MODEL FOR ANALYSING THE EVOLUTION OF INCOME AND EXPENDITURE OF THE POPULATION

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Abstract

The analysis of the whole evolution of the economy of a country, of the organization and development of the activity, must be subordinated to the obtaining of a superior gross added value, which will ensure a better standard of living for the population.

The analysis of the income and expenditure of the population shows that they have stagnated and have a tendency to decrease in real terms in the following periods.

In this sense, using our own methodology, that of using statistical-econometric indicators provided by the National Institute of Statistics and processed by authors, to be able to reveal the evolution of total population income and expenditure, context in which they can be correlated for the minimum basket of consumption of the population and with the requirements of raising the standard of living.

Keywords: income, expenses, population, standard of living, methods, models.

JEL classification: C10, H10

Introduction

In the analysis of the total and structured incomes and expenses of the population, we started from the situation registered in the third quarter of 2021, compared to the previous periods and then extrapolated for the future periods.

We briefly presented the evolution of the total income and expenditure of households, by sources of training and by destinations of use, realization of expenditure.

The data are presented in tables and graphs and interpreted by the authors to reveal the prospect of declining household incomes, making it difficult to cover expenses.

Of course, we also have in mind the explosion in the consumer price index, as a result of rising prices for a number of products, such as electricity,

natural gas, heat and, hence, indirect development, rising prices for most products and activities of the national economy.

The article is quite well developed, revealing a level of stagnant income, even depending on the average level of gross salary, or net salary in the economy, in the second quarter of 2021 and even the third quarter of the same year.

The data presented are easy to assimilate, taking into account the fact that we used graphical presentations, structure tables, structure graphs or possibilities to ensure comparability at the national level.

This can be done by using the purchasing power parity index and for international comparability.

Literature review

Burlacu M.I. (2021) presents a series of theoretical aspects of income classification and certain particularities present in Romanian households. Anghel, Barbu and Radu (2021) present the evolution of incomes between 2019 and 2020, the structure of total household incomes, by training sources, the level and structure of total expenditures and that of total consumption expenditures. Kroli, K. and Notowidigdo, M.J. (2016) make a study that presents theories and evidence on the link between income and unemployment, income and wages. Anghelache, C., Mitruț, C. and others (2007) in a vast macroeconomic analysis, also touch on aspects regarding the standard of living and implicitly the income of the population. Censolo, R., Colombo, C. (2008) present a detailed analysis of the impact of consumption growth on macroeconomic development. Mirea M. (2019) makes an economic analysis of income, addressing issues such as labor productivity or the profitability of companies. Barti C. (2015) has a study that analyzes the possibilities of households to absorb the shock of rising electricity costs. Anghel, Iacob and Dumitru (2020) make an analysis of the average monthly income by gender.

Methodological clarifications, data, results and discussions

The main theoretical trends divide income into two broad categories, cash income and income in kind. The National Institute of Statistics defines cash income as the set of cash receipts from various sources for which there is no obligation to repay (excluding amounts withdrawn from CEC Bank, other banks and similar institutions, loans and credits received).

Income in kind (valued in lei) is defined by the expression of the components, the value of human and fodder consumption of food and non-food products from the household's own resources (production, stocks, labor, received as a gift, etc.). being made at the average purchase prices of the

products by development regions and in the chosen reference month. At the same time, we are also informed that another component element is represented by the equivalent value of the social benefits, evaluated at the sale price.

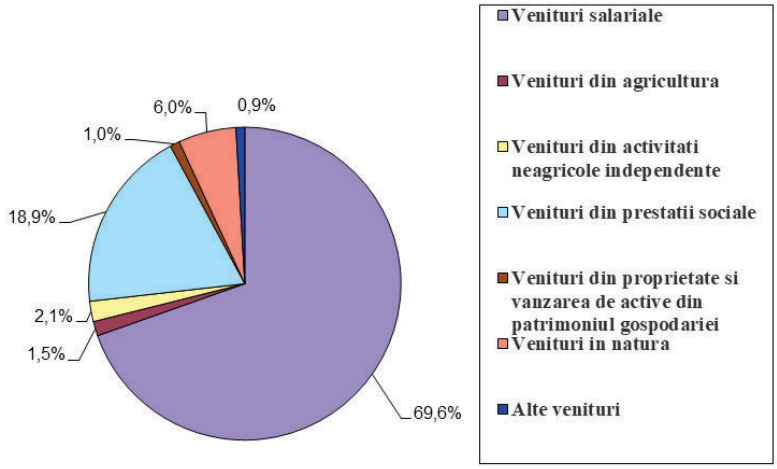
Six other types of income are derived from other types of income, from salaries and other salary rights, from agriculture, from independent non-agricultural activities, from social benefits, from property and from the sale of assets from the patrimony of the household.

Expenditures, on the other hand, are divided into monetary expenditures and the value of human and fodder consumption of agri-food products from the household's own resources. In the methodology of the National Institute of Statistics, all monetary expenses, regardless of destination (including the value of income in kind obtained by employees and beneficiaries of social benefits, excluding amounts deposited with CEC Bank, other banks and similar institutions, loans and loans repaid) made for: the purchase of foodstuffs (consumed and not consumed during the reference period), non-foodstuffs and payment for services, investments, production, payment of taxes, fees, contributions, dues and other monetary expenditures represent monetary expenditures, and the value of human consumption and feed of the own resources of the households is, the value expression of the human and fodder consumption of food products and of some non-food products coming from the own resources of the household (agricultural production, stocks of the previous periods, products processed in the household, products received in but or for work etc.).

Regarding the analysis of the situation registered in the third quarter of 2021, in nominal terms, a person achieved income of 2,256 lei and spent 1,954 lei, ie approximately 86.6% of total income. At the level of households, in the third quarter of 2021, revenues of 5,704 lei and expenses of 4,939 lei are registered, also in nominal terms.

The structure of the total incomes of the households, by training sources, in the third quarter of 2021

Chart no. 1



Source: https://insse.ro/

We note that 69.6% of income is represented by salary income, 18.9% is income from social benefits and 6% is income in kind (4.8% being the value of consumption of agri-food products from own resources). On the other hand, we have income from the sale of assets from the patrimony of the household with a value registered below the unit (0.9%), the income from agriculture with 1.5% and those from independent non-agricultural activities (2.1%).

The level and structure of total revenues, in the third quarter of 2021

Table no. 1

	Income TOTAL monthly averages per person - lei -	% of total:							
		Income money	from which:				Income in kind	din care:	
			gross salaries and other salary entitlements	agri-culture income	income from independent non-agricultural activities	income from social benefits		Counter-value of income in kind obtained by employees and beneficiaries of social benefits	The value of consuming agri-food products from own resources
TOTAL	2256,10	94,0	69,6	1,5	2,1	18,9	6,0	1,2	4,8
URBAN	2695,66	96,3	76,0	0,2	1,3	17,3	3,7	1,4	2,3
RURAL	1730,11	89,8	57,6	4,1	3,7	21,9	10,2	1,0	9,2

Source: https://insse.ro/

It can be seen that the environment of residence has particularities of the structure between household incomes. Thus, the monthly income per person in rural areas represents only about 64.2% of urban income. The situation is reversed when we look at incomes in kind, incomes from agriculture, incomes from independent non-agricultural activities, the equivalent value of consuming agri-food products from own resources and incomes from social benefits, as a percentage, in absolute value, I will continue to present some very suggestive examples.

Example number 1, we see that the income in kind represents approximately 100 lei in urban areas and 176 lei in rural areas, so it does not compensate too much from the difference between gross salaries and other salary rights.

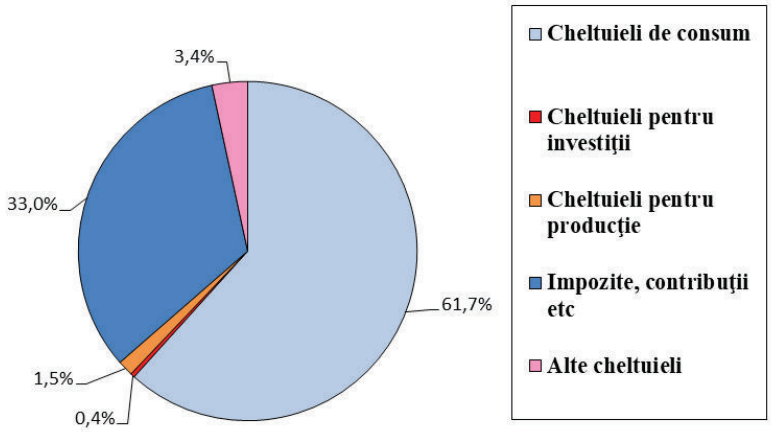
Example number 2, the equivalent value of consuming agri-food products from own resources represents 62 lei in urban areas and 159 lei in rural areas. We also note that the income from social benefits represents 466 lei in urban areas and only 379 lei in rural areas.

We see in the first example that although the percentage of income in kind is more than two and a half times higher in rural areas than in urban areas, the absolute value in rural areas is only 76% higher than in urban areas.

From example no. 2, we conclude that where the percentages are not exponentially higher in rural areas, we also have a better situation in urban areas. At the same time, example no. 2 shows us that people who choose to stay to work in rural areas are also sanctioned in old age with lower social benefits than they could have achieved in urban areas.

The structure of total household expenditures, in the third quarter of 2021

Chart no. 2



Source: https://insse.ro/

From the previous graph it can be seen that out of the total of 4,939 lei of the total expenses, in the third quarter of 2021, 61.7% went to consumption expenses and 33% to taxes, contributions and other taxes. In the mirror we have the investment expenses that reach the percentage value of 0.4% and the production expenses with a percentage value of 1.5%, in the same quarter III 2021.

The level and structure of total expenditures, in the third quarter of 2021

Table no. 2

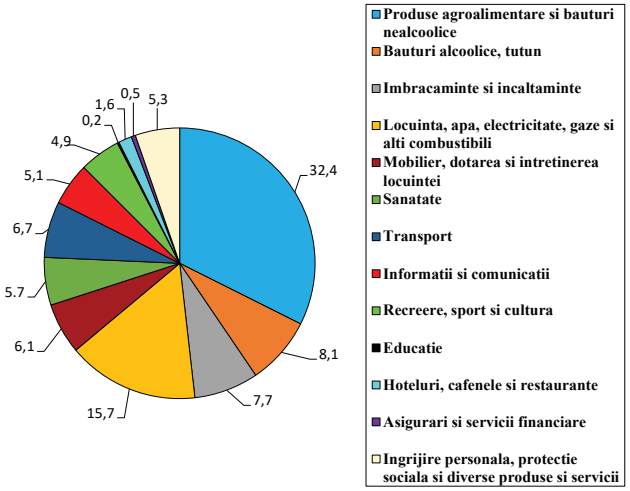
	Total expenses backgrounds monthly per person - lei -	% of total:						
		Costs money	of which, money for:					The value of consuming products food from own resources
			expenses of consumption	din care, pentru:			taxes, contributions, dues, taxes	
				food and drinks consumed	buying non-food goods	payment for services		
TOTAL	1953,78	94,5	57,3	17,7	24,7	14,9	33,0	5,5
URBAN	2310,99	97,3	56,9	17,8	22,7	16,4	36,7	2,7
RURAL	1526,32	89,5	58,2	17,5	28,4	12,3	26,5	10,5

Source: https://insse.ro/

Although the environment of residence also determines in the case of expenditure certain particularities in terms of size and structure of total consumption expenditure, at least a slightly higher balance is observed, the differences being within the limit of ten percentage points. The difference between the monthly averages per person of the total urban and rural expenditures reaches 66%, by two percentage points more than in the income analysis.

The structure of total consumption expenditures by destinations, in the third quarter of 2021

Chart no. 3



Source: https://insse.ro/

At the level of total consumption expenditures, it is observed that agri-food products and non-alcoholic beverages occupy the first position with 32.4%, followed by expenditures on housing, water, electricity, gas and other fuels with 15.7% of the total and on the third position we have vices (alcohol and tobacco). Expenditure on education remains at the lowest level, 0.2% resources allocated to total consumption expenditure in the third quarter of 2021.

The authors further set out to analyze the evolution of expenditure on housing, water, electricity, gas and other fuels, taking into account the fact that this issue required state intervention in the market to protect consumers from rising energy prices.We extracted 25 quarterly statistical data starting with the third quarter of 2015 regarding the total household income (which we noted with Vi), household expenditures on agri-food products and non-alcoholic beverages (marked with Ai) and expenditure on alcoholic beverages and tobacco. (marked with Bi). For the three independent variables mentioned above, we extracted data on the variable dependent expenditure on housing, water, electricity, gas and other fuels (noted Li).

Statistical data used in determining the regression equation, lei

Table no. 3

Year / quarter	Total income	Agri-food products and non-alcoholic beverages	Alcohol, tobacco	Housing, water, electricity, gas and other fuels
2015Q3	3033,48	651,36	147,08	286,59
2015Q4	3149,24	687,45	157,8	348,9
2016Q1	3246,94	655,39	142,21	429,56
2016Q2	3231,67	672,16	157,81	336,15
2016Q3	3362,27	658,4	166,27	305,27
2016Q4	3490,81	688,12	169,6	380,47
2017Q1	3682,05	698,29	163,75	460,38
2017Q2	3748,9	722,87	180,39	354,84
2017Q3	3852,39	697,64	189,34	311,84
2017Q4	4015,92	751,74	199,63	387,74
2018Q1	4444,62	749,24	190,82	480,32
2018Q2	4893,81	798,72	213,01	368,92
2018Q3	5120,25	777,31	213,5	326,59
2018Q4	5235,05	802,41	213,81	396,83
2019Q1	5302,72	799,52	210,34	528,2
2019Q2	5453,28	842,15	235,1	401,14
2019Q3	5655,76	817,84	243,35	367,23
2019Q4	5669,71	847,63	231,49	421,43
2020Q1	5815,35	875,22	229,8	516,09

2020Q2	5800,81	934,97	246,82	404,08
2020Q3	6230,78	928,72	264,52	379,65
2020Q4	6077,83	987,61	256,8	464,47
2021Q1	6252,92	988,45	242,38	566,11
2021Q2	6404,31	1044,51	276,91	452,64
2021Q3	6569,88	1037,03	276,27	432,26

Source: https://insse.ro/

Mathematically, the multifactorial regression model could be written as follows:

$$L_i = b_0 + b_1 \times V_i + b_2 \times A_i + b_3 \times B_i + \varepsilon_i$$

The data were processed using the Eviews program, which helped me to form the regression equation with the dependent variable Li and the independent variables Vi, Ai and Bi.

Eviews Results

Table no. 4

Dependent Variable: L_i
Method: Least Squares
Sample: 2015Q3 2021Q3
Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
b_0	272.0654	86.13541	3.158578	0.0047
V_i	0.136079	0.034280	3.969623	0.0007
B_i	-5.015306	1.053358	-4.761257	0.0001
A_i	0.655529	0.247433	2.649315	0.0150

R-squared	0.668593	Mean dependent var	404.3080
Adjusted R-squared	0.621250	S.D. dependent var	71.64053
S.E. of regression	44.08952	Akaike info criterion	10.55597
Sum squared resid	40821.61	Schwarz criterion	10.75099
Log likelihood	-127.9496	Hannan-Quinn criter.	10.61006
F-statistic	14.12209	Durbin-Watson stat	1.333515
Prob(F-statistic)	0.000029		

Source: Eviews program processing

Based on the results we can say that the following regression equation can be constructed:

$$L_i = 272.0654 + 0.136079 \times V_i + 0.655529 \times A_i - 5.015306 \times B_i$$

Considering the obtained results we can say that the values of the tests R2, respectively R2 - adjusted suggest the fact that the model is perfectible, the introduction of new variables being able to generate a representativeness over 66.85%, respectively 62.12%, as at present. There is a direct and positive connection between the dependent variable Li and the independent variables Vi and Ai. We observe a negative connection between the dependent variable Li and the independent one Bi. The four parameters (b_0, b_1, b_2, b_3) are statistically significant. The values recorded by the F-statistic and Prob (F-statistic) test indicate that the econometric model using the dependent variable expenditures on housing, water, electricity, gas and other fuels and the variable variables total revenues, expenditures on agri-food products and soft drinks respectively spending on alcohol and tobacco is fair.

Conclusions

The contents of this article were based on the research conducted by the authors and lead to the conclusion that the income status of the population at the household level is inconsistent with current needs.

Thus, a series of incomes (salaries, pensions, allowances) have stagnated in the last two years and the growth outlook is one that will probably barely be able to cover the effect of inflation in 2021, which will be very likely high, at a 2-digit level.

The second conclusion is that an effort must be made to find some additional sums in order to help the very low income population.

The economic and financial crisis, triggered by the pandemic crisis, will have unexpected effects on the situation of the population in our country. Expenditures will increase alarmingly and coverage will be increasingly difficult to cover.

This situation casts a negative shadow on the health of a part of the Romanian population that will not have, during the winter, a satisfactory situation in terms of food and living conditions.

One last conclusion is that the current government, in its mixed form, should reach a consensus to help, through various economic and financial forms, the population, between December 1, 2021 and March 31, 2022.

Without this support, it will not be possible to achieve total satisfaction, but not even the assurance of minimum living conditions, living and, why not, the survival of the Romanian population.

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