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Full Length Research Paper

The direction of the financial sector's involvement in overcoming crisis: A case study of Romania

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In the present economic circumstances of economical-financial crisis on a world-wide level, for the Romanian economy, the financial sector, being a key factor, have a great importance for supporting economic growth. The aim of this paper is to analyse the finance-growth relation in Romania, using quarterly data and applying statistical methods for a period of nine years. As such, we measure the qualitative development in the banking sectors using the interest rate margin and the value of total credit. Due to specific characteristics of the economic situation in Romania and other previous studies related to economic growth and credit market development, our results provide the answer to the question of whether or not the economic growth rate is always sustained by the financial sector development. The major findings and conclusion are that, in Romania, a short-run increase of bank loan and interest rate margin determines a decrease of economic growth, given by the coefficients of regression equation.

Key words: Credit market, economic growth, correlations, statistical analysis.

INTRODUCTION

In recent years, special attention is granted by specialists to issues regarding the state of the financial banking system and its influences on the economic growth, because the financial sector, especially the banking one, is extremely vulnerable to systemic crises. The economic growth registers irregular evolutions in time, in which the expansion periods follow periods of stagnation. The economic growth rate on long-term is determined by fundamental factors, such as: the economic organisation, its productive capacity due to technology, demographic and educational factors affecting workforce, etc. This rate meets the long-term equilibrium value (steady-state) of the economic growth rate from the neoclassical models and, usually, it changes on relatively long periods of time and only due to significant and lasting change of the basic conditions of the economy (Gala escu et al., 2007).

At the end of 2009, the world economy has significantly deteriorated, by -0.6%, facing the first contraction in 30 years, while the EU economy has had a larger decrease of over 4% (World Economic Outlook, 2010). The Romanian economy had a trend similar to that of other countries from Central and Eastern Europe, except Poland, where the economic contraction was severe at 7.1%. Regarding the banking sector, there was no need to support it with public funds, in that the significant increase of credit institutions' capitalization in Romania was fully achieved through the efforts of shareholders, in-cluding a response to the requests of NBR. Construction industry and real estate assets had an unfavourable development in 2009, affecting the quality of bank portfolios from mortgage loans (or mortgage securities), which has deteriorated significantly. The rate of bad loans for this segment increased during December 2008 to June 2010 from almost 1 to 8.9% - for the bank's portfolio regarding companies, respectively from 0.8 to 4.5% - for the portfolio regarding the population sector (National Bank of Romania, Financial Stability Report, 2010).

Despite the reduction in the total volume of loans, with regard to that of bank deposits, short-term deposits continued to be dominant (96% of the total deposits), while the non correlation on maturities of assets and lia-bilities was largely maintained. The rate of nonperforming loans (defined as arrears of more than 90 days, which is the most used indicator in international reporting, similar to the one used in international comparisons and by the

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IMF) had an upward trend, rising from 2.8% in December 2008 to 10.2% in June 2010, with the value being slightly above the regional average. Both loans classified as doubtful and losses were on the same upward trend, reaching 15% in late 2009 and the coverage rate of loan loss was above the EU average. As such, the credit risk presents a growing vulnerability. The phenomenon has increased in 2009, mainly because of the deepening economic recession and unemployment. Bad debts are at a manageable level, but the trend asks for maintaining a careful monitoring and further provisioning efforts. Banks have sufficient resources to cover any unexpected losses from credit risk that remain uncovered by the realized provisions and by capitalized guarantees. In the short term, the development trends regarding the quality of the portfolio are anticipated to remain the same. The cost of credit has increased significantly in 2009 and interest margins have risen, regardless of the financing currency or the type of debtor. As such, in the current economic conjuncture of econo-mic and financial crisis worldwide, for the Romanian economy, the banking system is of particular importance as a key factor in sustaining economic growth.

The main objective of this paper is to investigate the finance-growth relation for Romania, taking into account the effect of interest rate margin and the value of total credit over economic growth, using quarterly data for the period of 2001 to 2009, offered by the National Institute of Statistics and the National Bank of Romania. The methodology of our research comprised the application of the statistical method under SPSS program, using the linear regression method. We analyse both the correlation between dependent variable and independent variables and the necessary coefficients for determining the regression equation. The research seeks to answer the following questions:

1. What is the direction of the financial sector's implication in sustaining the economic growth in Romania?
2. Is the economic growth rate always sustained by the financial sector's development?

Literature review

The relationship between economic growth and credit market development has been an extensive subject of empirical research, which demonstrates that there is a strong correlation between them. This study both focus on a single country and on groups of countries. As such, the empirical results on the link between economic growth and the financial banking sector development showed, in most cases, direct link between the banking sector and particularly, the credit market development that supports economic growth on a short time horizon. For instance, Schumpeter (1934) emphasized the role of the banking sector as a financier of productive investments and, in this way, an accelerator of economic development. Another early evidence which demonstrated that the development of financing accelerated economic growth was in the paper of Goldsmith (1969). Pagano (1993) infers that three methods of influences on the financial sector development will be able to influence economic development: (1) it raises the investment productivity, (2) it reduces transaction costs (in this way, it can raise the savings) and (3) it can either promote or reduce the savings. Jappelli and Pagano (1994) developed a model in which the younger generation borrows extensively when no liquidity constraints accompany the liberalisation of consumer credit and mortgage markets.

A study applied for analysing the relationship between credit market development and economic growth in Italy for the period of 1965 to 2007 indicated that bank development was determined by the size of bank loan directed to the private sector at times of low inflation rates, leading to higher economic growth rates. Businesses help new investments to innovate products through bank loan in more developed countries (Vazakidis and Adamopoulos, 2009). Another model applied on the relative economic growth-financial development was the model of augmented production function, which can explore a possible channel by which the banking industry can make its contribution to the productive capacity of the economy (Ho, 2005).

At the microeconomic level, we can emphasize a model developed for analyzing the bankruptcy risk of the Romanian companies (Circiumaru, 2010). In this model, the study points out the impact of a crisis that occurred in the financial sector on the financial standing and on the economical and financial performances of a company. This effect is transmitted by the loans the companies contract mainly from the banks.

Levine realised a lot of studies with cross-country data regarding the correlation between financial sector and economic growth. Thus, King and Levine (1993) measured the financial sector's development of 80 countries using four variables: The amount of liquid liabilities divided by GDP, the importance of commercial banks in relation to the central bank when allocating credit, the ratio of credit to total domestic credit allocated to private enterprises and credit to private sector divided by GDP. "After controlling other factors affecting economic growth, King and Levine found a strong positive relation between each of the financial development indicators and economic growth" (Koivu, 2002).

Levine (2002), analysing the correlation between financial structure and economic growth (real per capita GDP growth) for 48 countries over the 1980 to 1995 period, underlines the critical importance of the banking system over economic growth and reveals the circumstances when banks can actively stimulate the future growth by identifying and funding productive investments. On the other hand, the conclusions of other research in transition countries stress that due to specific characteristics, the growth in credit has not always been

sustainable and in some cases, it may have led to a decline in growth rates (Koivu, 2002) . Thus, analysing the relationship between the amount of credit to the private sector and economic growth in 25 transition countries (including Romania) during the 1993 to 2000 period, Koivu (2002) demonstrated that their causality seems to run mostly from economic growth to credit growth. This outcome is justified by the characteristics of transition economies and the line of the financial market development in transition countries. The author noted the following: (1) banking crises rocked the financial sectors of many countries during the first decade of transition, thus, large amount of credit could have led to significant drops in GDP growth; (2) the soft budget constraints, still prevalent in many transition countries, have encouraged private sector actors to make counterproductive investments, thus the banking sector does not promote high economic growth and (3) the size of the financial sector is not a good variable to measure the development of the sector's effectiveness in transition countries.

We can say that, on the background of the analysis of Koivu from 2002, including the data of banking system from Romania in correlation with economic growth, our conclusion for the period of 2001 to 2009 is the same after about ten years. As such, the growth of private credit does not encourage economic growth, thereby leading to a relative decline in economic growth rates.

MATERIALS AND METHODS

Data sources

For this research, quarterly data offered by the National Bank of Romania were used for the period of 2001 to 2009. As a research method of the National Institute of Statistics, the backward method of linear regression (which consists of frequentative elimination of independent variables that have the most insignificant influence on the dependent variable) was applied to the SPSS program (Statistical Package for Social Sciences). The variables are:

1. Economic growth rate (real quarterly growth rate of GDP) for the correlation that was verified as the dependent variable;
2. The total credit and interest rate margin as independent variables.

Regarding economic growth, since 1990, the Romanian economy has had an oscillating evolution over the last twenty years. On the first decade, there have been two economic cycles, beginning with a recession period between 1990 and 1992, followed by an economy re-launching between 1993 and 1996 and a new recession period which was registered between 1997 and 1999. Beginning with the year 2000 (Figure 1), a new economic growth period reached an end with the installation of the financial crisis at the beginning of 2008. The economic policy was characterized by incoherency, although tough reforms were initiated, which allowed (2001 to 2002) a sustainable economic growth afterwards. The growth was determined, significantly, by the activity's increase from the service, construction and industry fields. The effective final consumption and, especially, the individual final consumption of households had registered a high growth determined by, distinctively, the rising of goods' sales through retail trade and the population services activity. Also, the gross fixed capital formation and, especially, the investment level have registered substantial growths. The economic growth after the year 2004 was considered the highest for Romania after 1989 and was realised principally due to a good agricultural year and to constructions, with an increase of 22% for agriculture and 9% for constructions.

Generally, during the period of 2000 to 2008 in Romania, the most important contribution to the form and dynamics of the GDP was the final consumption (the increase of one percent of the final consumption determines a GDP growth by 0.714%) (Dr cea et al., University of Craiova, Romania, personal communication). After 2009, together with the significant contraction of economic growth and the rising of unemployment, the national currency ("leul") fell under pressure, in that the credit debts arose unexpectedly and the credit level reduced considerably on the background of risk aversion and as such, limited the financing of banks' resources. As IMF presented the final report about Romania, "the economic situation worsened since the January review and as such, the staff revised the 2010 GDP growth forecast from +0.8 to -0.5%. However, high- frequency indicators suggest that the recession is the bottom line of the growth and thus the staff expects the growth to turn positive in the remainder of the year" (IMF, 2010). This prediction of the evolution of economic growth for 2010 was revised by IMF in August, at -1.9%. Dominated by foreign banks, banking activity grew quickly. From 2003 until the crisis, the private sector credit grew at an average annual rate of 50%. To stop credit growth rates, the National Bank of Romania (NBR) sharply increased reserve requirements on both RON and FX liabilities and tightened prudential regulations. Still, in the beginning of the economic-financial crisis at the international level and until now, in Romania, the number of debts registered to payment of credits has constantly increased. This fact is due to the economic situation of our country, in that lot of companies have reduced their activity, while others have disappeared. Banks intended to limit credit approach, on one hand because of the impact area of crisis (neither mother-banks nor branches from other states were kept off by its effect) and on the other hand, to ensure that the future clients will afford the payment of instalments. The credit costs have started to decrease, under the influence of the monetary policy interest of NBR in which the rate was reduced starting with May 2009, but the eligibility conditions of the credit institutions became more difficult to be accomplished by the clients.

Banks in Romania have charged high levels of interest rate margin when compared with other countries, due to the lower level of financial intermediation recorded in Romania (the share of non-governmental credit in GDP was 10.1% early in 2001 (Figure 2) and gradually increased to 34.5% at the end of 2009), where local banks mainly use the price level to obtain positive results. A study conducted by the National Bank of Romania in 2006 concludes that the evolution of the benchmark interest rate of the central bank and the GDP growth have a significant influence on interest margins (Neagu et al., 2006: 8).

Method description

Using these data by applying the linear regression within SPSS 17.0, it involves, on the one hand, a statistical analysis of the correlation between the dependent variable (economic growth rate) and independent variables (interest rate margin and total credit) and, on the other hand, the aim is to obtain the coefficients needed for the regression's equation. The purpose of multiple regression is to highlight the relationship between a dependent variable (explanatory, endogenous or resulted) and one or a set of independent variables (explanatory, factorial, exogenous or predictors). By using multiple linear regression, we can determine how much of the total variation of the dependent variable is influenced by changes in

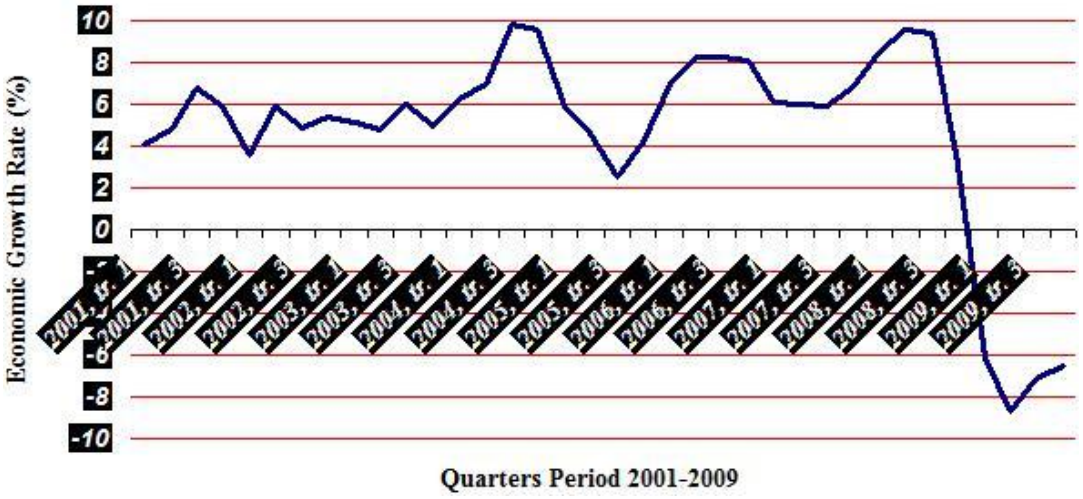

Figure 1. Economic growth rate in Romania (quarterly evolution from 2001 to 2009).

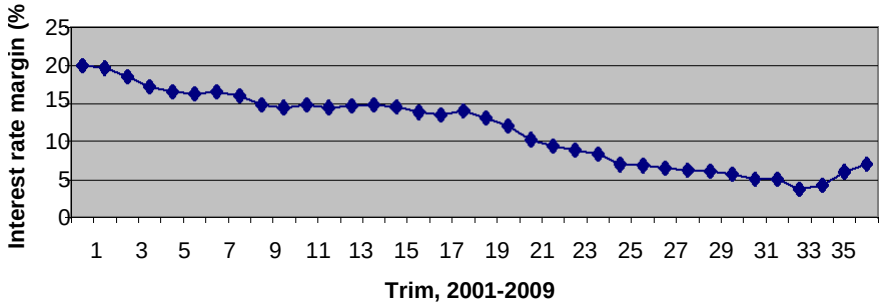

Figure 2. Interest rate margin evolution in Romania (quarterly data from 2001 to 2009).

independent variables. The general form of multiple linear regression equation is:

$$Y_i = B_0 + B_1 \cdot X_{i,1} + B_2 \cdot X_{i,2} + \ldots + B_k \cdot X_{i,k} + \varepsilon \quad (1)$$

Where, i = 1,2,…..,n are sample observations; Y_i = observation i of the dependent variable; X_1, X_2,….,X_k = independent variables; B_0 = constant (the free term of equation); B_1,…., B_k = coefficients of the independent variables and = error term of the equation.

Linear regression involves calculating the Pearson's correlation coefficient for the group of variables, practically analyzing the correlation between a dependent variable and a set of independent variables. The calculated value must be as close to the value 1 in order to estimate the fact that a strong correlation exists. The Pearson coefficients are found in the interval [-1, 1], where positive values indicate direct correlations and negative ones reverse correlations (one variable increases when the other decreases). The correlation coefficient (Pearson) indicates a stronger correlation as its value approaches 1 (1 implies a perfect correlation, which is obtained only when a data set correlates with itself). Also, the significance threshold (significance of table) must be less than 0.05, which corresponds to the statistical assumption that from 100 measurements, random results can be obtained, only in 5% of them maximally, due to chance or hazard.

RESULTS AND DISCUSSION

By applying the linear regression function, we determine how the economic growth (dependent variable) influences the following indicators (independent variables):

1. Total credit (billion Euros).
2. Interest rate margin (or spread).

As seen from Table 1, for the 36 observations (value of N in the table represents the 36 quarters in the period under review), the Pearson's coefficient values are negative for all the variables considered and it states that there is an inverse correlation between the independent variables and the dependent variable, respectively. As such, when one of the independent variables increases, the economic growth rate, as a dependent variable, decreases. The method chosen for the linear regression model analysis is

Table 1. Correlation coefficients and significance threshold for the dependent and independent variables.

		Economic growth rate	Interest rate margin	Total credit
Pearson correlation	Economic growth rate	1.000	-0.294	-0.611
	Interest rate margin	-0.294	1.000	-0.868
	Total credit	-0.611	-0.868	1.000
Significance (1-tailed)	Economic growth rate	0	0.041	0.000
	Interest rate margin	0.041	0.	0.000
	Total credit	0.000	0.000	0
N	Economic growth rate	36	36	36
	Interest rate margin	36	36	36
	Total credit	36	36	36

Table 2. The backward method for correlation testing.

Variables entered/removed[b]			
Model	Variables entered	Variables removed	Method
1	Interest rate margin and total credit[a]	.	Enter

a, all requested variables entered; b, dependent variable: economic growth rate.

model analysis is the backward method (Table 2) that requires the iterative removal of the independent variables which have the lowest influence on the dependent variable, in case that these variables are not correlated.None of the independent variables were removed, as is shown in Table 2. From Table 3, it can be observed that, in terms of value R (Pearson correlation coefficient), there is a good (R = 0.775) and direct (R has a positive value) correlation among the variables. In addition to this value, none of the independent variables have been removed, so all these variables have a significant influence on economic growth.

In Table 4, the linear regression model coefficients are included (Column B of Table 4) to determine the linear regression equation. The significance of the independent variables (column significance of Table 4) for total credit and interest rate margin is 0 and the tolerance value is 0.247. The tolerance value must comply with the condition of being greater than 1-adjusted R^2 (1-0.775 = 0.225), since the significance threshold value is below 0.05, in order to validate the statistical analysis and to eliminate the multicollinearity risk. The tolerance is set at 0.247, so there is no multicollinearity risk. Using the calculated coefficients (Column B of Table 4), the resulting linear regression equation is:

$$\text{Economic growth rate} = 2.053 \times 10^{-5} \times \text{total credit} - 0.196 \times \text{interest rate margin} + 21.953$$

The interpretation of the coefficients from the resulting regression equation reveals that, based on the data analysis for the period of 2001 to 2009, on a short time horizon, the following correlations are manifested:

1. When the total credit increases by 1 million euros, the economic growth rate declines by 0.02%;
2. When the interest rate margin increases by 1%, the economic growth rate falls by 0.916%.

Also, the histogram (Figure 3) shows that the use of the linear regression method can be validated in the case of the analysed data, whereas the splitting on intervals of the residual values approximately meets the Gaussian normal distribution curve. For seeing the evolution of data sets from a different point of view, an instrument available within SPSS, called control chart has been used. Control charts, also known as Shewhart charts or process-behaviour charts, in the statistical process control are tools used to determine whether a data set is in a state of statistical control or not. If the chart indicates that the data set is currently under control then it can be used with confidence to predict the future evolution. If the chart indicates that the data set is not in control, the pattern revealed can help determine the source of variation. A control chart is a specific kind of run chart that allows significant change to be differentiated from the natural variability of the data set. As such, the sigma level shows the accuracy of the calculation, to the extent at which a calculated statistical information actually varies randomly (3 sigma level shows about 99.8% accuracy). Since the economic growth rate does not meet the control band for the last year considered (2009), it shows that there is a strong influence of external factors on it, but with a trend to return to the lower threshold of the control interval

Table 3. Correlation coefficient.

Model summary[c]				
Model	**R**	**R^2**	**Adjusted R^2**	**Std. error of the estimate**
1	0.775[b]	0.600	0.576	3.02259

[b]Predictors: (constant), interest rate margin and total credit; [C]Dependent variable: economic growth rate.

Table 4. Coefficients for the linear regression model.

Coefficient[a]							
Model	**Unstandardized coefficient**		**Standardized coefficient**	**t**	**Sig.**	**Collinearity statistics**	
	B	**Std. error**	**Beta**			**Tolerance**	**VIF**
(Constant)	21.953	3.406		6.446	0.000		
Interest rate margin	-0.916	0.212	-0.959	-4.326	0.000	0.247	4.057
Total credit	-2.053E-5	0.000	-1.444	-6.512	0.000	0.247	4.057

a, Dependent variable: economic growth rate.

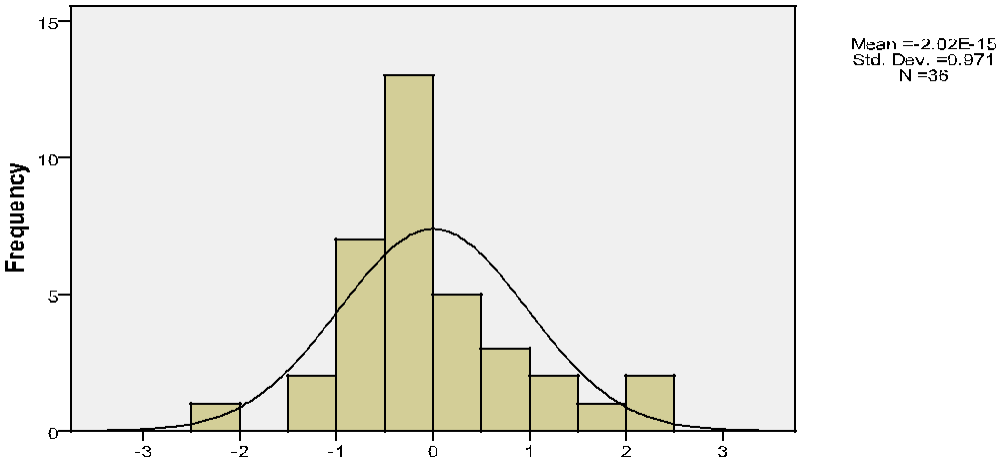

Figure 3. Histogram, showing the dependent variable (economic-growth-rate).

(Figure 4).

Figure 5 demonstrates that the interest rate margin shows strong external influences over the considered period, except 3 quarters, namely the 3rd and 4th quarters of 2005 and the first quarter of 2006 (values are located in the control band). Consequently, the interest rate margin decreased as the GDP grew (Figure 6). Concerning the correlation, it is noticed, that the interest rate margin is adjusted when the economic growth becomes negative, which means adapting the financial banking market conditions to the economic growth drop. The National Bank of Romania has closely monitored the evolution of the domestic and international economic environment, to ensure the achievement and maintenance of medium-term price stability and financial stability, by using the appropriate tools available. Figure 7 demonstrates that the total credit volume involves strong influences from external factors, and it has a diametrically opposed evolution to the interest rate margin. As such, when the credit amount is reduced, the interest rate margin increases and vice versa (Figure 8). Following the correlation between the economic growth drop and the increased interest rate margin, the total credit shows adjustments in the last 4 quarters (the year 2009 is represented by areas surrounded by red). Figure 9 shows that, when the credit value increases, the econo-mic growth rate decreases (the same conclusion results from the linear regression equation). This is so, because the credit destination is not-oriented towards productive investments, but rather towards consumption.

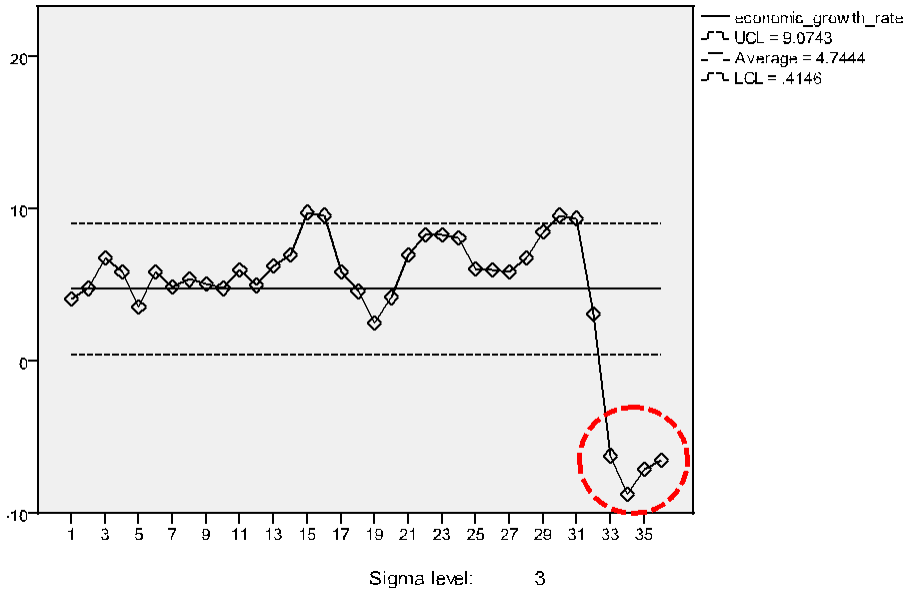

Figure 4. Control chart for economic growth rate (quarterly evolution).

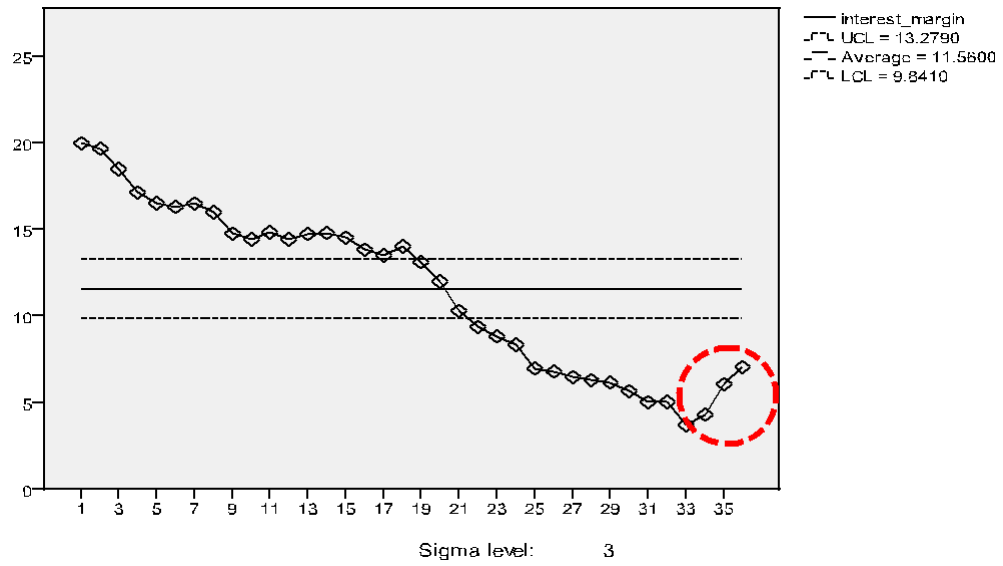

Figure 5. Control chart for interest rate margin.

Conclusions

By applying this research, answers were given to the following questions:

1. What is the direction of the financial sector's implication in sustaining economic growth in Romania?
2. Is the economic growth rate always sustained by the financial sector's development?

First, the growth of total credit and interest rate margin do not encourage the economic growth, leading to a relative decline in the economic growth rates.

Secondly, the economic growth rate is not always sustained by the financial sector development. Consequently, on short time, credit activity and the evolution of interest rate margin in Romania (Figure 2) have to be under control in order not to influence, in a negative way, the economic growth and to overcome the actual financial crisis. This conclusion is the same with that obtained by Koivu (2002) when he analysed the relationship

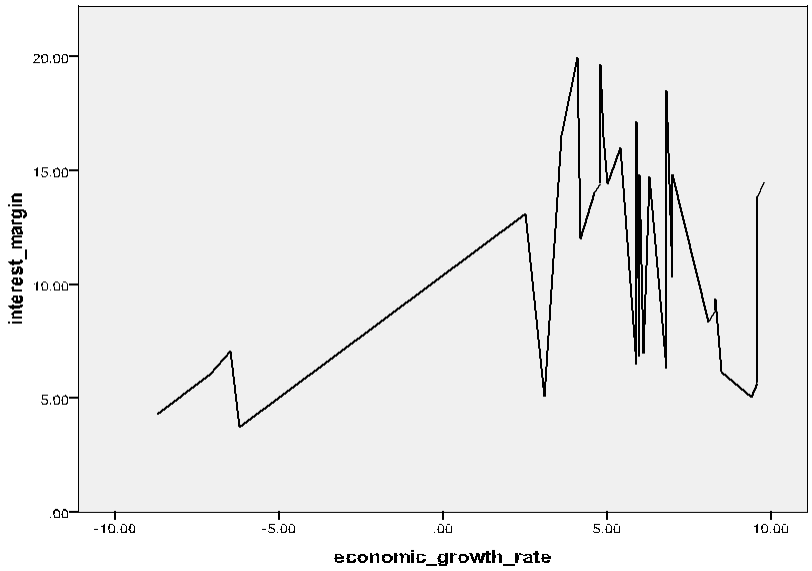

Figure 6. Correlation between interest rate margin and economic growth rate.

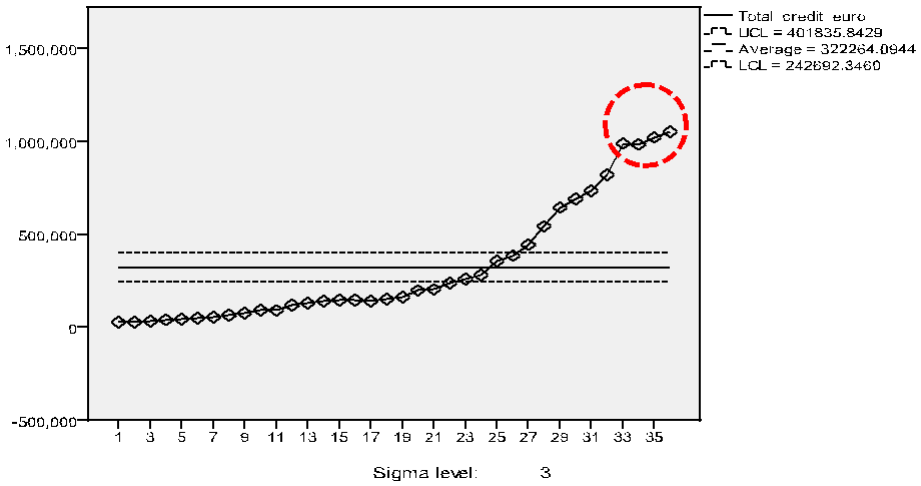

Figure 7. Control chart for total credit.

relationship between credit market and economic growth in 25 countries in transition, including Romania, and he invalidated previous theories which sustained the direct causality relation between credit market and economic growth. Extending the macroeconomic unbalances, consolidated budget deficit and current account deficit of payment balance makes it hard to sustain the dynamics of GDP, especially in a world-wide environment characterized by uncertainty and prudence. This is explained by the fact that the deficit is in figures, while the perspective problems are related with the budget's low income, on the background of an inadequate management of spen-ding, credit orientation towards consumption and less to productive investments, in the deep crisis manifested in Romania, too.

The global economical financial crisis has strongly influenced the evolutions of the real sector and of the financial sector in Romania, with further persistence. The first semester of 2010 marks the continued economic decline in Romania, by 1.5% in comparison to the first semester of 2009. The reduction of funding offer from Romanian banks has tightened the lending standards and the credit terms for both companies and people. To sustain economic growth, loans must be oriented to productive investment rather than consumption. The demand for loans is also reducing, in that the main factors that contributed to its restriction are: (1) unfavourable domestic macroeconomic developments, especially those related to gross domestic product, unemployment and wages; (2) maintaining high credit costs and (3) the increase

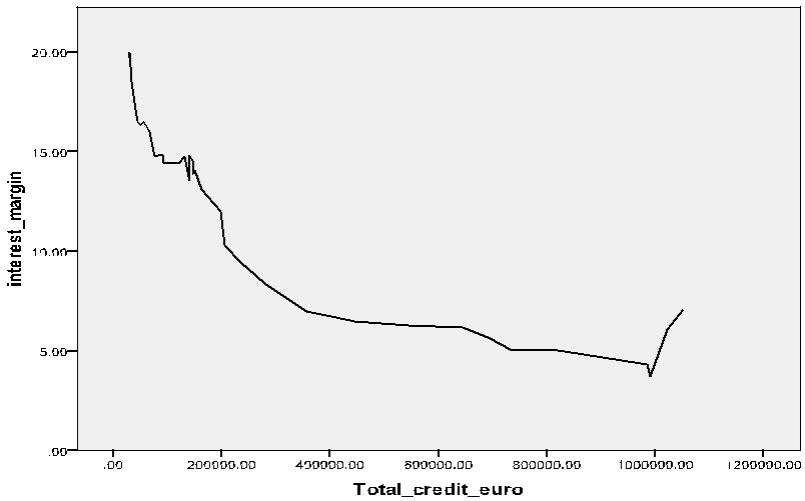

Figure 8. Correlation between interest rate margin and total credit.

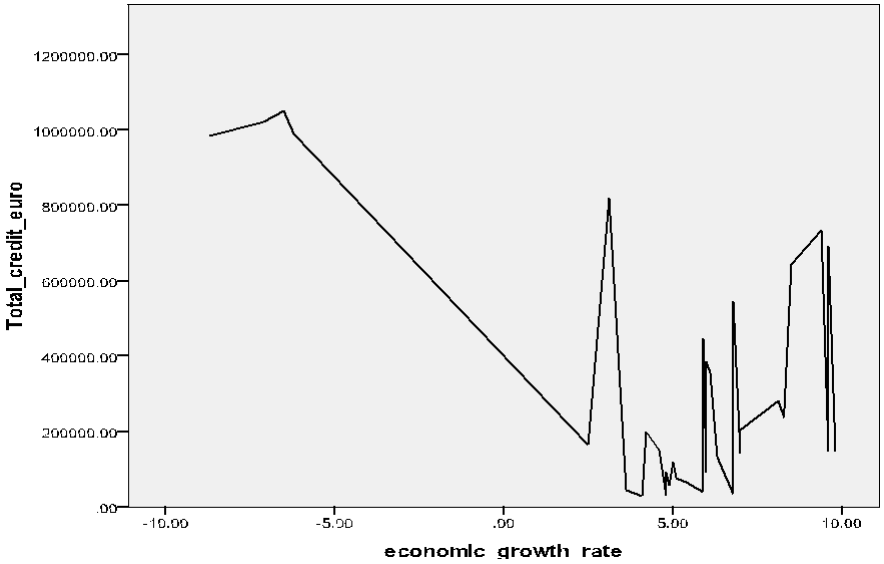

Figure 9. Correlation between total credit and economic growth rate.

increase of a more cautious approach by the population, shown by increasing savings trend. The need to adjust the volume and the structure of government spending will indirectly put pressure, in short-term, on the financial system. The main challenge to financial stability remains the credit risk. For a proper management of credit risk, we must act on the following directions:

1. A continuous improvement of the prudential regulatory framework for a proper management of risks associated with public indebtedness.
2. A continuous discouragement of foreign loans, but taking into account, the current limited capacity of banks to obtain resources in local currency on long-term, as well as the distinction between the debtors that are covered from foreign exchange risk and those who are not.
3. A review of policies that guarantee bank exposure with real estate collateral at updated values in order to obtain a better mix between the various criteria considered when granting the credits.

Short term prospects of the banking activity in Romania largely depend on restoring confidence in the economy as well as on international developments, in which a pro-cyclical tightening of credit standards can be observed, in correlation with the increase of reserves and the international trend of reduction. In this period of bank mediation, some signs of recovery can be seen in the credit activity, mostly for non-financial companies of important dimensions and in a relatively reduced manner

for real estate credit intended for the population.

In Romania, ”high-frequency indicators suggest that the recession is fading out and staff expect growth to turn positive in the remaining parts of the year. While the banking sector has so far withstood the crisis well, banks faced deterioration in asset quality and rising provisioning costs that were squeezing profits (…). The system remained liquid and adequately capitalized and foreign banks as a group have broadly maintained their exposure to Romania” (IMF, 2010). Future growth depends not only on re-establishing macroeconomic stability, but also on improving capital investment and increasing labour productivity. To boost investment, steps should be taken to improve the business climate, improve infrastructure and EU funds absorption and strengthen competition.

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