

Rural-Urban Segregation: A Special Case of Researching Monetary Income of the Population

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Differences in the level of socio-economic development of certain territory types (rural and urban) impact the level of monetary income of the population. This article raises the issue of social asymmetry of the population income depending on the settlement type. The research hypothesis includes several assumptions about the causes of the rural income backwardness due to ascribing factors, as well as several micro and macroeconomic factors. Another important point is the author's pry into the possible differences of the impact of these factors on the monetary incomes of rural and urban inhabitants. As a result of the analysis, the authors identified differences in distributing the social strata of the rural and urban population according to the level of monetary income, categorised the labour market possibilities depending on the territory types and identified gender and age proportions in the composition of the employed population. The regression analysis revealed differences in the list of factors influencing the income level of the population, which led to the conclusion on the high vulnerability of the rural population in the matter of revenue generation.

Keywords: *Money Income, Rural Economy, Labour Market, Social Asymmetry, Social Stratification.*

1. THEORETICAL BASIS

The issue of social stratification by income level was addressed by many foreign and Russian scientists. At the same time, the ever-changing macro and micro-environment conditions set the goal of regularly identifying the causes of income differentiation and widening the gap between the rich and the poor (Razafimandimby, 2017).

In their studies, many scientists use an integrated approach incorporating a group of non-quantitative indicators into econometric models. Thus, in his scientific research, A.V. Karavai proves the dependence of social stratification on ascriptive characteristics (sex, age, health condition, settlement type, etc.). Models of social imbalance in rural areas are of particular interest, where according to the study results, the population is more likely to enter high-income groups (under the condition of favourable ascriptive characteristics) than in capital cities. So the stratification by income level in the countryside is less pronounced (Karavay A. , 2018) (Karavay A. , 2020).

S. Yitzhaki and R.I. Lerman also studied the role of race and gender identity in allocating population in income strata. The author's approach included the distribution of the population into income groups according to the Gini index. However, if additional features (race, sex, age) are added to the model, the grouping changes the structure (Yitzhaki & Lerman, 1991).

The topic of social stratification is relevant in many countries so large-scale research involves in-country and inter-country scales. When studying the causes of income stratification, they often include age, health, gender and race identity (Income of the population 55 or older, 2014) (Social status and standard of living of the Russian population, 2017).

For our research, studies on the differentiation of the population income according to the settlement type are relevant. N. Tikhonovaindicates the decline in the share of the poor and the increase in the share of median income values of the rural population linking this to the mental drive of the rural part of the Russian society «to live like everyone else» (Tikhonova, 2017). Also in the study, the author indicates comparisons of significant interregional differences regarding the income of mass population segments being a momentum for researching the issues of specific regions without reference to the nationwide indicators.

The work of M.Scalnaya (Skalnaya, 2018) contains the data and conclusions confirming the serious imbalances in monetary income levels of the rural population as compared with urban ones.

In the scientific article by V.L. Shabanov (Shabanov, 2019), the author generated and validated the hypothesis concerning the high vulnerability of the working-age rural population in comparison to the urban population. The advantages of family living (from an economic standpoint) over living alone in rural areas were also justified.

Several Russian authors attribute the low level of the rural population income to the overall backwardness of rural territories in socio-economic development relating to larger administrative units (district centres, urban areas) (Kamenskaya, 2016) (Zaitseva & Remizova, 2018) (Anikin & Tihonova, Bednost v Rossii na fone drugih stran [Poverty in Russia compared to other countries], 2015) (Popova & Pishniak, 2016) (Anikin, Lezhnina, Mareeva, Slobodenyuk, & Tikhonova, 2016).

We are conceptually close to the standpoint of A.V. Karavai (Karavay A. , 2020) thinking that the complex of ascriptive characteristics impacts the general differentiation of the rural population and entering a certain stratum by income level.

Our research hypothesis includes several assumptions:

- differentiation of the population in traditional agrarian regions is less pronounced (between rural and urban populations) due to the concentration of systemic enterprises in rural settlements;

- factors impacting monetary incomes in urban and rural settlements are strikingly different. The necessity of identifying these differences lies in the development of adaptive measures to reduce social stratification.

2. DATABASE AND METHODOLOGY

The data for the research was incorporated from the Rosstat statistical compendiums. The research period was 6 five-year intervals from 1995 to 2020 (for the general statistical analytics). As for the group of indicators, however, the data for 2020 is not complete and should not be included in the article. The group of analytical indicators was compared in terms of two area types: urban and rural. To identify the factors impacting the monetary income level of the population, we implemented a regression model with the gradual exclusion of irrelevant variables. The sampling for regression analysis amounted to 18 years (2000-2018).

The dependent variable is the salary of the population, the list of independent variables is as follows: population by territory type, Inflation rate, domestic regional product, number of enterprises, consumer price index, unemployment rate; investments in fixed capital; improvement of the housing stock (gas supply, water supply, sewerage) by territory type; population housing by territory type.

The research subject is the traditional agrarian region of Russia: the Stavropol region. Agriculture is the leading industry in the GRP structure of the region (15% on average for 2016-2018) employing 197 thousand people mainly from rural areas (95%). In 2019 the rural population amounted to 41%. The high population density in the region (42.38 people per sq.

km) is due to the comfortable natural and climatic living conditions and its geopolitical situation (bordering more economically developed regions).

3. STATISTICAL ANALYSIS

According to the Rosstat official research (Kamenskaya, 2016) (Karavay A. , 2018), the main part of the monetary income of the population in the Stavropol region is the salary (Statistical Yearbook Stavropol territory, 2019). Fig. 1 demonstrates the growth of nominal income during five-year periods from 1995 to 2020. The urban-rural average salary gap is evident with rising to 30 % by 2020.

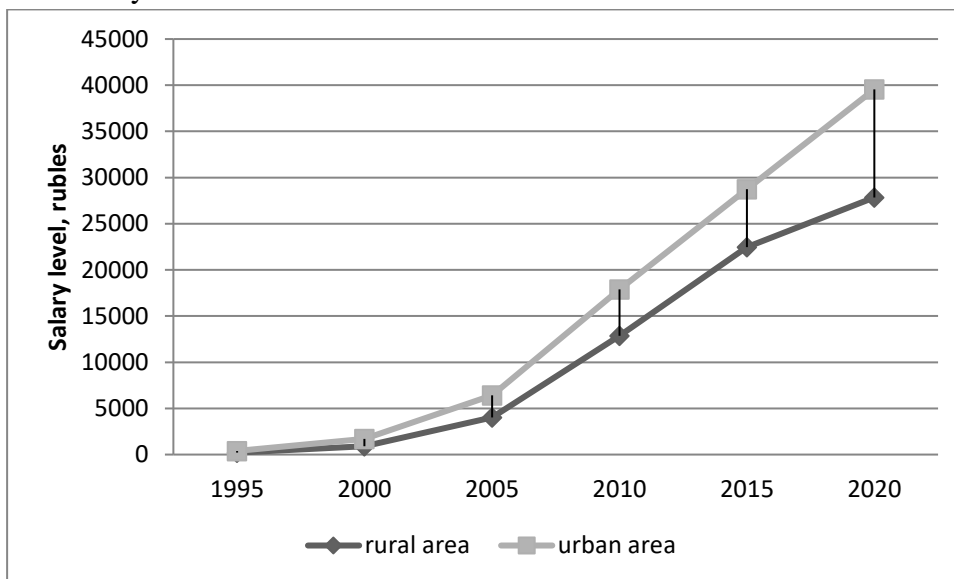


Figure 1 - Dynamic changes in population salary by settlement type in Stavropol region.

The level of asymmetry is also evident when analysing the population distribution by income groups (Table 1). Notably, there is an overall increase in the level of regional population well-being from 2000 to 2015. According to the income scale, the minimum income level has increased 10 times and the maximum one 11 times.

Particular attention is paid to the high share of the rural population in the low-income groups in 2000 (up to 1,000 rubles per capita) that is 39.5 % in rural areas compared to 25 % in urban areas. The majority of the population (56.2 %) has an average income between 1,000 and 3,000 rubles, while the high-income strata include only 4.3 % of the rural population versus 13.3 % of the urban population.

In 2005, the income scale changed with the minimum value recorded at 1,000 rubles level and the maximum value being over 7,000 rubles.

Table 1 - Population distribution by per capita monetary income (per capita, (scale in rubles) in % of the total regional population)

2000							
Up to 500,0	From500,1 to 750,0	From750,1 to 1000,0	From1000,1 to 1500,0	From1500,1 to 2000,0	From2000,1 to 3000,0	From3000,1 to 4000,0	Over 4000,0
Urban population							
5	9.6	10.9	21.6	19.3	20.3	7.6	5.7
Rural population							
6.2	14.6	18.7	25.2	17.5	13.5	3.2	1.1
2005							
Up to 1000,0	From1000,1 to 1500,0	From1500,1 to 2000,0	From2000,1 to 3000,0	From3000,1 to 4000,0	From4000,1 to 5000,0	From5000,1 to 7000,0	Over 7000,0
Urban population							
1.7	3.6	5.6	13.0	14.4	13.4	21.5	26.8
Rural population							
2.1	6.6	9.8	22.8	18.2	12.6	12.3	15.6
2010							
Up to 3500,0	From3500,1 to 5000,0	From5000,1 to 7000,0	From7000,1 to 10000,0	From10000,1 to 15000,0	From15000,1 to 25000,0	From25000,1 to 35000,0	Over 35000,0
Urban population							
4.2	6.4	13.1	21.4	23.1	19.8	7.5	4.5
Rural population							
10.2	12.3	18.4	18.8	1.4	15.7	4.1	1.1
2015							
Up to 5000,0	From5000,1 to 7000,0	From7000,1 to 10000,0	From10000,1 to 14000,0	From14000,1 to 19000,0	From19000,1 to 27000,0	From27000,1 to 45000,0	Over45000,0
Urban population							
1.8	3.4	9.4	11.5	19.5	21.4	20.8	12.2
Rural population							
5.2	7.8	13.2	20.3	14.5	16.0	16.2	6.8

In 2005, the population redistributed between groups in favour of middle-income groups (from 2,000 to 5,000 rubles) with 53.6 % of the rural population. The minimum range included 18.5 % of the rural population, which is 7.6 % more than the urban population. In 2010, the sharp increase in income intervals contributed to the rise in the share of the population with low monetary income in rural areas to 40.9 % (23.7 % in urban areas). If we prolong the interval scale to the level of 2005, the low-middle-income population ratios according to the data from 2010 in rural areas will repeat the figures from 2005. In urban areas, however, the share of the high-income population will increase significantly. Thus, since 2010, there has been a significant gap in the income of the population living in different locality types.

Data from 2015 return ratios of the first analysed time intervals (2000, 2005), the share of the population with small and ultra-low incomes in the countryside decreases to 26.3%, and the high level reaches 23%, which is a positive trend. The reasons for these fluctuations are to be found in the socio-economic differences between rural and urban areas.

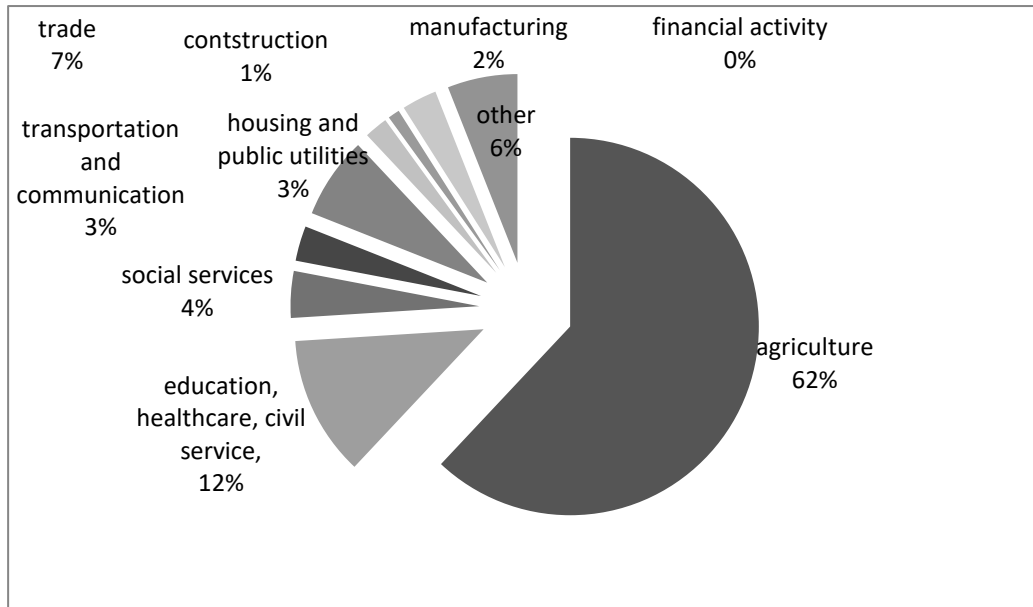


Figure 2 – Share of employed in rural area of all employed, %

Employment in certain industries also depends on the territorial factor, figures 2 and 3 show the distribution of the rural and urban population by economic sectors. The main industry of labour application in rural areas is agricultural production and budgetary activities (education, State authorities, healthcare).

The urban labour market has a more diversified sectoral structure, which provides competition and choice for the population in terms of employment and, as a result, income.

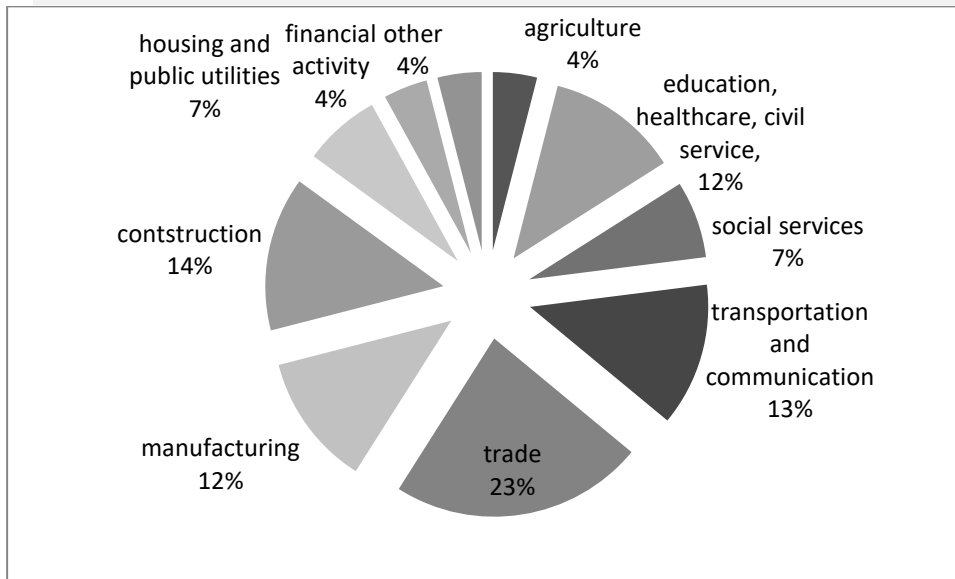


Figure 3 – Share of employed in urban area of all employed, %

Next, we consider the unemployment rate in the Stavropol region. Fig. 4 shows the distribution of officially registered unemployment and the sharp increase in rural indicator of unemployed population in 2005 associated with a significant decline in urban unemployment. Thus, it can be assumed that the low level of monetary income encourages the rural population to seek more gainful employment in urban areas.

According to the data from Table 2, it is possible to conclude that the employment structure depends on gender characteristics of the population. Thus, from 1995 to 2020, the share of employed women in rural areas increased by 2.5 %, whereas the share of employed men decreased by 1 %. There was a reverse trend in urban areas.

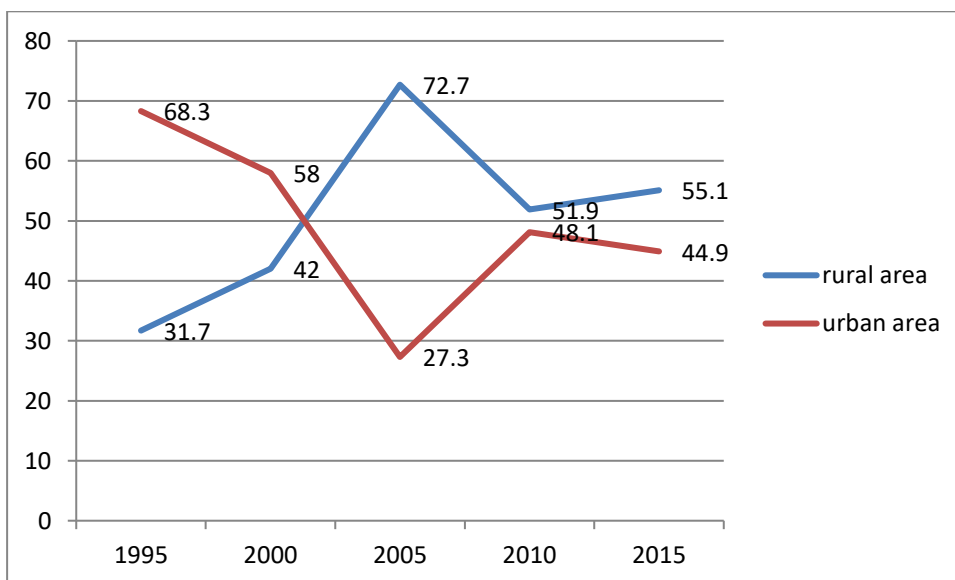


Figure 4 - Share of unemployed by settlement type, %

Table 2 - Share of employed by gender and settlement type, %

Years	Rural area		Urban area	
	women	men	women	men
1995	59.8	62.4	54.2	70.2
2000	60.7	61.9	55.6	72.4
2005	61.2	61.7	53.2	69.8
2010	62.4	62.3	52.7	71.6
2015	60.1	61.2	52.1	71.4
2020	62.3	61.4	51.7	72

Analysing the data on the age structure of the population in the Stavropol region shows a high share of the population over the age of 65 in rural areas, and a decline in the share of newborns and children under 6 years by 15 % in 2015 compared to the data from 2000. There is also decline in the working-age population.

4. RESULTS OF REGRESSION ANALYSIS

During the regression modelling, we had a task to compare the significance of individual indicators for the monetary income level of the rural and urban population. As a result, we implemented two regression analysis sessions and obtained the following results.

Table 3 – Regression analysis of monetary incomes for rural population in Stavropol region

Independent variables	Dependent variable: monetary income of rural population		
	Model 1	Model2	Model3
Number of rural residents (population)	0,07 (0,59)	-	-
DRP per capita, rubles	0,73 (0,01)*	0,72 (0,01)*	0,78 (0,01)**
Number of organisations, units	0,10 (0,18)	0,11 (0,08)	0,14 (0,02)*
Housing floorspace supply for rural population, sq. m. per person	0,07 (0,56)	0,08 (0,46)	-
Plumbing improve mentor rural population,%	-0,01 (0,91)	-0,04 (0,74)	-0,08 (0,45)
Investments in fixed capital, mln. rubles	0,42 (0,01)*	0,41 (0,01)*	0,47 (0,00)***
Consumer price index,%	-0,02 (0,77)	-0,02 (0,76)	-0,02 (0,67)
Unemployment rate,%	-0,01 (0,84)	-0,01 (0,80)	-0,01 (0,68)
Inflation rate, %	0,08 (0,31)	0,11 (0,09)	0,09 (0,12)

Normalized R-squared	0,99	0,996	0,996
Standard error	0,08	0,081	0,079

Note: * $p < 0,05$; ** $p < 0,01$; *** $p < 0,001$

Table 4 – Regression analysis of monetary incomes for urban population in Stavropol region

Independent variables	Dependent variable: monetary income of urban population		
	Model 1	Model 2	Model 3
Number of urban (residents) population,	0,24 (0,42)	0,21 (0,29)	-
DRP per capita, rubles	-0,06 (0,89)	-	-
Number of organisations, units	0,06 (0,38)	0,06 (0,28)	0,09 (0,06)
Housing floorspace supply for urban population, sq. m. per person	0,45 (0,02)*	0,44 (0,002)**	0,48 (0,000)***
Plumbing improvement for urban population, %	-0,09 (0,47)	-0,11 (0,34)	-0,05 (0,63)
Investments in fixed capital, mln. rubles	0,41 (0,02)*	0,41 (0,02)**	0,56 (0,000)***
Consumer price index, %	-0,08 (0,13)	-0,08 (0,09)	-0,11 (0,01)**
Unemployment rate, %	-0,07 (0,06)	-0,07 (0,04)*	-0,07 (0,02)
Inflation rate, %	0,01 (0,90)	0,01 (0,84)	0,06 (0,32)
Normalized R-squared	0,997	0,997	0,995
Standard error	0,072	0,069	0,070

Note: * $p < 0,05$; ** $p < 0,01$; *** $p < 0,001$

5. CONCLUSION

A step-by-step exclusion of irrelevant variables revealed the interdependence between population income and macro and microeconomic indicators:

-the investment factor plays an important role in income generation for the rural and urban population, the significance of this indicator increases with a reduction in the number of variables;

- the dependence of rural population income on the macroeconomic indicator of the region (gross regional product value) is remarkable. However, this factor does not play a significant role in urban settings, which leads to the conclusion regarding the urban socio-economic system to be more resilient and resistant to crisis processes;



-one of the main issues for the rural population is the limited job market explaining the dependence of income on the number of organisations (potential employment and therefore income generation). Moreover, the greater the housing supply for the urban population, the higher it's monetary income and the overall quality of life.

In summary, the results of the statistical and regression analysis confirm the initial hypothesis about the socio-economic backwardness of the rural population monetary income in comparison with the urban population defined by the overall linear dependence of the rural economy on macroeconomic processes, while the urban area has more developed economic immunity due to a diversified labour market and better living conditions (infrastructural security).

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