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THE SHADOW ECONOMY IS RETREATING: AN EXAMPLE OF GEORGIA

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Abstract. *The economy of Georgia had corruptive characteristics at the end of the last century and that has largely contributed to the existence of high-scaled shadow economy. Tax avoidance by entrepreneurs is considered to be the main cause of shadow economy¹ (Gabidzashvili, Kbiladze, 2010). The methodological measurement and assessment of the shadow economy is characterized by certain peculiarities; therefore, we have aimed to examine and assess the scale of shadow economy and its impact on the overall economy of Georgia. The research shows several differences between real indicators, obtained by interviewers using hidden chronometry, and those indicators declared by entrepreneurs (the non-traditional method of research). The differences reveal unregistered micro-level economy, and provide the basis for determining the scale of shadow economy on the macroeconomic level. This problem was discussed several times by the president of Georgia. The research uses methods of average values, time series and the correlation-regression analysis of data. The study allowed us to identify the pattern of shadow economy reduction in Georgia during recent years and its shifting from the illegal to legal sectors, also, the maintenance of same trends before 2020.*

Keywords: *Shadow economy, Declared indicator of turnover, Linear function, Correlation between events, Forecasting impulses.*

1. Introduction

Over the last 10 years, efforts of OECD member states are focused on overcoming problems related to tax evasion. The same could be said about Georgia. Given goal has direct link to determining the scope of shadow economy, which is possible by the usage of several methods.

¹ According to the survey results of the National Statistics Office, conducted in 2003, one-third of inquired heads of 274 large companies distort declared information intentionally and 83% of them assume that the reason is high tax rates.

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In this paper, we discuss the characteristics of evaluating shadow economy in the real economical conditions of Georgia, on levels pertaining both to microeconomics and macroeconomics. The paper is constructed as follows: Firstly, the results of empirical-statistical research, conducted by nontraditional methods, are given for studies of shadow economy. Here are also narrated the reactions of executive authorities regarding this research. Next, presented is a problem related to modernisation issues of statistical research and the usage of administrative resources of various administrative organs. Also in this paper are given, primarily, the relation between the total economical output and that of unrecorded economy (2003-2014) and, secondly, the forecasting empirical research results of these indicators (till 2020).

2. Review of the theory and literature

Discussions related to shadow economy are directed in several manners. The first ones are related to the definition of shadow economy (Ivanov, 2014, Lequiller, Blades, 2014; Schneider, 2012; Jie, Tat, Rasli, Chye, 2011). Discussions of scientists do not essentially differ from each other; they are mainly based on SNA-2008 documentations. Herewith, Schneider (2012) considers taxonomy of hidden economic activities in terms of monetary and non-monetary transactions. The second type of discussions is related to issues of shadow economy and corruption (Schneider, 2007; Papava, 2002). Herewith, scientists are discussing important losses in budgetary and non-budgetary funds of the country, which are caused by high levels of shadow economy and corruption. The third type of discussions is related with determining the scope of shadow economy (Schneider, 2012, 2015). The issue is related to an indirect assessment of a given phenomenon, an assessment that uses macroeconomic procedures. Direct micro-level procedures are also very actual; they aim to determine the extent of shadow economy in particular fields. Exactly that is the subject of our research, which introduces Georgian experience in this field (Schneider, 2012).

3. The revelation of shadow microeconomics

A particular amount of experience has been accumulated in the industrial field and other statistical directions in order to study shadow economy in Georgia. The research interest of this field arose from the fact that the period of the end of the past century until the beginning of the current century saw a broad operation of shadow economy, which, by consequence, sparked a high level of corruption. The “Integrated Index of Tax and Payment Corruption” reached 7.9 per cent in 1999, which indicates that the country’s budget and non-budget funds lost additional 7.9 tetri of potential income for each 1 GEL (Papava, 2002).

Same results were revealed by the authors’ calculations on the basis of data from the National Statistics Office about the average values of those sectors of economy the enterprises of which, according to representatives, are most “sensitive” towards shadow economy. For this analysis, we may use data of years 2003 and 2008. We can only rhetorically ask these questions: is it possible to believe that, according to 2003, the

declared average turnover of one restaurant was 104 GEL per day (according to data relating to 2008 – 376 GEL)? Or that the price of baked bread, produced by a bakery, reached an average of 144 GEL per day (according to data relating to 2008 – 350 GEL), or that stores that trade in second hand goods sold products of only 63 GEL value per day (According to data relating to 2008 – 87 GEL)? There is also hardly believable data of one enterprise that carries out technical service and repairs motor vehicles and is earning 34 GEL per day, and this as well, according to data relating to 2008, reached a higher value of 150 GEL (Gabidzashvili, Kbiladze, 2010).

The above-mentioned, which is, on the one hand, information characteristic of any corruption level and, on the other, distorted declared primary data, should be considered a serious signal (such is our hypothesis) for the existence of shadow economy; the determination of the boundaries of this phenomenon is the main goal of our research.

In order to reveal the scale of the above-mentioned distorted declared primary information and, accordingly, shadow economy itself, the State Statistics Department decided to conduct a specially organised selective statistical study. Similar studies were done within the overall framework of enterprise statistics, but, in our opinion, the most interesting and effective in terms of informative value was the individual selection of statistical observation methods for specific types of researches. Such studies were carried out by specially trained interviewers through hidden time-keeping and were based on real scale findings of the studied event: by counting, weighing, measuring and holding other manipulations. As an example, we may list the selective statistical observation, chiefly held in order to find the real indicator of restaurants turnover (National Statistics Office of Georgia, 2000). Interviewers, situated around the vicinity of selected restaurants, were observing and calculating the flow of entering customer from the opening until the closure of the restaurants for a total duration of 10 days. Statistical observation was carried out within working days as well as weekends. The second group of interviewers were as though negotiating with managers of the restaurants for the purpose of hiring services for a wedding, a birthday party or any other event; hence they were asking about the cost of such service per one person. Managers were providing the interviewers with detailed information about the minimum, average and maximum values of service per person. By multiplying the averages of obtained information with the flow of customers arrived at a restaurant, we acquire the real indicator of turnover. By distributing the obtained data on periods of a month, a quarter year and a year, we get the actual indicators of corresponding period turnover. Afterwards, by comparing obtained results with declared indicators of restaurants, we revealed the differences between them and exactly these results are considered to be the shadow side of this sector of economy.

Similar special studies were held in Georgia by support of the European Union program TACIS, and, in addition to restaurants, it was devoted to determine the turnover of beauty salons, quantity of fuel sales, actual indicators of construction produce, the real indicators of bread baking, trade turnover indicators of individuals at markets and etc.

The obtained results of statistical observations held by the above-mentioned method are as follows:

- The declared indicators of beauty salons were 6 times lower than real indicators;
- The indicators declared by restaurants were reduced by **3,7** times in comparison with real indicators obtained by the research;
- The actual volume of sold fuel was 3,1 times higher in comparison with presented official indicators;
- Actual volume of construction produce was more than 2 times higher as compared to officially declared indicators;
- The actual indicator of bread baking was more than 3 times higher than declared indicators;
- 40% of market individuals were hiding from state accounting and other official indications (Gabidzashvili, Kbiladze, 2010).

The survey results were sent to the former President of Georgia. The ministers of the relevant fields and the Mayor of Tbilisi were obliged, by the Resolution of the President, to take appropriate action on relation to the research results. In addition, 4 presidential decrees, relating to the condition and improvement of statistical accounting in the sectors of industry, tourism, transport and communication were prepared and published. Changes were made in the Tax Code, particularly the revising of tax rates, along with others. The National Statistics Office has cancelled the monthly business surveys and introduced quarterly surveys. Also, the enterprises turnover indicators of the Ministry of Finance began being introduced into monthly information.

4. Administrative resources and the panel of special researches in order to assess shadow economy

For as long as humans have it devised, statistical theory and practice are in the process of permanent renewal, but they have become especially actual in the modern, interactive world. In our opinion, statistical theory and practice in short and long term periods should acquire the function of preparing information in an operative way, and this will become the basis for correct and timely managerial decisions at different levels of management, including the sphere of shadow economy legalisation.

As we have already mentioned, the National Statistics Office of Georgia makes preliminary monthly estimations of economic growth, which are based on the turnover of enterprises of who are payers of value added; also, it is based on data of fiscal and monetary indicators. Assessments such as these made publications about current and annual characteristics of economic growth operational. For example, preliminary data of annual publications is published 11 months earlier than annual, regular publications. Herewith, the only problem in monthly assessment is monthly measurement of the volume of unobserved economy. One of the ways that are parallel with declared turnover indicators of entrepreneurs is the above discussed usage of alternative information about turnover.

Accordingly with the matter of enterprises, where significant differences of turnover volume between declared and actual indicators have been revealed by interviewers for years, we find it reasonable to establish a panel of such enterprises. This information will

be supplied systematically and in accordance to the data of new researches. This exact panel of such enterprises will become a major informative resource in order to assess shadow economy in the industrial sphere.

Researches of this kind will allow us a future glance from past information ($T - I$; $T + II$; $T + III \dots T + n$) and will also offer us forecasting impulses of turnover and unobserved economic characteristics.

Thus, in order to assess the shadow economy with short-term (monthly) intervals, we may possibly use the following equation:

$$Y = X_{\phi} - X_d$$

Where Y is the shadow economy,

X_{ϕ} – is the actual rate of turnover (with non-traditional, alternative assessments);

X_d – declared rate of turnover.

The scheme described above allows us to operatively evaluate (on a monthly period) the existing situation in economics. Using this scheme will make the monitoring of how economics function more credible and operative.

5. Annual estimations of unrecorded economy, the correlation between total output and forecasting impulses

Already adjusted data is published in accordance with regulated annual data in 11 months from the end of the year. Among that is data about shadow economy, the volume of which in addition to indicators of enterprise statistics includes household network data from employment, expenses-output table data and etc.

In order to reveal the interconnection and to make forecasting calculations according to the variables of total output and unregistered economy, we have to construct a time line corresponding to years 2003–2014.

TABLE 1. Total output, Unregistered Economy and share of unregistered economy in Total Output of Georgia in 2003–2014

	Unregistered Economy (billion GEL)	Total output (billion GEL)	Share of unregistered economy in total output (%)
2003	5,0	13,6	36,6
2004	4,7	15,0	31,2
2005	5,1	17,4	29,5
2006	5,3	20,5	25,9
2007	6,0	24,9	24,0
2008	7,0	28,2	24,7
2009	5,2	26,1	19,8
2010	6,6	30,5	21,7
2011	7,2	36,5	19,7
2012	5,5	39,4	13,9
2013	5,0	40,6	12,2
2014	5,0	44,3	11,2

Above-mentioned data is displayed graphically as follows:

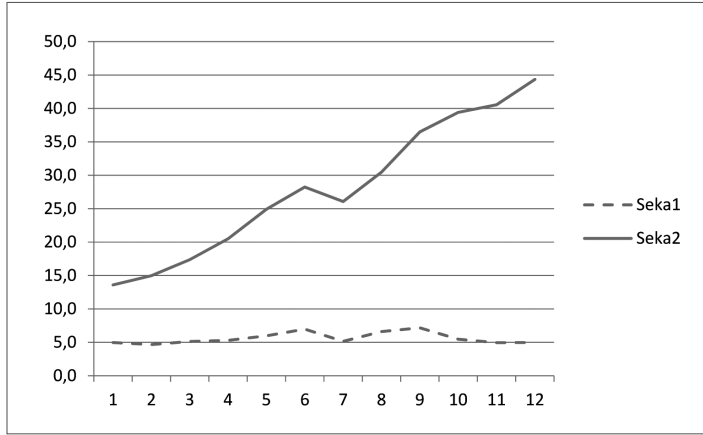


CHART 1. Real unregistered and total output

As the table shows, absolute indicators of unregistered economy are changeable according to years, so their characterisation in dynamics depends on the fact of how correctly we analyse their volatility trend. For characterising the volatility of unregistered economy, we have to level off empirical data according to chronological dates. Firstly, we must display the actual data in the form of a diagram. Hence, we have obtained a more uneven line, which is much closer to the linear equation $Y = a_0 + a_1t$. In order to find function parameters, we have to use the least squares method $\sum (y_t - \hat{y}_t)^2 \rightarrow \min$. We find such theoretical levels, whose deviation level squares sum from empirical levels, to be minimal. If we will place $\hat{y}$ instead of the appropriate function $\sum (y_t - a_0 - a_1t)^2 \rightarrow \min$, we will find the first order derivative separately for a_0 and a_1 parameters and we will receive the equation system for calculating parameters:

$$\begin{cases} na_0 + a_1 \sum t = \sum y \\ a_0 \sum t + a_1 \sum t^2 = \sum yt \end{cases}$$

In order to find the smoothed levels, we must solve the above-mentioned system by transferring t to the reference center. By transferring t , we will obtain the following: 2003 year = -6;

2004 year = -5 and so on, so that $\sum t = 0$. From the first equation $a_0 = \frac{\sum y}{n}$ and the second equation $a_1 = \frac{\sum ty}{\sum t^2}$ (see Table 2).

$$a_0 = \frac{\sum y}{n} = \frac{67,4}{12} = 5,61 \quad a_1 = \frac{\sum ty}{\sum t^2} = \frac{7,902179}{182} = 0,04$$

$$\hat{y} = 5,61 + 0,04t = 5,61 + 0,04(-6) = 5,4$$

With the same rule, we will find $\hat{y}$ for other years, which is reflected in Table 2.

TABLE 2. Smoothing time series of shadow economy 2003–2014

year	Unregistered economy (billion GEL) y	t	t^2	yt	$\hat{y}$	$y\hat{t}^2$	$\hat{t}^4$
2003	5,0	-6	36	-29,8459	5,4	179,0754	1296
2004	4,7	-5	25	-23,3395	5,4	116,6976	625
2005	5,1	-4	16	-20,5178	5,4	82,07136	256
2006	5,3	-3	9	-15,8964	5,5	47,68922	81
2007	6,0	-2	4	-11,9559	5,5	23,91183	16
2008	7,0	-1	1	-6,98255	5,6	6,982555	1
2009	5,2	1	1	5,155847	5,7	5,155847	1
2010	6,6	2	4	13,22663	5,7	26,45326	16
2011	7,2	3	9	21,51673	5,7	64,5502	81
2012	5,5	4	16	21,87713	5,8	87,50853	256
2013	5,0	5	25	24,78038	5,8	123,9019	625
2014	5,0	6	36	29,88357	5,9	179,3014	1296
	67,4		182	7,902179	67,4	943,2991	4550

The smoothed levels sum of unregistered economy $\Sigma\hat{y}$ is equal to 67.4, the sum of empirical levels Σy is equal to 67.4. This means that the function is precise; it is so because it meets the condition of problem minimisation (the condition of least squares method) $\Sigma(y_t - \hat{y})^2 = (67.4 - 67.4)^2 = 0$.

Now, we may observe the relationship between the indicators of the total output and the dynamics of unregistered economy. For this reason, we have to construct a table.

TABLE 3. The smoothed indicators of total output and unregistered economy

	Year	Unregistered Economy (Billion GEL) X	Total Output (Billion GEL) Y	xy	$x - \bar{x}$	$(x - \bar{x})^2$	$y - \bar{y}$	$(y - \bar{y})^2$	x^2	$\hat{y}$
1	2003	5,4	13,6	72,79894	-0,3	0,067866	-14	209,7204	28,66908	12,99921
2	2004	5,4	15,0	80,8674	-0,2	0,047129	-13	171,5134	29,13592	15,51233
3	2005	5,4	17,4	94,51881	-0,2	0,030163	-11	114,639	29,60653	18,02546
4	2006	5,5	20,5	112,4231	-0,1	0,016967	-8	57,45659	30,08092	20,53858
5	2007	5,5	24,9	137,7426	-0,1	0,007541	-3	9,990717	30,55907	23,0517
6	2008	5,6	28,2	157,3509	0,0	0,001885	0	0,027043	31,04099	25,56482
7	2009	5,7	26,1	147,5103	0,0	0,001885	-2	4,032607	32,01615	30,59107
8	2010	5,7	30,5	173,716	0,1	0,007541	2	5,709488	32,50938	33,10419
9	2011	5,7	36,5	209,6223	0,1	0,016967	8	70,71263	33,00639	35,61731
10	2012	5,8	39,4	228,1114	0,2	0,030163	11	128,3573	33,50716	38,13044
11	2013	5,8	40,6	236,4948	0,2	0,047129	12	155,5906	34,01171	40,64356
12	2014	5,9	44,3	260,5484	0,3	0,067866	16	264,6444	34,52002	43,15668
		67,4	336,9	1911,705		0,343101		1192,394	378,6633	336,9353

We must present the Indicators of smoothed and total output of unregistered economy according to 2003–2014 on the Diagram.

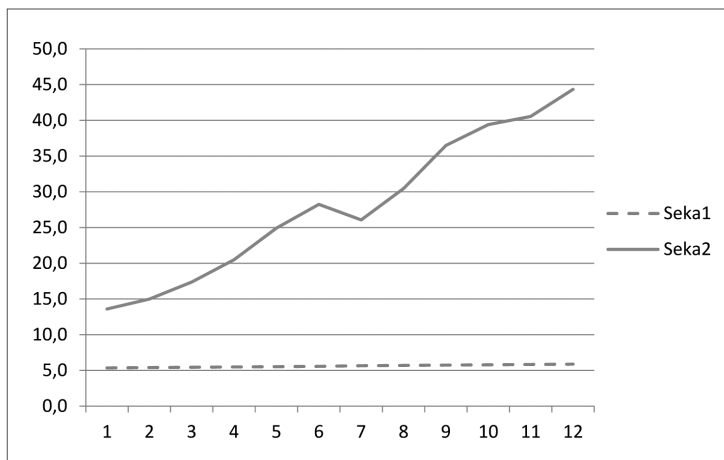


CHART 2. Indicators of smoothed and total output of unregistered economy 2003–2014

As we have already mentioned above, at the end of the last century, the indicator of unregistered economy was so high in the industrial sector that it came out higher than any of the official indicators. So we could have given its content with function $Y_x = f(x)$, where Y was unregistered economy and x the total output. By economic comprehension, it meant that the basic content of entrepreneurial process firstly had corruptive purpose, but we know that economy in general consists of 5 institutional sectors and, while calculating unregistered economy in the other four (financial corporations, public administration sector, households and non-commercial organisation serving households), the declared indicators of total output appear to prevail unregistered economy; in turn, the analysis of the correlation between events will be pertinent for non-financial corporations of whose independent and dependent variables exchange their places in the aforementioned function. Afterwards, the function will turn out to be $Y = f(x)$, where Y is total output (the result) and X unregistered economy (factor).

If we add the mentioned data in a linear function $Y = a_0 + a_1x$, we will acquire the following result: $Y = -296,9 + 57,8x$.

On the basis of our function, we calculated the coefficient of elasticity.

$$E = b \frac{\bar{x}}{\bar{y}} = 57.8 \frac{5.61}{28.1} = 11.54$$

In our example, the elasticity coefficient is greater than 1; consequently, X significantly affects Y .

Thus, the reduction of unregistered economy had caused the growth of total output, which was firstly reflected in the growth of declared indicators. This is a step forward for Georgian statehood.

Our research also demonstrates impulses of forecasting indicators until 2020, which are presented on the table below.

TABLE 4. Forecasting indicators of the total output and unregistered economy in 2015–2020

<i>Year</i>	<i>Total output (Billion GEL)</i> $\hat{y}$	<i>Unregistered Economy (Billion GEL)</i> $\hat{x}$	<i>t</i>
2015	45,66980242	5,91879	7
2016	48,18292481	5,96221	8
2017	50,6960472	6,00563	9
2018	53,20916959	6,04905	10
2019	55,72229197	6,09247	11
2020	58,23541436	6,13589	12

By 2020, the share of unregistered economy in total output will be 10.5 per cent, instead of the current 11.2 per cent in 2014.

Thus, as the given research shows, shadow economy is retreating from Georgia, a process that will become more visible after fully implementing the comprehensive trade agreement between EU and Georgia.

6. Conclusion

The purpose of the article was to investigate the change of such an unfavourable phenomenon of economics as shadow economy. Within the article are presented the features of measurement and evaluation of shadow economy in the real sector of Georgian economy, the correlation between indicators of total output and unregistered economy, and forecast impulses till 2020.

Within this article are proposed suggestions about the modernisation of statistical theory and practice. Here are considered the usage of alternative (non-traditional) forms of statistical observation and the advancement of operativeness of statistical research, which will not only catch up with timely publication of information that characterizes current events and processes, but will also offer forecasting impulses for making timely managerial decisions.

These research results will be useful for governmental organs while planning macro-economic development programs. Also, the results might be convenient for researchers, scientists and students who work on problems related to shadow economy.

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