

Differential Methods of Measuring the Non-Observed Economy as a Unified System of Calculation of the Indices of the Hidden and Informal Production

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Received: December 27, 2014 Accepted: February 19, 2015 Online Published: April 30, 2015

doi:10.5539/ass.v11n11p39

URL: <http://dx.doi.org/10.5539/ass.v11n11p39>

Abstract

The actual problem of obtaining qualitative assessment of socio-economic indicators is the account of hidden and informal activities on the basis of differential methods. They have a function of adjustment and directed to adjust the figures in the official statements. This allows you to have a fairly complete assessment of the economic transactions that fall outside the normal statistical error. However, obtaining them is complicated by the inadequacy of the output indicators. This raises the need to use different methods of estimating the hidden phenomena and how they characterize.

Keywords: hidden and informal activities, non-observed economy, up-account macroeconomic indicators

1. Introduction

For Russia, the problem of reflection activities in the informal and non-formal sectors of the informal economy is particularly relevant. This is due to the fact that in the course of economic reforms and introduction of market mechanisms in the economy, their role in the reproductive processes has increased dramatically (Grigoreva & Fesina, 2014). The objective of quality measurement of socio-economic indicators largely depends on how fully succeed statistical methods to cover the economic activity in the informal and non-formal sectors of the economy (Ankudinov & Lebedev, 2013).

The latent nature of the economy means that its parameters can not be evaluated by the usual statistical methods. Therefore, the existing methods of state statistics bodies aimed at the adjustment of macroeconomic indicators, derived from the official statistical observations (Kadochnikova, 2013). When the calculation of macroeconomic indicators, there are taken into account non-registered activities in the statistical reporting, which is legitimate, but deliberately downplayed by the manufacturers or is not registered with the statistical authorities due to their informal organization. Illegal economic activities are not taken into account. Thus, all macroeconomic indicators contain a correction for hidden and informal economic activities. First of all, it refers to the GDP, output and gross added value by economic activity (Abedi, Ahmadi, Bagheri, & Shokoohi, 2012).

2. Method

Objective and comprehensive understanding of the methodology of statistical estimation of economic activity in the non-observed economy is possible on the conceptual basis of the system of national accounts, its fundamental concepts, definitions and classifications (Morozova & Sahabutdinova, 2013).

The relationship of formal, informal and non-observed economy are presented in Figure 1.

To estimate the non-observed economy there is developed a wide range of methods (Popkova, Akopova, Alekhina, Dubova, Popova, Avdeeva, & Proskurina, 2013; Roy, Chan, & Rainis, 2013). The system of methods of non-observed economy is presented in Figure 2.

Methodology of statistical estimation of non-observed economy, which is based on the original principles of the system of national accounts and information capabilities, enables the selection of specific approaches, tools and methods of calculation of indicators reflecting different aspects of shadow and informal economic activity (Ismagilov, 2006). The choice of a particular statistical method of measuring the non-observed economy is

preceded by an analysis of the information obtained on the basis of both reporting and specially organized statistical surveys and other information (Dawes & Bozkurt, 2010).

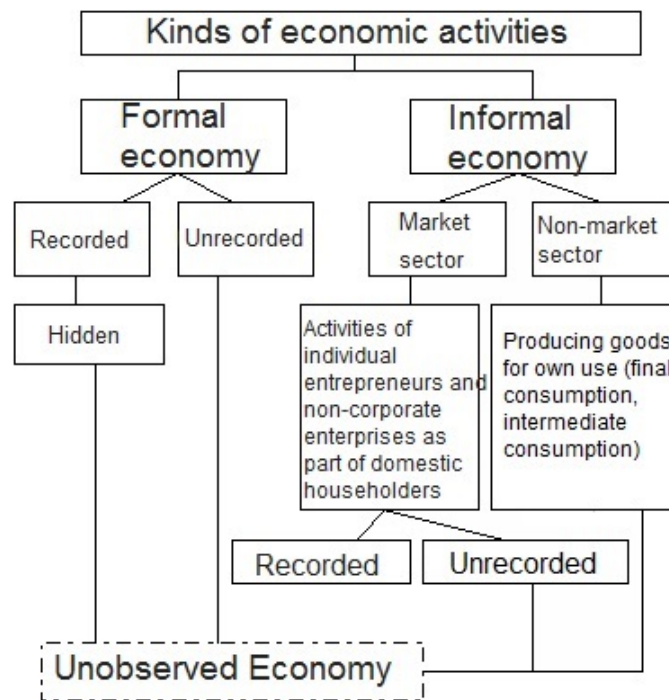


Figure 1. Place of non-observed economy in GDP

Differential methods of measuring the non-observed economy as a unified settlement system of the non-observed economy are classified into direct and indirect. The direct methods are based on information obtained by conducting sample surveys and polls. They are aimed at obtaining quantitative characteristics of the phenomena, non-covered by the statistical observation. Among them, it's necessary to mention specially the method of expert estimations, which is used in all existing methods of correction of macroeconomic indicators. The high importance of its application is due to the fact that in practice it is quite difficult to choose the appropriate mathematical tools to many of the models associated with the estimation of non-observed economy. The use of expert estimations is especially effective when there is a need to give a qualitative description or identify the general trend of the development of a phenomenon. Indirect expert knowledge combined with his practical experience can significantly improve the final results of the calculations to determine the size of non-observed economy. The main drawback of the method of expert estimations is the subjective nature of information received from respondents and the impossibility of carrying out their checks.

A large role in the adjustment of macroeconomic indicators is given to up-accounts based on the statistics of domestic households, which is one of the promising directions of development of statistics (Savdur & Fesina, 2014). It allows us to correct successfully the summary data at the macro level, which is especially important when a large volume of up-accounts of macroeconomic indicators. Statistics of domestic households involves the use of not only a wide range of methods for estimating the non-observed economy, but also allows us to quantitatively characterize the individual parties. As an example of the practical use of statistics of domestic households, we can present the calculation to determine the unrecorded trade, which is based on a comparison of consumer costs of the population with officially recorded turnover of goods and services across all sales channels, and determining the amount of the non-observed economy according to actual employment.

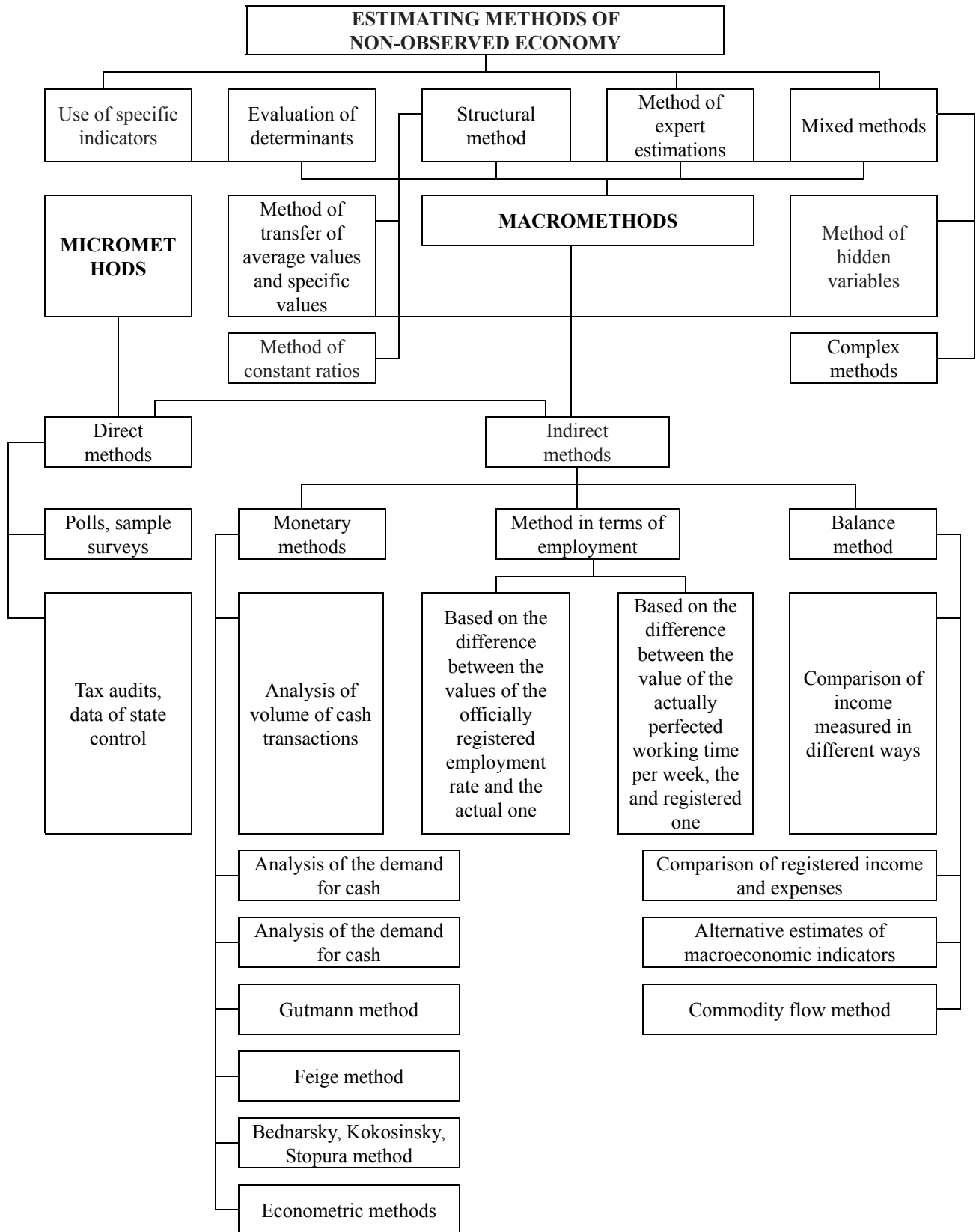


Figure 2. Methods of estimating the non-observed economy

We consider the kinds of indirect estimation methods used for measuring the non-observed economy. The method of comparison of indexes of interrelated indicators often is used when conducting up-accounts when

determining the hidden economic activity. It provides for the allocation of a range of indicators which, to the greatest extent, is more connected to the up-accounted than the rest. This problem is solved by calculating pair-wise correlation coefficients. The size of the unrecorded volume of the analyzed phenomenon is set based on the discrepancy between changes of the adjusted indicator and the associated one with it. For example, the indicator of the level of distribution costs can be used to find the approximate share of concealment in the volume of retail trade turnover by finding the difference between the growth rate and the index of physical volume of retail trade turnover in the reporting year compared with the previous year. The mismatch index indicates the presence of shadow components. The results obtained based on the method of comparing the indices of interconnected factors can be greatly improved if we make their correction by using correction factors. In particular, when conducting up-accounts on small businesses, their full range can be set using the correction factor determined by comparing the physical volume of trade turnover and distribution cost for medium and large enterprises. Thus, the accuracy of the results obtained by this method depends on an informed choice of indicators that determine the amount of adjustments, their correlation, and reliability of information used to establish the magnitude of the correction factor.

The method of constant ratios is based on the identification of indicators having with the adjusted some constant proportions and numerical determination of such proportions and comparing them at different stages of the survey. The accuracy of the results obtained using the method of constant ratios, depends on the proper establishment of the averaged values of long-term ratios used in the calculations, and timely accounting of economic and legal changes in the structural relationships of the analyzed indicators.

The resource method is based on data about the use of material resources per unit of calculated work (production) and the total amount of material resources to be used. This information is used to determine the possible magnitude of work (products) provided that all the resources are used up in production. To do this, there is chosen an equivalent material, which is traditionally used in production and cannot be replaced by another. Based on the definition of total equivalent material to be used and the possible production of the adjusted type of work (products) on this site there is found the hidden volume of production by the formula:

$$V_{\text{hid.}} = V_{\text{poss.}} \cdot K - V_{\text{rep.}},$$

where $V_{\text{hid.}}$ – hidden volume of production;

$V_{\text{poss.}}$ – possible production capacity;

$V_{\text{rep.}}$ – volume of production according to statistical reports;

K – Normative factor reflecting the loss of material in the production process.

The method based on calculation of the maximum possible value is used for the estimation of hidden production for particularly profitable products on the basis of the maximum possible value of its production. The maximum possible value is calculated on the basis of data available in a particular area of the production capacity and the percentage of their use. The calculation for this method is made if according to statistical reports there has been a sharp decline in capacity utilization for the production of coveted manufacturer, for example, the production of alcohol. The amount of hidden production is defined as the difference between the greatest possible volume of production of this product and production volume obtained according to statistical reporting. The calculation of the maximum possible volume of production is carried out according to the formula:

$$V_{\text{poss.}} = M_{\text{rep.}} \cdot K,$$

where $V_{\text{poss.}}$ – possible production capacity;

$M_{\text{per.}}$ – annual production capacity in the reporting year;

K –utilization of production capacities.

The method of transfer of mean values and specific values is the most simple, and therefore is used in almost all current adjustments of macroeconomic indicators. Its essence consists in the transfer of the observed set of the mean values and specific values obtained on the basis of the counted objects of the observed set to the unrecorded part. The advantage of this method is that the possibilities of adjustment of data using mean values are inherent in some software packages of statistical observation. However, due to the strong distortion of the distribution of the observed rate arising during its propagation to the full set, the assessment of the general average does not meet the requirements of non-offset and consistency.

The calculation method on the known parameters involves obtaining the estimates of non-observed economy based on the direct use of the information or when conducting comparative performance indicators of the different services defined in the prescribed manner. It has been in wide use when determining the scope of hiding

retail trade and agricultural products. The main disadvantages of this method are the dependence of results on the quality of the source information and the need for formulation of preconditions in order to abstract from the influence of undesirable factors on the estimation of non-observed economy.

3. Result

The study of theoretical, methodological and practical issues of measuring of the individual components of the non-observed economy has made it possible to classify differential methods of its evaluation in the context of individual sectors of the economy.

Table 1. Classification of differential methods of estimation of non-observed economy

Sector of economy	Differential methods	
	direct	indirect
Processing industries	Sensitivity method, method of expert estimations	Calculation method of the maximum possible value
Agriculture	Sample surveys of financial and economic activity of the peasant farms and private farms of the population, mixed surveys of domestic households, census of crop areas, livestock, the method of expert estimations	Calculation method on known parameters, the method of transfer of mean values and specific values
Construction	Budget domestic household surveys, method of expert estimations	Resource method
Trade	Special surveys of clothing, mixed and food markets, domestic household surveys method of expert estimations	Method of comparison of indexes of related indicators, method of constant ratios
Transport	Estimation of individual cargo and passenger carriers, method of expert estimations	Method of transfer of mean values and specific values
Paid services to the population	Microsurveys of population, methods of surveys and expert assessments	Calculation method on known parameters

Making classification of differential valuation techniques of non-observable economy allows to generalize the results of individual publications and methodological materials to determine the extent of the non-observed economy, to formulate proposals to improve the harmonization of approaches that enable the adjustments of economic activity directly which is not taken into account by regular statistical monitoring.

4. Conclusion

For certain types of economic activity in order to ensure consistency of the indicators, the volumes of hidden and informal economy defined for Russia as a whole, have been allocated to regions in proportion to the output and added value (Nikulina, Chistnikova, Lyschikova, & Orlova, 2013). Adjustments of macroeconomic indicators are carried out to the full range of data on the surveyed enterprises, but also for the hidden and informal economic activities according to the types of economic activities. Methodology for conducting adjustments of production volumes, including hidden and informal economic activity is designed to ensure the lowest possible errors in the construction of macroeconomic indicators. This means that it does not aim at determining the actual volume of the non-observed economy but at the calculation of the amendments that reduce the accuracy of the data obtained on the basis of the official statistical observations.

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