

Assessment of the Population Welfare on the Basis of the Asset Index

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Introduction

In most countries of the world, well-being is measured by a monetary-metric approach that is based on income and expenditure data.

At the same time, other approaches considering well-being as a multidimensional indicator have become increasingly popular in recent years.

To take into account its multidimensionality a wide range of socioeconomic indicators is being collected. It has become a common practice to construct composite indices based on selected indicators.

Literature review

Sahn D. E., Stifel D. C. “Poverty comparisons over time and across countries in Africa”. *World Development*, **2000**, 28(12), pp. 2123–2155.

Booyesen Frikkie F., Van Der Berg Servaas S., Burger Ronelle, Von Maltitz Michael, Du Rand Gideon. “Using an *Asset Index* to Assess Trends in Poverty in Seven Sub-Saharan African Countries.” *World Development*, **2008**, Vol. 36, No. 6, pp. 1113–1130.

Wittenberg M., Leibbrandt M. Measuring Inequality by *Asset Indices*: A General Approach with Application to South Africa. *Review of Income and Wealth*, **2017**, 63, pp. 706-730.

Kabudula C.W., Houle B., Collinson M.A. et al. Assessing Changes in Household Socioeconomic Status in Rural South Africa, 2001–2013: A Distributional Analysis Using Household *Asset Indicators*. *Social Indicators Research*, **2017**, 133, pp. 1047-1073.

Aim and Scope

The aim of the research is to conduct the welfare analysis of the Russian population with the help of a new indicator, asset index, and to compare the results with the official statistical data on well-being.

Data

Comprehensive Monitoring of Living Conditions of the population (CMLC) by the Russian Federal State Statistics Service (Rosstat) for 2014 and 2016.

In 2016, the number of respondents was 134,852.

Methodology

We modified the method of calculating the asset index in relation to the Russian conditions. In the original methodology applied to African data Booysen et al. used seven variables to construct the index:

- the availability of radio;
- the availability of television;
- the presence of a refrigerator;
- the presence of a bicycle;
- the availability of toilet;
- water supply;
- the flour material.

At the same time, the researchers themselves emphasized the limitations of the methodology due to the lack of variables.

For Russia, a wider list of variables is available, in this regard, in our methodology, their number is increased to 12.

Methodology

The CMLC does not provide data about the material of the floor in the building where the household lives, so this variable is excluded from the calculations. Variables on housing conditions are added. These variables can provide a broader picture of the property status of the household. We also add the self-assessment of the property status of the household to the variable list.

- Type of housing (flat, house, room, dormitory);
- Own habitation;
- Self-assessment of housing;
- Bath/toilet location;
- Type of water supply;
- Type of sewer;
- Colour TV;
- Phone;
- Computer;
- Internet access;
- Car.

To construct the asset index the multiple correspondence analysis is used.

Why we used MCA?

Table 1

**Distribution of index values by quartiles:
Multiple correspondence analysis vs. Principal component analysis**

Groups by multiple correspondence analysis	Groups by principal component analysis				
	1 (poorest)	2	3	4 (richest)	Total
4 (poorest)	33 568	0	0	471	34 039
3	67	31 897	0	71	32 035
2	0	4 932	30 088	4	35 024
1 (richest)	0	0	0	33 754	33 754
Total	33 635	36 829	30 088	34 300	134 852

** Calculated by the author*

Table 2

Property characteristics of households of the poorest quartile by multiple correspondence analysis and the richest quartile by principal component analysis

Variable	Number of people	Mean	Min	Max
Presence of a bathroom in the house	471	0.04	0	1
Presence of a toilet in the house	471	0.04	0	1
Water supply	471	0.98	0	1
Sewerage	471	0.93	0	1
Color TV	471	0.96	0	1
Phone	471	0.97	0	1
Computer	471	0.51	0	1
Internet access	471	0.58	0	1
Car	471	0.19	0	1
Own habitation	471	0.63	0	1

** Calculated by the author*

Table 3

Property characteristics of the richest quartile households by
multiple correspondence analysis

Variable	Number of people	Mean	Min	Max
Presence of a bathroom in the house	33754	1	1	1
Presence of a toilet in the house	33754	1	1	1
Water supply	33754	1	1	1
Sewerage	33754	1	1	1
Color TV	33754	1	1	1
Phone	33754	1	1	1
Computer	33754	1	1	1
Internet access	33754	1	1	1
Car	33754	1	1	1
Own habitation	33754	1	1	1

** Calculated by the author*

Results

Descriptive statistics of the asset index

Values	2014	2016
Minimum (the richest)	-0.92	-0.87
1st quartile	-0.75	-0.87
Median	-0.37	-0.40
Mean	0	0
3rd quartile	0.48	0.47
Maximum (the poorest)	3.83	4.45

**Calculated by the author on the CMLC data*

Mean values by in selected quartiles

	4 th quartile (poorest)	1 st quartile (richest)	Total
Asset index	1.51	-0.87	0
Living in a separate house or flat	0.82	1	0.94
Living in own home	0.88	1	0.89
Bathroom inside	0.23	1	0.79
Toilet inside	0.23	1	0.79
Centralized water supply	0.50	1	0.85
Centralized or individual sewerage system	0.15	1	0.69
Color TV	0.98	1	0.99
Phone	0.97	1	0.99
Computer	0.39	1	0.70
Internet access	0.36	1	0.69
Car	0.34	1	0.51
Self-assessment of dwelling conditions as excellent, good or satisfactory	0.84	1	0.94

Share of individuals in the poorest quartile, in percents

Rank	Region	2014	2016	Difference (2016-2014)
85	Moscow	0.01	0.34	+0.33
84	Murmansk Oblast	1.08	1.36	+0.28
83	Kamchatcka Krai	0.69	1.58	+0.89
...
3	Tyva Republic	68.01	76.12	+8.11
2	Zabaykalsky Krai	70.27	78.27	+10.26
1	Altai Republic	82.45	84.82	+2.37

**Calculated by the author on the CMLC data.*

Share of individuals in the richest quartile, in percents

Rank	Region	2014	2016	Difference
1	Moscow	46.06	51.40	+5.34
2	Khanty-Mansiysk Autonomous Okrug	34.69	45.91	+11.22
3	Saint Petersburg	39.74	45.34	+10.65
...
83	Zabaykalsky Krai	7.90	6.95	-0.95
84	Tyva Republic	6.67	6.34	-0.33
85	Altai Republic	0.00	0.32	0.32

**Calculated by the author on the CMLC data.*

Distribution of poor and non-poor individuals by asset index quartiles in 2014, in percents

Quartiles	Poor	Non-poor
1 (richest)	10.65	25.90
2	21.36	30.86
3	22.07	25.73
4 (poorest)	45.93	17.51
Total	100	100

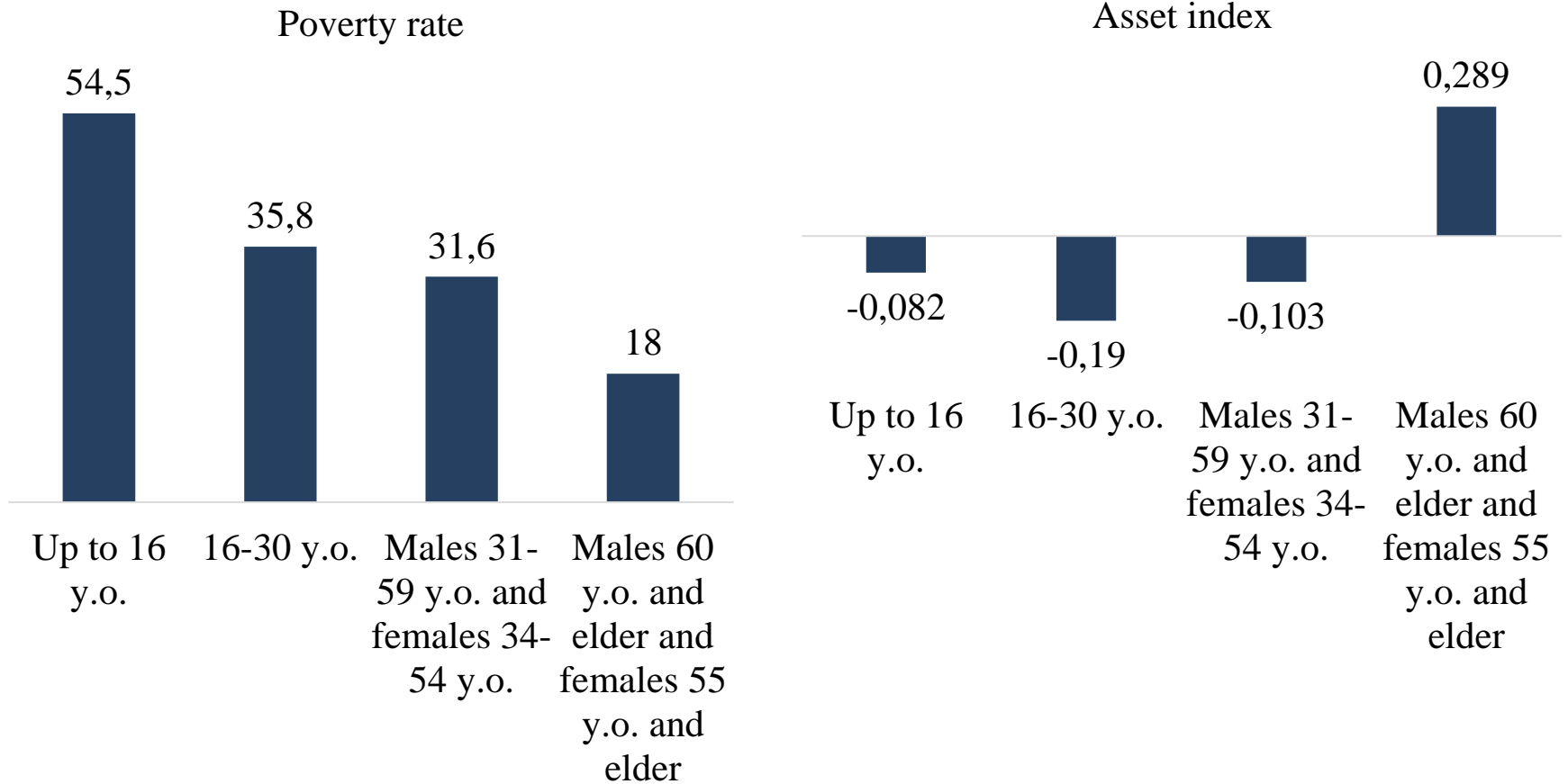
**Calculated by the author on the CMLC data.*

Distribution of poor and non-poor individuals by asset index quartiles in 2016, in percents

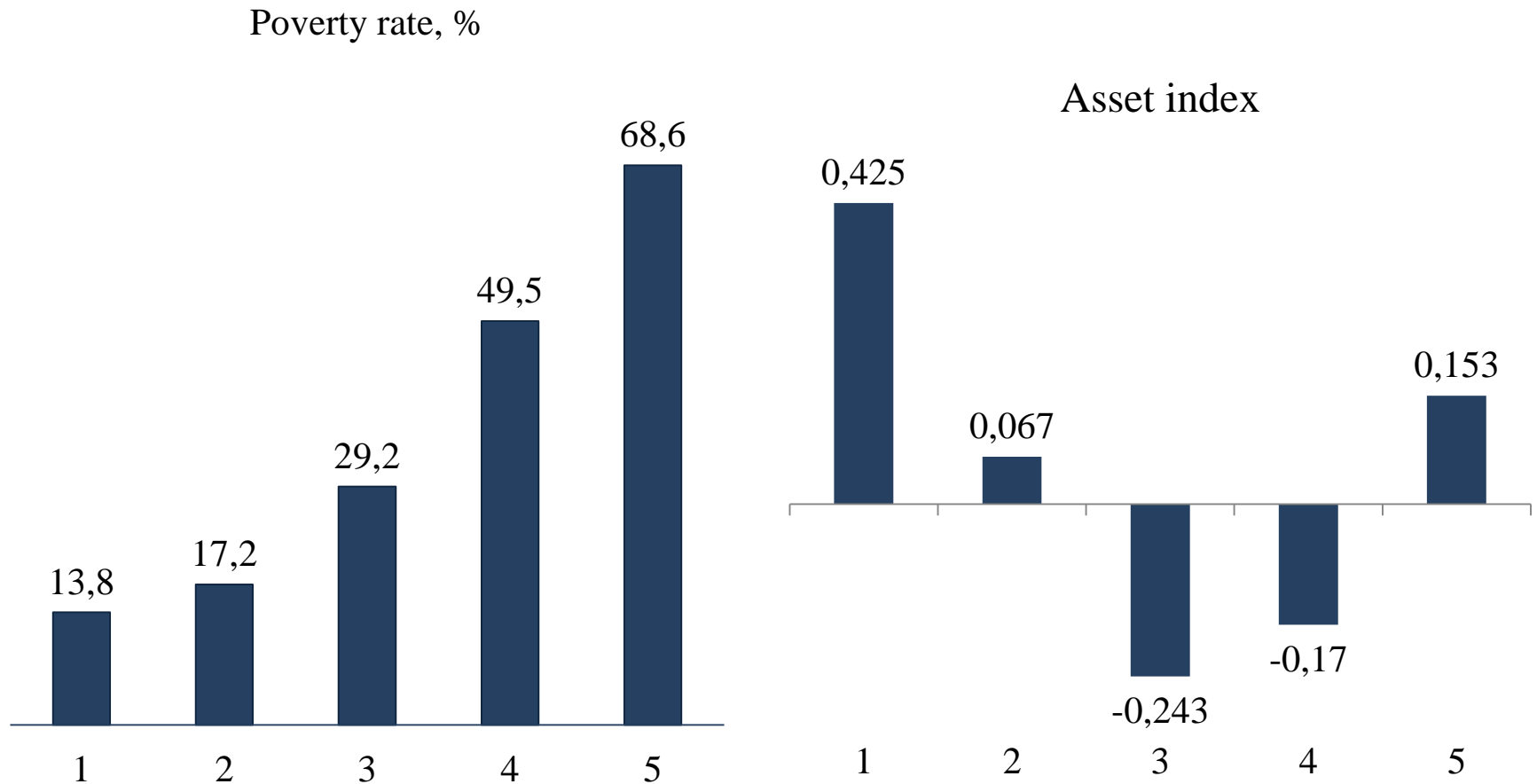
Quartiles	Poor	Non-poor
1 (richest)	14.45	30.05
2	21.71	28.00
3	22.18	24.50
4 (poorest)	41.67	17.44
Total	100	100

**Calculated by the author on the CMLC data.*

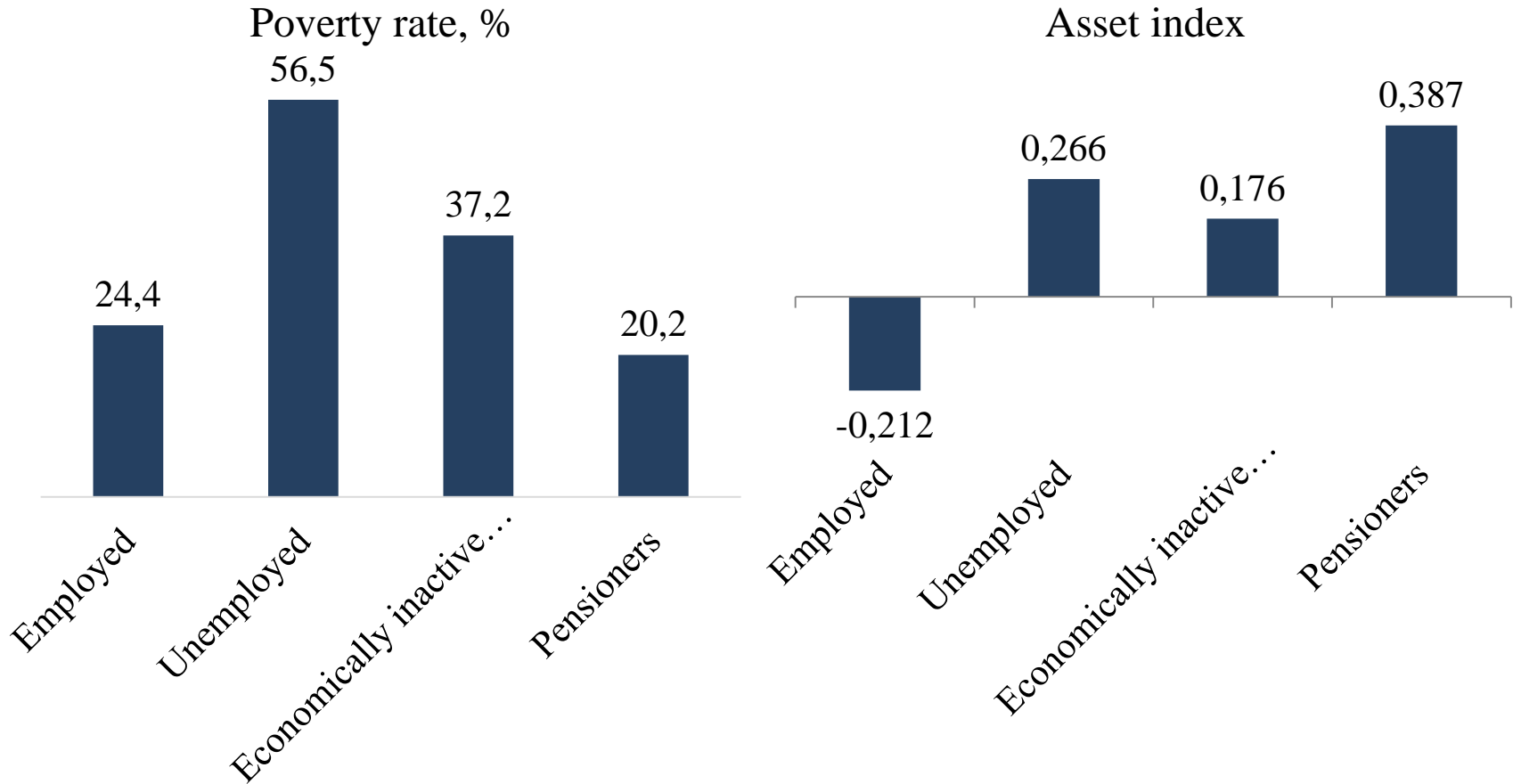
Poverty rate by the age groups in 2016, in percents



Poverty rate by the number of household members in 2016, in percents



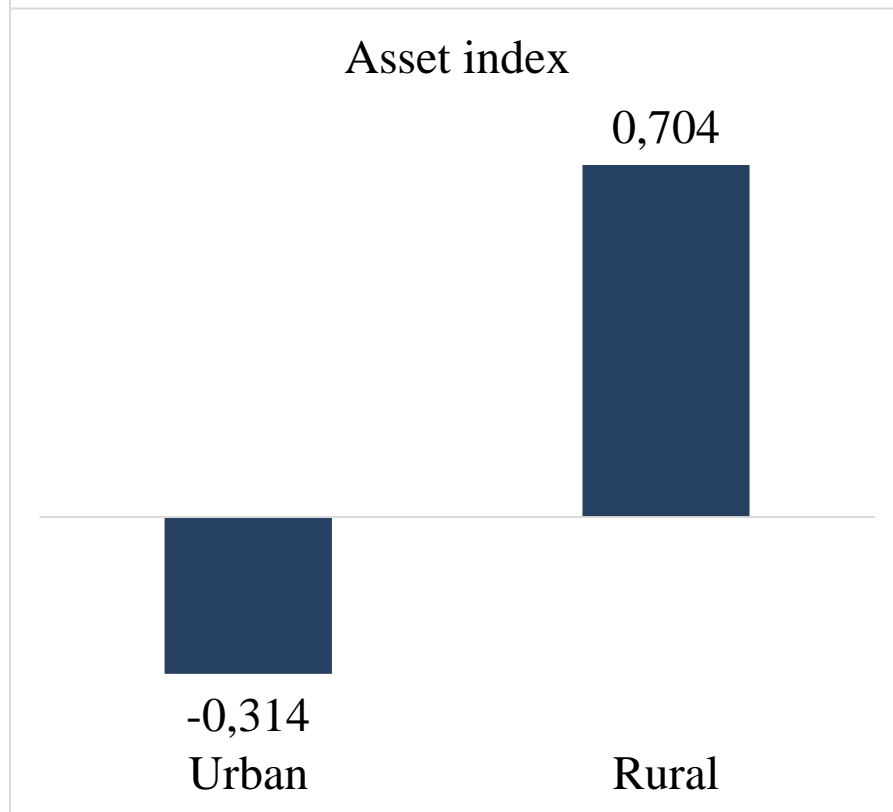
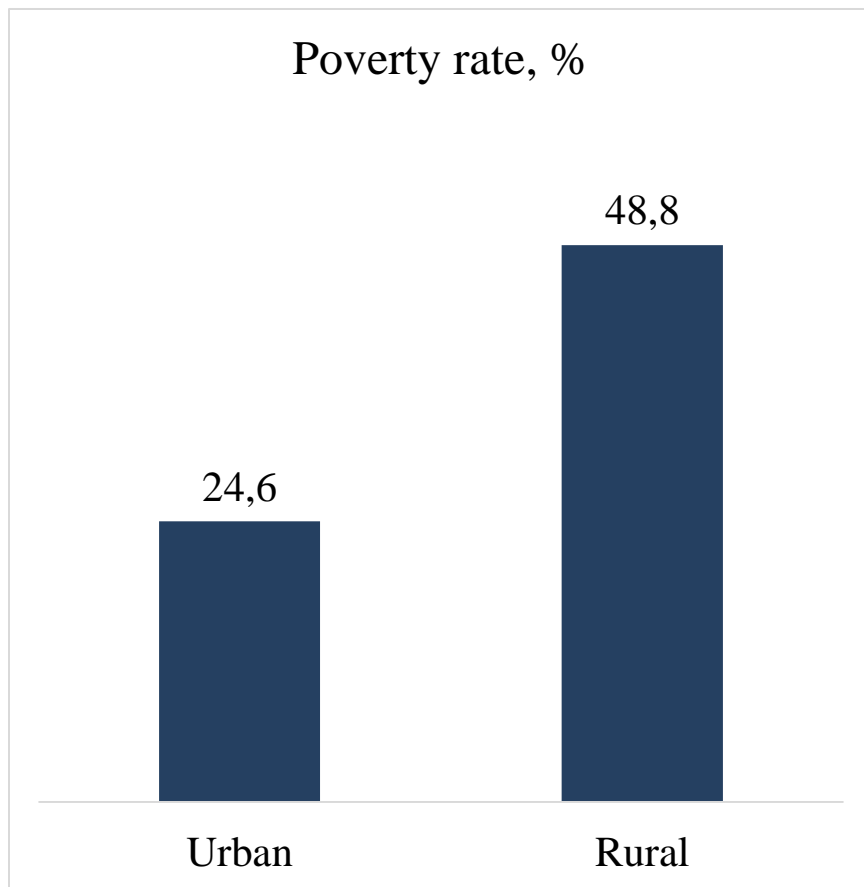
Poverty rate by labor force or employment status in 2016, in percents



Constant	0.339***
Age	
15-19	-0.011*
20-29	0.162***
30-39	0.162***
40-49	0.216***
50-59	0.290***
60-69	0.321***
70-79	0.421***
80-99	0.475***
Education of the household head	
Higher unfinished	0.120***
Specialized secondary	0.305***
Secondary school	0.531***
Less than secondary school	0.872***
Employment status	
Workers	-0.252***
Pensioniers	-0.091***

Number of children in household	
1	-0.137***
2	-0.083***
3	0.108***
4 or more	0.362***
Number of adults in household	
2	-0.245***
3	-0.332***
4 or more	-0.330***
Federal district	
Northwestern	-0.013*
Southern	0.095***
North Caucasian	0.209***
Volga	0.200***
Ural	0.121***
Siberian	0.558***
Far Eastern	0.254***
Urban type of residence	
	-0.844***

Poverty rate by type of residence in 2016, in percents



Oaxaca – Blinder decomposition of urban-rural difference in mean values of asset index, 2016

Variable	Mean
Explained	0.174***
Age	0.006***
Education	0.122***
Size of household	0.011***
Federal district	0.035***
Unexplained	0.843***

Conclusion

After analyzing the socio-economic groups of the population, we came to the conclusion that it is necessary to consider the welfare of the population more comprehensively, taking into account a number of combined indicators that reflect the different aspects of household welfare.

Our calculations revealed a significant differentiation of the regions of the Russian Federation by the property status of households.

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