

Econometric Analysis of Informal Employment in the Russian Labor Market

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Abstract— Informal employment is a problem for many countries. On the one hand, the state receives lower-than-usual tax refunds, and on the other hand, it leads to social insecurity of workers. The paper investigates the problem of informal employment in the regions of the Russian Federation on the basis of the data taken from the Russian Federal State Statistics Service (Rosstat in Russ.), also from the monitoring of the economic situation in Russia and the population health at the Higher school of Economics. The research of the informal employment structure in different Russian regions has been conducted, namely data on gender, age groups and types of economic activity have been compared. Binary choice models were used to identify factors that influence an individual's inclination to the informal employment. The constructed models have revealed the dependence of this factor on sex, the level of education and age, alongside with the place of residence and marital status. The proposed tools can be used in the development of the regional development strategies for obtaining projections of the employment structure in the regional labor market.

Keywords: *labor market, informal employment, statistical analysis, binary choice models*

I. INTRODUCTION

Unreported employment represents a problem for many countries, since, on the one hand, it produces tax gaps for the state, and on the other hand, it leads to social insecurity of employees. Most of those working without concluding employment agreements would like to earn officially shown salaries. However, for a variety of reasons, they came to be unemployed in the formal sector of economy. Therefore,

unreported employment is an alternative to unemployment for them. Demand for such working places comes into being, for instance, in retailing, i.e., at relocatable points of sales or on markets, as well as in construction and agriculture, where unskilled workers are wanted. Incomes of officially unemployed people are usually considered to be low and comparable to living wages.

However, among the informally employed people, there are other categories. According to the Rosstat methodology, the criterion of no state registration as a legal entity is taken as the criterion of defining the informal sector units. Therefore, both individuals working for wages/salaries without being officially employed and self-employed individuals, and their family members involved in their family businesses, and freelancers without registration are categorized as those employed in the informal sector [1]. Currently, this category is considered as self-employed population.

The problem of unreported employment exists in both advanced economies and emerging countries. Until about 15 years ago, it was believed that informal sector was holding just an inconsiderable labor market share in the best-situated European countries and that it was represented by atypical occupations in form of self-employment. In recent years, due to migrant influx, the growth of unreported employment is observed in those countries, as well. Conventionally, unreported employment was common in countries, such as Italy, Spain, or Greece, where it is represented as microbusinesses and self-employment. Much more, it holds a considerable labor market share in emerging and transition economies [2].

Works [3-6] deal with the research on how migration processes affect the level of unreported employment. The military conflict in Syria has resulted in many refugees appearing, in particular in Turkey. In studies [3, 4], the adverse effects are noticed that are provided by the influx of refugees upon the economy of Turkey, which affects are centered around the increase in unemployment and the declining employment in the informal sector of economy. Great Britain faces the issues of the unreported employment of migrants. Works [5, 6] focus on the influence of Chinese, Bangladeshi, and Turkic diasporas upon the structure of the informally unemployed. They notice the presence of many "wild cards" regarding moving to the informal sector, which, along with no documents required for official employment, include "fair" salaries, support, trust, family ties, and social bonds. Moreover, not the least of the factors is discrimination regarding the employees from among ethnic minorities at official places of employment.

However, the problem of unreported employment is more severe in emerging countries that include the countries of Eastern Europe. Works [7, 8] provide the assessments of the size of the "shadow" economy in Ukraine, the part of which is unreported employment. According to [7], the rate of those employed informally was over 26% of all the employed in 2015, but it had reduced to 21.8% by 2018. Study [8] provides an assessment of the financial losses due to "shadow" employment, incurred by the financial system of public social protection. According to its authors, the level of the "shadow" sector in the economy of Ukraine has increased from 35% up to 50% over the last decade. At the same time, the legalization of just 1% of the informally unemployed would allow increasing the social protection funding within UAH 402-1147 million.

Many authors emphasize that informal employment predominates in rural regions [9-13]. Work [10] provides the research on the labor market of Moldova. It is shown that a considerable cause of that is that there are no alternatives on the labor market in rural areas, which is also aggravated with social payments, such as unemployment allowances and retirement benefits. Research on living standards and unreported employment in the rural areas of Ukraine is presented in work [11]. It is shown that, with increasing the unreported employment rate in the regions, the level of incomes in households reduces considerably. T. Nefedova [12] and M.N. Mukhanova [13] studied the specificity of unreported employment in the rural regions of Russia. Despite low salaries and the fact that unreported employment is a survival mechanism for rural population, a positive function of informal sector is noticed. Due to it, people have just some income, which is the reason for a relative stability of the Russian countryside.

Conventionally, unreported employment is considered to provide adverse effect on the economy. In the countries, such as France, Italy, or Spain, to reduce unreported employment, a soft policy is used, which combines lower taxes in the formal sector with the increased tax rates for the companies involved in the informal sector [14]. The authors of [7] tend to the same measures. Practically all those studying the labor markets of Eastern Europe notice the necessity of improving the

economic situation in the country and enhancing its stability. However, there appear more and more studies that identify the positive role of the informal sector of economy. For example, the comparison of working conditions and social benefits in Great Britain, presented in work [15] showed that benefits for those employed officially reduce continuously, while the requirements increase, which may result in increasing the popularity of the informal economy with the employees. As mentioned above, work [13] notices such positive effect of the presence of informal employment, too.

Russian economy is still categorized as transitional [16]. According to Rosstat, the share of informally employed was 20.1 % in 2018, and it keeps growing. In Russia, the issues of unreported employment are studied by the Centre for Labor Market Studies (CLMS) of the National Research University Higher School of Economics (HSE). Director of that center, professor V.E. Gimpelson, and his co-authors analyze in their works [2, 17-19] the composition and structure of those employed in informal sector, as well as their wages/salaries and the mechanisms of forming thereof. In work [17], the increase of the informal sector share is noted along with the growth of GDP. Among wage-earning workers, the largest share is occupied by young people with a low level of education, while the structure of self-employed population does not differ from that of formally employed in terms of age and education. The basis of informal sector is provided by trade, construction, and personal services.

When evaluating the incomes of those informally employed, work [17] notes a lower income level among wage-earning workers as compared to the formal sector; however, the incomes of the self-employed turned out to be higher. Estimation results obtained using quantile regression provided the evidence of the lower incomes from 21 to 12 % (depending on their income levels) for informal wage-earning workers as compared to those working under employment agreements. At the same time, among the self-employed, the up to 25% exceedance of incomes was observed until the fourth decile, and then a sharp exceedance of incomes was further observed up to 90%. In study [18], they note the existence of severe restrictions hampering employment in formal sector, which is a "failure" of the institutional system. It is the state that is guilty of reducing the number of legal entities due to high taxes. Should the current state policy be maintained further, the number of unreported employers will only grow.

II. METHODS OF RESEARCH

In investigating the factors affecting the individual choice of an employment form, one should work with the categorical values of an effective factor. In case of two possible values, binary choice models are used; if there are more values, multiple choice models are used [20].

In binary choice models, the variable is dependent, which can only take two values: 1 and 0. In the context of analyzing unreported employment, "people employed in informal sector" are used as 1 and "the overall number of the employed" as 0. Factorial features are individual characteristics, such as "age,"

“education,” “sex,” etc. The specific basket of factors is defined while constructing the model.

In binary choice models, the likelihood is estimated that the dependent variable would take a value equaling to one (or zero):

$$\hat{y}_i = P(y_i = 1) = F(u_i),$$

$$u_i = \sum_{j=0}^k x_{ij} b_j$$

where

As $F(u_i)$, the logistic distribution function was used in this study

$$F(u) = \Lambda(u) = \frac{e^u}{1 + e^u},$$

while the model itself is called “logit model.”

There is a wide range of the applications of these models in analytic studies; in some cases, these tools proved to be sound as an efficient means of predictive case estimates [21, 22]. These models were also used to investigate employment and unemployment [23].

III. RESULTS AND DISCUSSION

The empiric base of our study is the data of the Russian Federal State Statistics Service (Rosstat) [1, 24], as well as the data of the Russian Longitudinal Monitoring Survey – HSE (RLMS-HSE) conducted by the National Research University Higher School of Economics and OOO “Demoscope” together with Carolina Population Center, University of North Carolina at Chapel Hill, and the Federal Center of Theoretical and Applied Sociology of the Russian Academy of Sciences [25].

Studying the changes in the numbers of those employed in informal sector, shown in Fig. 1, you can see its correlation with the gross domestic product (GDP). Computing the lag coefficients of correlations has shown the maximal correlation with the lag within one year. The value of the linear coefficient of correlation for the annual data over 2003-2018 was $r(Y_{t+1}, X_t)=0.847$, where X is the gross domestic product at current prices, Y is the number of those employed in informal sector, in thousands of people. Thus, informal sector responds to changes in the economic situation in Russia with the one-year delay. In the diagram below, we can see a decrease in the number of the informally employed in 2009-2010 as a response to the economic crisis in the second half of 2008, as well as in 2017 as a response to the 2015 banking crisis in Russia.

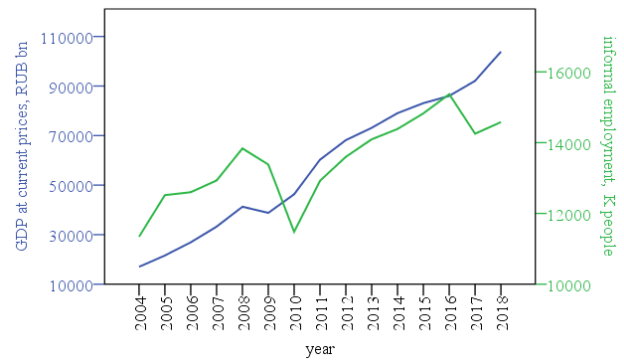


Fig. 1. Changes in the gross domestic product at current prices and in the numbers of people employed in informal sector (on the right)

However, even over the relatively stable period in 2010-2015, no workforce migration into formal sector is observed, which might be expected to take place. Changes in the absolute growth of indexes in the structure of those employed by primary employers (as the percentage of the workforce size) and in the unemployment levels are shown in Table I.

TABLE I. ABSOLUTE GROWTH OF INDEXES IN THE STRUCTURE OF THOSE EMPLOYED BY PRIMARY EMPLOYERS (AS THE PERCENTAGE OF THE WORKFORCE SIZE) AND UNEMPLOYMENT LEVELS

Year	Unemployment level	Share of the employed aged 15-72 at primary employers			
		Formally employed ^a	Without legal arrangements ^b	Employed by individuals ^c	In their own household ^d
2010	-1.0	3.0	-0.3	-1.5	-0.2
2011	-0.8	-0.9	0.2	1.3	0.2
2012	-1.0	0.1	0.0	1.0	-0.1
2013	0.0	-0.8	0.3	0.4	0.1
2014	-0.3	0.0	0.1	0.3	-0.1
2015	0.4	-0.7	0.0	0.3	0.0
2016	-0.1	-0.3	0.2	0.1	0.1
2017	-0.3	0.9	0.0	0.3	-0.9
2018	-0.4	0.0	0.3	0.1	0.1

At an enterprise or organization with legal identity.
 In business activities with no separate legal identity
 Employed by individuals, by self-employed, or at a private farm
 In their own household aimed at manufacturing agricultural, forestry, hunting and fishing products to be sold or exchanged

According to the data in Table 1 above, we can see a stable decrease in the unemployment level, starting from 2010. However, the absolute growth in the number of the formally employed over the period from 2010 through 2016 is also predominantly negative. At the same time, the figures grow regarding those employed with no separate legal identity and those employed by individuals or self-employed. This suggests that, despite the general growth of the gross domestic product, enterprises and organizations do not tend to open new working places with adequate wages/salaries. Therefore, people prefer to get their money “under the table,” but higher, rather than doubtful social safety nets.

Upon further thought, the problem of the growing numbers of the informally employed turns out not to be so unambiguous. In Fig. 2, the share of the informally employed in 2018 is compared to those in 2010. The lowest values are observed in the Central, Ural, and Northwestern Federal Districts, while those values for the North-Caucasian Federal District are double the average informal employment across Russia.

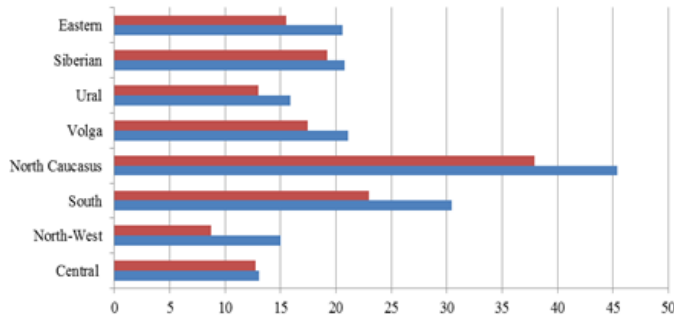


Fig. 2. Comparing the informal employment levels in the federal districts of Russia in 2010 vs. 2018

However, if we consider the statistics by the constituents of the Russian Federation, comparing the growth rate of the unreported employment levels in 2018 vs. 2010 (Table II), this index falls in 35 % of the regions. The most troubled are in this regard the Chechen Republic (64.1 % of informally employed of the total number of the employed), Republic of Dagestan (52%), Ingushetia (48.7%), and Kabardino-Balkar Republic (48.2%). Therefore, we will further primarily focus

TABLE II. RATING THE REGIONS BY THE GROWTH RATE OF UNREPORTED EMPLOYMENT IN 2018 VS. 2010

Rating position	RF substituent	Share of the informally employed in 2018, %	Growth rate
1	Moscow	4.0	-0.131
2	Chukotka Autonomous District	4.8	-0.156
33	Krasnoyarsk Territory	19.8	0.165
77	Kabardino-Balkar Republic	48.2	0.254
78	Republic of Ingushetia	48.7	0.069
79	Republic of Dagestan	52.0	0.001
80	Chechen Republic	64.1	1.173
	Russian Federation	20.1	0.086

Structure of the employed in informal sector and aged 15 or older by activities and generally across Russia, according to Rosstat [1], shows that one third of the informally employed market (32.2%) falls within trading and repairing motor vehicles. Over 17% of the population are employed in agriculture, hunting, and fishing. Those are followed by construction (11.1%), handling and storage and processing industry (10% each), and other activities.

However, the situation is substantially different in the constituents of the North-Caucasian Federal district. In Table III, economic activities are shown, for which the unreported employment figures differ most from the average ones across Russia. For instance, the percentage of the informally employed in trade is 1.5-2 times lower that average across Russia. The main body of the informally employed is in construction and agriculture. Indeed, 48-65 % of the population live in villages in the Chechen, Kabardino-Balkar, and Dagestan Republics, while this index reaches just 26% in average across Russia. This is why the share of those employed in their own household is higher in the above regions. Considering that the informally employed include both wage-earning workers and those having their own households, the extremely high values of the unreported employment in the republics of the North-Caucasian Federal District fall well into place.

However, in our opinion, these are not the household owners or self-employed who deliver troubles, in terms of tax evasion, but the wage-earning workers. If we consider the structure of the wage-earning workers employed informally (the lower half of Table III), most of them are focused on construction, not trade or agriculture. Share of such workers from Kabardino-Balkar is double as much and from Chechnya almost 3.5 times as much as in average across Russia. Nevertheless, the total share of wage-earning workers among the informally employed in the North-Caucasian regions is about 45%, which is even lower than in average across Russia.

TABLE III. STRUCTURE OF THE INFORMALLY EMPLOYED POPULATIONS

Economic activities	RF	Chechnya	Kabardino-Balkaria	Dagestan
<i>Employed in informal sector</i>				
Trade	32.2%	15.6%	20.6%	20.8%
Agriculture	17.3%	34.7%	31.1%	35.1%
Construction	11.1%	21.0%	13.3%	15.3%
<i>Employed in informal sector by individuals or by self-employed</i>				
Trade	37.9%	13.9%	25.0%	27.9%
Agriculture	10.0%	4.9%	13.5%	5.9%
Construction	12.1%	41.5%	24.0%	27.5%

Therefore, the category of wage-earning workers was selected for further analysis. The data of monitoring performed by Rosstat [1] was used in our analysis. To identify the effects provided by the individual characteristics upon the probability of getting into informal sector, a binomial logit-model was used. Unreported employment was used as the effective feature, the factorial features are as follows:

- zan_nf – the employed in informal sector (1 – employed, 0 – all others);
- nas_pol – sex (1 – male, 2 – female);
- nas_vozr – age;

- nasbrach – marital status (1 – married, 2 – unregistered marriage, 3 – widowed, 4 – divorced, 5 – living separately, 6 – single, never married);
- posel – type of location (1 – city/town, 2 – village);
- obraz – education (1 – graduate degree, 2 – secondary vocational, 3 – secondary school), to be used as the ordered categorical variable;
- kdet18 – number of children aged under 18.

To build the model, we used the data for the years of 2010 and 2018, based on the results of Rosstat’s sample surveys [1]. Binary logit-models were built for the Russian Federation and for the Chechen Republic as a representative of an abnormal level of the employed in informal sector. We assessed the probability of the official employment, i.e., $\hat{y}_i = P(zan_nf = 0/x_j)$.

The best splitting of observations on grounds of employment in informal sector was achieved when considering the interaction of the sex and age factors of a location. The estimates of the model parameters, their significance, and the accuracy of the model prediction are shown in Table IV.

TABLE IV. PARAMETER ESTIMATES OF THE LOGIT-MODEL

Factors	Russian Federation		Chechen Republic	
	2010	2018	2010	2018
intercept	2.20***	1.91***	3.77***	1.11***
<i>Continuous predictors</i>				
nas_vozr	0.02***	0.02***	0.02*	0.04***
obraz	-0.30***	-0.34***	-0.81***	-0.68***
kdet18	-0.07***	-0.07***	-0.05	-0.15***
<i>Categorical factors</i>				
nas_pol, level 1	-0.08***	-0.04***	-0.24**	-0.26***
posel, level 1	0.26***	0.12***	0.04	0.17***
nasbrach, level 1	0.20***	0.21***	-0.49*	0.59**
nasbrach, level 2	-0.17***	-0.11***	-1.04**	1.99***
nasbrach, level 3	0.04	0.07***	-0.15	-1.02***
nasbrach, level 4	-0.05***	-0.08***	0.45	-1.68*
nasbrach, level 5	-0.08***	-0.17***	1.51*	0.07
posel*nas_pol, level 1	0.06***	0.06***	0.003	-0.05
*** p<0.01, ** p<0.05, * p<0.1				

Comparing the estimates of the logit-model linear form coefficients shows how the same characteristics may provide different effects in different constituents and at different times on the probability of official employment. However, since the basket of factors proposed cannot be interpreted as exogenous independent variables, it would be incorrect to give a quantitative estimation of the level of how different factors affect the results. Moreover, eight factors of ten are nominal features that can only change discretely.

Of the basket of factors proposed, the age impact on the result has no specifics in the Chechen Republic and has not practically changed over eight years: The older a person is, the higher the probability is that they work under an employment agreement. On the other hand, the factor of having children was not significant at all in Chechnya in 2010, while its effect became double as high as in average across Russia in 2018. The negative value suggests that the more children a person has, the higher the chance is to be employed informally. Apparently, the duty of care of their children instigates people to any jobs.

Influence of education is considerably higher in the Chechen Republic than in average across Russia, although the influence of this factor slightly decreased in 2018 as compared to 2010. There are fewer university-degree professionals in Chechnya, therefore, they are more valuable, and the probability of their official employment is higher.

Another feature reflecting regional specifics is gender. Generally, across Russia, the differences in employing a man or a woman are neutralized with the time (-0.08 in 2010 and -0.04 in 2018), while in the Chechen Republic the influence of this factor is much higher (-0.26 vs. -0.04 across Russia), and it is still rising.

Thus, analyzing the specifics of and modeling the state of unreported employment at regional level allow identifying critical structural differences typical of the territory under consideration. This allows correcting the measures to be taken in order to enhance the stability of the formal sector of economy.

IV. CONCLUSIONS

This paper presents the research in the changes in the indicators of unreported employment in the Russian economy over the years 2010-2018. Despite the growth in the informal employment rate nationwide, the indicator dropping is observed in 35% of Russian regions. Therefore, our analysis was focused on the regions of concern. In those regions, the main body of those employed informally falls within construction and agriculture.

Based on logistic regression models, we identified the factors promoting official employment. Similar studies can be performed for other territories to adjust the measures enhancing economic stability in the region. Those measures must vary widely, although not exclusively at the regional level, but at the level of municipal entities.

Based on the research findings, we can state that, in case of the development unevenness of the economic environment, the statement of the unambiguously positive changes in the share of unreported employment is incorrect. Besides, there are the so-called regions of concern that have some specifics regarding their reproduction circuit, the development of which is primarily ensured by agriculture and construction. A large share of the owned households is typical for such regions, which accounts for a higher percentage of unreported employment as compared to industrial or metropolitan areas. It is strategically crucial to make more nuanced decisions on the structural changes in the employment levels, focused on

considering the territory specifics and regional diversity. Hence, retaining the institutional stability of formal employment sector does not always contribute to the efficient economic development of territories.

REFERENCES

- [1] "Federal State Statistics Service", Results of the sample labour force survey [Electronic resource]. Available at: <https://www.gks.ru/compendium/document/13265>.
- [2] V. Gimpelson and A. Zudina, "Informal workers in the Russian economy: Who are they and how many?", *Voprosy Ekonomiki*, 2011, vol. 2011 (10), pp. 53–76. DOI: 10.32609/0042-8736-2011-10-53-76.
- [3] O. Esen and A.O. Binatli, "The impact of syrian refugees on the turkish economy: Regional labour market effects", *Social Sciences*, 2017, vol. 6 (4), 129. DOI: 10.3390/socsci6040129.
- [4] E. Ceritoglu, H. Yunculer, and H. Torun, "The impact of Syrian refugees on natives' labor market outcomes in Turkey: evidence from a quasi-experimental design", *IZA J Labor Policy*, 2017, vol. 6, 5. DOI:10.1186/s40173-017-0082-4.
- [5] M. S. Shahid, P. Rodgers, and C. C. Williams, "Evaluating the participation of an ethnic minority group in informal employment: a product of exit or exclusion?", *Review of Social Economy*, 2017, vol. 75:4, pp. 468–488. DOI: 10.1080/00346764.2016.1269941.
- [6] A. Bloch and S. McKay, "Employment, Social Networks and Undocumented Migrants: The Employer Perspective", *Sociology*, 2015, vol. 49 (1), pp. 38–55. DOI: 10.1177/0038038514532039.
- [7] M. Kopytko, A. Pazicieva, A. Khorosheniuk, M. Matviienko, and M. Vinichuk, "Shadow employment in Eastern Europe: practical aspects of evaluation and counteraction", *Business: Theory and Practice*, 2019, vol. 20, pp. 485–491. DOI: 10.3846/btp.2019.45.
- [8] M. Malyovanyi, O. Rolinskyi, and N. Lysa, "Selected aspects of the social protection system's financial security in the context of shadow economy", *Economic Annals-XXI*, 2016, vol. 158 (3-4), pp. 88–91. DOI: 10.21003/ea.V158-20.
- [9] O. E. Atesagaoglu, D. Bayram, and C. Elgin, "Informality and structural transformation", *Central Bank Review*, 2017, vol. 17 (4), pp. 117–126. DOI: 10.1016/j.cbrev.2017.11.002.
- [10] B. Pfau-Effinger, "Informal employment in the poor European periphery", *International Journal of Sociology and Social Policy*, 2017, vol. 37 (7-8), pp. 387–399. DOI: 10.1108/IJSSP-07-2016-0080.
- [11] M. Chrenková, K. Melichová, E. Marišová, and S. Moroz, "Informal Employment and Quality of Life in Rural Areas of Ukraine", *European Countryside*, 2016, vol. 8 (2), pp. 135–146. DOI: 10.1515/euco-2016-0011.
- [12] T. Nefedova, "From the transformation of rural areas to informal employment among southern Russia's population", *Zhurnal Issledovaniy Sotsial'noi Politiki*, 2019, vol. 17 (1), pp. 119–132. DOI: 10.17323/727-0634-2019-17-1-119-132.
- [13] M. N. Mukhanova, "The employment structure of rural inhabitants in the informal economy", *Sotsiologicheskiy Zhurnal*, 2017, vol. 23 (2), pp. 74–95. DOI: 10.19181/socjour.2017.23.2.5161.
- [14] E. Di Porto, L. Elia, and C. Tealdi, "Informal work in a flexible labour market", *Oxford Economic Papers*, 2017, vol. 69 (1), pp. 143–164. DOI: 10.1093/oep/gpw010.
- [15] J. Shapland and J. Heyes, "How close are formal and informal work?" *International Journal of Sociology and Social Policy*, 2017, vol. 37 (7-8), pp. 374–386. DOI: 10.1108/IJSSP-06-2016-0071.
- [16] V. M. Kul'kov, "Zavershilsya li perekhodnyy period v ekonomike Rossii", *Ekonomicheskiye i sotsialnyye peremeny: fakty. tendentsii. prognoz*, 2015, vol. 4, pp. 45–59.
- [17] V. E. Gimpelson, R. I. Kapelyushnikov, "Normalno li byt neformalnym?", *Ekonomicheskiy zhurnal Vyshey shkoly ekonomiki*, 2013, vol. 17, vol. 1, pp. 3–40.
- [18] V. Gimpelson and R. Kapeliushnikov, "To live in the shadows or to die in the light: Informality in the russian labor market", *Voprosy Ekonomiki*, 2013, vol. 2013 (11), pp. 65–88.
- [19] V. Gimpelson and R. Kapeliushnikov, "Between light and shadow: Informality in the Russian labour market", *The Challenges for Russia's Politicized Economic System (Book Chapter)*, 2015, pp. 33–58.
- [20] V. V. Davnis and V. I. Tinyakova, "Predelnyy analiz regressionnykh modeley diskretnogo vybora", *Ekonomicheskiy analiz: teoriya i praktika*, 2006, vol. 10 (67), pp. 4–13.
- [21] Y. V. Hayrutdinova, A. V. Aksyanova, and M. R. Safiullin, "Scenario forecasting of tendencies of development of macroeconomic indicators of the region on the basis of models of the multiple choice (on the example of the republic of tatarstan)", *Quid: Investigación, Ciencia y Tecnología*, 2017, vol. 28, pp. 1457–1462.
- [22] J. Chen, S. Li, "Mode Choice Model for Public Transport with Categorized Latent Variables", *Mathematical Problems in Engineering*, 2017, 7861945. DOI: 10.1155/2017/7861945.
- [23] M. A. Giltman, "Employment in the north of Russia: Microdata analysis", *Zhurnal Novoi Ekonomicheskoi Assotsiatsii*, 2017, vol. 3 (35), pp. 103–124.
- [24] *Rabochaya sila, zanyatost i bezrobotitsa v Rossii (po rezultatam vyborochnykh obsledovaniy rabochey sily)*, 2018, Stat.sb., Rosstat., M., 2018, 142 p.
- [25] *Russian Longitudinal Monitoring Survey – HSE* [Electronic resource]. Available at: <https://www.hse.ru/en/rlms>.