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CHANGES, TRENDS AND RELATIONSHIPS BETWEEN AVERAGE INCOME AND CONSUMPTION EXPENDITURES PER HOUSEHOLD IN ROMANIA IN THE PERIOD 2007-2017

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Abstract

The paper analyzed the dynamics of average monthly income (AMI) and average monthly expenditure (AME) per household and the relationships between these indicators of living standard in Romania in the period 2007-2017. The dynamic analysis, descriptive statistics, correlations, and regression functions were used to process data. The results pointed out that both AMI and AME per household increased in Romania, but income growth rate was higher than expenditure increase rate. In the rural area, AMI per household is 64.3 % of the urban average and 76.1 % of the national one. AME is the highest in the urban area. In the rural households it represents 77.1 % of the urban one and 85.6 % of the national average. A person living in the rural area spends three times less money than an urban citizen. The share of AME in the AMI decreased from 80.7 % in 2007 to 66.5% in 2017, because the income growth rate was higher than the spending rate. In the rural communities, this percentage was 74.9 in 2017, higher than in the urban area. The expenditures on food and non alcoholic beverages also increased, being higher in the urban area. The share of food and non alcoholic beverages in AME is 29 % in the rural area, the highest in the country. AME per household accounts for 61.1 % of GDP, placing Romania on the 8th position in the EU-28. Also, Romania comes on the top position for 17 % share of expenditure on food and non-alcoholic beverages in GDP. The correlations proved a high and positive connection between income and expenditure. According to the regression equations, an AMI increase by Lei 100 will increase AME by Lei 52.9 at the national level, by Lei 49.30 in the urban household, by Lei 58.96 in the rural household, will raise consumption expenditure on food and non alcoholic beverages by Lei 12.02 nationally, by Lei 10.39 in the urban household and by Lei 14.58 in the rural one. Household income is still lower in Romania compared to other EU countries. A new strategy is required to increase population's income in order to improve life quality and reduce the discrepancies with the other EU countries.

Key words: *income per household, expenditure per household, trends, changes, correlations, regression functions, rural versus urban areas, Romania*

INTRODUCTION

Between income and consumption it is a close relationships as humans cover their needs by consumption and this involves income. The dependence of consumption, C, on income, Y, is reflected by consumption function: $C_t = f(Y)$, also named "propensity to consume", which could be expressed as: (i)average propensity to consume, APC, defined by C/Y, and (ii) marginal propensity to consume, MPC, defined by $\Delta C/\Delta Y$, which is symbolized "b".

Therefore, $C_t = C_a + bY$, where: C_t = total consumption, C_a = autonomous consumption when income is equal to zero, and b is MPC (Keynes, 1936).

According to the "Fundamental psychological law of consumption", "men and women are disposed to increase their consumption as their income increases, but not as much as the increase in their income". This means that the additional consumption ΔC is smaller than the additional income, resulting $\Delta C/\Delta Y$ or "b"< 1. In other words, when income increases by one unit, consumption increases by b, as suggested by consumption function [10,11, 22].

Across the time, the connection between income, consumption, wealth was approached and completed in different ways by James Duesenbery's theory on "consumption expenditures and savings" (1949), by Milton Friedman's "theory on permanent income

which sustains that consumption is determined not only by the current income but also by the income expected in future" (1957), by Davidson *et al*. (1978) who analyzed the links between consumers' expenditure and income using econometric modelling of the aggregate time series, by Cuttler (2005) who found "a stable connection between consumption, income and wealth with a long-run marginal propensity to consume", by Hon Tai-Yuen (2016) who used "the co-integration theory to test whether between permanent consumption and income is a long-run equilibrium" [2, 3, 5, 7, 8, 22].

In Romania, important contributions to the study of income, expenses, consumption, GDP were given by various researchers. A long-run bidirectional relationship was found between the expenditure and revenues using "the autoregressive distributive lag approach to co-integration, variance decomposition and rolling regression method" [9]. Household's consumption was estimated based on a macroeconomic model taking into account income, interest rate and the weight of the rural population [4]. The use of the error correction equations revealed that consumption was depressed during the economic crisis as sustained the permanent income theory [21].

The relationship between income, wealth and expenditure in various countries with different development level was study using the logistic, Ferni-Dirac and polynomial distribution [15]. The correlation and regression between household income and expenditures was investigated by [1].

Income and expenditure are important indicators reflecting the living standard of the population and are used to set up the strategic socio-economic policy destined to improve life quality.

In Romania, income is mostly used to cover the fundamental needs of the population. For the expenditures for food consumption per household Romania is on the top with around 26.4% % in total consumption spending compared to 11.1 % the EU-28 average or 7.2 % the lowest level in United kingdom [6].

Between the household income in Romania and other countries there are differences regarding income and expenditure levels determined by employment and its structure, salary policy, labor productivity etc [12].

Of Romania's population, about 44 % is living in the rural area where the average income per household is smaller compared to the urban area and this is due to the fewer opportunities to find jobs and a good salary and for this reason the main activity is still agriculture [16,17,18, 19, 20].

In this context, the purpose of the paper was to analyze the changes, trends and discrepancies between the dynamics of average monthly income per household and average monthly consumption expenditure per household in Romania, and in the rural versus urban area in the period 2007-2017. Also, the study was focused on the dependence of average monthly consumption spending and average monthly consumption expenditures of agro-food products on the average monthly money income per household using linear regression model.

MATERIALS AND METHODS

Data collection.

The empirical data were taken from the National Institute of Statistics for the reference period 2007-2017, and also for comparison were used the data provided by Eurostat Statistics Explained.

The indicators selected to be used in this research have been:

(i)Average monthly income per household, AMI, which has been studied both at the national level, AMI_n, in the urban area, AMI_u, and in the rural area, AMIr;

(ii)The share of the average monthly income per household in the urban area versus rural area in the national level;

(iii)Average monthly consumption expenditures per household, AME, which has been approached both at the country level, AME_n, in the urban area, AME_u, and in the rural area, AMEr;

(iv)The share of the average monthly consumption expenditures in the urban versus the rural area in the national level;

(v)The share of the consumption expenditures in the money income per household;
(vi)Average monthly consumption expenditures on agro-food products and nonalcoholic beverages per households;
(vii)The share of the consumption expenditures on agro-food products in the urban versus the rural area in the national level;
(viii)The share of the average monthly consumption expenditures for agro-food products and non alcoholic beverages per household in the average monthly income per household.

The statistical methods used for processing data have been:

-*Dynamic analysis* based on the use of fixed basis index, which reflects the changes and trends of each indicator in the reference period;

-*Descriptive statistics for each indicator*, including: mean, standard error, median, standard deviation, sample variance, kurtosis, skeweness, minimum, maximum and variation coefficient.

-*Pearson-Bravais correlation coefficients and Sign (2-Tailed)test* to reflect the direction and intensity of the relationship between the expenditures-income pairs of indicators, and also the significance of this connection.

-*The determination coefficients, R square*, were used to show how much of the variation of the dependent variable, Y = expenditures is determined by the variation of the independent variable, X = income.

-*Regression equations* were used to estimate the measure in which the average monthly consumption expenditures will grow for an increase by one unit of the average money income per household both at the national, urban and rural level.

RESULTS AND DISCUSSIONS

Average monthly income per household by residence area

The average monthly income per household in Romania increased by 123.7 % from Lei 1,367.7 in the year 2007 to Lei 3,062 in 2017.
In the urban area, the average monthly income per household raised by 128.6 % from Lei 1,715.3 in 2007 to Lei 3,621.2 in 2017.
In the rural areas, a household earned by 153.1 % more income in average in 2017, when it achieved Lei 2,329.8 compared to Lei 920.4 in 2007 (Fig.1).

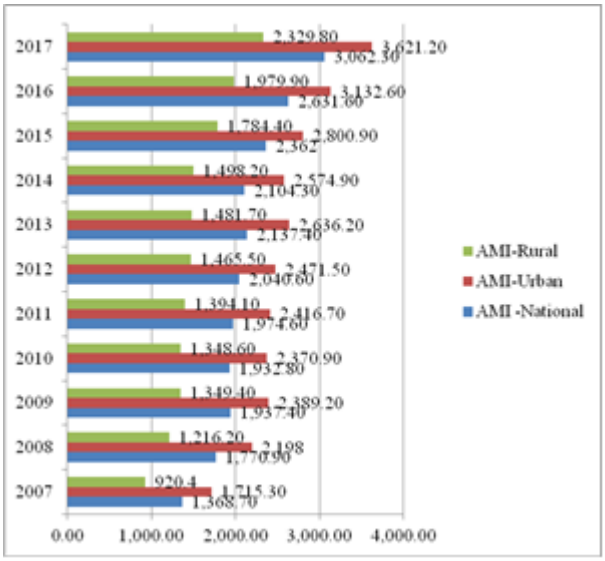

Fig. 1. Dynamics of the average monthly income (AMI) per household by residence area, Romania, 2007-2017 (Lei/household)
Source: Own design based on the data from [14].

Therefore, the average income per household in the rural area registered a more significant growth rate than the income per household in the urban area. But, a household living in the urban area earns more money per month compared to a rural household.
The percentage difference between the average monthly income in the rural versus urban has slightly decreased from - 46.4 % in 2007 to -33.7 % in 2017, which is a positive aspect, reflecting an improvement in the living standard of the rural population.
Compared to the national level of income per household, in the urban area the average monthly income is only by 18.2 % higher in 2017 compared to 25.3 % in the year 2007.
In the rural area, the average income is still below the national average income, but the gap has diminished from -32.8 % in 2007 to -23.9 % in 2017 (Table 1).
Of the total average income in 2017, the highest share accounting for 61.2 % was kept by salaries. On the second position came social benefits which accounted for 21.6 %.

Also, in-kind income, representing the value of self-consumption of own sources recorded 9.7 %.

Table 1. The share of the average monthly urban income per household versus the share of average monthly rural income per household in the national level of the average monthly income per household (%)

	Share in national average monthly income per household in Romania (%)		AMI-Rural/ AMI - Urban (%)
	AMI-Urban	AMI-Rural	
2007	125.3	67.2	53.6
2008	124.1	68.6	55.3
2009	123.3	69.6	56.5
2010	122.7	69.7	56.8
2011	122.4	70.6	57.7
2012	121.1	71.8	59.3
2013	123.3	69.3	56.2
2014	120.3	71.2	58.2
2015	118.6	75.5	63.7
2016	119	75.2	63.2
2017	118.2	76.1	64.3

Source: Own calculations.

Other incomes came from agriculture (2.3 %), independent non-agricultural activities (2.3 %) and household sale assets (1.6%) [13].

In 2017, the money income per person and month, on average, accounted for Lei 1,166, representing 38 % of money income per household.

Also, the average monthly income per person in Romania was Lei 1,290.9, Lei 1,537.44 in the urban area and Lei 1,005 in the rural area, meaning by 35 % less than in the urban area.

Of the total income, money income accounted for 90.3 % at the country level, for 94.7% in the urban area and for 82.5% in the rural area.

Salary is the main income source with a share of 61.2 % at the national level, 69.9 % in case of the people living in the urban area and only 45.7 % for the rural population.

In money income, 6 % is coming from agricultural activities in case of the people living in the rural communities.

In the rural area, the share of social benefits and of the in-kind income is higher compared to the urban area: 24 % and respectively 17.5 % [13].

Average monthly consumption expenditures per household by residence area

The average monthly consumption expenditures per household increased by 184.5 % from Lei 1,104.7 in 2007 to Lei 2,039 in 2017 at the country level.

In the urban area, the level of this indicator raised by 76 % from Lei 1,285.8 in 2007 to Lei 2,263.3 per household in 2017. In the rural area, the growth rate was 100.5 % from Lei 870.4 in 2007 to Lei 1,745.1 in 2017 (Fig.2.).

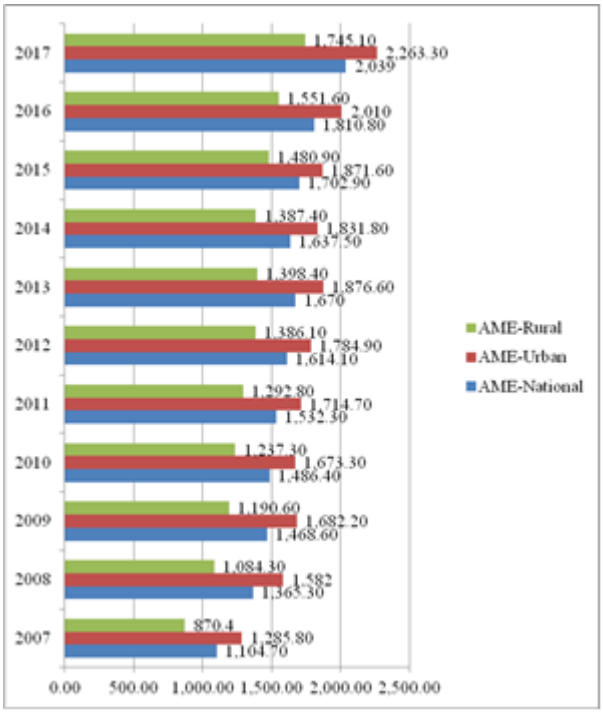

Fig. 2. Dynamics of the average monthly consumption expenditures (AME) per household by residence area, Romania, 2007-2017 (Lei/household)

Source: Own design based on the data from [14].

Therefore, in 2017, in the urban area, the expenditures for consumption are by 11 % higher compared to the level of consumption expenditures per household at the national level compared to 16.4 % in 2007. This aspect reflects that the higher the average income, the higher the average expenditures, but the expenditures increased by a lower growth rate, which explains the tendency to savings of the households earning a higher income and confirms the permanent income theory issued by Friedman (1957).

In the rural areas, the average consumption expenditures are lower than the national level by -14.4 % in 2017 compared to -21.2 % in 2007, as a result of the higher growth rate in the rural areas compared to the national growth.

If we divide the average consumption expenditures per household in the rural areas by the level of this indicator in the urban area, we may notice that the discrepancy between these two levels has been diminished, so that in 2017, a rural household spent by -23.9 % less for consumption than an urban household compared to -32.4 % in 2007 (Table 2).

Table 2. The share of the average monthly urban consumption expenditures versus the share of average monthly rural consumption expenditures per household in the national level of the average monthly consumption expenditures per household (%)

	Share in national average monthly consumption expenditures per household in Romania (%)		AME-Rural/ AME - Urban (%)
	AME-Urban	AME-Rural	
2007	116.4	78.8	67.6
2008	115.9	79.4	68.5
2009	114.5	81.1	70.8
2010	112.6	83.2	73.9
2011	111.9	84.4	75.3
2012	110.6	85.8	77.6
2013	112.4	83.7	74.5
2014	111.9	84.7	75.7
2015	109.9	86.9	79.1
2016	111.0	85.7	77.2
2017	111.0	85.6	77.1

Source: Own calculations.

In general, households spend money for purchasing food and non-food goods, to pay services and obligations to the public and private administration (taxes, contributions, dues etc) and in the rural areas, there are also payments on forages, labor force, seeds, fertilizers, veterinary services etc.

Of the total average expenditure per household, the highest share, 71 %, is represented by consumption expenditures, 21.1 % belongs to taxes and other contributions etc, 3.8 % other spending, 3.6 % production expenditure and 0.5 % expenditure on investments.

In 2017, the average expenditure per person and month was Lei 1,093,92 in Romania. in the rural area, it accounted for Lei 861.84, being by 32.06 % lower than in the urban area (Lei 1,284.58).

The share of money expenditure in the total average monthly expenditure per person accounted for 90.2 % at the country level, for 95.5% in the urban area and for 81.1 % in the rural area.

Of the average money expenditure, the weight of the consumption expenditure was 64.1% at Romania's level, 66.8% in the cities and 59.5 % in the rural communities [13].

The share of the average monthly consumption expenditures per household in the average monthly income per household

At the national level, it was noticed a general decreasing trend from 80.7 % in 2007 to 66.5 % in 2017, reflecting that the income growth led to the increase of the consumption expenditures, but also to savings.

In the urban area, it was observed the same tendency of decline, but from 74.9 % in 2007 to 62.5% in 2017.

Therefore, in the urban area, where the average income is higher, the average consumption expenditures have increased, but the income level also allowed to accumulate savings.

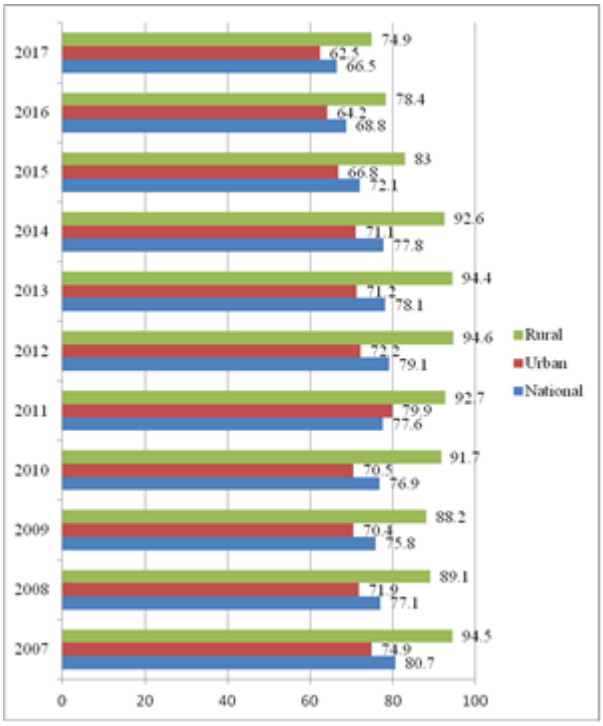

Fig. 3. Dynamics of the share of the average monthly consumption expenditures per household in the average monthly income per household (%)
Source: Own calculation.

In the rural area, the share of average consumption expenditures in the average income per household is the highest because the level of the needs is higher than in the

urban area, but the average income level per household is lower than the one in the urban area and at the country level. But, even in this case, there is a decreasing tendency of the share of the consumption expenditures in the average income level from 94.5 % in 2007 to 74.9 % in 2017 (Fig.3).

Average monthly consumption expenditures for agro-food products and non-alcoholic beverages per households

At the national level, the average monthly consumption expenditures for agro-food products increased by 51.7 % from Lei 460.9 in 2007 to Lei 699.6 in 2017.

In the urban area, the growth rate in the analyzed period accounted for 48 % from the level of Lei 484.4 per household in 2007 to Lei 717.3 in 2017. The value of the consumption expenditures for agro-food products was higher than at the national level.

Fig. 4. Dynamics of the average monthly consumption expenditures for agro-food products, Romania, 2007-2017 (Lei/household)

Source: Own design based on the data from [14].

But the weight of the expenditures in the urban area in the average expenditures at the national level registered a decline from 105.1 % in 2007 to 102.5 % in 2017, which reflects that the expenditures for consumption of agro-food products have increased in a lower rhythm than the average rhythm at the national level (Fig.4).

In the rural area, the average expenditures for agro-food products recorded the highest growth rate in the studied interval: +57.2 % from Lei 430.5 in 2007 to Lei 676.6 per household in 2017. But, the level of these expenditures is lower than the national level and especially compared to the level registered in the urban area.

The ratio between the average consumption expenditures for agro-food products in the rural area versus urban area also reflects the same aspect, as long as the value of the ratio is below 100 %. However, it was noticed a general increasing trend from 88.8 % in 2007 to 94.3 % in 2017, which shows that in the rural area the growth rate of the average consumption expenditures for agro-food products was higher than in the urban area (Table 3).

Table 3. The share of the average monthly urban consumption expenditures for agro-food products versus the share of average monthly rural consumption expenditures for agro-food products per household in the national level of the average monthly consumption expenditures for agro-food products per household (%)

	Share in national average monthly expenditures for agro-food products in Romania (%)		AMEAFP-Rural/ AMEAFP-Urban (%)
	AMEAFP-Urban	AMEAFP-Rural	
2007	105.1	93.4	88.8
2008	105.9	92.4	87.3
2009	104.8	97.7	89.4
2010	103.4	95.3	92.1
2011	102.5	96.7	94.4
2012	101.0	98.6	97.5
2013	102.7	96.4	93.7
2014	102.5	96.8	94.4
2015	101.9	97.4	95.6
2016	102.2	97.1	95.0
2017	102.5	96.7	94.3

Source: Own calculations.

In 2017, of the average consumption expenditure, food and beverages represented 20.1 % at the national level, 20.9 % in the urban area and 18.8 % in the rural communities.

Of the total consumption expenditures, the purchase for non-food products was higher than for food products and beverages: 25.6 %

at the level of Romania, 25.2 % in the cities and 26.3 % in the rural localities.

Of money expenditures, the equivalent of agro-food self-consumption is 18.9 % in the rural area, the highest level compared to only 4.5 % in the urban area [13].

The share of the average monthly consumption expenditures for agro-food products and non alcoholic beverages per household in the average monthly income per household

At the national level, the share the consumption expenditures for agro-food products in the average income per household declined by 33.6 % in 2007 to 22.8 % in 2017. In the urban area, this share has a lower level than at the country level and registered a similar decreasing trend from 28.2 % in 2007 to 19.8 % in 2017.

This reduction of the weight is explained by the fact that the higher the incomes, the lower the share of the expenditures for agro-food products. More than this, it could be possible as in the urban area people to consume less agro-food products and non alcoholic beverages taking into account the lower physical effort for the urban jobs compared to the activities in the countryside.

Table 4. The share of the average monthly consumption expenditures for agro-food products and non alcoholic beverages per household in the average monthly income per household (%)

	National level (%)	Urban level (%)	Rural level (%)
2007	33.6	28.2	46.8
2008	31.5	26.9	42.4
2009	31	26.3	41.7
2010	31.4	26.5	43.0
2011	32.3	27.1	44.4
2012	33.2	27.7	45.5
2013	32.4	27.0	45.0
2014	31.3	26.0	42.3
2015	27.5	23.7	35.5
2016	24.8	21.3	32.0
2017	22.8	19.8	29.0

Source: Own calculations.

In the rural area, the share of the expenditures for agro-food products in the average income per household has the highest share both versus the national level and the urban level. But, it has a general decreasing tendency from 46.8% in 2007 to 29 % in 2017.

This declining trend of the share of the consumption expenditures for agro-food products reflects a higher growth rate of the income compared to the growth rate of consumption expenditures (Table 4).

Household consumption expenditures in Romania compared to other EU countries

Household expenditures could be expressed as a percentage of GDP as well in order to allow comparison among various countries.

In the EU-28 the total expenditures per household represented 54.4% of GDP in 2017. At the EU level, food and non alcoholic beverages represent 12.2 % of household expenditure and alcoholic beverages, tobacco and narcotics 3.8 %.

Regarding the share of household expenditure in GDP, Romania came on the 8th position in 2017, for 61.1 % after the countries with the highest share: Cyprus 76.4 %, Greece 73 %, Portugal 68.3 %, Bulgaria 64.1 %, Lithuania 62.9 %, United Kingdom 62.4 %, and Italy 61.4 %. The countries with the lowest share of household expenditure in GDP were Ireland 30.3 % and Luxembourg 34.3 %.

Concerning the weight of the household expenditure on food and non alcoholic beverages in GDP, Romania came on the top position, having the highest share 17 %, being followed by Lithuania 13.6 %, Greece 12.4 %, Bulgaria 12.3 %, Portugal 11.4 %, Latvia 10.6 % and Cyprus 10.5 %. The country with the lowest share of expenditures on this category of products in GDP is Ireland, 2.8 %, followed by Luxembourg 3.1 %, Netherlands 5 %, Austria 5.1 5, United Kingdom 5.1 %, Sweden 5.4 %, Germany 2.3 % and Denmark 5.2 %.

If we consider, the share of the expenditures for alcoholic beverages, tobacco and narcotics in GDP, on the top position is Latvia with 4.7 %, followed by Cyprus 4.3 %, Estonia 4.1 %,Czech Republic 3.9 %, Lithuania 3.8 %, Hungary 3.7 % and Romania is situated on the 7th position for 3.5 % [6].

Descriptive statistics for the analyzed income and expenditures indicators are presented in Tables 5, 6 and 7.

Table 5. Descriptive statistics for the average monthly income per household at the national level (AMI_n), in the urban area (AMI_u) and in the rural area (AMI_r)

	AMI per household		
	(AMI_n)	(AMI_u)	(AMI_r)
Mean	2,120.2	2,575.2	1,524.3
St. error	134.5	149.3	115.5
Median	2,040.6	2,471.5	1,465.5
St. Dev.	446.1	495.3	383.1
Sample variance	199,093.1	245,339.06	146,804.03
Kurtosis	1.36	1.51	1.04
Skeweness	0/68	0.62	0.81
Min.	1,368.7	1,715.3	920.4
Max.	3,062.3	3,621.2	2,329.8
Count	11	11	11
Var. coef. (%)	21.04	19.23	25.13

Source: Own calculations.

Table 6. Descriptive statistics for the average monthly consumption expenditures per household at the national level (AME_n), in the urban area (AME_u) and in the rural area (AME_r)

	AMEs per household		
	(AME_n)	(AME_u)	(AME_r)
Mean	1,584.6	1,779.6	1,329.5
St. error	73.0	74.8	71.1
Median	1,1614.1	1,784.9	1,386.1
St. Dev.	242.2	248.1	235.8
Sample variance	58,683.3	61,555.8	55,631.3
Kurtosis	1.21	1.58	0.65
Skeweness	-0.13	-0.02	-0.26
Min.	164.7	1,285.8	870.4
Max.	2,039	2,263.3	1,745.1
Count	11	11	11
Var. coef. (%)	15.28	13.94	17.73

Source: Own calculations.

Table 7. Descriptive statistics for the average monthly consumption expenditures per household for agro-food products at the national level ($AMEAFP_n$), in the urban area ($AMEAFP_u$) and in the rural area ($AMEAFP_r$)

	AME per household for agro-food products		
	($AMEAFP_n$)	($AMEAFP_u$)	($AMEAFP_r$)
Mean	626.8	645.8	601.9
St. error	20.7	19.5	22.6
Median	650.1	662.7	633.5
St. Dev.	68.9	64.7	74.9
Sample variance	4,750.4	4,192.08	5,623.1
Kurtosis	2.61	3.50	1.58
Skeweness	-1.51	-1.64	-1.35
Min.	460.9	484.4	430.5
Max.	699.6	717.3	676.6
Count	11	11	11
Var. coef. (%)	10.99	10.01	12.44

Source: Own calculations.

The correlation coefficients between the average monthly income per household and the average monthly consumption expenditures per household are shown in Table 8. Their values reflect a strong and positive relationship between all the pairs of variables taken into consideration, and the Sig (2-tailed) test for $\alpha = 0.05$ and df= N-2=11-2=9, proved that the critical r value is 0.602 lower than r calculated, therefore all the correlations are significant.

Table 8. The correlation coefficients between the average monthly income per household and the average monthly consumption expenditures per household

Indicators	**r**	**Significance**
AMI_n - AME_n	0.976	***
AMI_u - AME_u	0.984	***
AMI_r - AME_r	0.957	***
AMI_n - $AMEAFP_n$	0.778	***
AMI_u - $AMEAFP_u$	0.795	***
AMI_r - $AMEAFP_r$	0.745	***

Source: Own calculations.

The results regarding regression analysis between the dependent factor Y= average monthly consumption expenditures per household and the independent factor X= average monthly income per household are presented in Table 9,10,11,12,13 and 14.

According to the data from Table 9, the determination coefficient R-square = 0.952 reflects that 95.2 % of the variation of AME_n is caused by the variation of AMI_n, therefore it is a strong dependence between the two analyzed indicators.

More than this, the regression equation: $Y= bX +a$ or $AME_n = 0.5299\ AMI_n + 461.04$, tells us that if AMI_n increases by one unit, AME_n will grow by 0.5299 units.

The data from Table 10 show that R-square = 0.969 tells us that 96.9 % of the variation of AME_u is caused by the variation of AMI_u, therefore the two variables are strongly correlated.

The regression function: $Y= bX +a$ or $AME_u = 0.493\ AMI_u + 509.81$ shows that if AMI_u will grow by one unit, AME_u will raise 0.493 units.

According to the data from Table 11, the R-square value = 0.917 shows that 91.7 % of the variation of AME_r is caused by the variation of AMI_r, and in consequence, we identified a strong dependence relationship between these two variables.

The regression function: $Y= bX +a$ or $AME_r = 0.5896\ AMI_r + 430.68$ could be interpreted as follows: an increase by one unit of AMI_r will lead to an increase by 0.5896 units of AME_u.

Table 9. The regression analysis between average monthly consumption expenditures per household (AME_n) and average monthly income per household (AMI_n) at the national level

Regression analysis between Y = AME_n and X= AMI_n					
R-square	0.952				
Adjusted R-square	0.947				
Std. Err. of regression	55.43				
Observations	11				
Sum squared residuals	27,656.5				
F-stat	181.96				
Sign. F	2.83407	Coefficient	Std. Err.	t-Stat	p-value
Intercept (a)		461.04	84.95	5.426	0.000418
X var 1 (b)		0.5299	0.039	13.48	2.83407

Source: Own calculations.

Table 10. The regression analysis between average monthly consumption expenditures per household (AME_u) and average monthly income per household (AMI_u) at the urban level

Regression analysis between Y = AME_n and X= AMI_n					
R-square	0.969				
Adjusted R-square	0.965				
Std. Err. of regression	45.97				
Observations	11				
Sum squared residuals	19,024.46				
F-stat	282.20				
Sign. F	4.208	Coefficient	Std. Err.	t-Stat	p-value
Intercept (a)		509.81	76.85	6.633	9.5505
X var 1 (b)		0.493	0.029	16.798	4.208

Source: Own calculations.

Table 11. The regression analysis between average monthly consumption expenditures per household (AME_r) and average monthly income per household (AMI_r) at the rural level

Regression analysis between Y = AME_r and X= AMI_r					
R-square	0.917				
Adjusted R-square	0.908				
Std. Err. of regression	71.41				
Observations	11				
Sum squared residuals	45,898.05				
F-stat	100.08				
Sign. F	3.5706	Coefficient	Std. Err.	t-Stat	p-value
Intercept (a)		430.687	92.39	4.661	0.00111
X var 1 (b)		0.5896	0.0589	10.004	3.5706

Source: Own calculations.

Table 12. The regression analysis between average monthly consumption expenditures per household for agro-food products ($AMEAFP_n$) and average monthly income per household (AMI_n) at the national level

Regression analysis between Y = $AMEAFP_n$ and X= AMI_n					
R-square	0.605				
Adjusted R-square	0.562				
Std. Err. of regression	45.61				
Observations	11				
Sum squared residuals	18,723.93				
F-stat	13.834				
Sign. F	0.004725	Coefficient	Std. Err.	t-Stat	p-value
Intercept (a)		371.886	69.90	5.3199	0.000481
X var 1 (b)		0.1202	0.032	3.7194	0.004775

Source: Own calculations.

The data from Table 12 show that the R-square value = 0.605, which means that 60.5 % of the variation of $AMEAFP_n$ is influenced by the variation of AMI_n, and in consequence we could conclude that there is a strong dependence between the two indicators.

The regression function: Y= bX +a or $AMEAFP_n = 0.1202\ AMI_n + 371.886$ tells us that an increase by one unit of $AMIAFP_n$ will determine an increase by 0.1202 units of $AMEAFP_n$.

The data from Table 13 reflects that the R-square = 0.632, meaning that that 63.2 % of the variation of $AMEAFP_u$ is the result of the variation of AMI_u, and this proves the existence of a high dependence between the two indicators.

The regression function: Y= bX +a or $AMEAFP_u = 0.1039\ AMI_u + 378.091$ reflects that an increase by one unit of $AMIAFP_u$ will determine an increase by 0.1039 units of $AMEAFP_u$.

Table 13. The regression analysis between average monthly consumption expenditures per household for agro-food products ($AMEAFP_U$) and average monthly income per household (AMI_U) at the urban level

Regression analysis between Y = $AMEAFP_u$ and X= AMI_u					
R-square	0.632				
Adjusted R-square	0.591				
Std. Err. of regression	41.36				
Observations	11				
Sum squared residuals	15,398,5				
F-stat	15.501				
Sign. F	0.00342	Coefficient	Std. Err.	t-Stat	p-value
Intercept (a)		378.091	69.14	5.468	0.000396
X var 1 (b)		0.1039	0.026	3.937	0.00342

Source: Own calculations.

The data from Table 14 mention that the R-square = 0.565, pointing put that only 56.5 % of the variation of $AMEAFP_r$ is caused by the variation of AMI_r, the difference of 43.5 % is given by the variation of other factors.

The interpretation of the regression function: Y= bX +a or $AMEAFP_r = 0.1458\ AMI_r + 379.571$ is that if $AMIAFP_r$ will increase by one unit, this will determine an increase by 0.1458 units of $AMEAFP_r$.

Table 14. The regression analysis between average monthly consumption expenditures per household for agro-food products ($AMEAFP_r$) and average monthly income per household (AMI_r) at the rural level

Regression analysis between Y = $AMEAFP_u$ and X= AMI_u					
R-square	0.565				
Adjusted R-square	0.506				
Std. Err. of regression	52.70				
Observations	11				
Sum squared residuals	24,996.58				
F-stat	11.2462				
Sign. F	0.008476	Coefficient	Std. Err.	t-Stat	p-value
Intercept (a)		379.571	68.182	5.567	0.000349
X var 1 (b)		0.1458	0.043	3.353	0.008476

Source: Own calculations.

CONCLUSIONS

The average monthly income and average monthly expenditure per household increased in Romania in the analyzed period, but income growth rate was higher than expenditure increase rate, attesting Keynes and Friedman's theories.

There are differences regarding income and expenditure levels by residence area. In the rural area, average income per household is the lowest one, compared to the national

average and mainly to the urban income. In 2017, it accounted for 64.3 % of the urban income and 76.1 % of the national average income per household.

Salary is the main income source with a share of 61.2 % in the average income and money income per person represent 38% of money income per household.

In the rural areas, social benefits and in-kind income have the highest share in total average income: 24 % and respectively 17.5 %.

The average consumption expenditure has the highest level in case of the households in the urban area, and it exceeds the national average, while the average consumption expenditure in the rural households represents 77.1 % of the urban one and 85.6 % of the national average.

Consumption expenditure represents 71 % of total expenditure, a high percentage reflecting that Romania is a country based on consumption due the low level of income compared to high developed countries.

The expenditure per person is three times lower in the rural area compared to the average in the urban area.

The share of average consumption expenditure in the average money income decreased from 80.7 % in 2007 to 66.5% in 2017, because the income growth rate is higher than the expenditure rate. But, in the rural area, despite that this percentage declined from 84.7 to 74.9 in 2017 is much higher than in the urban area due to the lower income per rural household and person compared to the level in the cities.

The expenditures on agro-food products and nonalcoholic beverages increased in the urban area and even exceeded the national average, while in the rural area they represent 96.7 % of the country average.

In 2017, the share of expenditures on agro-food products and non alcoholic beverages is the highest in the rural area 29 %, 19.8 % in the urban area and 22.8 % at the national level.

Consumption expenditure of Romania's households as percentage of GDP is enough high, accounting for 61.1 %, placing the country on the 8th position in the EU-28. The expenditure for food an nonalcoholic beverage in Romania is 17 %, the highest in the EU, compared to 11.1 % the average of the EU.

The correlation coefficients between income and expenditure per household are positive, high and statistically significant, reflecting the close link between these two variables.

The regression equations attested the strong dependence of expenditure on income in all the analyzed cases.

It was found that an increase by Lei 100 of the average monthly money income per household will determine an increase by Lei 52.9 of the average monthly consumption expenditure per household at the national level, by Lei 49.30 per urban household and by Lei 58.96 per rural household.

Also, an increase by Lei 100 of the average monthly money income per household will determine an increase of the average monthly consumption expenditure on food and non alcoholic beverages per household by Lei 12.02 at the national level, by Lei 10.39 in the urban household and by Lei 14.58 in the rural area.

As a final conclusion, this research proved that, even though in Romania household's income increased, it is still very low compared to other EU countries. This is confirmed by the high share of consumption expenditures and of expenditures on food and non alcoholic beverages.

Therefore, a high part of income is spent to cover the basic needs of the population, and reflects that a new strategy is required to establish a more rationale income for the population in order to improve the living standard and life quality in Romania and to reduce the discrepancies with the other EU countries.

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