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

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

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This article presents an alternative approach to assess welfare and asset inequality of Russian population using an asset index. We modify the methodology of calculating the asset index suggested by Booysen et al. (2008). The methodology is based on the household assets indicators. The author proposes that the asset index gives more accurate estimates of welfare inequality in Russia compared to income indicators. We use modified methodology on the data of the Rosstat's 2016 Comprehensive Monitoring of Living Conditions. Based on the calculated values of the index all households are divided into four groups. We demonstrate a polarization of Russian regions by the property status of households. Compared to income poverty the asset index shows a much lower level of poverty among the employed and among large households.

Keywords: welfare, inequality, asset index, standard of living, quality of life

JEL Codes: I31, P36, R29

I. 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.

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The first attempt to create an integral characteristic of property status was conducted by D.E. Sahn and D. Stifel (Sahn and Stifel, 2000). An important contribution to this area was made by a team of researchers, including Frikkie Booysen, Servaas Van Der Berg, Ronelle Burger, Michael Von Maltitz and Gideon Du Rand from different universities in South Africa (Booysen et al., 2008). They applied a completely new indicator – asset index – for evaluating trends in poverty in sub-Saharan countries. Note that this indicator does not follow the monetary-metric approach, which is currently the main one for a number of countries, including Russia. The indicator definition is based on the property status of the household. This indicator provides a picture of household socioeconomic conditions much more properly than the monetary income. This indicator has become very popular, as confirmed by extensive citations of the original paper (e.g. Wittenberg et al., 2017; Kabudula et al., 2017). Our research is the first attempt to apply the methodology to calculate the asset index in Russia.

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.

The paper has the following structure. Section 2 presents the official data which was used for the calculation of the asset index. Section 3 describes the methodology of the asset index calculation. Section 4 provides the results.

II. Data

To calculate the asset index for the Russian Federation, we use the data of the Comprehensive Monitoring of Living Conditions of the population (CMLC) by the Russian Federal State Statistics Service (Rosstat) for 2014 and 2016. The CMLC is a sample survey of households from all regions of Russia, conducted with the aim of statistical observation of the conditions and lifestyle of Russians, their needs in a favorable and safe environment. In 2016, the number of respondents was 134,852. The questionnaire and the procedure for conducting the survey were approved by the Decree of the Federal State Statistics Service dated July 4, 2016 No. 320 "About confirmation of statistical toolkit for Comprehensive monitroing of living conditions". For our study, we used microdata of the survey available on the website of Rosstat. [2]

III. 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, and 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.

[2] URL: http://www.gks.ru/free_doc/new_site/KOUZ16/index.html (access date: 21.11.2018)

Based on the available list of variables, some original indicators are replaced by others. For example, the survey in the original study contains a question about the presence of a radio in the household. Due to the lack of such a question in the CMLC questionnaire, this variable is replaced by the Internet access. 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. The full list of variables is presented in Appendix 1.

Thus, for the analysis, we have chosen 12 variables that describe the property status of the household more comprehensively than the original method. Household living conditions characterize the place of residence of household members. Living conditions include a separate apartment, a communal apartment, an individual house, part of an individual house, as well as accommodation in a dormitory. To assess living conditions, it is also determined whether the main dwelling is owned by the household. The next variable selected is the location of the bath/shower and toilet. The well-being of households is higher when they are located directly in the apartment or house, and not outdoors. We pay special attention to the availability of water supply and wastewater and household waste disposal system. Self-assessment of housing reflects the subjective position of household members but gives an idea of how people themselves assess their living conditions. The presence of a telephone, color TV, computer, and car characterize the presence of durable goods in the

household. As a property characteristic, the availability of access to the Internet is also included.

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

IV. Results

The results of calculating the asset index are presented in Table 1. The minimum value corresponds to the highest observed welfare, and the maximum value corresponds to the lowest one. Thus, an increase in the asset index is associated with a reduction in welfare. In 2016, more than one-quarter of all individuals have all assets covered by the index, therefore the minimum value equaled the first quartile value.

Table 1

Descriptive statistics of the asset index

Values	2014	2016
Minimum	-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	3.83	4.45

Source: calculated by the author on the CMLC data.

According to the calculated values of the asset index, we divide all individuals in the survey into four quartile groups. Table 2 provides mean values in the lowest and highest quartiles and in the overall sample.

Table 2

Mean values by in selected quartiles

	4th quartile	1st quartile	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

Source: calculated by the author on the CMLC data.

We analyze the distribution of individuals by the national quartiles in each of the regions of the Russian Federation. The asset index clearly indicates the differentiation of the regions by the property status.

In 2016, the largest shares of households in the highest national quartile were observed in the Altai Republic (84.82%), Zabaykal Krai (78.27%), the Tyva Republic (76.12%). In 2014, these regions also headed the list of the poorest households, but in 2014 the shares of households in the fourth quartile were lower and amounted to 82.45%, 70.27% and 68.01% respectively (Table 4). The largest shares of households in the lowest national quartile were observed in Moscow (51.4%), Khanty-Mansiysk Autonomous Okrug (45.91%), Saint Petersburg (45.34%). On average, there was an increase of 5 percentage points in these regions from 2014 to 2016 (Table 3). Thus, we see a polarization of regions by the property status of households.

Table 3

Share of individuals in the lowest 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

Source: calculated by the author on the CMLC data.

Table 4

Share of individuals in the highest 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

Source: calculated by the author on the CMLC data.

We compare our results with poverty rates estimated by monetary income. On the one hand, there is a clear correlation between poverty by income and asset poverty: 46% of the income poor in 2014 and 42% of the income poor in 2016 were in the highest quartile of asset index (Tables 5, 6). On the other hand, the fact that a large percentage of the income poor are in other quartiles (up to the lowest) indicates that the asset index provides additional information on household welfare.

Table 5

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

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

Source: calculated by the author on the CMLC data.

Table 6

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

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

Source: calculated by the author on the CMLC data.

Among all regions, the highest correlation between the two indicators is observed in the Republic of Dagestan. It should be noted that in 2016 the share of income-poor households in the lowest quartile increased by 3.8 percentage points, that indicates an improvement in the property status of households with incomes below the subsistence minimum.The analysis of sociodemographic characteristics reveals that the lowest values of the asset index are observed in the households of pensioners and rural inhabitants. Compared to other approaches, the asset index is more differentiated by the size of settlements and less differentiated by age groups. Compared to income poverty the asset index shows a much lower level of poverty among the employed and among large households (Fig. 1-8).

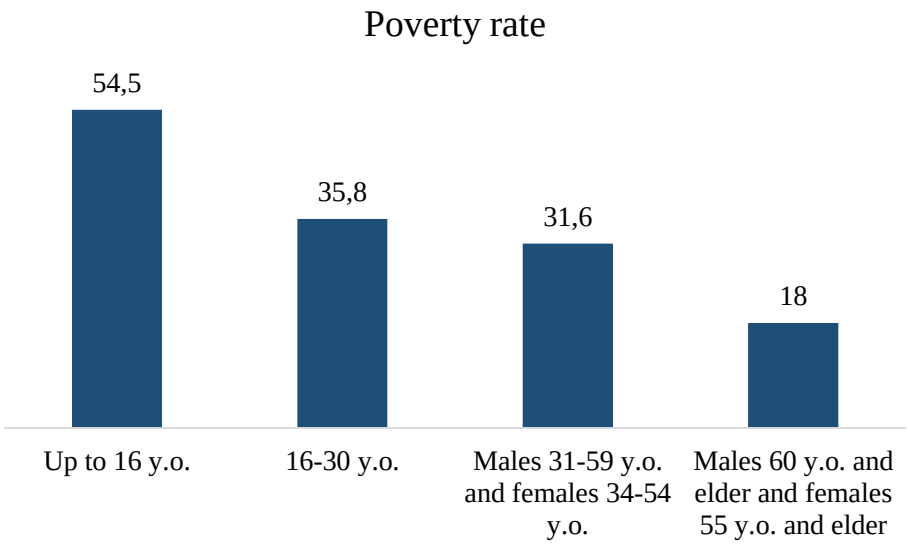

Fig. 1 Poverty rate by the age groups in 2016, in percents

Source: calculated by the author on the CMLC data.

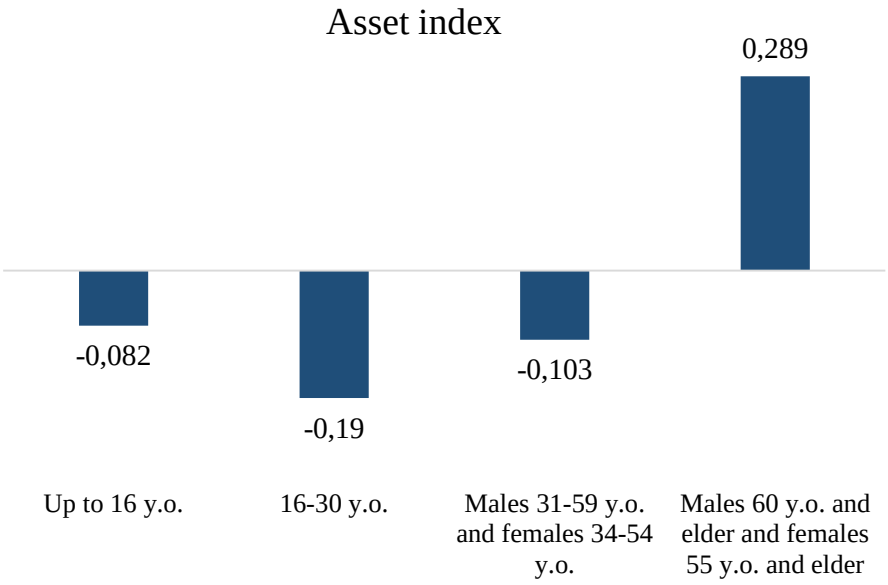

Fig. 2 Mean values of the asset index by the age groups, 2016

Source: calculated by the author on the CMLC data.

Comparing figures 1 and 2, it can be seen that income poverty is the most prevalent among the youngest group. At the same time, according to the asset index, the poorest group is people of retirement age and older.

We also analyzed welfare according to the number of household members (fig. 3-4) and employment and labor force status (fig 5-6).

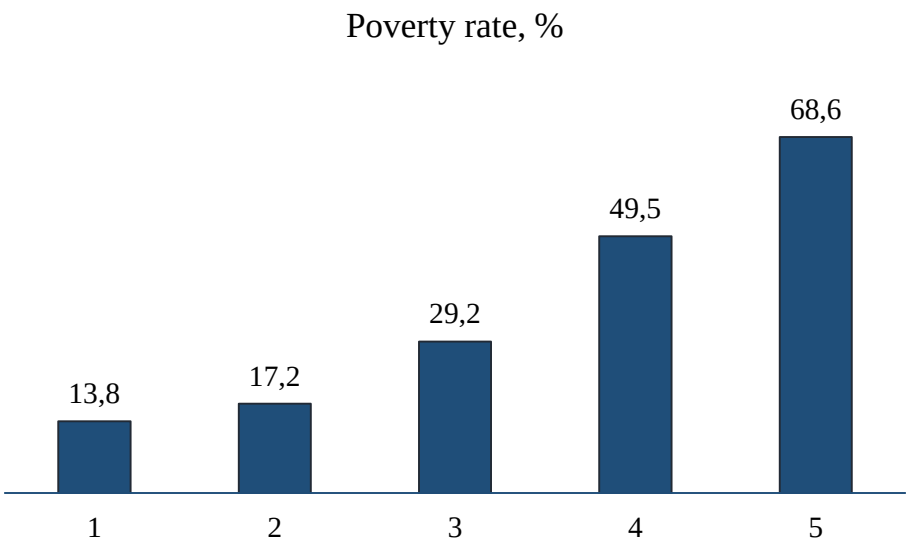

Fig. 3 Poverty rate by the number of household members in 2016, in percents

Source: calculated by the author on the CMLC data.

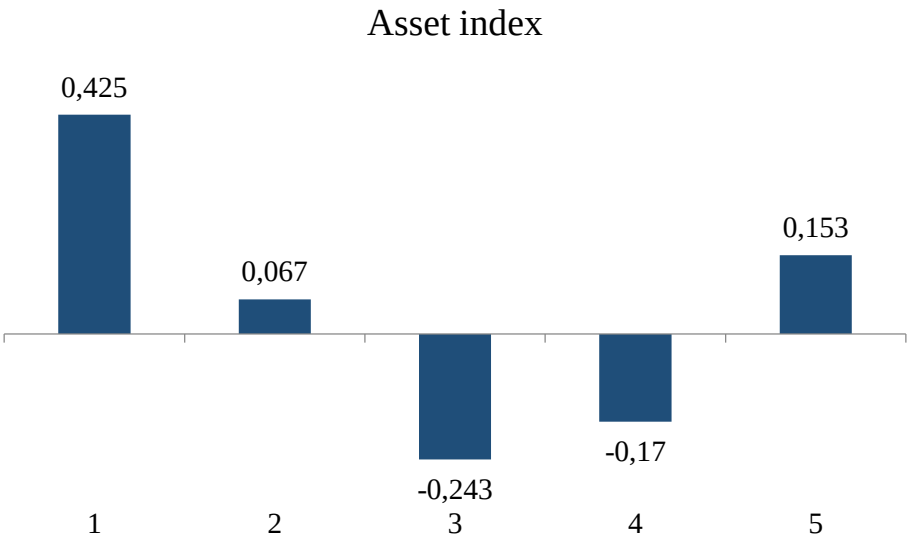

Fig. 4 Mean values of the asset index by the number of household members, 2016

Source: calculated by the author on the CMLC data.

Well-being increases with the size of the household. It is worth noting that the index values above the average are observed only in households with three or four

members. When the number of household members is five or more, their welfare begins to decline. On the basis of income poverty, households with one or two members are the least poor, whereas under the asset index, such households are among the least well-off.

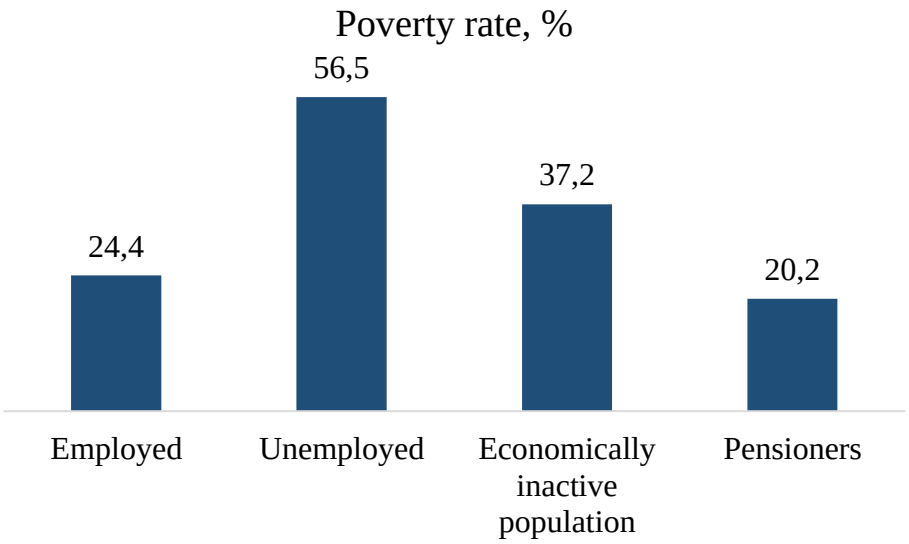

Fig. 5 Poverty rate by labor force or employment status in 2016, in percents

Source: calculated by the author on the CMLC data.

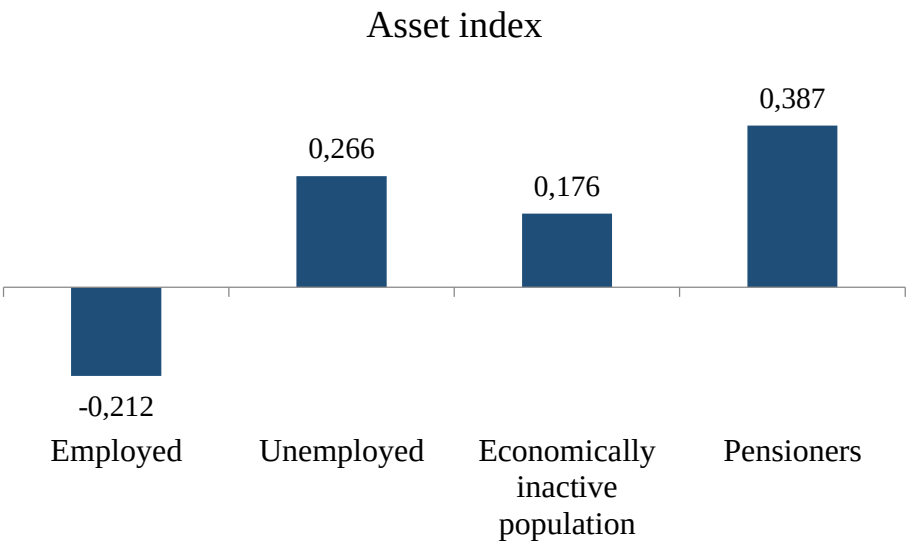

Fig. 6 Mean values of the asset index by labor force or employment status, 2016

Source: calculated by the author on the CMLC data.

The highest level of well-being is observed among the employed, which is quite expected. The unemployed, the economically inactive population and pensioners have below-average levels of well-being.

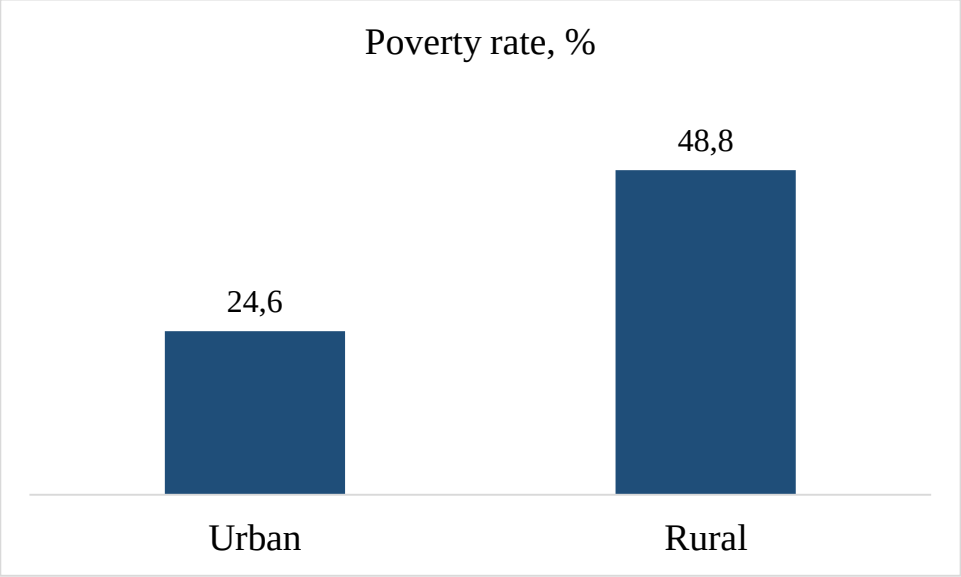

Fig. 7 Poverty rate by type of residence in 2016, in percents

Source: calculated by the author on the CMLC data.

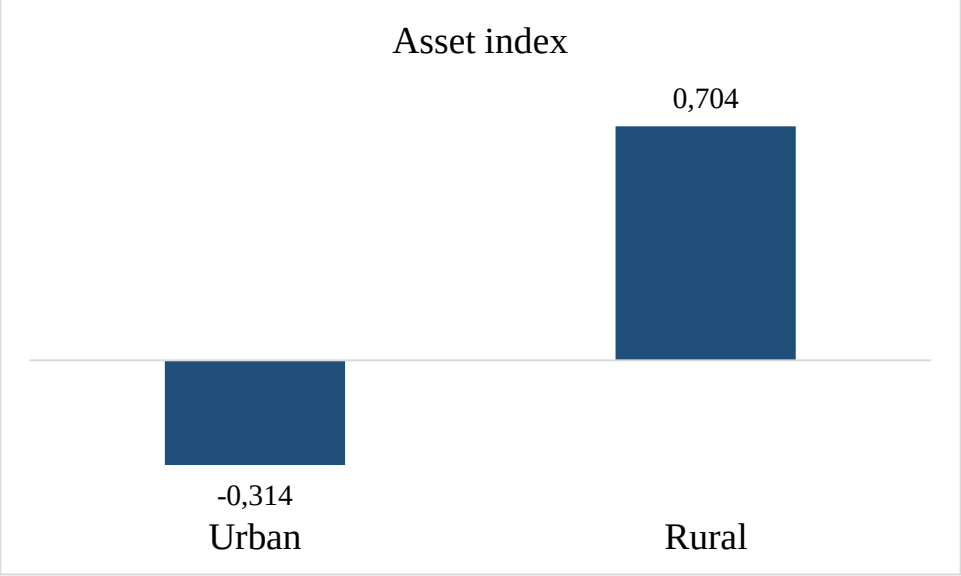

Fig. 8 Mean values of the asset index by type of residence, 2016

Source: calculated by the author on the CMLC data.

The regression analysis reveals a strong significant association of the asset index with the age and the education of the head of the household, the number of children and adults in the household, the availability of work and pensions of household members, territorial dummies. Table 7 presents the results obtained by the OLS regression on the 2016 data, the significance of estimates is determined on the base of the robust standard errors.

Table 7

Regression estimates (dependent variable – asset index), 2016

Variables	Coefficents
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***

Source: calculated by the author on the CMLC data.

The results in Fig. 7-8 and Table 7 indicate that urban households have substantially more assets compared to rural households. The factors of differences in the value of the asset index between urban and rural residents are analyzed on the basis of the Oaxaca-Blinder decomposition (Table 8).

Table 8

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

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

Source: calculated by the author on the CMLC data.

It is revealed that the education of the head of the household (both absolute difference and difference in the return on education) has the greatest impact on the

gap, and the higher return on the availability of work in rural areas contributes to the reduction of the gap.

V. 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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Appendix 1

CMLC questions used to calculate the wealth index

№	Questions	Answers
1.	Determine the living conditions of	• Private apartment;

	your household.	• Communal apartment; • One-bedroom house; • Part of one-bedroom house; • Dormitory; • Other.
2.	Your household lives	• in an individual room (several individual rooms) occupied by your household; • in the same room with another person (s) who are not (not) members of your household.
3.	Is your main home owned by someone in your household?	• Yes; • No.
4.	Who is the owner of your main home?	• State, municipality; • Other legal entity; • Private person.
5.	Where are located in your house toilet, bathroom, shower?	• apartment/house; • in common areas/ in a separate building/ in the yard; • absents.
6.	Indicate the house in which you live...	• officially recognized as an emergency; • not officially recognized as an emergency, but is in an emergency condition; • requires major repairs; • is in satisfactory condition; • I find it difficult to answer.
7.	What water supply is available in the house where your household lives?	• Centralized water supply; • Water supply from an individual artesian well; • Water supply from the well; • No running water.
8.	Disposal of sewage and liquid household waste in your home is carried out…	• centralized sewerage system; • individual sewer system (including septic tank); • through a system of pipes into cesspools, etc.; • there is no sewerage system.
9.	Does your household have a color TV, telephone (landline or mobile) and computer in working condition? If not available, could you purchase or install if desired?	• Yes, available; • No, not available; • Can purchase (install) if desired; • We would like to, but can't afford it; • Can't for other reasons.
10.	Do you have access to the Internet at home?	• Yes, using wired Internet access technology; • Yes, using wireless Internet access technology; • No, there is no Internet access at home.
11.	For what reasons do you have no access to the Internet at home?	• No access to "Internet" in our area/house; • It is possible to use access to the Internet in other places; • Payment for Internet access services is too high»; • No need.
12.	Do your household have cars and / or motor vehicles that are in	• Passenger car; • No.

	working order or that you plan to repair in the coming months (including service vehicles that can be used for personal purposes)?	
13.	How would you assess the overall condition of your living space (walls, ceiling, floor, windows)?	• Excellent; • Good; • Satisfactory; • Bad; • Very bad.