

Does Gross Average Earning Affect Residual Loans in Romania?

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Abstract

The evolution of overdue credits follows a progressive trend from one year to another, start with 2007, under the influence of some economic factors among which: the financial crisis which started in 2007, the precarious financial situation of the population as a result of the financial crisis, the unemployment rate which in the second half of 2009 reached very high levels, the level and dynamics of the incomes, the change in prices, the change in expectations regarding the ratio of current expenses and future losses, redundancy.

Using Eviews programme we study influence of gross average salary on residual loans during 2007-2016. We construct an econometrical model. The model consists of two variables: the independent variable (the gross average salary per economy) and the dependent variable (value of overdue loans recorded by individuals).

Key words: salary; residual credits; regression

J.E.L. classification: G21, E24, C58.

1. Introduction

Within the market economy the majority of economic activities are also salary activities which involve the remuneration of the labour factor on the basis of a predefined contract, having as pay a certain amount for the contribution made to the activity and the creation of the economic assets. The salary is the main profit source of the working population, over 80% of the active population of developed countries performing activities remunerated in the form of salary.

The implications of salary in the economic, social and political life explain the substantial number of economic theories regarding multiple aspects related to its nature (Angelescu et al, 2001, p. 102):

The natural salary theory founded by D. Ricardo, taken over and developed by Karl Marx, based on the fact that the salary represents the costs necessary for the survival of the worker and of their family. The amount of a salary is exact. Deviation from this level upwards leads to increased birth rates and generates unemployment or by increasing supply forces salary reduction, and an even lower level makes survival impossible for the worker and their family.

The salary fund theory was originally exposed by A. Smith and taken over by J. St. Mill, says that the salary is determined by the ratio between the amount of money that the capitalist is willing to spend on labour and the number of employees. This theory also supports the relative stability of salary due to the need to introduce technical progress, which means supplementary costs allocated to fixed capital at the expense of the wage bill.

The marginal productivity theory which states that under perfect competition conditions, each factor of production, thus implicitly the factor of labour will be remunerated according to the the marginal income cashed out of its use.

The theory of the ratio of forces between employees and those using the labour force or between trade unions and employers interprets salary as a result of participants interests in the economic activity. Salary is a consequence of its negotiation between social partners, seeking to meet their present and future interests.

Analyzing the nature of the salary according to its determinants, there are also several concepts regarding salary, namely (Angelescu et al, 2001, p. 103):

- salary - labor income, the salary is an income earned by the worker based on an employment contract and is the result of the work he has done in the enterprise. Its size depends on the costs of training and maintaining the workforce and at the same time as the work efficiency;
- salary - the labor factor being paid by the enterprise for the purchase of this factor. Obviously, the workforce is more valuable, ie better professionally trained, the higher its productivity and thus the price paid for its higher purchase;
- salary - rent for hiring is a conception that derives from the nature of employment contracts that, even if they are indefinitely, are not "lifetime" contracts, in other words, labor is not sold definitively, it remains the property of the employee who hires the practice of using it for the benefit of the employer;
- the cost – salary reflects the employer’s point of view for which the salary is an expenditure like any other, being included in the production cost and which can be recovered by selling the created economic assets;

The salary can be viewed in two different sides: nominal salary and actual salary.

The nominal salary represents the sum of money that the worker gets in exchange for their work. Its amount varies according to the following factors: the work value on labour market; the evolution of the economic situation, in times of crisis the demand for work force decreases salaries, and in the times of economic growth we can trace a reverse phenomenon; the payroll policy;

The real salary reflects the quantity of goods and services that can be bought by a nominal salary. It reflects the purchasing power of the nominal salary and is calculated by reporting the nominal salary (S_n) at prices (P):

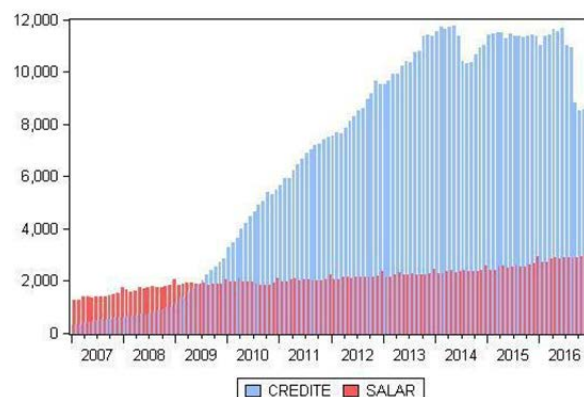
$$S_r = S_n/P$$

The real salary varies according to the nominal salary, the price level, the money purchasing power and the trade unions’ claims.

2. The evolution of the amount of residual credits and average gross income per economy registered in Romania during the period 2007-2016

Some authors study the determinants of loans to the private sector in the euro area. (Calza et al., 2003). Over the period of the ten analyzed years, our country faced a series of events that influenced in their turn the apparition of other negative phenomena, among which the financial crisis with its debut in 2007, the poor financial situation of the population as a result of the financial crisis, the unemployment rate that reached very high rates in the second half of 2009. And in terms of crediting, we can talk about a natural evolution considering the events faced by our country. A very special year in crediting is the second half of 2011 that came with credit growth and continued this trend until the third quarter of 2012, not the same can be said about the period that followed.

Chart no. 1. The evolution of the amount of residual credits and average gross income per economy registered in Romania during the period 2007-2016



Source: Personal data processing in the Eviews software

Where:

CREDITE = the value of residual credits made by physical persons during 2007-2016 (debts longer than 30 days recorded by individuals)

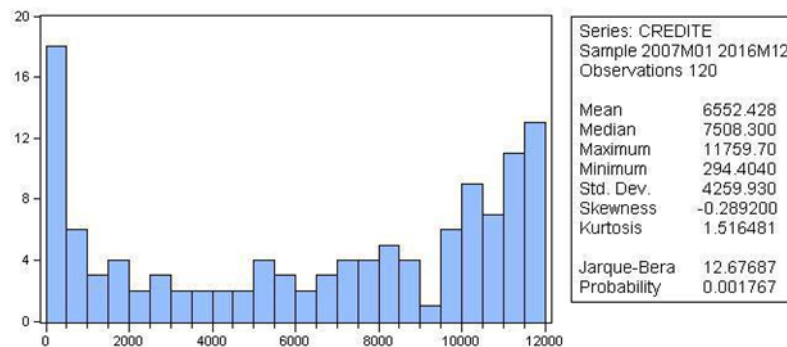
SALAR = the value of the average gross salary income per economy made in the period 2007-2016.

The evolution of overdue credits as one can easily see follows a progressive trend from one period to another, from one year to another, under the influence of some economic factors among which: the financial crisis which started in 2007, the precarious financial situation of the population as a result of the financial crisis, the unemployment rate which in the second half of 2009 reached very high levels, the level and dynamics of the incomes, the change in prices, both for natural resources and goods, the change in expectations regarding the ratio of current expenses and future losses, redundancy.

Overdue credits register a rise from one period to another. Strangely enough in the first three years (2007-2008-2009) considered we can speak of a rapid rise of the value of overdue credits. It so happens that at the end of the year we researched the value of overdue credits doubled as compared to the beginning of the same year.

Using Eviews programme we carried out a series of statistical tests meant to provide a more accurate picture of the evolution of overdue credits during the period considered. The tests performed are: histogram, distribution, mean, median, minimum and maximum values, standard deviation, asymmetry coefficient, Kurtotics of the series and the Jarque-Bera test. These tests help to know more precisely the level of overdue credits, its extreme values per year, and the distribution of data series. The software used will help confirm suspicions about this development.

Chart no.2. Statistical tests on overdue credits recorded for physical persons during the years 2007-2016



Source: Personal data processing in the Eviews software

We can see that based on statistic tests applied the average value of the overdue credits indicator for the period of time 2007-2016 is of 6552,428 million lei, varying between 294,40 million lei (registered in January 2014) and 11759,7 million lei (registered in May 2014). The skewness coefficient is different from zero, registering the value of -0.289200, which means that the normal distribution is not perfectly symmetrical. A normal distribution, kurtosis is 3. In our study, Kurtosis has a value of 1.516481. So, is below the level of a normal distribution. Since this is less than 3 and the distribution is called platikurtotica, the distribution is a flat one (kurtosis < 3). For the analyzed years, we find that most of the average overdue credits are between the minimum values and the average of all the values considered. Jarque-Bera tests whether a distribution is normally distributed. The test has a null hypothesis: the series is not normally distributed. In the above test, we note that the associated probability value is close to zero, which means that the null hypothesis is rejected, as the series is normally distributed.

If at the beginning of the research, we were talking about the importance of the individual analysis of the two indicators considered for the linear regression model we can see the net importance of each period considered as well as the separate analysis of the two indicators.

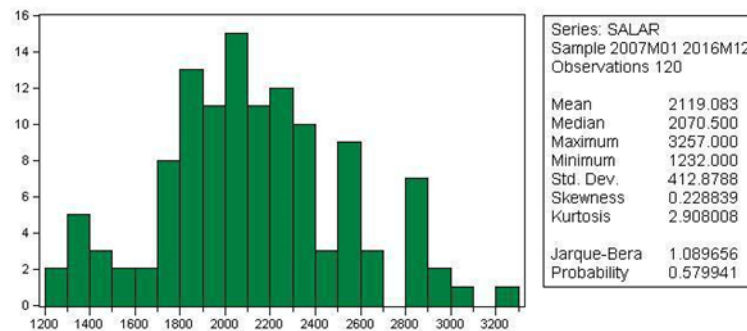
Thus, we will analyze the next indicator, the gross average salary per economy, which we find in the linear deregression model as being an independent variable. From a value point of view, the evolution of the gross average salary per economy during the 10 years is presented in chart no. 1.

A series of statistical tests were performed using Eviews programme. We aimed to obtain accurate information on the evolution of gross average salaries per economy over the 10 years and to get the most relevant information regarding the average gross salary per economy registered in Romania during the 10 years, the minimum level reached by the gross average salary per economy as well as the maximum and the histogram.

Based on chart no. 1 we can highlight the oscillations that take place on the value of the gross average salary per economy recorded during the analyzed period. Overall, we see a slow increase of the average gross salary earnings per economy recorded in Romania for the period between 2007 and 2016 respectively.

The statistical tests were carried out for the evolution of the gross average salary per economy for the whole period between 2007-2016, namely: the distribution histogram, the mean, the median, the minimum and maximum values, the standard deviation, the asymmetry coefficient, the kurtotica of the series and the Jarque-Bera test. These tests can be traced in the following:

Chart no. 3. Statistical tests performed on the gross average salary per economy registered in Romania during the period 2007-2016



Source: Personal data processing in the Eviews software

Previously, we were talking about the oscillations recorded by the average gross salary per economy over the 10 years (2007-2016), so we can speak of the lowest achieved level of the gross average salary in the economy in January 2007, amounting to 1232 lei respectively a maximum level of gross average salary per economy recorded in December of 2016, amounting to 3257 lei. The average gross salary per economy registered by our country during the period 2007-2016 was in the amount of 2119,083 lei. In this case Skewness records the value of 0,228839, although the coefficient of asymmetry is close to zero we have a normal distribution of data, because kurtotica is far inferior to the ideal value of 3 (2,908008), which means that the distribution is platykurtic. The Jarque-Bera test has a normal distribution because it records a small value of 1,089657, with a probability of about 57% of not accepting the normality assumption of the data distribution.

3. The model

For a more accurate emphasis on the evolution of credit, namely the evolution of overdue credits (loans with overdue payments of more than 30 days registered by individuals), based on the influence of gross average salary on the economy, a linear regression model is needed. The linear regression model consists of two variables: the independent variable and the dependent variable (resultative variable). In the present case, the dependent variable is represented by the value of overdue loans recorded by individuals, while the independent variable is represented by the gross average salary per economy. Thus, the linear regression model can be replayed under the following mathematical equation: $CREDITS = a + b \cdot SALARY$

Where:

CREDITS = the value of residual credits made by physical persons during 2007-2016 (debts longer

than 30 days recorded by individuals)

SALARY = the value of the average gross salary income per economy made in the period 2007-2016.

To determine the parameters of this linear regression model, we considered a series of data on the evolution of the two macroeconomic indicators of results in the period 2007-2016.

To estimate the parameters of this regression model we used the Eviews software, within which we defined the equation which has as a variable the value of overdue credits, registered by individuals during the period 2007-2016, and as a variable factor the gross average salary per economy recorded in Romania during 2007-2016. We also considered that this regression model will contain the free term c. The estimation method defined in the program is the least squares method. Based on the above, the following results were obtained:

Table no. 1. Statistical variable

Dependent Variable: CREDITE			
Method: Least Squares			
Sample: 2007M01 2016M12			
Included observations: 120			
Variable	Coefficient	Std. Error	t-Statistic Prob.
SALAR	8.887723	0.512695	17.33529 0.0000
C	-12299.34	1109.836	11.08212 0.0000
R-squared	0.719769	Mean dependent var	6600.743
Adjusted R-squared	0.717374	S.D. dependent var	4257.790
S.E. of regression	2263.552	Akaike info criterion	18.30392
		Schwarz	
Sum squared resid	5.99E+08	criterion	18.35063
Log likelihood	-1087.083	Hannan-Quinn criter.	18.32289
F-statistic	300.5124	Durbin-Watson stat	0.123009
Prob(F-statistic)	0.000000		

Source: Personal data processing in the Eviews software using the least squares method.

The probability that this model is correct is high - approximately 70%, R - squared (0.719769) and Adjusted R - squared tests (0.717374). The Durbin Watson statistic (DW) is a statistical test that tests the serial error correlation, the DW symbolic test refers to the lowest squares approach hypothesis on non-autocorrelation error. The DW test is designed for the linear case regarding the possible correlation. It involves determining the value which compares with the values tabulated by Durbin and Watson. It is accepted that for values around 2 the non-autocorrelation hypothesis is confirmed; for levels close to zero or 4, the hypothesis is invalidated. If errors are not correlated, then Durbin-Watson value will be around 2. In the above case, this indicator is 0.123009, and therefore there is no serial correlation of the errors (residues).

The validity of the regression model is confirmed by the values F - statistical tests (300.5124 - value above the table level considered as a benchmark in the econometric models' validity analyzes), as well as the degree of null risk (reflected by the value of the Prob F - statistical test), which means that a high significance of that parameter is indicated.

Based on the above-mentioned elements, we can consider the regression model that describes the correlation between the gross average salary per economy and that of the overdue credits as being correct, which faithfully reflects the real evolution of the two macroeconomic indicators.

The linear unifactorial regression model will be:

$$\text{CREDITS} = 8.887723 - 12299.34 \cdot \text{SALARY}$$

It is noted that there is a directly significant relationship between the value of the gross average salary per economy and the value of overdue credits registered by our country during the analyzed period. Thus, we can state that a growth with a monetary unit of the gross average earnings in the economy will lead to a decrease by 12299.34 currency units of the value of overdue credits recorded by individuals.

4. Conclusions

Therefore, we can conclude that the level of gross average salary in the economy is not the only factor which influence the evolution of the overdue credits' level. As the gross average salary for the economy increases, the amount of overdue credits decreases.

Starting with 2014, with the entry into force of the new prudential rules required by Basel III international standards, as well as by Directive 2013/36 / EU and Regulation No. 575/2013, overdue sales transactions have come into the forefront of investors. Romania ranks first in Central and Eastern Europe in sales of overdue credits portfolios, with trades worth 3.5 billion euros in 2015 and 2016.

5. References

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