Shadow Economy in Regions of Russian Federation and Ukraina

1. Introduction

Shadow economy becomes a very popular object of study now. But as discussed in more detail later, shadow economy is difficult to measure. Still, there is widespread evidence that it is extensive and commonplace in nearly all countries. For the Russian Federation, the most reliable estimates suggest that the shadow economy consist 35-40% GDP. Evidence from other post socialist countries (for example Ykraina) clearly indicates that the Rassian experience is not an isolated one.

Investigation of shadow economy is important for many reasons. The most obvious is that its presence reduces quality of life. Its presence requires that government expend resources to deter shadow economy, to detect its magnitude, and to penalize its practitioners. Shadow economy alters the distribution of income in unpredictable ways. It creates misallocations in public resource use for education and health care. It affects the accuracy of macroeconomic statistics. More broadly, it is not possible to understand the true situation with quality of life without recognizing the existence of shadow economy.

The most popular research direction considers the effects of the shadow economy on allocation, distribution, stabilization, and fiscal policy. The impact of the shadow economy on the quality of life of the population is currently not sufficiently investigated.

We suppose that the shadow economy has variable effects on the level and quality of life. It effects positively on the level of life (as shadow income increased total revenues). But it can impact negatively on the quality of life (quality of working life, health, safety, etc.). Inverse relationship between the level and quality of life was first suggested by J. Forester (founder of system dynamics). But, his model does not take into account the impact of the informal sector.

Determination of the shadow economy is complicated by several factors: complexity assessments, multiplicity of shadow activity. Also, different methods provide overstated or understated results. In this paper we concentrate on studying of relationship between shadow economy and various socio-economic indicators which reflect quality of life. Different models allow the size of the shadow economy. Some of them demonstrate the link with the separate indicators of life quality. However, in better part of models, the quality of life is the casual variable, witch changes leads to the changes in the latent variable (the shadow economy). Our task is to determine the reverse effect - the shadow economy on the quality of life. The aim of this paper is to identify -- that determine shadow economy on regional level and to group the factors using shadow economy and the quality of life factors as variables.

In this paper we also discuss the current research on shadow economy measurement. This literature has grown in only the last years, and it has generated numerous and important insights. Shadow economy exists in a regional framework which has a significant role in explaining its dimensions. The vast bulk of this research has examined shadow economy in different countries, and its influence on economic growth. The area of regional estimation of shadow economy is narrow, and is this area that we examine. We focus on regional differences in the level of shadow economy in two countries: Russian Federation and Ukraina in this research. How extensive is the influence of the shadow economy on the quality of life in this countries? What factors indicate the influence of the shadow economy on the quality of life? Can we estimate the scare of shadow economy using the quality of life indicators? These questions we try to answer.

2. Theoretical background of shadow economy estimation

2.1. Definitions of shadow economy

The basic framework of our study is the concept of the shadow economy. This term is not disclosed in the legislation of Russian Federation, but the necessity to counteract the shadow economy is declared in many publications. The lack of a clear understanding the subject of counteraction, reject the quality of this struggle.

There are also multitude definitions of shadow economy in literature. To identify this phenomen in English-speaking countries often used terms 'shadow', 'unsanctioned', 'parallel', 'hidden' economy. In French-speaking countries often used terms 'souterraine', 'informelle', 'inofficielle' economy. Besides shadow, a term introduced into initially in the German language literature (*Schattenwirtschaft*). The term 'black' was probably the first term used, especially in the form of 'black labor' in the original 1970s literature in Italian (*nero lavoro*) and in German (*Schwarzarbeit*).

In Russian literature we can find terms 'unformal', 'unlegal', 'underground', 'grey', 'criminal', 'hidden' 'black' and so on. As usual, all terms emphasizes three major features of shadow economy: it's hidden nature; lack of regulation and control; the opposition to the official activities (tab.1)

Tab. 1 Features of shadow economy in terms

Hidden nature	Lack of regulation and control	Opposition to the official activities
non-observed, unobserved	unregulated	secondary
hidden concealed	unorganized	second
Unexposed	unofficial, non-official	other
invisible	unrecorded	alternate
twilight, clandestine	off-the-books	parallel
Occult	dual	peripheral
Shadow	untaxed	counter
Grey	cash	autonomous
black	cash-in-hand	precarious
Submerged	moonlight	irregular
Underwater	marginal	everyday
subterranean, underground	ghetto	

Source: authorial computation on the base: Measuring the Non-Observed Economy*;* Williams, Colin C. Cash-in-hand work [Electronic book]: the underground sector and the hidden economy of favours. – Palgrave Macmillan, 2004

Most of the literature on this topic has tended to view the shadow economy as all those economic activities not reported to the government to appear in official GDP statistics. Also there are policy-important sub-categories of shadow economy. The authors denote four.

- first is completely legal household sector activities that would not be included in official GDP statistics, even if they were reported to the government.
- next is what they label the informal sector, following de Soto (1989). This involves market activities that are not reported to the government, but which are tolerated by the government, despite their technical illegality due to non-payment of taxes.
- third is irregular economy, market activities illegal only due to non-payment of taxes and which the government does not tolerate.
- Finally, there is the criminal sector, where the activities themselves are illegal, irrespective of whether they are reported or taxes are paid.

For the purpose of our study there is no distinction between legal but unreported activities that are government tolerated and those that are not tolerated. We imply all type of non-observed economy shadow.

2.2. Measurement of shadow economy in regions: Literature review

A major difficulty in analyzing shadow economy is its measurement. And the measurement the in the regional level within a country is rather more difficult. Several methods have been developed to measure shadow economy. All are subject to much imprecision and controversy. Various methods of measuring the size of the shadow economy can be divided into three approaches:

Direct approach. Direct approach includes tax auditing, surveys and other researches based on voluntary replies. We can find some examples of measuring the shadow economy in regions by this method. Micro-survey of informal sector in eight geographic regions of Romania (Albu L. L., Ghizdeanu I., Stanica C. 2008) and micro-survey regions of Estonia, Latvia and Lithuania (Putniņš T. J. 2011).

Indirect approach. Indirect approach includes: the method using differences between income and expenditure statistics; the method using differences between officially measured and actual participation rates; the transactions method; the monetary methods; he physical input method (based on data of electricity consumption), including Kaufmann–Kaliberda method and Lackó method. The example of monetary measures (on the base of denomination of bank notes) is the estimation of nineteen municipalities of the Brussels-Capital Region (Dotti, N.F., van Heur, B., Williams, C. C. 2015). On the base of currency ratio/demand method estimation for Spanish regions (González-Fernández M., González-Velasco C.) and Italian provinces (Ardizzi G., Petraglia C., Piacenza M., Turati, G. 2011). Income & expenditure measures used Alderslade J., Talmadge J., Freeman Y. (2006) to measure shadow economy in USA and Fortin B., Lacroix G., Pinard D. (2010) for Province of Quebec (Canada). Using indirect non-monetary measures based on Electricity consumption see, for example, estimation for States of USA (Heath E.B., Jones L R. 2013). Method using spatial patterns of nighttime imagery for States of Mexico (Ghosh T., Sutton P., Powell R., Anderson S., Elvidge C. D. 2009) and for States and Union Territories of India (Ghosh T., Powell R.L., Anderson S., Sutton P.C., Elvidge C.D. 2010)

Model approach. This approach is implemented by compiling of econometric models using statistical tools to assess the shadow economy as «unobservable» variable. Structural equation modeling (SEM) examine statistical links between unobservable and observable variables. Special cases of SEM - MIMIC (multiple indicator multiple cause model) and DYMIMIC (dynamic multiple-indicator multiple-cause model). The shadow economy is investigated as a «latent» variable, which is connected, on the one hand, with a set of observable indicators (reflecting changes in the size of the shadow economy) and, on the other hand, with a set of observed independent variables, which are considered as most significant factors determining unrecorded economic activity. There is also a large and growing literature on the MIMIC model in regional level: for Federal states of Germany (Schneider F. 2003) Mummert A., Schneider F. (2001), major states of India (Chaudhuri, K., Schneider, F., & Chattopadhyay, S. 2006), EU regions (Tafenau E., Herwartz H., Schneider F. 2010), districts in Germany (Buehn, A. 2010), states of USA (Wiseman T. 2013). We can see the example of MIMIC modelling in estimation the shadow economy at Russian regions presented in several research (tab2)

Tab. 2 Estimation the shadow economy in Russian regions

Author/ year	Approach/model	Estimated years	Quantity of regions	Min / max share of shadow economy in estimation
Komarova T. 2003.	Indirect approach/ electricity consumption	1996-2000	69 regions	20-55%
Bilonizhko O. 2006.	Model approach / MIMIC model	2001-2003	79 regions	16-67%

Vorobyev P. 2015.	Indirect approach/ electricity consumption	2004-2001	67 regions	3-101%

3. Model of shadow economy in regions

3.1 Selection the model indicators on the base of factor analysis

The use of factor analysis is based on the assumption that, with a low level of shadow economy, the income and expenses of a population should be mostly defined by formal employment. Meanwhile the low correlation between employment, unemployment, and income indicates the existence of an outside source of income. The use of factor analysis in assessing the level of shadow economy has been mentioned in some research, but mostly as a specific case of a more general approach to structural equation modeling.

The purpose of factor analysis is to show the presence of absence of any noticeable relationship between the standard of living and quality of life indices. In the case of a strong impact of shadow economy it can be assumed that the clusters of the standard of living and quality of life indices reflect different factors. The advantage of such an approach is that it is not necessary to directly assess the level of shadow economy, as it becomes manifested as one of the factors that define the differences between entities. This research has used an exploratory factor analysis based on the assumption that it is not known from the start which set of factors makes a description of the correlational matrix possible. Thus, the number of factors and the relationships between them are not fixed by default.

The main drawback of factor analysis consists in the complexity of interpretation of the modeled factors and neglect of the cyclic changes (trends) over time. However, if the structured factors do not change over time, this may be interpreted as the presence of some stable impact factors. Normalized factor values for each entity may serve as an implicit assessment of the level of shadow economy in the area.

The factor analysis methodology involves several stages: choosing the variables that characterize the object of research, deciding on the method of analysis, determining the number of factors to be used, calculating the factor loads, rotating the factors, interpreting the factors, and defining the values of the factors to be considered.

The factors were identified with the help of Principal Components Analysis based on defining the minimum number of orthogonal factors that affect data dispersion the most. It is presumed that there is a linear correlation between the latent factors and observed variables. The advantage of such an analysis consists in the consecutive isolation of the most general factors that allow for taking into account most of the features dispersion. Each subsequent factor defines the remaining share of dispersion and is orthogonal to all the preceding factors. Thus the factors themselves are independent of one another. From the point of view of this research, if two independent factors define the standard of living and quality of life, it may be taken as evidence of the different sources of sustenance.

To decide how many factors should be included in the model two criteria have been used: Cattell's scree test and the Kaiser criterion. The scree test consists in finding on the plot of subsequently decreasing proper values of the factors such a point where the decrease maximally slows down. The Kaiser criterion determines the choice of the number of factors whose proper value exceeds 1. In our research both the criteria yielded harmonized results for the two countries almost for all the time periods. The appropriate number of factors was 4. In specific years (2004, 2005, 2009 and 2011 for the RF) the number dropped to 3 but, as calculations show, the values of the fourth proper figure were close to unity, therefore this factor was also included; however, at the preliminary stage it did not show any relevant factor loads.

To increase the factor, interpretability rotation methods have been used that allow for a better interpretability of the factor load matrix. At the same time the number of factors did not change. One of the most popular methods is VARIMAX rotation; it consists in changing the factor coordinate axes so as to get more contrasting loads for the structured factors. Following the axes rotation, new factors are identified in the form of a linear combination of the existing factors which maximizes the dispersions for the squared variable factor loads. The advantage of this method is in the more precise separation of the factors due to the decreased number of the initial variables related to each factor; this allows for a more precise interpretation.

The factor structures identified by the Principal Components Analysis without their rotation appeared to resist coherent interpretation, and for the Ukraine they also turned out to be unstable. Thus, the strongest factor identified for the Ukraine was the most difficult for interpretation, because it combined the income—expenses, employment, and crime rate indices. Since criminally received revenues were not singled out in the income structure, we assumed that the crime rates did not directly relate to incomes and employment but were, rather, a manifestation of the agglomeration factor. Higher income levels were shown for the more industrially developed regions of the Ukraine with a higher urban population density. Therefore, the number of criminal offences in economy and the attraction large cities have for asocial individuals lead to an emergence of a correlation between the crime rate and income.

What appeared to be characteristic for the RF was the expansion over time of the number of indices that correlate with the more significant employment factor; it subsumed both the demographic indices and the structure of consumption, while the percentage of the dispersion explained by this factor remained practically unchanged.

Thus, the factors most common for the two countries are the demographic factor and the criminogenic factor. There are significant differences in the structure of the standard of living monetary support factor. In Russia, monetary income and formal employment have shown a weak correlation, while in the Ukraine they are closely related. The demographic indices for the quality of life are significantly affected by the ethno-socio-cultural factors, therefore their application in the analysis of correlations between the various manifestations of shadow economy is quite limited. Finally, the fact that the indices for the standard and quality of living can be regularly explained by the influence of various factors shows that there is a gap between the economic and societal components in the functioning of the two states.

Using this method, we conducted a factor analysis of the relationships of quality and standard of living in regions of Russian federation for the period of 2002-2013 and in Ukraine for the period of 2004-2013 in the same indices of 17 sections.

The results of calculations of factor loadings, obtained by main component analysis and refined using varimax-rotation are shown in the Tab.2. Bold line allocates significant factor loadings. Calculations were carried out in the Program Statistica 8.0. Comparative results of the factor analysis according to the most indicative 2012 year for the two countries are shown in Tab. 3.

Tab 3 The most significant factors for Russian Federation and Ukraina in 2012.

	Russian Federation		**Ukraina**	
Indicators	**1- socio-demographic**	**3- cash security**	**2- socio-demographic**	**1- cash security**
Income	0,001	**0,946**	0,090	**0,915**
Goods	-0,107	**0,912**	-0,122	**0,903**
Convenience food	0,457	-0,389	-0,488	-0,219
Cars	-0,399	0,274	0,280	0,431
Deposits	-0,077	**0,889**	-0,208	**0,946**
Birthrate	**0,880**	-0,164	**-0,912**	-0,082
Mortality rate	**-0,873**	-0,208	**0,829**	-0,360

Natural growth rate	**0,955**	0,011	**-0,945**	0,165
Infant mortality	0,478	-0,078	0,102	0,121
Unemployment	**0,790**	-0,386	0,146	-0,387
Employment	-0,649	0,640	0,116	0,645
Pre-school institutions	**-0,704**	0,431	**0,710**	0,324
Hospital beds	0,437	-0,188	-0,172	-0,485
Criminality	-0,070	0,130	0,213	0,298
Serious crimes	0,299	-0,063	0,235	0,128
Juvenile delinquency	0,015	0,017	0,212	-0,240
Life expectancy	0,210	0,038	-0,353	0,293
Explained dispersion	4,931	3,621	3,643	4,115
The share of the total explained dispersion	0,290	0,213	0,214	0,242

The most significant factor in Russia turned out to be the demographic factor which explains also the variation of unemployment and the provision of pre-school institutions. In general, this factor explains 26-31% of the dispersion parameters. Unemployment, the birth rate and natural growth rate in the whole time interval are codirectional factors and mortality rate - the opposite of them (in the matrix of factor loadings these figures correspond to the number of different signs). This, apparently, is explained by the socio-ethno-geographical reasons.

High birth rate is explained not as much by the improvement of the living conditions of the population as because of cultural traditions. We should conclude that the pace of economic development of Russian regions with high fertility are not enough to provide employment for the growing population. Thus, the highest level of unemployment was recorded in 2013 in the Republic of Ingushetia, the Chechen Republic and the Republic of Tyva, and they also observed the highest birth rates. But even excluding these three regions retains the overall trend.

It is remarkable that from 2010, the demographic factor also explains the substantial variation in the provision of pre-school institutions, and moreover this figure has the same direction with mortality. For a more accurate description of the situation we should provide an additional research. However, we can assume the influence of the degree of urbanization territory. In rural areas, mortality tends to be higher, however, due to lower birth rates and lower levels of employment (in particular, as employees) need in pre-schools institutions is less, or at least considered as such.

For Ukraine, the demographic factor turned to be the second largest for the entire period except 2004 year, when it was the most significant. However, it is not connected with any employment or unemployment. There is the same slightly transparent alignment of availability of pre-school institutions and mortality rate. It can be assumed that this relationship also in Ukraine is a side effect of agglomeration - necessity for pre-school institutions in the cities is higher and provide opportunities for them in the city budget is also higher. Thus, from the point of view of the purpose of our study demographic indicators cannot be considered as a unique quality of life and require further study.

The second most important for the Russian Federation and the third for Ukraine factor reflects the criminal situation in the regions. It is remarkable that the level of criminality (all types included in this factor) is closely related to the negative connection to the life expectancy at birth (mostly demographic indicators). It implicitly supports the idea that the criminal situation is a socio-economic problem, but not exclusively moral. A special feature of Ukraine is that in 2006-2008 this factor was closely (greater than 0.7) associated with a specific gravity of food expenses. In the Russian Federation we also observe a similar relationship, but significantly weaker (at the level of 0.4 - 0.5). While in Ukraine, this years were not in crisis, however, we have seen a slight increase in stratification of the population by income.

Therefore, we can assume that criminality rates can be a reflection on the quality of life and the level of social tension in the region. It is more typical for the Russian Federation, where the national average crime rate since 2006 is reducing, and life expectancy is increasing. In Ukraine, the criminality rate dynamics is unstable, so it is impossible to make definitive conclusions, however, in the context of regions the situation is similar. It should also be noted that the criminality rate is significantly depend on the effectiveness of law enforcement, and therefore requires a more in-depth study to clarify the relationship with the living level.

3.2 MIMIC model

We develop our model, using results of preliminary factor analysis, which revealed some significant factors explaining dispersion of all variables included in the sample.

Casual variables for life quality:

- Unemployment rate (also this variable is frequently using in MIMIC-model, including models for regional level)
- Rate of natural increase (as result of our factor analysis)
- Number of registered crimes committed by juveniles or with their complicity (literature review is also confirm their appropriateness for MIMIC-model)
- Provision of childcare facilities (as particular measure of public goods' provision)

Indicator variables demonstrate some dimensions of real welfare and productive activity:

- Consumption expenditure per capita (measure of purchasing power)
- Ratio between quantity of passenger cars (per 1,000 inhabitants) and per capita cash income of the population (per month, rubles) (to our mind, partly similar approach was developed by Braguinsky S., Mityakov S., Liscovich A. (2014). They implement estimation based on direct method, using data on discrepancy between data of car registries and employers' records of paid earnings)
- Electricity intensity: Ratio between electricity consumption in region and the Gross Regional Product (this measure is rather popular in estimation of shadow economy, as indicator in electricity consumption method, see e.g. Vorobyev P. (2015) and as possible indicator in MIMIC-models at regional level, e.g. see Wiseman T. (2013)).

Our variable definitions and their explanations are presented in tab. 4.

Tab 4: Variable definitions and explanations

Variables	**Explanation**	**Theoretically expected signs**
Causal variables		
Unemployment rate (percentage)	UNEMPLOY	+
Rate of natural increase (per 1000 population)	NAT_INCR	indefinite
Number of registered crimes committed by juveniles or with their complicity (per 100 000 population)	CRIMES_J	+
Provision of childcare facilities (percentage of the number of eligible children)	CHILDCAR	–
Indicator variables		
Consumption expenditure per capita (per month, rubles)	CONSUMPT	–
Ratio between quantity of passenger cars (per 1,000 inhabitants) and per capita cash income of the population (per month, rubles)	CARS	normalising variable, with its coefficient fixed to 1
Electricity intensity: Ratio between electricity consumption in region and the Gross Regional Product (kWh per ruble)	ELECTRIC	+

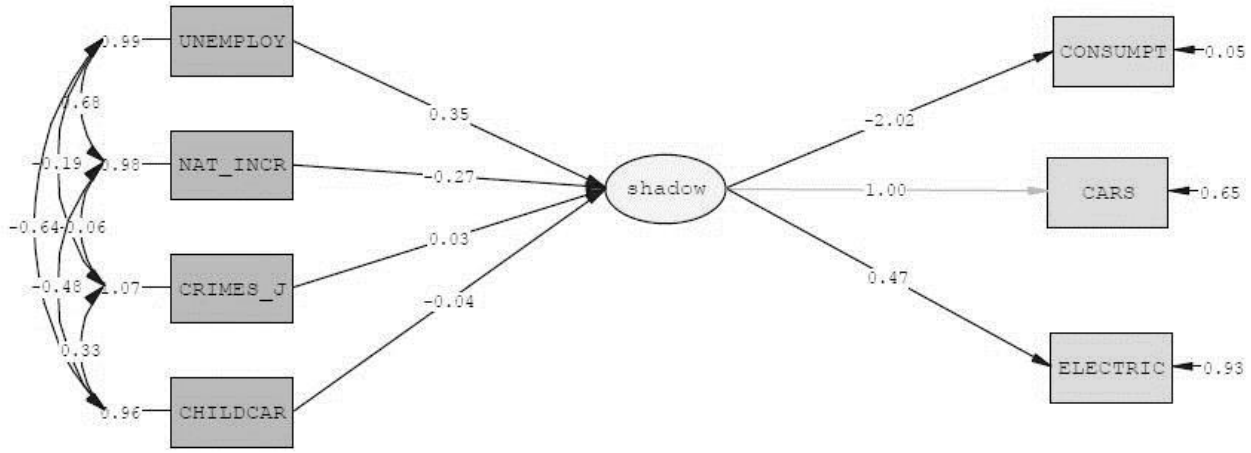
We use data from 79 regions, including Moscow, St. Petersburg, not including Chechenskaya Republic (for lack of data in considered period). The following years are considered: 2001-2013. Normalising variable is ratio between quantity of passenger cars and per capita cash income of the population. Estimation of our MIMIC model had done by means of special computer program for the analysis of covariance structures - LISREL. Results of our MIMIC model estimations are presented in table 6, graphical representation is given in figure 1.

Table 5: MIMIC model estimation results

Causal variables	**Values**
Unemployment rate	0.352
Rate of natural increase	- 0.272
Number of registered crimes committed by juveniles or with their complicity	0.0307
Provision of childcare facilities	- 0.0369
Indicator variables	
Consumption expenditure per capita	- 2.017
Ratio between quantity of passenger cars and per capita cash income of the population	1.000
Electricity consumption	0.467
Statistical tests	
Root Mean Square Error of Approximation (RMSEA) P-Value for Test of Close Fit (RMSEA < 0.05)	0.190 0.000285
Chi-Square for Independence Model (21 df)	171.957
Adjusted Goodness of Fit Index (AGFI)	0.695
Degrees of freedom	10
Number of observations	553

Source: authors calculation

Figure 1: Results of MIMIC-model estimation



The estimated MIMIC coefficients allow us to determine only relatively estimated sizes of the shadow economy, which describe the pattern of the shadow economy in a particular country over time. In order to calculate the size and trend of the shadow, we must convert the MIMIC index into «real world» figures measured as percentage of official GDP. This final step requires an additional benchmarking or calibration procedure.

In the first step, the MIMIC model index of the shadow economies is calculated using the structural equation, i.e. by multiplying the coefficients of the significant causal variables with the respective time series. The structural equation is:

$$SHADOW = 0.00166 + 0.352*UNEMPLOY - 0.272*NAT\_INCR + \\ + 0.0307*CRIMES\_J - 0.0369*CHILDCAR \quad (1)$$

This index is converted into absolute values of the shadow economies, which take up a base value in a particular base year. The base value is from Bilonizhko (2006) who presents estimates of the shadow economies in 2001-2003.

Thus, the size of the shadow economy *SHADOWt* value at time t is given as:

$$SHADOW_t = \frac{SHADOW_{index\ t}}{SHADOW_{index\ base}} * SHADOW_{base} \quad (2)$$

where $SHADOW_{index\ t}$ denotes the value of the MIMIC index at *t* according to equation,
$SHADOW_{index\ base}$ is the value of this index in the base year 2002, and
$SHADOW_{base}$ is the exogenous estimate (base value) of the shadow economies in 2002.

Applying this benchmarking procedure, the final estimates of the shadow economies are calculated for each region.

Results

According average value of estimated share of shadow economy during investigated period, Moskow-city has the lowest hidden economy, though Ingushetia has higher rank; the other leaders are Tyumen region, Sakha (Yakutia) Republic, Chukotka and St.Petersburg; the lowest positions are occupied by Ivanovo region, Vladimir region, Smolensk region and Pskov region. In whole, share of shadow economy vary from 48% to 62% from GRP at considered regions during investigated period.

Summary of results is given in figures 2-3.

Fig. 2: Share of shadow economy – maximum and minimum value, % (our estimation)

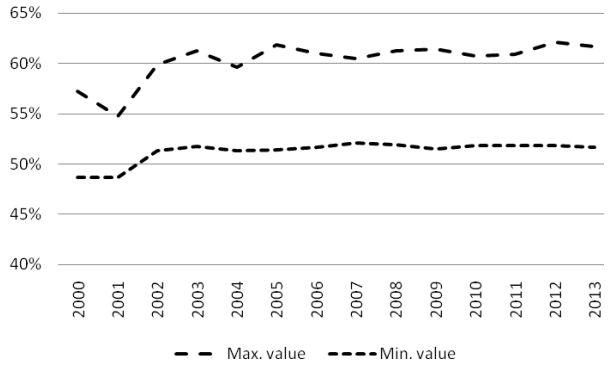


Figure 4: Share of shadow economy in Russia: comparison of estimations

Fig. 3: Share of shadow economy – some regions, % (our estimation)

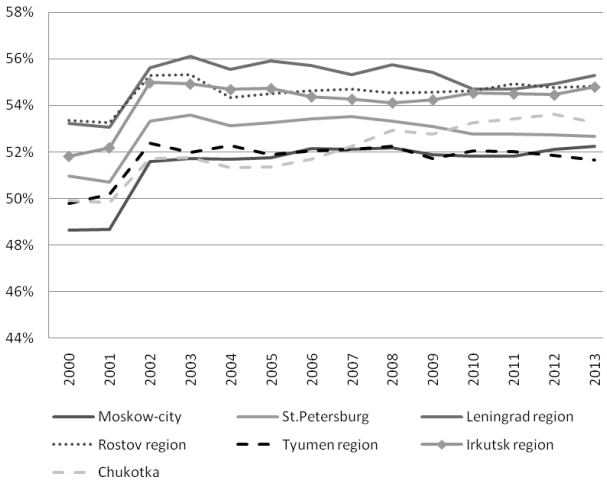


Figure 5: Share of shadow economy in Russia: comparison of estimations (MIMIC method)

Share of shadow economy grown in 19 regions of the 79 regions if to compare 2013 to 2002 (2002 is base year of estimating by Bilonizhko (2006)): Kursk region, Lipetsk region, Orel region, Yaroslavl region, Komi Republic, Kaliningrad region, Karachaevo-Cherkesia, Tatarstan, Kirov region, Penza region, Saratov region, Ulyanovsk region, Altai Krai, (Yakutia) Republic, Primorsky Krai, Khabarovsk region, Magadan region, EAO, and Chukotka.

Summary and Discussion

The results support our hypothesis concerning impact of shadow economy on quality of life.

Signs of coefficients in equation (1) indicate, that the shadow economy is the larger,

- the more unemployment rate,
- the less rate of increase,
- the more crimes committed by juveniles or with their complicity,
- the less provision of childcare facilities.

On the other part, the shadow economy is the larger,

- the less consumption expenditure,
- the more electricity intensity.

Thus, 5 of 5 theoretically expected signs had been confirmed.

We believe that our proposed approach for evaluation of the shadow economy at the regional level can be used to justify decisions on the allocation of funds from the federal budget in kind of transfers to regional budgets, which are aimed to at improving the quality of life.

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Shadow Economy in Regions of Russian Federation and Ukraina

Summary

The aim of this paper is to determine shadow economy on regional level in connection with quality of life. In this paper we concentrate on studying of relationship between shadow economy and various socio-economic indicators which reflect quality of life. The paper focuses on shadow economy's regional differences in two countries: Russian Federation and Ukraina. The research methods used in this paper are factor analysis and MIMIC modelling. Using this method, we conducted a factor analysis of the relationships of quality and standard of living in regions of Russian federation for the period of 2002-2013 and in Ukraine for the period of 2004-2013 in the same indices of 17 sections. The factors most common for the two countries are the demographic factor and the criminogenic factor. There are significant differences in the structure of the standard of living monetary support factor. In Russia, monetary income and formal employment have shown a weak correlation, while in the Ukraine they are closely related. The demographic indices for the quality of life are significantly affected by the ethno-socio-cultural factors, therefore their application in the analysis of correlations between the various manifestations of shadow economy is quite limited. Finally, the fact that the indices for the standard and quality of living can be regularly explained by the influence of various factors shows that there is a gap between the economic and societal components in the functioning of the two states. Using results of factor analysis the MIMIC model was developed. The results point out that the level of shadow economy in Russian Federation vary from 48% to 62% from GRP at considered regions during 2000-2013.

Key words: Shadow Economy, Quality of life, MIMIC model

JEL classification: E 26, O 17.