



Methodological approaches to solving the problems of insufficient coverage of the most highly profitable population groups in Ukraine

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- In practice, the results of government sample surveys at the stage of evaluation of indicators can be adjusted by modifying the estimation procedures, above all, the procedures of calculation of statistical weights of surveyed households.
- In official statistics, method of statistical weight calibration for its adjusting is the most common and reasonable procedure the gist of which is to minimize the distance function between calibration scales and scales, which are calibrated, provided the calibration weights satisfy conditions based on external data available

The problem of statistical weights calibration is presented in this form.

$$\sum_{i=1}^n \frac{(w_i - d_i)^2}{d_i} \rightarrow \min;$$
$$\sum_{i=1}^n w_i x_{ij} = X_j, j = 1, \dots, k$$

where d_i - statistical weight of the household i before the calibration, $i = 1, 2, \dots, n$;

n - number of households;

w_i - household weight after calibration, $w_i = g_i d_i$;

g_i - weight conversion factor (so-called g-weight) ;

x_{ij} - estimation of the external variable j for the household i ;

j - external variable estimation;

x_1, \dots, x_k - external variables used, where

$$X_j = \sum_{i=1}^n x_{ij}$$

k - number of external variables.

**Main aspects of external data compliance
with data from a sample survey
of household living conditions**

- ✓ observation units (data ought to characterize the same observation units),
 - ✓ observation period,
- ✓ coverage (data should be harmonized on the territorial scope, coverage of observation groups, etc..),
- ✓ indicators (methodology for defining indicators to be used for adjusting survey results, must be agreed upon),
 - ✓ classification.

Input information for the implementation of adjustment procedures results of survey of household living conditions in order to better account for income and expenditure of the population with a higher level of income - the results of household micro-level surveys, and income and expenditure distribution calculated on the basis of external data.

However, most external data are aggregated at the national level.

Outgoing information on the results of the implementation of calibration procedures of household living conditions survey - adjusted system of statistical weights of surveyed households and household members.

Consumption structure, 2012

Major expenditure groups by COICOP	National accounts data (% of consumption)	Data from a sample survey of household living conditions (% of consumption)	
		before adjustment	after adjustment
Food and non-alcoholic beverages	39,79	55,56	43,73
Alcoholic beverages and tobacco	8,46	3,92	7,33
Clothes and shoes	6,09	6,80	6,27
Housing, water, electricity, gas and other fuels	6,46	10,26	7,40
Household items, household appliances, current housing maintenance	4,35	2,56	3,90
Health care	4,95	3,76	4,65
Transport	13,33	4,73	11,18
Phone/internet communication	2,78	3,07	2,86
Recreation and culture	4,43	2,22	3,87
Education	1,44	1,46	1,45
Restaurants and hotels	2,59	2,77	2,64
Other goods and services	5,33	2,89	4,72
Total	100	100	100

Inequality Indicators, 2012

Indicator	before adjustment	after adjustment
Gini index	0,23	0,27
Decile concentration ratio	2,80	3,33
Decile ratio of funds	4,60	5,36
<u>Quintile coefficient of funds</u>	3,30	3,85

Comparison of the number of groups of workers by salary scale according to the data from a survey of household living conditions and the fiscal service (by examples from a selected region)

	Number of groups according to fiscal service	Number of groups according to the data of the survey of household living conditions, calculated using the deciles according to fiscal service	The difference in the number of groups according to the survey of household living conditions and fiscal service
1.	50440	83852	33412
2.	50440	51381	941
3.	50440	62970	12530
4.	50439	53154	2715
5.	50440	120842	70402
6.	50439	108015	57576
7.	50440	94353	43913
8.	50440	70309	19870
9.	50440	41510	-8930
10.	50440	22579	-27861
Total	504397	708965	-

The problem of statistical weights calibration is presented in this form

$$\left\{ \begin{array}{l} 0,5 \sum_{i=1}^n \frac{(w_i - d_i)^2}{d_i} \rightarrow \min; \\ \sum_{i=1}^n w_i z_{8i} = \tilde{Z}_8; \\ \sum_{i=1}^n w_i z_{9i} = \tilde{Z}_9; \\ \sum_{i=1}^n w_i z_{10i} = \tilde{Z}_{10}; \\ \sum_{i=1}^n w_i t_{cityi} = T_{city}; \\ \sum_{i=1}^n w_i t_{towni} = T_{town}; \\ \sum_{i=1}^n w_i t_{rurali} = T_{rural}; \\ \sum_{i=1}^n w_i hsize_i = MEM. \end{array} \right.$$

where d_i - statistical weight of the household i before the calibration, $i = 1, 2, \dots, n$;

n - number of households whose statistical weight is calibrated;

w_i - household weight after calibration;

z_{8i} - identifying marker of a member of the household i of group 8 by salary scale;

z_{9i} - identifying marker of a member of the household i of group 9 by salary scale;

z_{10i} - identifying marker of a member of the household i of group 10 by salary scale;

\tilde{Z}_8 - number of people in group 8 by salary scale, formed by the deciles from the fiscal service data;

\tilde{Z}_9 - - number of people in group 9 by salary scale, formed by the deciles from the fiscal service data;

\tilde{Z}_{10} - - number of people in group 10 by salary scale, formed by the deciles from the fiscal service data;

t_{cityi} - geographic adjustments of household i - city;

t_{towni} - geographic adjustments of household i - town;

t_{rurali} - geographic adjustments of household i - country;

T_{city} - total number of households in big cities;

T_{town} - total number of households in towns;

T_{rural} - total number of households in the country;

$hsize_i$ - number of members of the household i receiving salary or employed;

MEM - number of people, receiving salary or employed.

Inequality Indicators, 2015

;	before adjustment	after adjustment
Gini index	0,227	0,237
Decile concentration ratio	2,7	2,8
Decile ratio of funds	4,5	4,8
Quintile coefficient of funds	3,2	3,3

Inequality Indicators, 2016

	before adjustment	after adjustment
Gini index	0,220	0,234
Decile concentration ratio	2,5	2,5
Decile ratio of funds	4,2	4,5
<u>Quintile coefficient of funds</u>	<u>3,0</u>	<u>3,2</u>



Thank you for your attention!