Poverty Measuring: New Challenges and Statistical Response

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Abstract:

The implementation of social policy in relation to poverty reduction depends significantly on the adopted methodology for the statistical measurement of poverty. Particular attention is paid to measuring poverty in Russia. This is due to the decrease in disposable income of the population under the influence of the fall in the exchange rate of the ruble, lockdown and other restrictions due to the pandemic. The change in the well-being of Russians coincided with a change in the official statistical methodology for measuring poverty in Russia. Since 2021, Rosstat has moved from an absolute measurement of poverty - based on the development and determination of the cost of a minimum consumer basket (MCB) - to a relative measurement of poverty based on a share of the median per capita income. It is premature to compare the results of measuring poverty in the two ways, as there is still no sufficiently stable data.

Keywords:

Poverty, income, Russia, minimum consumer basket, measuring poverty.

I. Introduction

The problem of poverty and its statistical measurement does not lose its relevance. As part of the UN Sustainable Development Goals, a special place is given to the goals "Goal 1: No Poverty" and "Goal 10: Reduced Inequalities". The main indicator characterizing the level of poverty in Russia is the proportion of the population with incomes below the subsistence level. The dynamics of this indicator had a favorable trend since 2000 till 2020, when the proportion of the population with incomes below the subsistence level decreased from 29.0% in 2000 to 12.1% in 2020 (Table 1).

Table 1 - Poverty indicators in Russia

| Year | Population with monetary incomes below the Subsistence level | | Money Income Deficit | | Subsistence minimum per capita, per month, rubles |
	bln. persons	In total population, percentage	bln Rub.	In the total money incomes, percentage	
2000	42,3	29,0	199,2	5,0	1210
2010	17,7	12,5	375,0	1,2	5688
2015	19,6	13,4	701,7	1,3	9701
2016	19,4	13,2	701,8	1,3	9828
2017	18,9	12,9	702,5	1,3	10088
2018	18,4	12,6	699,0	1,2	10287
2019	18,1	12,3	721,6	1,2	10890
2020	17,8	12,1	726,9	1,2	11312

Nevertheless, about 18 million Russians remain below the poverty line. The amount of the monetary deficit has not increased since 2018, despite inflation (about 4% per year). This means further impoverishment of the poor. The dynamics of the subsistence minimum over the years is much lower than the inflation rate. The population officially recognized as poor is joined by those who hardly reach their incomes to the level of the subsistence minimum (Eliseeva, Raskina, 2017) and there are at least 14% of such people in the Russian Federation.

Traditionally the main source of income for the population in the Russian Federation is wages. In the period under review, the role of this source of income for the population in general increased: if in 2013 the share of wages in the structure of income was equal to 55.1%, then in 2020 and 2021 it was equal to 58.4% and 57.6%, respectively. So, the level of wages is one of the important factors of poverty and inequality in disposable income.

The differentiation of wages has its own characteristics associated with territorial affiliation. When considered by federal districts, the largest weight of wages in the income structure in 2020 took place in the Far Eastern Federal District (67.5%), the Urals Federal District (64.0%) and the Northwestern Federal District (62.3%). A smaller role of wages in the income structure is typical of the North Caucasian Federal District (34.4%) and the Southern Federal District (45.7%). In these federal districts, a significant role in income belongs to the item "other income". According to the official statistical methodology, other monetary income includes remittances; lottery winnings; income from the delivery of recyclables; income hidden from taxation by illegal cashing out of funds; receipts not distributed according to the items of formation of monetary incomes of the population (Eliseeva, Dekina, 2020).

The level of wages should be tied to the population's expenditures on housing and communal services, health care, education, etc. (Dekina. 2018).

II. Methodology

One of the methods for identifying factors influencing the monetary incomes of the population and wages is the use of multilevel modeling (Raudenbush, 1989; Raudenbush, Bryk, 2002; Goldstein, 2011).

The first stage of multilevel modeling is the construction of a null model, which takes into account only the selected level without other factors:

- null model:

$$Y_{ij}=\gamma_{00} + u_{oj} + e_{ij} \qquad \text{or} \qquad Y_{ij}=\beta_{oj} + e_{ij}, \qquad (1)$$

$$\beta_{oj} =\gamma_{00} + u_{oj}$$

Further, a more saturated model can be built:

- two-level model with a constant and one fixed factor of the first level:

$$Y_{ij}=\gamma_{00} + \gamma_{10}\, x_{1ij} + u_{oj} + +e_{ij} \qquad \text{or} \qquad Y_{ij}=\beta_{oj} + \beta_{1j}\, x_{1ij} + e_{ij}, \qquad (2)$$

$$\beta_{oj} =\gamma_{00} + u_{oj},$$

$$\beta_{1j} = \gamma_{10}$$

where Y_{ij} – dependent variable for the i-th individual in the j-th group;

e_{ij} – individual level errors (individual residuals) (normally distributed with mean zero and variance σ_e^2);

u_{oj} – group effect on dependent variable values (between group residuals) (normally distributed with mean equal to zero and variance σ_u^2);

x_{ij} – level 1 predictor.

To assess the contribution of the selected level to the overall variation of the indicator, the interclass correlation coefficient is calculated:

$$ICC = \frac{\sigma_{u0}^2}{\sigma_{u0}^2 + \sigma_{e0}^2} \tag{3}$$

where $\sigma_{u0}{}^2$ – dispersion of residuals of the second level (intergroup residuals), $\sigma_{e0}{}^2$ – variance of first-level residuals (individual residuals).

This method of analysis can be used to analyze wages as the main component of the population's cash income.

III. Data analysis

For the analysis, we used microdata from the Sample Observation of Population Income and Participation in Social Programs for 2020, which contains information on 132,043 individuals. For the analysis, data on 54482 employees were taken, for which all the necessary information is available. In the structure of employees, the share of women was 51.7%, men - 48.3%. According to the main characteristics, these samples meet the conditions of representativeness.

Table 2 contains the results of calculating the interclass correlation coefficient in 2020; in addition, for comparison, the values of this coefficient for 2012, 2014, 2016, 2017 and 2019 are shown, which are also calculated for persons with complete information.

Table 2 - Wage variation based on null models

Variable	For reference *					2020
	2012	2014	2016	2017	2019	
Type of settlement	0,144	0,153	0,152	0,167	0,138	0,131
Gender	0,072	0,071	0,066	0,068	0,068	0,065
Education	0,148	0,197	0,194	0,231	0,304	0,291
Socio-professional group	0,147	0,161	0,206	0,21	0,245	0,252
Federal district	0,067	0,095	0,093	0,096	0,087	0,092
Type of economic activity	0,096	0,089	0,079	0,088	0,147	0,162
Marital status	0,035	0,015	0,026	0,025	0,026	0,030
The subject of the Russian Federation					0,199	0,205
Sample size	11207	46912	59956	155291	57363	54482

* (Dekina, 2019)

The factors "education" (29.1%), "socio-professional group" (25.2%) and "subject of the Russian Federation" (20.5%) make the greatest contribution to the variation in wages of workers. In addition, the factors "type of economic activity" (16.2%) and "type of settlement" (13.1%) make a fairly large contribution to wage differences. The influence of the gender factor and marital status on wage differences have the lowest values of the interclass correlation coefficient, but they are also statistically significant.

The identified factors allow us to conclude that when studying the monetary income of the population, it is important to take into account the territorial location, type of settlement, the number of household members, the level of education and the socio-professional group.

IV. Official Statistics Response

The implementation of social policies to reduce poverty largely depends on the adopted methodology for statistical poverty measurement. The slowdown in the growth in the welfare of Russians after 2014 coincided with a change in the official statistical methodology for poverty measuring in Russia. Since 2021, Rosstat has moved from an absolute measurement of poverty, which was based on the composition and calculation of the cost of the minimum consumer basket, to a relative measurement of poverty, based on the income distribution of the population and defining the poverty level as a certain share of the median income. According to the OECD methodology relative poverty is defined as 2/3 Me, while in the methodology of Rosstat it is 44.2% of median income, which provided an approximate equality in measuring absolute and relative poverty. An analysis of income distributions over the past five years shows a shift of the mean and median to the left, which corresponds to a downward trend. Under these conditions, the transition to a new methodology for determining poverty means lowering the poverty threshold. The transition of Rosstat to the methodology of developed European countries is premature. The previous method of measuring poverty took into account the structure and content of the minimum consumer basket, which was approved for five years and its cost was annually indexed in accordance with the CPI.

V. Conclusion

Thus, the level of poverty in Russia remains quite noticeable, however, it is characterized by a favorable reduction trend. The income inequality of the population is largely determined by the peculiarities of the income structure of a particular individual and household. The leading role in the structure of income belongs to wages, the differentiation of which includes both the impact of external factors and personal characteristics.

An officially adopted poverty measurement methodology is essential for an effective social policy. Currently, Rosstat is trying to test the relative approach to measuring poverty, while maintaining the absolute approach.

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