

# **METHODOLOGICAL DEVELOPMENTS IN MEASURING INEQUALITY AND POVERTY DURING THE TRANSITION TO NEW SOURCES OF INFORMATION: EXPERIENCE AND CHALLENGES**

# Background

Russian state statistics produce indicators on income distribution statistics since 1970 and poverty rate indicators since 1992.

## *Data sources*

Before 1992 – from the special sample population income survey (every five years up to 1989 inclusive) covering 170 000 households throughout the Russian Federation.

In the period between the surveys – project estimates.

Starting from 1992 – from household budget survey (HBS) (quarterly) covering 48 000 households throughout the Russian Federation.

Starting from 2017 – from annual sample survey of population income and participation in social programs (PIS) covering 60 000 households (each five years – 160 000 households) throughout Russian Federation.

# Transition to new source of information – population income survey

## GOAL:

- development of the updated system of inequality and poverty indicators compatible to the international standards

## TARGET:

- implementation of specialized household income survey (the target was set in May 2010 at the meeting of Rosstat's Scientific and Methodological Council)

## SOLUTION:

- set up of the federal statistical monitoring system for the most important socio-demographic issues (Resolution of the Government of the Russian Federation of 27 November 2010, No. 946)

## **OUTCOMES: 2012-2015**

- **SPECIALIZED INCOME SURVEY (PIS)  
IMPLEMENTED INTO THE STATISTICAL PRACTICE**
- **NEW METHODOLOGICAL PRINCIPLES  
DEVELOPED AND TESTED ON THE BASIS OF PIS  
(2012-2015)**

# FEATURES OF EMPIRICAL DATA BY INCOME LEVEL

Composition of  
components of total  
household income

established by relevant  
guiding principles agreed at  
the international level  
(namely, by Resolution on  
household income and  
expenditure statistics ILO,  
2003)

Differences from the  
system of  
macroeconomic  
indicators produced  
within the SNA

household income indicator is  
based on the simplified  
procedure aimed to estimate  
the volume of all the cash  
receipts that make a real  
contribution to economic  
well-fare of people.



# EMPIRICAL BASE OF SAMPLE SURVEY OF POPULATION INCOME AND PARTICIPATION IN SOCIAL PROGRAMS (PIS) AND THEIR KEY FEATURES

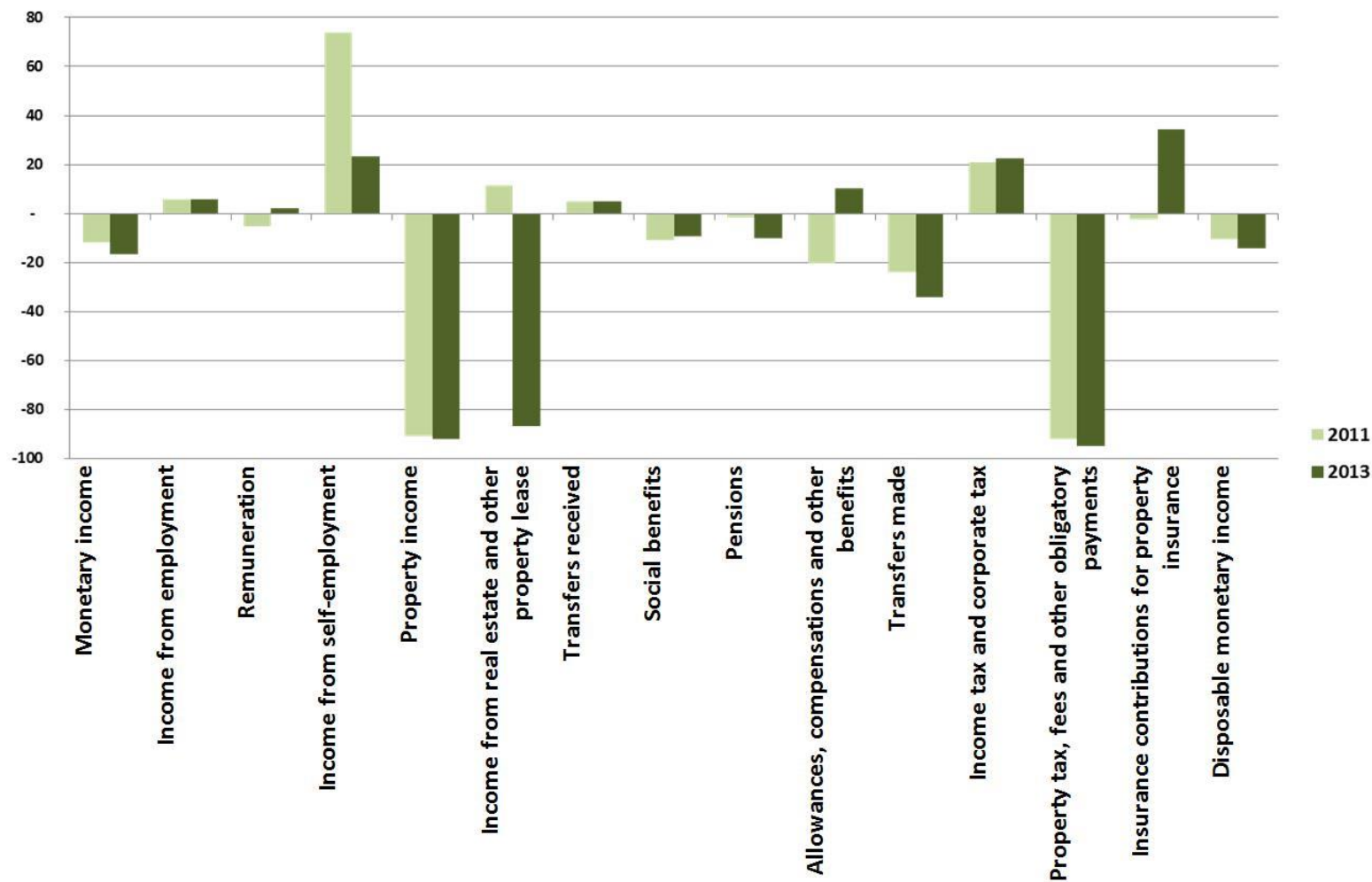
	2012	2014	2015	2016
<b>COVERAGE:</b>				
Number of households in all entities of the Russian Federation	10 000	45 000	45 000	60 000
Number of people aged 16 and above	20 400	86 900	86 100	113 300
Number of children aged 16 and below	4 500	18 900	19 000	25 100
<b>PERIOD OF SURVEY CONDUCTING:</b>	April 2012	March 2014	March 2015	January-February 2016
<b>IN THE COURSE OF SURVEY:</b>				
Selected (thousands of addresses)	20,0	90,0	90,0	120,0
Visited (thousands of addresses)	14,6	66,1	69,2	92,4
Interviewed (thousands of households)	10,0	45,0	45,0	60,0
Refused to participate (thousands of households)	2,1 (14%)	10,0 (14%)	10,6 (15,3%)	13,9 (15,1%)
No contact established (thousands of addresses)	2,5	11,0	13,6	14,9

# COMPARING PER CAPITA POPULATION MONETARY INCOMES BASED ON PIS WITH MACROECONOMIC INDICATOR OF PER CAPITA MONETARY INCOMES

(RUB per month)

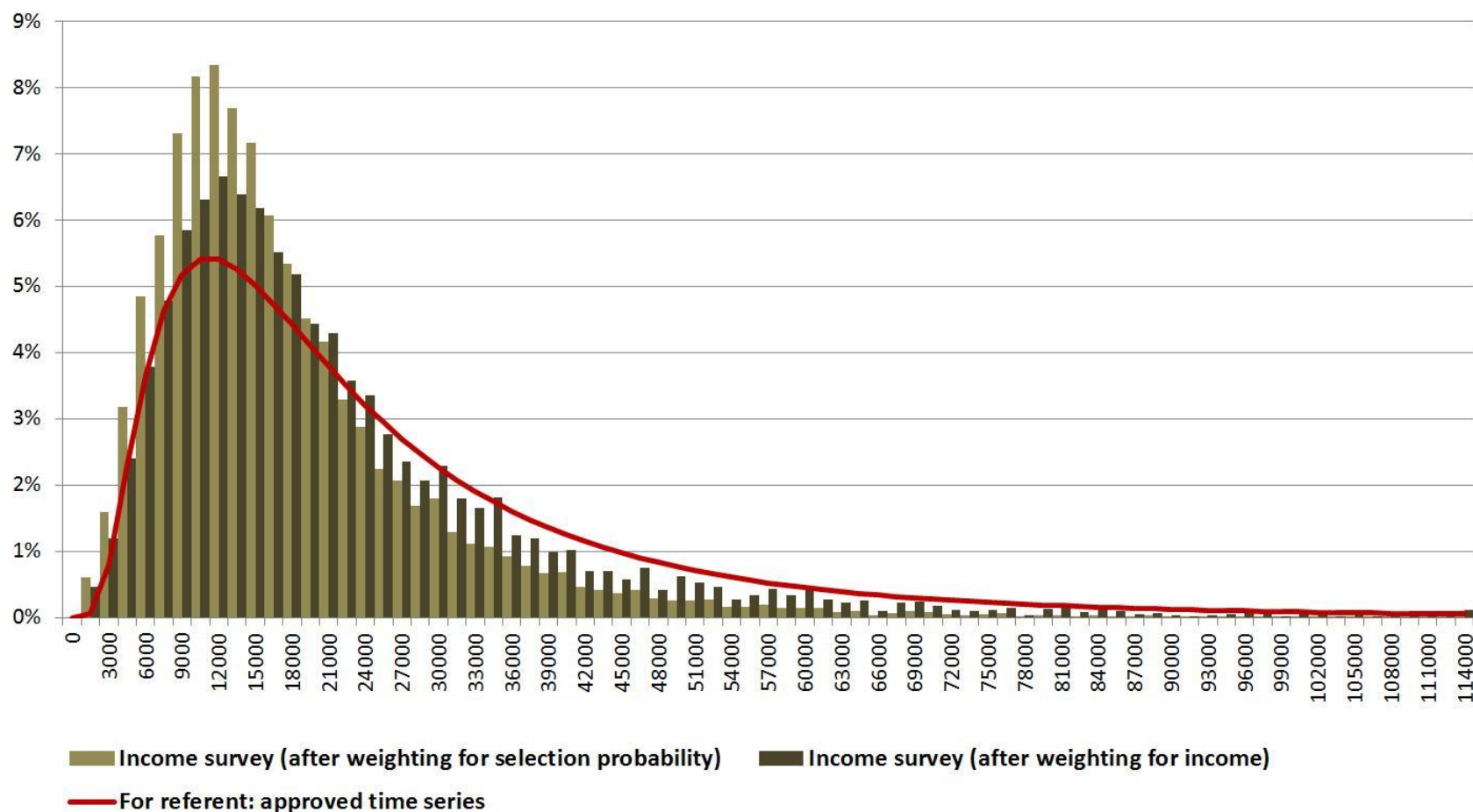
	INCOME SURVEY			MACROECONOMIC INDICATOR			PIS DEVIATION FROM MACROECONOMIC INDICATOR (%)		
	2011	2013	2014	2011	2013	2014	2011	2013	2014
<b>Total monetary income</b>	<b>17 571</b>	<b>21 832</b>	<b>24503</b>	<b>19 910</b>	<b>26 140</b>	<b>28 448</b>	<b>88</b>	<b>84</b>	<b>86</b>
<b>Total earned income</b>	13 472	16 656	18848	12 713	15 706	16 954	106	106	111
Remuneration	11 011	14 587	16449	11 575	14 305	15 490	95	102	106
Income from self-employment	1 983	1 732	1855	1 138	1 401	1 463	174	124	127
Income from other regular work activities	478	338	544	-	-	-	-	-	-
<b>Total income from property</b>	103	128	215	1 128	1 639	1 782	9	8	12
incl. income from real estate and other property lease	81	59	151	72	444	468	111	13	32
<b>Total received transfers</b>	3 996	5 048	5440	3 797	4 811	4 999	105	105	109
Welfare benefits	3 379	4 363	4618	3 786	4 798	4 985	89	91	93
including									
pensions	2 537	3 048	3243	2 574	3 397	3 509	99	90	92
allowances, compensations and other benefits	842	1 315	1374	1 056	1 192	1 248	80	110	110
Monetary receipts from individuals and institutions other than welfare authorities	617	685	823	11	13	14	5425	5170	5705
incl. alimony and other similar payments	66	63	76	-	-	-	-	-	-
Other income	-	-	-	2 272	3 984	4 714	-	-	-
<b>Total transfers made</b>	1 633	2 076	2348	2 146	3 158	3 370	76	66	70
Income tax on wages and salaries and self- employment taxes	1 479	1 866	2099	1 221	1 521	1 638	121	123	128
Property tax, duties and other obligatory payments	65	80	86	834	1 540	1 639	8	5	5
Property insurance payments	89	130	163	91	97	93	98	134	175
<b>Disposable income</b>	<b>15 938</b>	<b>19 756</b>	<b>22155</b>	<b>17 764</b>	<b>22 983</b>	<b>25 078</b>	<b>90</b>	<b>86</b>	<b>88</b>

## PIS deviation from macroeconomic indicator (%)

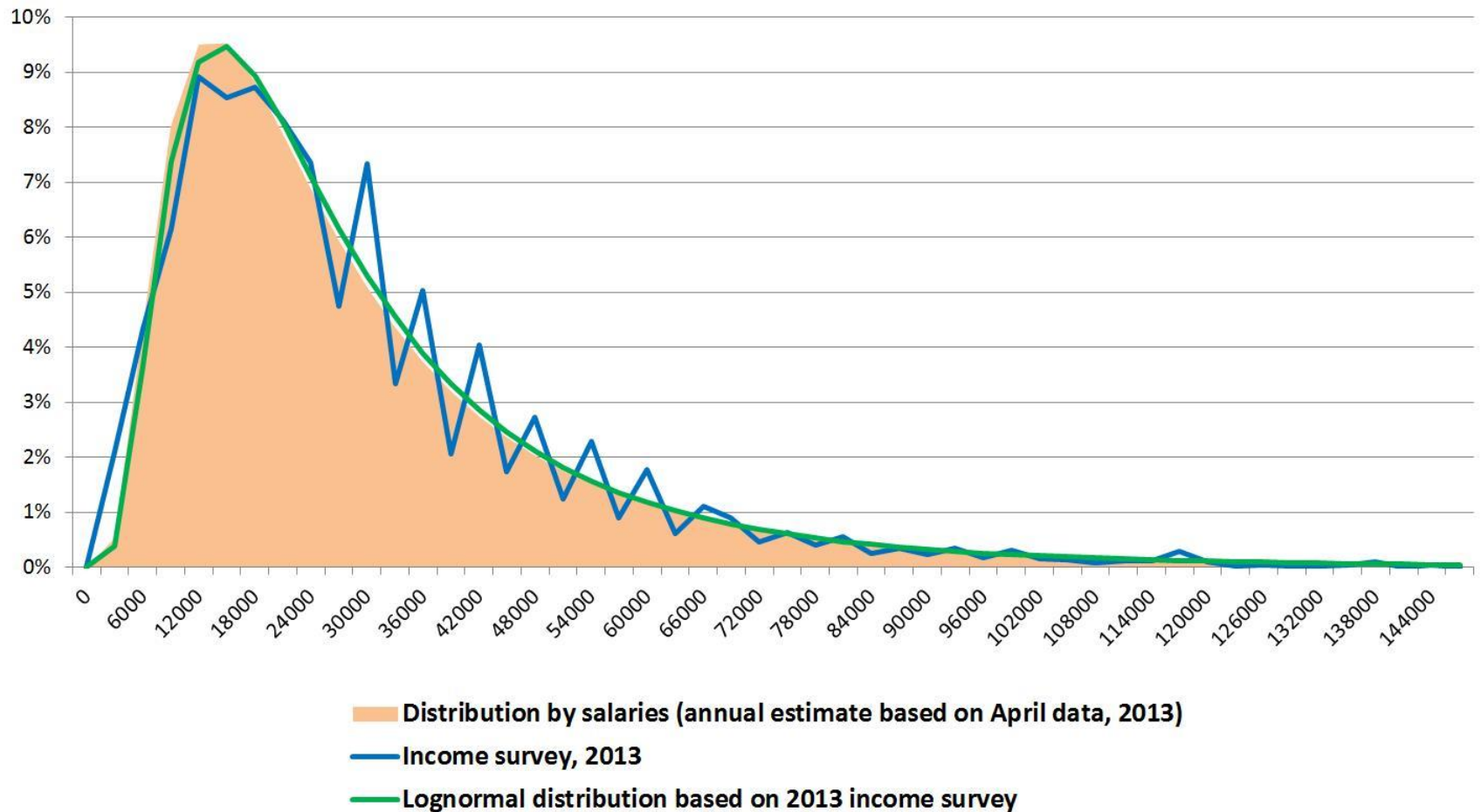




# Frequency distribution by monetary income, 2013 (based on income survey)



# Employees' frequency distribution by gross salary, 2013



# OUTCOMES OF METHODOLOGICAL PRINCIPLES TESTING

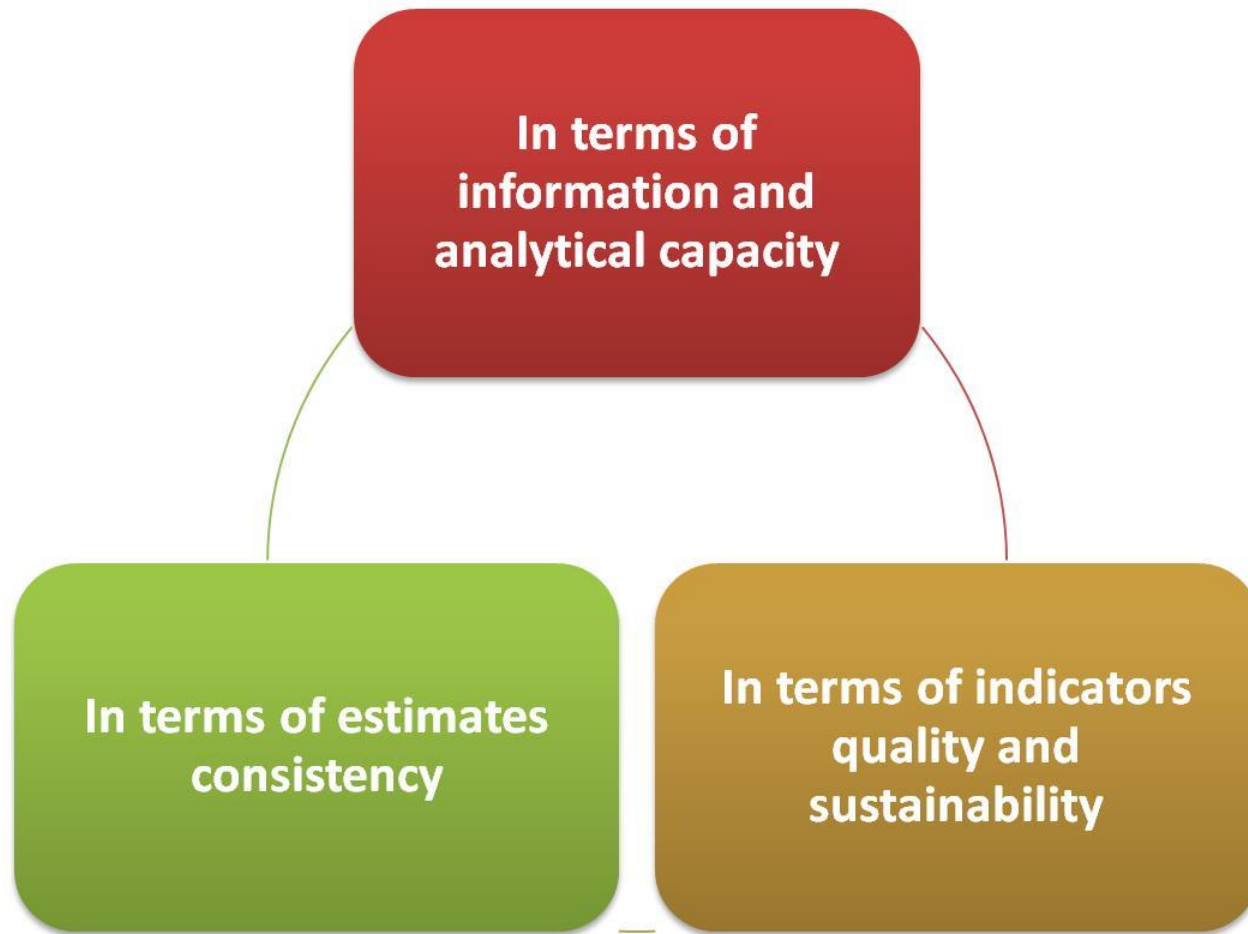
- ❖ The estimates of socio-demographic differentiation and poverty indicators are obtained and verification of this data compliance to data obtained before from analytical model is conducted.
- ❖ Experimental estimates of socio-demographic differentiation and (relative) poverty indicators on the OECD methodology are obtained.
- ❖ Data of (relative) poverty indicators on the OECD methodology is obtained from HBS, 2008-2011 in order to compile this indicator in the long-term dynamics.

## **ACTIVITIES WITHIN THE METHODOLOGICAL PRINCIPLES TESTING**

- Comparison of income distribution based on the PIS results and on the approved data for the years 2011 and 2013-2014 (according to the analytical model);
- Comparison of wages distribution based on the PIS results and on the business sample survey results for the April 2011 and years 2013-2014;
- Comparison of estimates of socio-demographic differentiation and poverty key indicators based on the PIS results and on the approved data for the years 2011 and 2013-2014 (according to the analytical model).



# **New opportunities coming from analytical capacity of PIS program**



# New opportunities coming from analytical capacity of PIS program

**In terms of information and analytical capacity:**

Range of indicators for provision of statistical characteristics of inequality and poverty is extended;

Linkage between indicators by population as a whole and by separate demographic and socio-economic groups is accomplished;

Standards for international comparability of income differentiation level and relative multidimensional poverty are implemented.

# Extension of statistical indicators range

## Differentiation indicators

**Population  
distribution by per  
capita income**

**Distribution of total  
income by quantile  
population groups:**

- by quintile groups (20%)
- by decile groups (10%)

**Coefficients of income differentiation and  
concentration**

- **Quantile R/P 10% ratio:**
  - Quintile R/P 10% ratio ( $K_{f20}$ )
  - Decile R/P 10% ratio ( $K_{f10}$ )
- **Quantile differentiation coefficient:**
  - Quintile differentiation coefficient ( $K_{d8/d2}$ )
  - Decile differentiation coefficient ( $K_{d9/d1}$ )
- **Income concentration index (Gini coefficient)**

## Extension of statistical indicators range

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### Relative poverty indicators

Share of population with per capita incomes below the lines set on the basis of actual level of population income at the rate of:

40% of median income

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50% of median income

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60% of median income

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Share of population with per capita equivalized incomes below the lines set on the basis of actual level of population income at the rate of:

40% of equivalized median income

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50% of equivalized median income

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60% of equivalized median income

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Deprivation index

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# Extension of statistical indicators range

## Absolute poverty indicators

Number (share) of population with monetary (total) incomes below the subsistence minimum level (population living in poverty)

Poverty depth index

Poverty severity index

Poverty risk index

Per capita monetary (total) incomes of population living in poverty

Deficit of monetary (total) income of population living in poverty (in % of total amount of monetary incomes per capita)

Share of population with incomes below the poverty line set at the international level considering the PPP:

1\$ per day

2,5\$ per day

4\$ per day

10\$ per day

# **New opportunities coming from analytical capacity of PIS program**

In terms of indicators quality and sustainability:

the full transition of estimates to the empirical data of population income survey (PIS) that helps to avoid conventionalities, overestimates and hypotheses applied and criticized before is achieved;

the continuity of indicators dynamics is achieved

# Population whose income is below the subsistence minimum level by main age and gender groups, 2011 ( $\varepsilon=1$ );

% of total population of relevant age group

	2011 <sup>1)</sup>	Estimate based on income survey	95% confidence interval (limits)	
			Lower	Upper
<b>Total population</b>	<b>12,7</b>	<b>12,4</b>	<b>11,0</b>	<b>14,1</b>
<b>Children under 16 yrs</b>	<b>19,9</b>	<b>24,7</b>	<b>21,1</b>	<b>28,7</b>
Children under 3 yrs	16,2	25,8	21,2	30,9
Children under 7 yrs	18,7	24,7	21,1	28,7
Children from 7 to 16 yrs	21,1	22,4	19,5	25,5
<b>Working age population</b>	<b>12,9</b>	<b>12,4</b>	<b>10,9</b>	<b>14,1</b>
male aged 16-59	12,1	11,9	10,3	13,6
female aged 16-54	13,8	13,0	11,4	14,7
Youth aged 16-30	12,8	13,2	11,5	15,2
Male aged 16-30	12,0	11,9	10,1	14,1
Female aged 16-30	13,6	14,5	12,5	16,7
Working age individuals aged 30+	13,0	12,0	10,4	13,7
Male aged 31-59	12,2	11,9	10,2	13,7
Female aged 31-54	14,0	12,1	10,6	13,9
<b>Total elder people</b>	<b>6,1</b>	<b>3,5</b>	<b>2,9</b>	<b>4,2</b>
Male aged 60+	5,6	2,5	1,8	3,5
Female aged 55+	6,3	3,9	3,2	4,7

<sup>1)</sup> Approved data. Estimates based on budget household surveys and macroeconomic indicator of income per capita.

# Population whose income is below the subsistence minimum level by main age and gender groups, 2013 ( $\varepsilon=1$ );

% of total population of relevant age group

	2013 <sup>1)</sup>	Estimate based on income survey	95% confidence interval (limits)	
			Lower	Upper
<b>Total population</b>	<b>10,8</b>	<b>11,1</b>	<b>10,4</b>	<b>11,8</b>
<b>Children under 16 yrs</b>	<b>17,9</b>	<b>20,5</b>	<b>19,2</b>	<b>21,9</b>
Children under 3 yrs	12,2	24,3	22,1	26,6
Children under 7 yrs	15,6	21,5	19,9	23,2
Children from 7 to 16 yrs	20,0	19,7	18,3	21,2
<b>Working age population</b>	<b>11,0</b>	<b>10,9</b>	<b>10,2</b>	<b>11,7</b>
male aged 16-59	10,4	10,1	9,4	10,9
female aged 16-54	11,7	11,8	11,0	12,6
Youth aged 16-30	10,8	11,7	10,8	12,6
Male aged 16-30	10,2	10,4	9,5	11,3
Female aged 16-30	11,3	12,9	11,9	14,0
<b>Working age individuals aged 30+</b>	<b>11,1</b>	<b>10,6</b>	<b>9,9</b>	<b>11,3</b>
Male aged 31-59	10,5	10,0	9,3	10,8
Female aged 31-54	11,9	11,1	10,4	11,9
<b>Total elder people</b>	<b>5,0</b>	<b>3,2</b>	<b>2,9</b>	<b>3,6</b>
Male aged 60+	4,6	2,5	2,1	3,0
Female aged 55+	5,2	3,5	3,2	3,9

<sup>1)</sup> Approved data. Estimates based on budget household surveys and macroeconomic indicator of income per capita.



# Population whose income is below the subsistence minimum level by main age and gender groups, 2014 ( $\varepsilon=1$ );

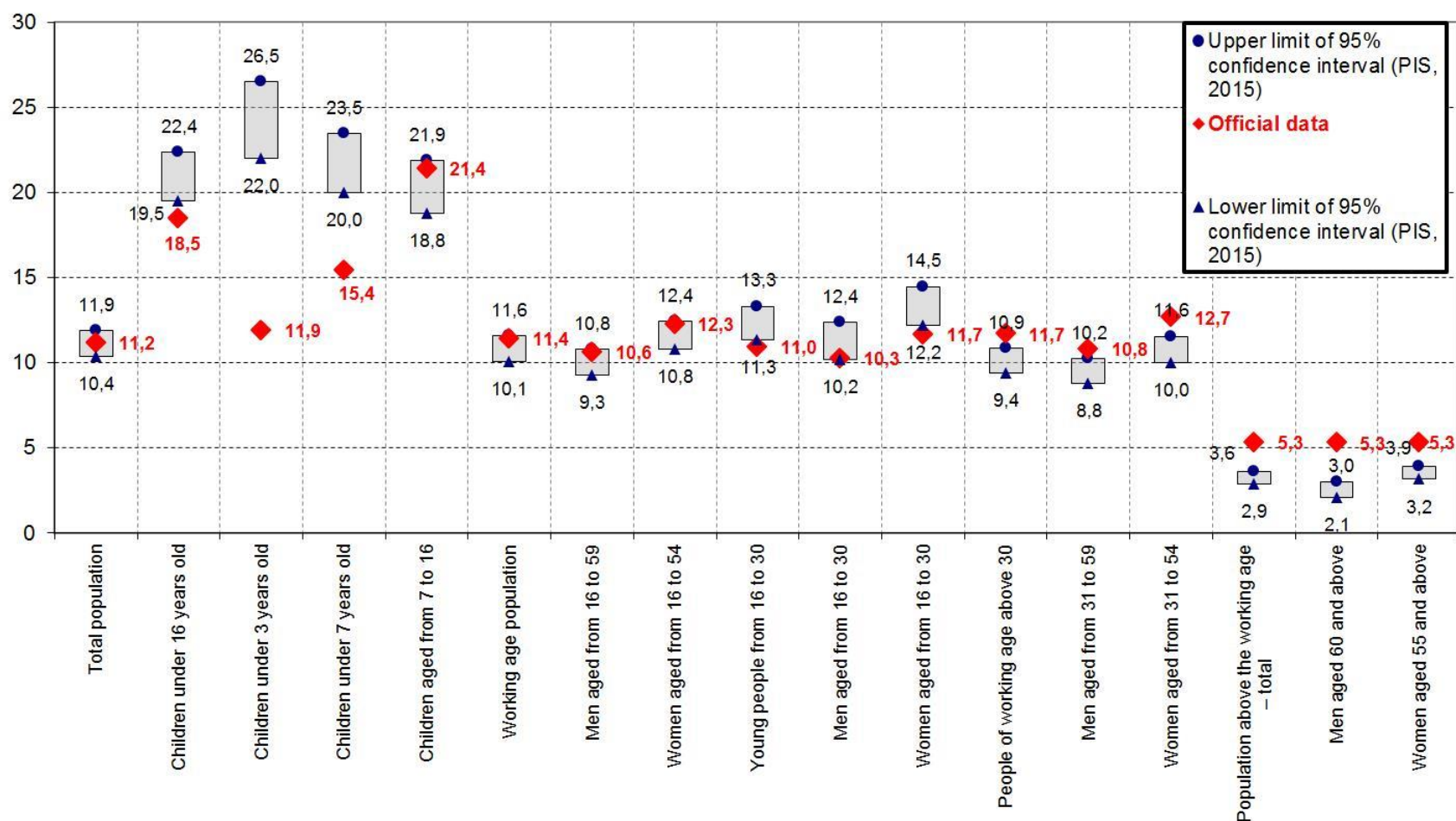
% of total population of relevant age group

	2014 <sup>1)</sup>	Estimate based on income survey	95% confidence interval (limits)	
			Lower	Upper
<b>Total population</b>	<b>11,2</b>	<b>11,1</b>	<b>10,4</b>	<b>11,9</b>
<b>Children under 16 yrs</b>	<b>18,5</b>	<b>20,9</b>	<b>19,5</b>	<b>22,4</b>
Children under 3 yrs	11,9	24,2	22,0	26,5
Children under 7 yrs	15,4	21,7	20,0	23,5
Children from 7 to 16 yrs	21,4	20,3	18,8	21,9
<b>Working age population</b>	<b>11,4</b>	<b>10,8</b>	<b>10,1</b>	<b>11,6</b>
male aged 16-59	10,6	10,0	9,3	10,8
female aged 16-54	12,3	11,6	10,8	12,4
Youth aged 16-30	11,0	12,3	11,3	13,3
Male aged 16-30	10,3	11,2	10,2	12,4
Female aged 16-30	11,7	13,3	12,2	14,5
Working age individuals aged 30+	11,7	10,1	9,4	10,9
Male aged 31-59	10,8	9,5	8,8	10,2
Female aged 31-54	12,7	10,8	10,0	11,6
<b>Total elder people</b>	<b>5,3</b>	<b>3,2</b>	<b>2,9</b>	<b>3,6</b>
Male aged 60+	5,3	2,5	2,1	3,0
Female aged 55+	5,3	3,5	3,2	3,9

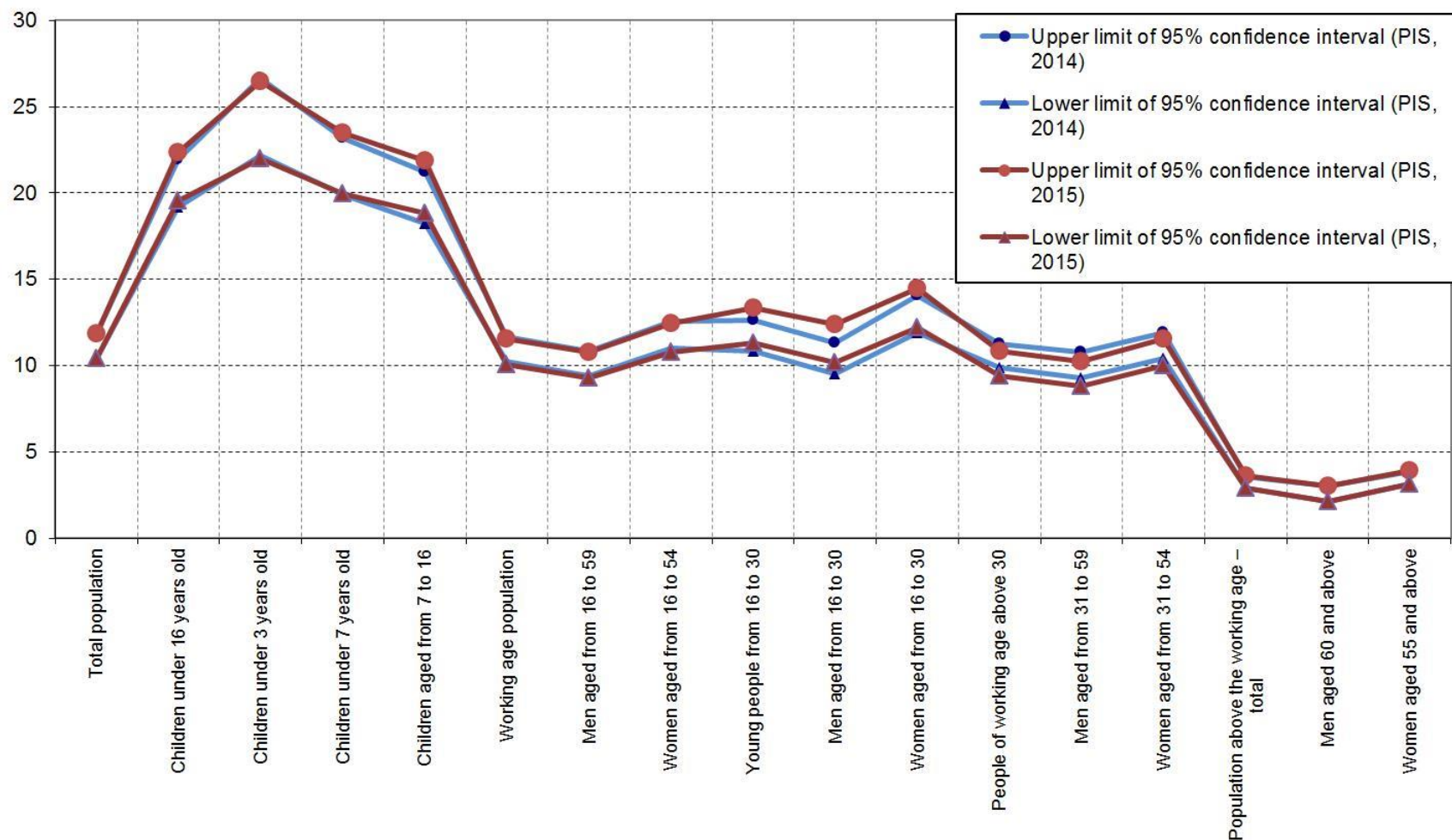
<sup>1)</sup> Approved data. Estimates based on budget household surveys and macroeconomic indicator of income per capita.

# Number of population with monetary incomes below the subsistence minimum level by main age and gender groups, 2014

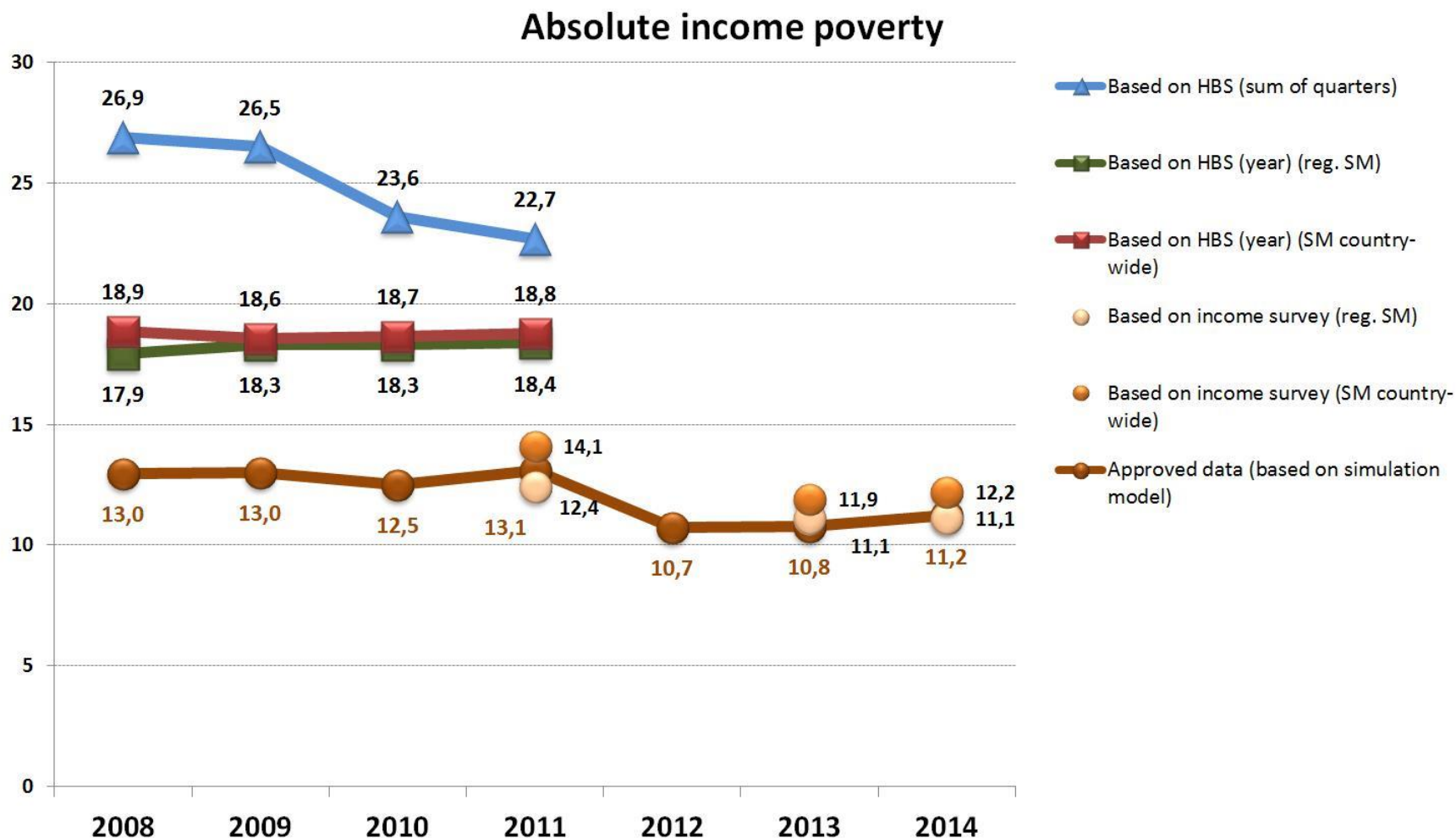
(% of total population by correspondent age group)



# Poverty rate by main age and gender groups in 2014 comparing to 2013 (by confidence interval level)

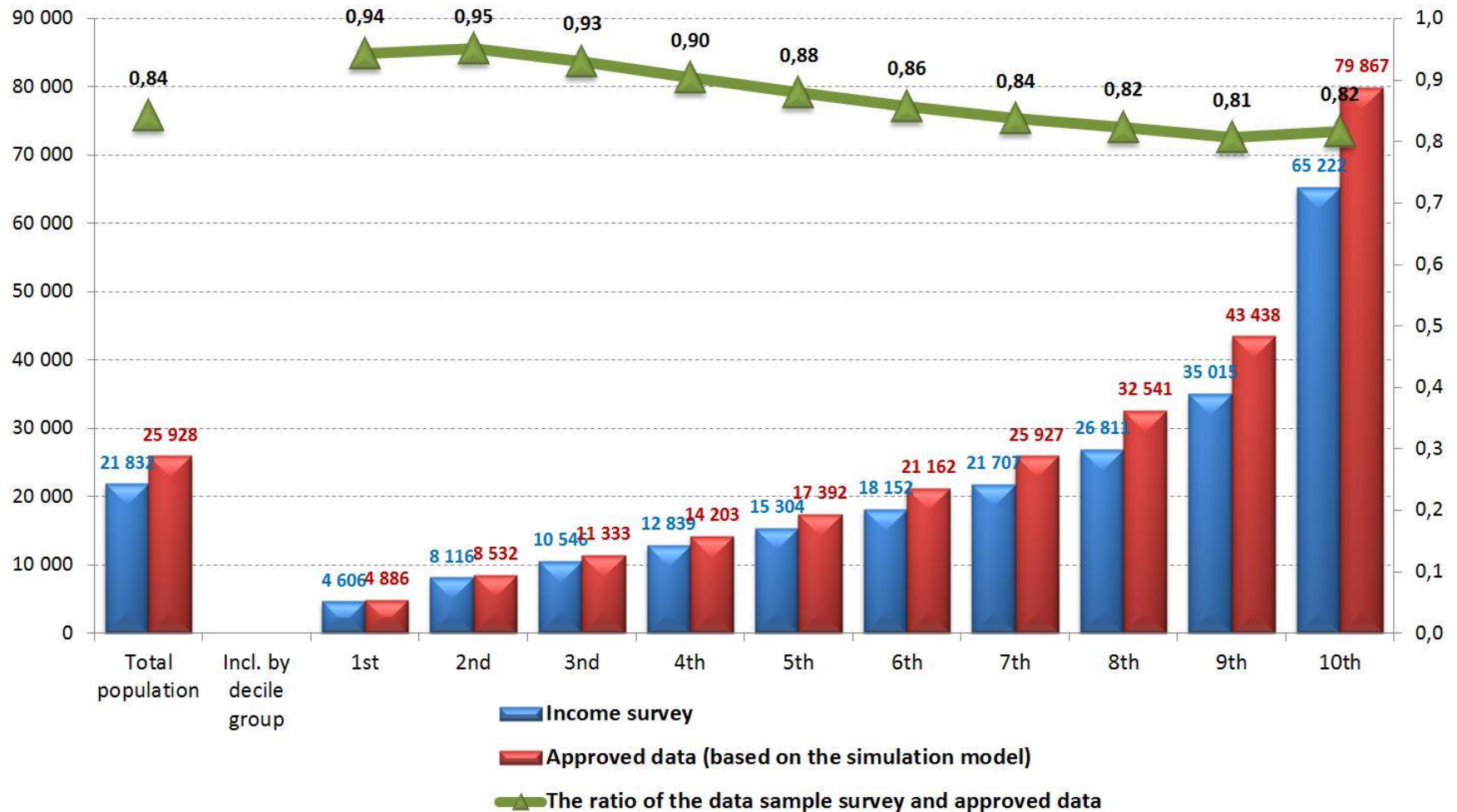


# Absolute poverty estimates based on simulation model and direct estimates based on Income Survey and HBS ( $\epsilon=1$ )





# Average income per capita, roubles per month ( $\epsilon=1$ ) (2013)



# **New opportunities coming from analytical capacity of PIS program**

In terms of estimates consistency:

interconnected system of operational and final estimates of inequality and poverty indicators is developed

# Estimates of differentiation indicators

	R/P 10% ratio	Decile coefficient	Gini coefficient
<b>Approved data (based on the simulation model)</b>			
2011	16,2	7,3	0,417
2012	16,4	7,4	0,420
2013	16,3	7,4	0,419
2014	16,0	7,3	0,416
<b>Based on income survey (<math>\epsilon=1</math>)</b>			
2011	14,4	6,4	0,391
2012	...	...	...
2013	14,2	6,2	0,394
2014	13,5	6,4	0,389

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**Conclusions:** The form of population distribution by per capita monetary income based on PIS does not contradict to theoretical longnormal distribution.

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Absolute poverty estimates based on PIS confirm the reliability of estimates obtained from the analytical model.

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PIS can be applied for the empirical estimates of inequality and poverty.

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Analytical model can be considered as an appropriate tool for obtaining the preliminary estimates of inequality and poverty key indicators.

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Analytical model allows to additionally estimate non-observed part of the whole population in the sample surveys and can be considered as an appropriate tool for obtaining the final estimates of inequality and poverty key indicators by the whole population.

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**THANK YOU FOR YOUR  
ATTENTION!**