical research. Estimation of the sixth group of shadow economy (N6) - economic activity of entities which deliberately distort reporting data - is based on the results of tax audits for certain areas. Detected differences between these results and official statistical data are applied to the totality of economic units. Seventh group (N7) is presented by economic activity, the data of which are not fully reflected in official statistics because of a lack of statistical observation. Measurement of this activity is carried out by identification of differences between registered businesses and enterprises, which are reported in official statistics agencies, in the calculation of the coefficient of "active" companies by dividing the number of firms that report into the number of registered enterprises and adjustment of key performance indicators (production, value added ones, etc.) multiplying these figures by a factor of "active" companies.

United States of America, Canada and Lithuania are bright representatives of the second group of countries. Statistical measurement of the shadow economy of the United States is characterized by focusing on the study of hidden economic activities with the purpose of tax evasion. No special statistical techniques are used to quantify the sizes of illegal and informal economic activities through their small share in gross domestic product of the country. U.S. official statistical service includes sizes of hidden economic activities in the national accounts without breaking this activity into subtypes. Evaluation of hidden activity is based on special studies of tax returns. Identified differ-

ences between these special studies and data of the official statistics are used in the estimation of the sizes of the hidden activity in the U.S.

Statistical methodology for the quantitative measurement of the shadow economy of Canada also has certain features. In 1994, the Statistical Service of Canada published a study that contained the data about the large sizes of hidden activity connected with value added tax evasion. Since then, the official statistical agencies of Canada haven't made any estimates of the shadow economy. But "Guidelines on measuring the economy, which is not directly observed," published with the support of the OECD in 2002, was the impetus for Canadian statistics authorities to begin the process of improvement of statistical study of the shadow economy of Canada. The main steps of the methodology of measuring and evaluating shadow economy were:

- Creation of the analytical basis of research in this sector, which is concentrated on the identification of economic activity that is hidden so as to evade taxes, social contributions and mandatory administrative procedures, on the study of the production, distribution and possession of non-legal goods and on the assessment of the informal sector which includes the economic activity of enterprises, which are not the objects for mandatory registration;

- improvement of the statistical data collection.

In the process of shadow economy's research, the statisticians of Lithuania concentrate their attention in the study of the underground sector (enterprises' income misreporting). Estimation of underground economy in Lithuania is based on opinions of experts from the State Tax Inspectorate and data obtained from Labor Force Survey. Also as a secondary research official statistical services of Lithuania analyze and assess illegal sector of economy and cover the following activities:

- illegal production and sales of alcoholic drinks;
- production and sales of drugs;
- sexual services;
- sales of stolen cars;
- production and sales of illegal copies of audio, video and other recordings as well as computer games.

A bright representative of the countries, whose exploration of the shadow economy is based on their own methodology, is Italy. Italian National Institute of Statistics was one of the first statistical services that began to develop an effective approach to the quantitative measurement of the shadow economy. At the beginning of 1990, the analytical framework was established and a method of estimating the shadow economy was introduced by this institute, with the support of the European Commission. Under this analytical framework, shadow economic activity is divided into three groups: economic activity of unregistered units, not surveyed economic activity and economic activity data of which is distorted. Special estimations of illegal sector are

not included in the national accounts of Italy. So according to the Eurostat analytical basis, Italian National Institute of Statistics measures the sizes of not shadow but hidden economic activity. For these purposes a special approach is used. It contains procedures such as carrying out the surveys that can measure the value of unregistered employment, decrease of enterprises' income distortions by adjusting output per capita and checking consistency of aggregate economic performance through comparison of resources and their use in industry. The first two components of the approach to the assessment of hidden economic activities in Italy are the basis of so-called method of labor costs. The main steps of this method are: the measurement of labor costs in terms of sectors and sizes of business as a result of enterprises' survey and as a result of surveys of household labor force or other sources of demographic data, calculation of productivity and value added per unit of labor costs for each sector and enterprise-class and multiplying these figures by the quantity of labor costs in terms of sectors and sizes of business. These indicators will reflect real output and value added created in the economy. The difference between these indicators and reporting data of companies can be characterized as the sizes of hidden economic activity. (Schneider, 2011, p.22)

Among the countries that are focusing their researches on the certain areas of the shadow economy, we should mention such states as Turkey, Mexico and Georgia. Despite on the relatively high level of statistics in Turkey there isn't any complete, detailed and systematic measurement of all components of the shadow economy. Calculation of the shadow element in industry and agriculture is based on differences between the number of employees received as a result of labor force survey of households and business surveys. This difference is multiplied by the average value added per worker. Shadow added value produced in the trade and transport sectors of the Turkish economy is analyzed by the comparison of trade and transport margins for manufactured and imported goods. Data about the sizes of the informal activity is accumulated from a special survey of the informal sector, which has been held in Turkey since 2000.

In Mexico, the measurement of the shadow economy is carried out by performing a satellite account in the system of institutional accounts, which represents the volume of informal economic activities of households. This account also includes the sizes of the illegal economic activities (exceptions are production and distribution of drugs, illegal copying of intellectual property, selling and transporting goods prohibited by law, unlicensed medical activity). Sizes of hidden economic activities of enterprises are not included in this account.

For measuring shadow economy, Georgian statistical services use comparison of employment data from regular surveys of enterprises and data from the Labor Force Sur-

vey. The comparison is carried out by the type of activity. Also statisticians conduct special surveys such as survey of the tobacco consumption, survey of restaurants, cafes, bars and other similar establishments, survey of the construction activities, survey of health care services, survey of educational services, survey of supply and use of tobacco goods, TV sets and other consumer commodities.

Representative examples of countries whose statistical authorities concentrate on the study of informal economic activities as part of the shadow economy are Albania and Brazil. The process of establishing the methodology of quantitative measurement of the shadow economy of Albania can be divided into two stages. The first stage lasted from 1993 to 2003. During this period, Albanian Institute of Statistics used the expert approach for estimation of the shadow economy. But this approach had significant limitations due to the large share of subjectivity in assessments. As a result, since 2004 Albania's Institute of Statistics and the National Institute of Statistics of Italy have been collaborating in order to introduce "labor approach", aimed for quantitative measurement of the shadow economy of Albania. This approach involves three major steps. The first step is carrying out two basic surveys: structural business survey and survey of living standards in order to obtain the number of the employed population. The next step is calculation of the value added per employee based on data obtained from structural business survey. The last step is multiplying the value added per person employed by the excess of the number of employees obtained from the survey of living standards over the number of employees, obtained from structural business survey. The indicator calculated in such way characterizes the size of the shadow economy.

Statistical study of the shadow economy of Brazil is based on a comparison of the number of employees, collected by the National Survey of households with the number of employees, received during the Economic Census. If the number of employees according to the Survey exceeds the number of employees according to the Economic Census, the difference multiplied by the gross output per employee will characterize the sizes of shadow economy.

Thus, different countries use different approaches for quantitative measurement, analysis and evaluation of the shadow economy. Therefore, the international comparison of this phenomenon becomes not only complicated but even impossible in some cases. The imperfection of theoretical and methodical base and its practical application can be well-illustrated by the example of the Ukraine. In this country, there are two official methods of measuring the shadow economy: methodic of State Statistical Service of the Ukraine and the methodic of Ministry of Economy of the Ukraine. The first methodic is based on the Eurostat's framework T1-T8 and the other is using the system of alternative macroeconomic methods to assess the size

of Ukrainian shadow economy. Despite two existing methodologies, evaluation of the Ukrainian shadow economy lacks accuracy and adequacy. Such situation can be confirmed by figure 3.

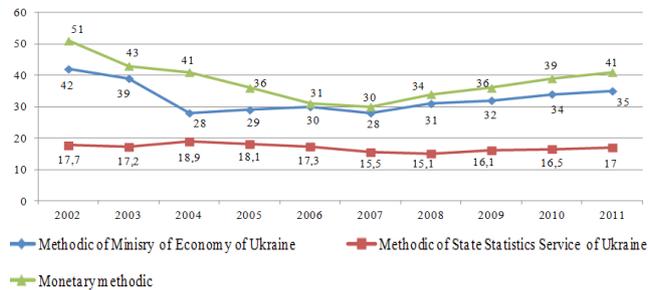


Figure 3. The sizes of shadow economy of the Ukraine measured by methodic of State Statistical Service of the Ukraine, methodic of Ministry of Economy of Ukraine and Monetary methodic in the period of 2002-2011, % to GDP

Source: Created by the author on the basis of (Ladyuk&Ogreba, 2012).

According to figure 3, it can be seen that two official methods of measuring shadow economy give not only different sizes of phenomenon being studied but even multi-directional tendencies. Such difference can be caused by political underreporting, methodical superficiality and data incoordination. To compare the adequacy of official data of shadow economy in the Ukraine, we have defined the size of the country's shadow economy using monetary methodic that is the most popular and widespread approach in Europe. According to our independent calculations, the sizes of shadow economy in the Ukraine measured by official services is understated and the most disappointed fact is that the largest deviation is showed by methodic of State Statistical Service of the Ukraine that is based on Eurostat's Recommendations. This fact stands for that the formal implementation of international standards doesn't guarantee the objective and accurate assessment and adequate international comparison of the shadow economy. So if the sizes of the shadow economy can't be compared objectively between countries that applied international recommendation in their practice, the adequate comparison of indicators of shadow economy between other countries is very doubtful. Therefore the process of unification of shadow economy measures needs further improvement in theoretical, methodical and organizational aspects.

Conclusion

Thus, as the different countries use various methods to measure the shadow economy, it is difficult to analyze the sizes of this phenomenon not only in the spatial sense, but also in the dynamics. Since the assessment methodology of the shadow sector is constantly improved, the tendency of decrease or increase in size of economic activity that is not directly observed in a particular country may depend both

on the results of economic activity and changes in methods of estimation of the shadow economy. Eurostat Recommendations were the first steps toward a unified approach to quantitative measurement of the shadow economy, and every year more and more countries are using developments of European statisticians to improve the assessment of this phenomenon. But unfortunately application of these improvements is not enough for adequate and accurate estimation of shadow economy, as it can be seen by example of the Ukraine. The process of unification of shadow economy's assessment should be further modified to create the international statistical system of measurement and analysis of the shadow economy and to develop an effective strategy for identifying and overcoming its negative consequences. For this purpose we propose the following ways of modernization:

1. Definition of priority ways of estimations: improvement of the current assessment of the shadow economy and provision of the exhaustiveness of the GDP calculations; maintenance of the analysis of the shadow economy by sectors of economy; focusing on the assessment of the underground, but not forbidden by law activity; improvement of the methods of the informal sector's evaluation.

2. Modernization of the data base: development of the entity's registration directed to the full exhaustiveness of units; realization of the program of the Economic Census; study of the indicative types of economic subjects; improvement of the Labour Force Surveys; conduct of the special sample surveys; formation of the data base for using the indirect methods of the quantity evaluation of the shadow economy.

3. Implementation of the most effective methods of calculations: goods flow method, system of the agricultural balances, combining the various methods of calculations expanding the alternative evaluation, application of the mathematical models with adding of the micromethods.

4. Increase of the analytical value of the calculations.

And the most serious and effective step that should be implemented in practice is the creation of the international database of the shadow economy's sizes. This database should include not only general measurements of this phenomenon but methodical, theoretical and organizational basis of estimation of shadow economy in each country, substance and quantitative indicators of shadow economy's structural components. Only the sufficient coordination between countries all over the world will lead to the solving the problem of the measurement and international comparison of shadow economy's sizes.

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