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COMPENSATING INCOME VARIATION FOR ASSESSING THE INFLATION IMPACT ON UKRAINIAN HOUSEHOLDS WELL-BEING

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ABSTRACT

The article is devoted to the development and approval of analytical tools, which should improve the sensitivity of common methods of household well-being by assessing the changes in the structure of consumer expenditures. For this purpose, it is proposed to use the concept of compensating variation (CV) and Slutsky's approach to graphic modelling and formal expression of the compensating variation. Application of the developed toolkit for assessing the dynamics of the Ukrainian households' well-being for the period 2014-2021 made it possible to clarify the distribution of inflationary pressure between households with different income levels. Groups of households were singled out, which due to the specific structure of their consumer expenditures (their high concentration on essential goods and services, the prices of which are growing faster than the aggregate consumer price index) find themselves in the position of "outsiders" and face a lack of growth nominal incomes, even in order to maintain consumption volumes (economic welfare) at the level of the basic period. Approbation of the proposed tools confirmed its analytical potential, in particular with regard to highlighting the contribution of certain product groups to the dynamics of household well-being and clarifying the features of the dependence between the dynamics of household income and the rate of growth of their economic well-being.

Keywords: economic well-being, inflation, consumer spending, compensating variation, consumer price index, households

JEL Classification: D12, H52, I31

INTRODUCTION

Inflationary depreciation of incomes has always been and still is the leading factor in the dynamics of the population well-being in Ukraine. Despite the macroeconomic nature of this important element of the balancing mechanisms of commodity and financial markets, the impact of inflation on different population groups and sectors of the economy is significantly differentiated. Such differentiation has a significant impact on the reproduction of the economic and human potential of society. For example, the lagging of the rate of expansion of budget financing from the rate of inflation, which is traditional for Ukraine, became a leading factor in the destruction of the resource potential of the budget sector of the social sphere, which had a complex system of contradictory consequences. A significant part of households whose well-being depended on pension payments, and salaries in the budget sphere and in employment sectors where the wage lagged behind the rates of inflation faced extremely unfavourable conditions for the development and even simple reproduction of human potential. Accordingly, the control and planning of the distribution of costs and benefits caused by the implementation of state policies, both directly aimed at protecting the population's standard of living and devoted to supporting growth through the maintaining of financial stability, have to take into account how the inflationary burden is distributed between the population and sectors of the economy. In the conditions of the crisis caused by Russia's war against Ukraine, large-scale threats to the balance of commodity and financial markets, and the growing population dependence on budgetary and donor aid, the urgency of such a task is only increasing. Accordingly, this article is aimed at improving the tools for analyzing the distribution between households of costs and benefits generated by

the implementation of inflation control policy and income policy. A key point of such improvement is taking into account the differences in inflationary pressures that households with different incomes face due to the specific structure of their consumer spending.

LITERATURE REVIEW

Estimates of the dynamics of economic well-being are mainly based on the ratio of growth in nominal incomes and rates of consumer inflation, measured by consumer price indices (ICP). If the research equates well-being with the volume of purchases of private consumption goods, then instead of income, consumer spending can be used, which gives certain advantages in terms of taking into account the impact on the well-being of the availability of credit resources and the presence of informal income [1]. Against the background of complex discussion regarding the relationship between income, consumer spending and the well-being of households [2 – 4], the two indicators named above traditionally play a leading role in assessing the level and dynamics of well-being, both averaged – in relation to all households, and in relation to a certain number of them a group separated by the size of income, consumer spending, or their structure [5-7].

The theoretical connection between the ICP and the measurement of the level of well-being was established in the works of Slutsky and Hicks [8-11]. In particular, the principles of modelling income changes necessary to maintain a stable level of well-being (level of total utility) after a change in the price system faced by the consumer were formulated in the concept of compensating income variation [10-11]. Accordingly, changes in income that provide the same change in aggregate utility of the consumer that occurs as a result of price changes, but with the preservation of the prices, observed in the base period – in the concept of equivalent variation of income [9]. A similar wording is used to define the essence of the cost-of-living index (COLI), a consumer welfare research tool derived from the consumer price index: "a COLI measures the change in the minimum cost of maintaining a given level of utility, or welfare, that results from changes in the prices of the goods and services consumed" [12]. At the same time, an "ideal", justified "purely theoretical" COLI involves a comparison of consumer expenditures necessary to obtain a stable level of utility at old and new prices: "An ideal COLI for an individual is a ratio of minimum expenditures in the current and the reference periods needed for maintaining the same utility level" [13, p. 3], which corresponds to Hicks' approach to modelling the equivalent and compensatory variation of income. According to Hicks, the "auxiliary" budget line is constructed as a tangent to the old indifference curve (ensuring constancy of the consumer's utility), but parallel to the new budget constraint (ensuring the reflection of the new system of relative prices) – to model the compensatory variation of income [10].

But since this approach involves operating with the quantitative value of utility or the marginal rate of substitution in consumption, the use of the Hicks concept to assess real well-being is complicated – one has to use artificial estimations instead of values that are observed in the process of collecting actual data. Therefore, the basic concept for the international practice of calculating SRI and COLI assumes that to ensure a constant well-being level should be used the constant volumes of goods consumption, amidst the constant level of utility – which corresponds to Slutsky's model. After all, according to Slutsky approach, in the process of modelling the compensatory variation, the auxiliary budget line is drawn directly through the initial point of the consumer's optimum (ensuring the invariability of the amounts of goods consumption) and parallel to the new budget line that arose after the change in relative prices [11]. Thus, the modified Laspeyres index used by Ukrainian statistics to calculate the ICP [14] is, in fact, an embodiment of Slutsky's approach to modelling the compensatory variation of income adapted to obtaining actual data.

However, like any indicator that directly characterizes a certain criterion of well-being, the ICP causes certain distortions. Traditionally, in the economic literature, a number of shortcomings ("biases") inherent to the well-being evaluation based on the combination of the household income size (consumer expenditures) and ICP are identified, in particular, Upper-level substitution bias, Elementary aggregate bias, Outlet substitution bias, New products bias, Quality change bias [13; p. 6 - 7]. We will try to clarify the calculations of the medium-term dynamics of the economic well-being of Ukrainian households with different incomes, using the direct expression of Slutsky's approach to compensatory variation modelling: calculating the amount of expenditure necessary to maintain the amount of goods consumption of the base period at the prices of the reporting period. At the same time, the calculations will be carried out separately for each group of Ukrainian households, distinguished according to the size of "per capita equivalent total income" in the official statistical issue "Household Expenditures and Resources" [15] for 2014-2021.

The advantages of this approach are as follows. First, calculations will be performed separately for households belonging to different deciles of equivalent per capita income. This will allow taking into account the specific structure of consumer expenditures of households with different sizes of equivalent income. If in the ICP the price indices of certain commodities are weighted by the average for the entire population share of the corresponding costs, then our proposed approach will

allow taking into account the influence of the consumption structure on the strength of inflationary pressure. For example, if a certain group of households spends a relatively larger share of their budget on goods that increase in price faster than the average level of growth in consumer prices, they will face a greater negative impact of inflation on well-being than the ICP reflects. Conversely, households that spend a larger share of their consumer budget on goods (services) that rise in price more slowly than the aggregate ICP will experience a smaller decrease in welfare due to inflation than estimated using the ICP.

Secondly, our proposed approach is directly consistent with Slutsky's approach to modelling the compensatory variation: our calculations are aimed at determining the size of income (consumer spending) necessary to maintain the size of consumption of the base period in the actual system of prices. In contrast to ICP calculations, which, according to the methodology adopted in Ukraine [14], provide the fixation of the cost structure, i.e., the costs of the base period multiplied by the ICP give the sum of income (consumer spending), which allow maintaining the structure of the consumer spending of the base period in the prices, observed in actual period. Despite the fact that the structure of expenditures is closely related to well-being, the principle embedded in the calculations of the ICP leaves much more space for ambivalence in the interpretation of the results.

AIMS AND OBJECTIVES

Accordingly, our article is aimed at developing analytical tools for assessing the inflation pressure on the households' well-being, which should create prerequisites for clarifying the distribution of costs and benefits of macroeconomic policy between households with different incomes.

METHODS

The database for calculations is formed based on the data of the official statistical issue "Expenditures and resources of households of Ukraine" and data on consumer price indices for the main categories of goods (services) [15; 16]. Accordingly, as the base of all calculations and representation in tables, data about the average spending of Ukrainian households with different per capita equivalent incomes, in monthly dimension was used.

The formula proposed by us for calculating the compensating variation of income, which corresponds to Slutsky's approaches and was adapted to the existing statistical base, is given below:

$$CVi = Si_0 \times (ICPi /100 - 1), \quad (1)$$

where: CVi – the absolute increment in consumer spending, necessary to maintain the basic volumes of consumption of the i-th commodity at the prices formed in the reporting period; Si_0 – consumer spending on the purchase of the i-th commodity in the base period; ICPi – consumer price index for the i-th commodity in the reporting period, compared to the base one.

Accordingly, the result reflects the absolute increment in consumer spending, necessary to maintain the basic volumes of consumption of the i-th commodity at the prices formed in the reporting period. Then, the ratio of compensating variation to the total consumer expenditures of the base period characterizes the percentage of income (consumer expenditures) growth necessary to maintain the amount of consumption of the i-th commodity of the base period at the prices observed in the reporting period:

$$SIi = CVi / St_0, \quad (2)$$

where: SIi – the relative increase in consumer spending necessary to maintain the basic amount of consumption of the i-th commodity at the prices formed in the reporting period; St_0 – total consumer spending in the base period.

Thus, comparing the actual nominal consumption expenditures of households in the reporting year with those necessary to maintain the basic physical volumes of consumption, we will obtain the "solvency gap": the absolute size of the lack of consumption expenditures (income) of households to compensate for the pressure of inflation on the well-being of households:

$$GAPi = Si_1 - (Si_0 + CVi), \quad (3)$$

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where: GAPi – the absolute gap between the actual expenses for the purchase of the i-th good (i-th group of goods) in the reporting period and the expenses necessary to compensate for price changes and maintain consumption volumes of the base period; Si_1 – consumer spending on the purchase of the i-th good (i-th group of goods) in the reporting period.

Accordingly, the sum of the gaps in all commodity groups gives the aggregate increase in consumer spending, which is necessary to maintain the basic consumption volumes of all commodity groups at the prices of the reporting period:

$$GAPtotal = \sum_1^{12} GAPi \quad (4)$$

where: GAPtotal – the total absolute gap between the total consumption expenditures of households and the expenditures necessary to maintain consumption volumes at the level of the base year at the prices reported for all product groups; $\sum_1^{12} GAPi$ – the sum of absolute gaps in 12 "and" commodity groups, according to the classification of Ukrstat [15].

Thus, the ratio of such a gap to the actual consumer expenditures of the reporting year gives the percentage of loss (if the absolute size of the gap is negative) of household welfare due to inflationary pressure, or the percentage of welfare growth (if the absolute size of the gap is positive) ensured by the fact that actual nominal incomes grew faster for inflation:

$$IW_1 = GAPtotal / St_1, \quad (5)$$

where: IW_1 – aggregated index of shortage (<1), surplus (>1) of actual consumer expenditures to preserve the consumption amount of the base period at the prices of the reported; St_1 – total consumer spending in the reporting period.

Finally, the classic rule "the product of the chain indices is equal to the base one" allows to estimate the relative decrease/increase in the welfare of households for any interval of the retrospective period. We performed calculations for the period 2014 – 2021, both with chain indices (the year before the previous one) and with the base year 2014, and reporting years – 2021.

RESULTS

Data on the relative gap between the actual spending for a certain commodity and those necessary to maintain the amount of consumption of the base year in the reporting period are shown in Table 1. Negative values indicate a lack of actual growth in nominal spending for a certain commodity to compensate for price increases and maintain consumption at the base year level. Formally, this means that the increase in expenditure that was actually observed was less than the compensating variation in income. Accordingly, the size of such a gap characterizes the reduction in well-being caused by changes in the consumption of a certain commodity. Positive values indicate an excess of the actual increase in nominal expenditure for a certain commodity over what is necessary to maintain the consumption of the base period at the prices of the reporting year. Formally, this means that the actual increase in nominal spending for the commodity exceeds the compensatory variation. Accordingly, there was an improvement in welfare caused by the expansion of consumption of a such commodity.

Table 1. Relative gaps between actual increases in consumer spending and compensating variation (% of actual nominal spending of the reporting period) by years of the retrospective period.

	2015/ 2014	2016/ 2015	2017/ 2016	2018/ 2017	2019/ 2018	2020/ 2019	2021/ 2020	2021/ 2014
Food and non-alcoholic beverages	-9.04	-0.86	3.77	2.37	2.45	-0.04	1.04	-0.88
Alcoholic beverages and tobacco	-0.58	-0.28	0.20	0.18	-0.16	-0.10	-0.25	-0.98
Clothes and shoes	-1.13	-0.26	1.32	0.83	0.78	-0.50	1.08	2.11
Housing, water, electricity, gas and other fuels	-6.74	-1.37	0.71	1.65	2.99	0.89	0.27	-1.90
Household items, household appliances and current home maintenance	-0.95	-0.16	0.76	0.34	-0.05	0.46	0.34	0.73
Health care	-0.32	0.68	0.29	0.56	0.49	-0.07	0.93	2.60
Transport	-1.30	0.15	0.46	0.04	1.75	-0.86	0.95	1.17
Communications	-0.03	0.24	0.43	0.37	0.34	0.45	0.40	2.21
Recreation and culture	-0.60	-0.11	0.54	0.36	0.13	-0.12	0.38	0.57
Education	0.05	-0.19	0.22	-0.05	0.13	-0.44	0.22	-0.08
Restaurants and hotels	-0.41	0.29	0.35	0.18	0.43	-1.49	0.44	-0.23
Various goods and services	-0.37	-0.15	0.46	0.43	0.09	-0.10	0.78	1.14
Total consumer spending	**-21.43**	**-2.02**	**9.50**	**7.26**	**9.37**	**-1.92**	**6.57**	**6.46**

Gaps are given in relative size (in % of the actual spending on certain commodities of the reporting period). For example, the aggregated estimation for all commodities of "-21.43" indicates that the cumulative increase in consumer spending of Ukrainian households in 2015, compared to 2014 was insufficient to maintain consumption volumes observed in 2014. The shortfall in actual nominal spending to compensate for price increases was 21.4%. This value can be considered a generalized (averaged for all groups of households) assessment of the dynamics of economic well-being in 2015, compared to 2014. It is important that the value for individual commodities (for example, "-9.04" in the line "food") characterizes the contribution of food products to the overall lack of nominal income and reduction of well-being. In particular, in 2015 the actual increase in food expenditure was insufficient to offset the increase in prices of that commodity and total expenditure would have to increase by 9.04% to allow food consumption to remain at the 2014 level, under the prices observed in 2015.

The characteristics of the dynamics of well-being by groups of households with different equivalent per capita incomes are shown in Table 2.

Table 2. Relative gaps between actual increases in consumer spending and compensatory variation (% of actual nominal spending in the reporting period) for the period 2014-2021. by groups of households with different equivalent per capita incomes.

	All households	Including equivalent per capita incomes. UAH / month										
		under 3000.0	3000.1 - 4000.0	4000.1 - 5000.0	5000.1 - 6000.0	6000.1 - 7000.0	7000.1 - 8000.0	8000.1 - 9000.0	9000.1 - 10000.0	10000.1 - 11000.0	11000.1 - 12000.0	over 12000
Food and non-alcoholic beverages	**-0.88**	-57.96	-15.92	-12.46	3.70	0.26	-1.78	-4.34	-6.46	0.80	-2.63	-7.80
Alcoholic beverages and tobacco	**-0.98**	0.29	-3.43	-1.99	-0.77	-0.15	-1.27	-0.60	-1.25	-1.51	1.27	-1.16
Clothes and shoes	**2.11**	-1.62	-1.43	1.02	3.03	2.61	1.50	1.20	1.54	2.46	1.53	1.49
Housing, water, electricity, gas and other fuels	**-1.90**	-17.22	-1.60	-4.37	0.43	-1.01	-2.76	-5.27	-5.27	-6.71	-0.60	-5.39
Household items, household appliances and current home maintenance	**0.73**	-1.08	1.10	0.84	1.00	0.19	0.26	0.71	1.10	0.49	-0.01	0.87
Health care	**2.60**	-7.74	2.61	4.10	3.78	2.92	2.03	1.11	3.60	1.21	2.32	1.26
Transport	**1.17**	-2.69	0.98	0.70	2.72	0.69	1.22	-0.89	2.62	-1.05	1.29	-1.91
Communications	**2.21**	0.19	4.17	2.12	2.99	2.68	2.03	1.86	2.48	1.67	1.97	1.30
Recreation and culture	**0.57**	-4.27	-0.08	0.00	0.44	0.29	0.60	0.94	1.62	0.47	0.14	-0.43
Education	**-0.08**	0.09	-0.94	-0.19	-0.04	0.00	0.16	-0.53	-0.15	1.26	0.03	-0.43
Restaurants and hotels	**-0.23**	-7.33	-0.58	-0.73	-0.11	-0.22	-0.26	-0.06	-0.20	-0.81	-0.71	-1.20
Various goods and services	**1.14**	-1.20	0.14	0.65	1.46	1.46	1.61	0.70	1.07	1.48	1.31	0.38
Total consumer spending	**6.46**	**-100.55**	**14.97**	**10.28**	**18.64**	**9.71**	**3.31**	**-5.18**	**0.70**	**-0.24**	**5.91**	**13.01**

These estimates are calculated for the entire retrospective period (with a base year of 2014 and reporting years of 2021) and allow us to move from characteristics of well-being dynamics averaged over all households to more significant and useful for determining guidelines, problems and policy tasks – characteristics of changes in well-being by groups households with different incomes. Differences in incomes cause differences in the structure of consumption, respectively – different pressures of inflation on the well-being of every group of households.

To illustrate the advantages of our proposed approach, we also calculated the indices of the dynamics of the households' well-being according to the traditional method: by comparing the monetary expenditures of the reporting and base years, with the reduction of the nominal monetary expenditures of the reporting year to the prices of the base year through consumer price indices (Table 3).

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Table 3. Dynamics (relative growth rates) of real consumer spending of households for 2014-2021, estimated through weighted average consumer price indices. Note: * - calculated by the weighted average price indices corresponding to the structure of consumer spending of each group of households.

	All households	Including equivalent per capita incomes. UAH / month										
		under 3000.0	3000.1 - 4000.0	4000.1 - 5000.0	5000.1 - 6000.0	6000.1 - 7000.0	7000.1 - 8000.0	8000.1 - 9000.0	9000.1 - 10000.0	10000.1 - 11000.0	11000.1 - 12000.0	over 12000
Food and non-alcoholic beverages	2.92	-29.23	19.52	7.46	23.86	20.62	16.15	9.74	8.79	20.08	7.32	-4.37
Alcoholic beverages and tobacco	-22.01	5.18	-36.33	-31.54	-6.81	2.21	-21.11	-7.15	-20.72	-34.98	43.74	-27.08
Clothes and shoes	49.65	-3.84	52.13	71.17	109.80	99.44	78.13	63.28	72.66	68.49	38.97	50.35
Housing, water, electricity, gas and other fuels	-8.60	-43.10	25.13	4.41	18.26	11.73	3.41	-11.31	-12.51	-19.34	8.45	-9.18
Household items, household appliances and current home maintenance	48.04	-100.00	148.49	107.62	116.32	59.41	79.02	75.43	100.15	67.86	41.45	78.33
Health care	72.87	-59.86	188.83	167.87	177.52	104.85	90.07	53.93	120.95	44.67	77.34	52.44
Transport	35.84	-100.00	192.80	82.60	178.07	63.95	85.95	23.31	103.62	19.74	69.84	34.15
Communications	97.83	31.87	213.23	125.10	165.36	144.68	111.31	93.88	134.33	91.13	99.68	78.43
Recreation and culture	45.93	-100.00	77.34	47.35	104.57	76.93	81.50	115.61	163.02	56.70	35.62	40.88
Education	-2.60	-100.00	15.01	-0.36	22.78	27.51	38.89	-9.16	11.60	130.78	23.46	-8.08
Restaurants and hotels	-5.62	-100.00	-8.16	-16.45	39.17	18.70	27.22	30.22	26.92	-4.68	-0.89	4.38
Various goods and services	47.16	-12.07	65.72	63.96	96.75	88.31	98.19	57.37	68.26	79.58	70.79	37.32
Total consumer spending	**9.35**	**-33.02**	**33.72**	**19.46**	**42.57**	**32.08**	**26.38**	**14.51**	**22.71**	**17.39**	**19.19**	**5.59**
Total consumer spending*	**9.71**	**-42.68**	**17.75**	**12.16**	**36.92**	**28.83**	**25.43**	**16.03**	**27.18**	**24.20**	**26.37**	**16.58**

DISCUSSION

The aggregated information presented in Table 1 is convenient for identifying commodities that during the retrospective period caused the greatest impact on the welfare of households and periods when the pressure of price growth on welfare was the greatest. The calculation method assumes that the calculated gap sizes reflect the influence of two factors. First, the price growth of a certain commodity: other things being equal, the higher the rate of price growth, the larger the negative gap becomes. Accordingly, the smaller the price growth, the larger the positive gap becomes (the smaller the increase in nominal costs is sufficient to compensate for the price increase).

The second is the change in the size of expenditure (and the amount of consumption) by a certain commodity: other things being equal, the higher the expenditure (and, accordingly, the amount of consumption), the smaller the negative gap becomes (the larger the positive gap, if the actual increase in nominal expenditure exceeds the compensating variation).

Accordingly, for example, in 2015 compared to 2014 there was a reduction in the economic well-being of consumers: inflationary pressure exceeded the growth of nominal incomes and the total well-being of households decreased by 21.4%. At the same time, the biggest contribution to such a significant reduction (in fact, a reduction in the amount of consumption by almost a fifth) was made by the increase in prices for two commodity groups. First, the increase in food prices (a 45.9% increase in prices) led to a 9.04% decrease in welfare (a lack of total spending to maintain food consumption). Secondly, the rapid increase in prices for communal services (the commodity "Housing, water, electricity, gas and other types of fuel" increased in price by 2.2 times in 2015) led to insufficient total spending by another 6.74%.

As we can see, the proposed method, first of all, makes the contribution of different commodity groups to the general change in the welfare of households visible. Secondly, it is sensitive both to the rates of price growth and to the share of spending for the relevant commodity in the consumer budget, which is very important for a meaningful assessment of the

dynamics of the households' well-being with different expenditure structures and, in fact, is a new means of solving the task of evaluating the dynamics of household well-being, which meets the requirements formulated in [4; 17 – 20]. As we can see, in 2015, the leading contribution of the increase in the price of food products to the reduction of household welfare (the negative gap between the increase in nominal spending and the compensating variation) was due to the high share of food expenditure: although the prices of utility services grew faster, the share of corresponding spending in the consumer budget was smaller, so the contribution to the reduction of well-being is inferior to the contribution of food. Such estimation of food price dynamics' contribution to shifting in households' well-being remains impossible with using methods of calculating real income traditional for domestic literature, which states that income lags behind price growth, but lacks tools for quantifying the impact of such a lag on well-being [21;22]

Over the entire retrospective period (the last column of Table 1), the growth of nominal consumer expenditures of households outpaced the compensating variation by 6.5%. Accordingly, a very moderate increase in the welfare of households was recorded – only about 6% in 7 years. At the same time, the leading contribution to the growth of well-being was made by the commodity "communications" – the actual increase in expenditures exceeded the compensating variation by 2.2% and "clothing and footwear" – the actual expenditures on such goods became greater than necessary to maintain the amount of consumption of the base year by 2.1%. Among the commodities whose price increase had the most negative impact on the welfare of households: "Housing, water, electricity, gas and other fuels" – reduction of welfare by 1.9%; Alcoholic beverages and tobacco – by 1%; and "Food and non-alcoholic beverages" – by 0.9%.

We see that in the long-term, essential goods (primarily food and utilities – "Housing, water, electricity, gas and other fuels") become more expensive than the growth of household spending, which leads to the distribution of the burden of inflation mainly on the poorest households, whose demand is highly concentrated precisely on commodities that satisfy basic needs So, we obtain evidence, proving the results of widely cited researches that operated on the data of a range of countries (panel database) [23;24], but using a time series database.

It is also important to notice the reduction of the amount of commodity "education" was consumed – this is a sign of extremely negative trends in the accumulation of human capital and indicates the possibility of falling into the trap of "low productivity – low income – low investment activity to improve the quality of human capital – low productivity" [25; 26].

We note that the assessment of well-being according to the traditional method of converting nominal consumer spending into real dimension through the ICP (Table 3) for the period 2014-2021 years gives a somewhat overestimated increase in well-being (9.4% growth using the ICP for total consumer spending and 9.8% – if converting nominal costs into real costs based on weighted average price indices – in accordance with the actual structure of total spending distribution between commodities).

Even more significant differences are observed between our results and traditional calculations on basis spending and price indices [21;22; 27], taking into account the welfare characteristics of households with different equivalent per capita incomes (Table 2).

The indicators in Table 2 indicate a high differentiation of the well-being dynamics and the distribution of the burden of inflation between the strata of the population. With an average welfare increase of 6.5% for all households (a positive excess of consumer spending over the compensating variation), the welfare of the poorest households has radically worsened (actual spending would have to more than double to ensure that consumption remains unchanged under inflationary pressures – a negative gap 100.6%). Significant negative dynamics of economic well-being are observed in three groups of households with the lowest incomes. According to the data of 2021, these three groups accounted for 37.9% of all households in Ukraine. In addition, the negative dynamics of well-being are observed in the group of households with equivalent per capita incomes from UAH 8 to 9 thousand (the lack of growth in consumer spending to compensate for inflationary pressure by 5.2%) and in the group with incomes from UAH 10 to 11 thousand and in the group with the highest equivalent incomes (over UAH 12.000 per month).

The above shows that about 50% of the population (the average size of households and the number of households in groups distinguished by income size is almost the same) do not have access to the opportunities and advantages that increased incomes provide. The economic well-being of households with equivalent per capita income below UAH 5.000 in 2021 did not improve, but significantly worsened, compared with 2014. Even two groups of households with relatively high incomes also did not benefit from growth - since their demand was concentrated on commodities, whose prices grew faster than ICP. Accordingly, the relationship between the level of income and the rate of growth of well-being in Ukraine is close to a "bell-shaped" pattern: the average rate of growth of well-being increases in groups with average incomes and decreases in groups with the lowest and highest incomes (Figure 1).

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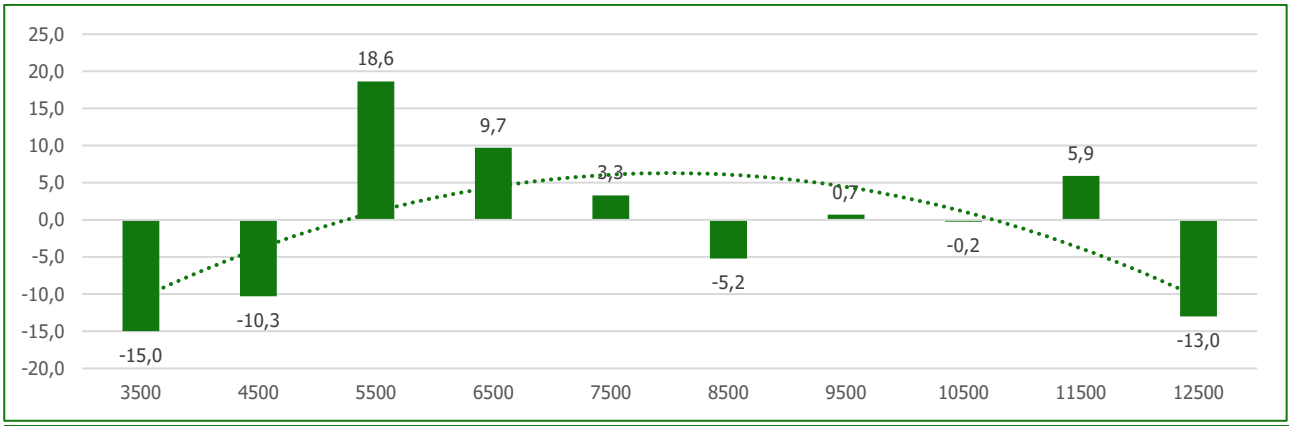

Figure 1. Growth rates of well-being, estimated through the compensating variation for 2014 – 2021 by groups of households with different equivalent per capita incomes.

A certain deviation that clearly violates the general "bell-shaped" dependence of welfare growth rates on per capita incomes is observed from the right edge of a number of households arranged by income – in relation to the group with per capita equivalent incomes of UAH 11 to 12 thousand / month. The reasons for such a deviation from the general model of distribution can become the object of special research, the focus of which will be households with exactly such size of income.

Although observed dependence between the achieved well-being and the rate of its growth contributes to the general equalization of the well-being distribution, the model of such equalization is far from optimal. After all, the reduction of inequality is achieved only thanks to the lagging of the growth rates of the welfare of the richest households. However, the poorest households are not approaching the average level: their welfare improvement rates are the lowest. Moreover, such a situation indicates the threat of marginalization of a significant part of the population and relates Ukraine more to the countries of the third world than to the orientations of the income policy of the European community [24].

We emphasize that the using of traditional calculation methods [21;22;27], even if nominal consumer expenditures are converted into real ones through weighted average consumer price indices specific to each group of households (the last line of Table 3), does not reflect all the complexity of the distribution of inflationary pressure among Ukrainian households. Thus, according to the traditional method of calculations, the negative dynamics of well-being are recorded only in relation to one group of households – with the lowest equivalent per capita income (Table 3).

However, it is important to emphasize that the "bell-shaped" dependence of welfare growth rates on the level of income size is also observed using the traditional method of converting nominal consumer expenditures into real ones: the highest welfare growth rates for 2014 – 2021 are observed "in the middle" of the range of households ordered by per capita income, lower – observed for households with the highest and lowest incomes. An exception to this rule is observed in relation to households with incomes from UAH 3 to 4 thousand (they are distinguished by high rates of welfare growth, although they are located on the left edge of the row of households ordered by income – Figure 2).

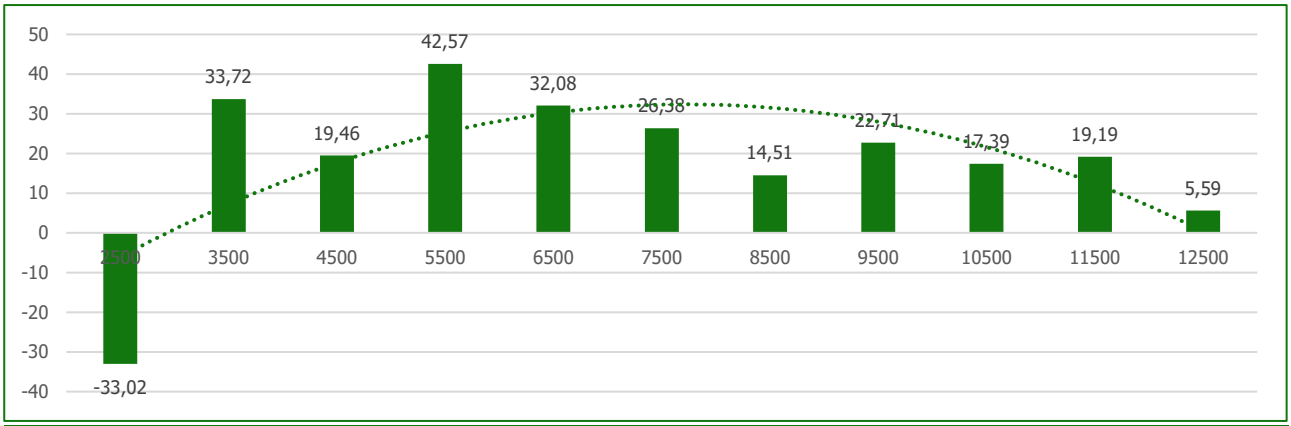

Figure 2. Growth rates of well-being, estimated by converting nominal consumer spending into real through a single CPI for all groups, for 2014 – 2021 by household groups with different equivalent per capita incomes.

The explanation for such a "prong" in the diagram can be certain features of social protection programs, for example, if there is an "income limit" between two groups with similar incomes, at which the legislation provides access to a certain social support program. However, we consider not only the presence of this "prong" to be a sign of the shortcomings, inherent to the traditional method of assessing the well-being dynamics. After all, it is for the traditional methodology that significant differences in the dynamics of well-being are observed between those groups of households that have similar incomes. Such characteristics of the distribution have a rather low probability of occurrence and testify to the shortcomings of the calculations rather than to the peculiarities of the actual distribution of inflationary pressure. According to this feature, the general shape of the distribution of households according to the growth/decline of welfare in the case of using our proposed calculation method (due to the gap between the compensating variation and actual consumer spending) looks much more "consistent" and the differences in the growth rates of welfare between groups of households with similar incomes much smaller.

CONCLUSIONS

Calculations according to the proposed methodology made it possible to reveal significant differences in the distribution of inflationary pressure between Ukrainian households with different equivalent per capita incomes. The trend of shifting the burden of inflation to the least wealthy sections of the population looks extremely threatening. Having a highly concentrated demand (the majority of their budget is spent on essential goods, the prices of which are rising the fastest), such households face extremely unfavourable conditions for the development and even simple reproduction of human potential, and the effectiveness of social protection programs is clearly insufficient to counteract the decline in well-being and risks of marginalization of these population groups.

In the medium-term retrospective (for 2014 – 2021), the dependence between the achieved well-being and the rates of its growth, inherent to Ukraine, contributes to the general equalization of the well-being level, but the model of such equalization is far from optimal. The reduction of inequality is achieved only due to the lagging of the welfare growth rates of more affluent households; however, the poorest households do not approach the average level: their welfare improvement rates are the lowest. Such a situation indicates the threat of marginalization of a significant part of the population and relates Ukraine more to the countries of the third world than to the guidelines of the income policy of the European Community.

Also, the tendency to reduce the amount of consumption of goods and services created in the "education" industry looks threatening, even taking into account, that the rate of increase in the price of educational services lags behind the average consumer price index. Such curtailment of the education services consumption against the background of their relative cheapening may be a sign of a deep crisis of economic motives for investing in human capital and indicates the need for a corrective policy that would be more effective compared to the current order of budgetary financing of education.

A number of advantages of the approach proposed by the authors to assessing the dynamics of household well-being (based on the gap between the compensating variation and the actual households' consumer expenditures) were revealed, compared to traditional methods based on the converting of nominal spending and incomes into real ones using the consumer price index. First, the proposed approach is more sensitive to differences in inflationary pressure faced by households with different incomes and, accordingly, the different structure of consumer spending. Secondly, it makes it possible to assess the contribution of every commodity to the aggregate dynamics of households' well-being. Finally, thirdly, it is better aligned with the conceptual foundations of the welfare dynamics evaluation, due to the direct use of Slutsky's approach to the assessment of the compensating variation.

ADDITIONAL INFORMATION

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Visualization: *Andrii Samiilenko, Mykola Halaburda*
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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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КОМПЕНСАЦІЙНА ВАРІАЦІЯ ДОХОДУ ДЛЯ ОЦІНКИ ВПЛИВУ ІНФЛЯЦІЇ НА ДОБРОБУТ УКРАЇНСЬКИХ ДОМОГОСПОДАРСТВ

Стаття присвячена розробці та апробації аналітичного інструментарію, що має поліпшити чутливість поширених методів оцінювання динаміки добробуту домогосподарств до змін у структурі їхніх споживчих видатків. Для цього запропоновано використовувати концепцію компенсаційної варіації доходу (споживчого бюджету) та підхід Слуцького до графічного моделювання й формального вираження розмірів компенсаційної варіації. Застосування розробленого інструментарію для оцінювання динаміки добробуту домогосподарств України за період 2014-2021 рр. дозволило уточнити характер розподілу інфляційного тиску між домогосподарствами з різним рівнем доходу. Було виділені групи домогосподарств, що через специфічну структуру своїх споживчих видатків (їх високу сконцентрованість на товарах і послугах першої необхідності, ціни на які зростають швидше, ніж агрегований індекс споживчих цін за всіма товарними групами) опиняються в становищі «аутсайдерів» та стикаються з нестачею зростання номінальних доходів навіть для того, щоб зберегти обсяги споживання (економічний добробут) на рівні базового періоду. Апробація запропонованого інструментарію підтвердила його аналітичний потенціал, зокрема щодо виділення внеску окремих товарних груп у динаміку добробуту домогосподарств і уточнення характеру залежності між рівнем доходу домогосподарств і темпами зростання їхнього економічного добробуту.

Ключові слова: економічний добробут, інфляція, споживчі видатки, компенсаційна варіація, індекс споживчих цін, домогосподарства

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