

## **CREDIT GROWTH DETERMINANTS IN ROMANIA**

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### **Abstract**

*Through an empirical analysis, using a multiple linear regression model, the aim of this paper is to study the effects on credit growth of some of the macroeconomic factors as well as indicators of assets and liabilities of the Romanian banking system. Credit growth is determined by the dependent variable of bank credit to the private sector as percent of GDP. The results showed a direct statistically significant relationship between the dependent variable and factors such as ROE, bank lending-deposit interest rate spread, capital investment, and the indicators of bank assets as percent of GDP and the unemployment rate.*

**Keywords:** *Bank Credit to the Private Sector, Credit Growth Determinants, Multiple Linear Regression, Romanian Banking System*

**JEL classification:** *G21, C30*

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### **1. Introduction**

Credit activity is essential for a country's economy, especially for the CEE countries, whose financial system is largely based on the banking sector. The credit measure that is placed in the economy is often a very important factor when analyzing the economic growth in the country, which comes from the transformation of savings into productive investments. To understand more about the factors that determine lending, many studies have been conducted for these countries, but also for other countries similar to them, judging also by the level of development or the stages they have gone through. The rapid growth of credit activity was a common feature of countries in

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transition especially after the 2000s, but it changed to the opposite side after the onset of the financial crisis.

Until 2019, Romania had very good macroeconomic conditions that led to a positive development of the banking sector and an acceleration of lending. One of the most important aspects of credit activity performance is the identification and evaluation of the credit growth determinants, taking into account their impact on the demand and supply of bank credits. The latter is also the main objective of this paper, where through an empirical analysis, using a multiple linear regression model, will be studied the effects on credit growth of some of the macroeconomic factors as well as indicators of assets and liabilities of the Romanian banking system. To determine these factors is not easy, because bank credit to the private sector, a very useful indicator of banking performance is influenced by many factors: macroeconomic, financial, the impact of crises over the years, international economic relations, the behavior of business entities etc. In addition to many other papers that have been written to study the determinants of bank credit to the private sector, I have expanded the model with a variety of variables to see a clearer effect of the impact of each factor on bank credit.

The study of a wide range of key determinants of bank credit to the private sector is of multidimensional importance. Initially, the importance stems from the fact that bank credit is increasingly seen as an important factor of economic growth in the country, respectively in most studies these two indicators have a positive correlation between themselves. The second is that in the CEE countries, with a few exceptions, almost the entire financial system is covered by the banking sector, and as an indicator of the development of the banking sector, credit is increasingly taken as a basis.

Bank credit studies up to 2008 focused on finding bank credit factors to provide an answer as to what were the main determinants of such high credit rates. Numerous studies have concluded that the process of economic convergence and increased financial intermediation or financial deepening were the main arguments used to justify such high lending rates in the CEE countries. After 2008 the studies focused on dividing the main factors before and after the crisis, finding the common points between these two periods and the dividing points or differences between the periods. Other studies belonging to almost all periods try to compile a set of variables for groups of countries to describe the measures of the impact of factors on bank credit. My study will

be focused in determining the credit growth determinants in Romania, as one CEE country.

The current pandemic has negatively affected the economy and, in particular, the credit activity of the Romanian banks, but the latter have continued to support through credits both the needs of the population and the business activity affected by the restrictions that were necessary to limit the spread of the coronavirus.

## **2. Literature Review**

Credit activity is influenced by several factors, macroeconomic, bank-specific or other factors relevant to each country. There is a growing empirical literature examining the determinants of bank credit to the private sector, which can be either supply-side or demand-side. Some studies consider both sides of the factors that may influence the model and some divide them. The majority of the empirical studies from the literature focused in explaining how credit activity was affected in the period before the financial crisis and in the one that follows.

Gourinchas, Valdes, and Landerretche (2001), in one of the first comprehensive studies focused on credit growth, use an event study covering a sample of 91 advanced and emerging countries in Latin America and the rest of the world. They suggested that a number of macroeconomic variables change during the accumulation of credit expansion, which means that these variables can trigger such increases.

In the period 2002-2008, credit growth in Central and Southeastern European countries was studied to analyze credit behavior, to see if it is stable, whether it is a real growth as a result of the "awakening" of the credit market or is a bubble which will cause crises in various markets of the economy (Backe, Egert & Zumer, 2007). The high credit levels accompanying the SEE and CEE region have been accompanied by concerns from various authors (Cottarelli, Dell'Ariccia, Vladkova Hollar, (2005); Egert, Backe and Zumer, (2006); Coricelli and Masten, (2004)) regarding the risks it may convey to macroeconomic indicators.

Cottarelli, et. al. (2005) identified the long-term relationships between the ratio of bank credit to the private sector and GDP and a set of economic and institutional variables, for a group of developing and industrialized countries that are not in transition. They then used these estimates for a balanced level of GDP credit in the CEE and the Balkans. They concluded

that: there was evidence of an exclusionary effect (due to a negative ratio on the public debt ratio); a positive and significant relationship of credit growth to GDP per capita; inflation above a certain threshold negatively affects the dependent variable; greater financial liberalization and transparency in accounting standards lead to a higher ratio of bank credit to GDP.

Boissay et.al. (2006) evaluated the deviations of the credit-to-GDP ratio from the equilibrium level for 11 CEE countries. They found out that the increase in this ratio was consistent with the performance of macroeconomic factors only in Slovenia and Romania. Their results also suggested that credit growth was above the optimum level in the countries with fixed exchange rates. On the other hand, using a similar framework, Kiss et.al (2006) found no evidence of excessive credit growth in any of the CEE countries, with the exception of Latvia and Estonia.

The ability and willingness of banks to provide credits affects bank lending in general and in particular during the financial crisis. One of the first studies after the crisis was that of Hempell and Sorensen (2010). They studied the impact of supply constraints on euro area bank credit activity, focusing specifically on the crisis period.

The study on the determinants of credit growth in developing countries was built in the form of finding the determinants of credit growth before the crisis, to find the factors of that credit boom, and the study tried to find the determinants of galloping credit decline during and after the crisis financial 2008-2009 (Guo & Stepanyan, 2011).

Bakker and Gulde (2010) found that external factors (bad luck) were the main reason for the increase in credit. Kamil and Rai (2010) argued that funding sources (external vs. internal) were important during the crisis to increase lending, countries that rely more on external financing are most affected. Barajas et.al (2010) found that the fundamentals at the bank level, capitalization and credit quality, helped to explain the differences in credit growth in the countries of the Middle East and North Africa.

Shijaku and Kalluci (2013) focused on identifying and assessing the long-term determinants of bank lending to the private sector in the case of Albania, using an approach to the vector error correction mechanism (VECM) based on supply and demand indicators. Estimates have shown that there is an adjustment mechanism that restores bank credit. The results imply that loans are positively linked to economic growth. Moreover, banking and financial

intermediation as well as financial liberalization would stimulate a greater demand for credit.

A study conducted in recent years is written by Contreras et.al. (2019). This research assessed the relationship between private sector credit and institutional variables, taking into account countries at different levels of development. The results suggest that institutional efficiency determines the performance of the credit market, both in developed and developing countries. I also studied the credit activity in Albania (2019), and I found out that developments in the global economy, and in particular the global economic crisis, have had a negative impact on the Albanian banking sector and caused the credit market to shrink.

Finally, Alebachew (2021) mainly aims to investigate the factors that increase the credit of the private commercial bank in Ethiopia through the use of OLS. The result of the econometric regression indicates that GDP, inflation, bank liquidity and the increase in deposits have a significant positive impact on the growth of bank credit to the private sector. However, the population growth rate has positive but insignificant effects on credit growth, while the unemployment rate has a negative and insignificant effect on the growth of commercial banks' credit to the private sector.

### **3. Research Methodology**

The main objective of this paper is to identify the credit growth determinants of the commercial banks operating in Romania, through adequate empirical analysis, using a multiple linear regression model. Credit growth is determined by the dependent variable of bank credit to the private sector as percent of GDP. My approach is dividing the independent variables into two groups: macroeconomic and financial-banking factors, so in a way I can provide answers to multiple relationships between bank credit and the factors included in the model.

The method applied is the method of least squares and the model is tested in advance via EViews software for basic assumptions of the method. The data sets are collected mainly from the Global Economy and from the Romanian annual bank reports. All the independent variables, such as the dependent variable are considered for a period of 29 years with annual data, starting from the year 1991 to the year 2019.

As I mentioned, the dependent variable as proxy for credit growth is the indicator of bank credit to the private sector as percent of GDP (CREDIT).

In Romania, bank credit is outlined as the credit given to only the private sector, both firms and households, and not to the government by the banking institutions.

On the other hand, the independent variables chosen after a research analysis will be grouped as follows:

I. Macroeconomic factors

- ✓ Economic Growth (GDP). It is calculated as the annual percentage growth rate of GDP. Economic growth is the positive variation in the production of goods and services in an economy over a given period, generally long.
- ✓ Inflation Rate (INF), consumer prices (%). It is calculated as percent change in the Consumer Price Index from the same month last year. Inflation is a major imbalance present in the economy of any country, represented by a general increase in prices and the simultaneous decrease in the purchasing power of the national currency.
- ✓ Unemployment Rate (UNMP). It is calculated as the number of unemployed people as percent of the labour force. The most common measure of unemployment is the unemployment rate, which is the number of unemployed divided by the number of people in the workforce.
- ✓ Capital Investment (CAPINV). It consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories as percent of GDP.

II. Bank Specific Factors

- ✓ Bank Assets as Percent of GDP (ASSETS). It is calculated as total assets held by deposit money banks as percent of GDP. Banking assets are common to include real estate, securities, investigations, loans, as well as all other items that can be valued in monetary equivalent.
- ✓ Real Interest Rate (RIR). It is calculated as bank lending rate minus inflation. The real interest rate in the approximate form represents the difference between the nominal interest rate and the inflation rate. This is a very important indicator for the promotion of the monetary policy, which accurately describes the nature of the policies promoted at a certain time.
- ✓ Return on Equity (ROE). ROE is one of the most important indicators that measure the performance of a bank. The indicator is calculated as

the ratio between the net profit obtained by the company and the own capitals, practically expressing the way and the efficiency with which the shareholders invested their money.

Of course, there were lots of other determinants that could have had an impact on credit growth in Romania, but for this study I used those seven factors. Initially I run the model using also the indicator of bank lending-deposit interest rate spread, but it resulted slightly insignificant so I extracted it from the final model.

It is expected a positive relationship between economic growth and bank credit to the private sector, because a growing economy would lead to a higher opportunity for banks to grant credits to the private sector. But the literature has also found a negative correlation. As per the other factors, there is an ambiguity in the literature regarding the direction of the impact that the independent factors have on credit growth.

#### **4. Results and Discussion**

As seen from the EViews output of the econometric model in Figure 1., there is a direct statistically significant relationship between bank credit to the private sector as percent of GDP and factors such as ROE, capital investment, and the indicators of bank assets as percent of GDP and the unemployment rate. On the other hand, it has been found an indirect statistically significant correlation between the dependent variable used as a proxy for credit growth and the determinants of economic growth, real interest rate and inflation rate.

The determination coefficient ( $R^2 = 0.9678$ ) shows that independent variables in regression explain 96.78% of the variation of the dependent variable, bank credit to the private sector. The model is statistically significant because of the value of F-test and the probability is below the level of importance  $\alpha = 0.05$ . Durbin Watson statistics is equal to 1.884, which means that residuals are not correlated, pointing their independence as a completion of one of the conditions of the least squares method.

An increase by 1% of the level of GDP will decrease bank credit by 39.1%. An increase by 1% of the level of UNMP rate will increase bank credit by 43.7%. An increase in the Inflation Rate by 1% will decrease bank credit by 15.09%, an increase of ROE by 1% will increase bank credit by 11.66% and an increase of RIR by 1% will decrease bank credit by 41.46%. An

increase by 1% of the level of assets ratio will increase bank credit by 50.64%. An increase by 1% of the level of capital investment will increase bank credit by 89.82%.

**Figure 1: Output Evaluation in EViews**

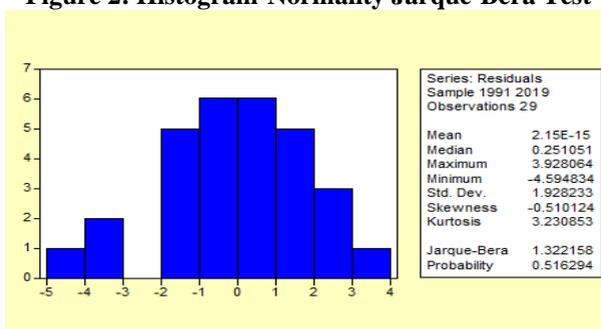
Dependent Variable: CREDIT  
 Method: Least Squares  
 Date: 05/26/21 Time: 23:39  
 Sample: 1991 2019  
 Included observations: 29

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-18.32391	4.628475	-3.958953	0.0007
GDP	-0.391088	0.179181	-2.182641	0.0406
INF	-0.150932	0.017686	-8.533889	0.0000
ROE	0.116622	0.053913	2.163171	0.0422
ASSETS	0.506477	0.072393	6.996190	0.0000
CAPINV	0.898260	0.187186	4.798757	0.0001
UNPM	0.437067	0.647792	2.218407	0.0377
RIR	-0.414611	0.075117	-5.519540	0.0000
R-squared	0.967829	Mean dependent var		21.34172
Adjusted R-squared	0.957105	S.D. dependent var		11.40188
S.E. of regression	2.361465	Akaike info criterion		4.785392
Sum squared resid	117.1069	Schwarz criterion		5.162577
Log likelihood	-61.38819	F-statistic		90.25029
Durbin-Watson stat	1.884660	Prob(F-statistic)		0.000000

Source: own data processing in the EViews program

It is important that the series be stationary. The stationarity was verified using the Unit Root test. To verify whether the results obtained are reliable or not, it will be checked whether the errors of the regression equation ( $\varepsilon$ ) are distributed normally. To test the normality of the residue, I applied the Jarque-Bera test. The Jarque-Bera test has the null hypothesis that the errors are distributed normally. As can be seen from Figure.2. below, the probability associated with the test (51.6%) shows that we cannot reject the null hypothesis, which ensures the robustness of my results. Also, as it can be seen, the average error (mean) is very small, close to zero.

**Figure 2: Histogram-Normality Jarque-Bera Test**



Source: own data processing in the EViews program

## 5. Conclusions

The macroeconomic framework determines consumption and investments, so basically it can affect also the demand for credits. On the other hand, the economic activity can influence the income for household and companies. Higher incomes are mirrored to a higher solvency for them, so that the evolution of the economic activity can also affect the willingness of banks to grant credits. The results showed that economic growth, credit quality, financial intermediation rate, together with external and internal financing sources are the main determinants of credit growth (Gabeshi (2021)).

Most studies have found a direct correlation between economic growth, with GDP as the most commonly used variable, and the evolution of credit activity. My study showed a negative correlation between bank credit to the private sector and economic growth, which means that there are problems with the allocation of loans and poor financial regulation and supervision. Or banks are not very interested in lending to the productive sector of the economy because of the high level of risk.

Likewise, the more profitable the banking system, the more credits it grants and a higher economic growth is reflected in a higher demand for credit. The direct relationship between bank credit to the private sector and ROE, can be explained by the fact that banks that tend to lend more are the most profitable ones. Well-capitalized, highly liquid, low-risk and more profitable banks tend to lend more, especially in the national currency.

The current pandemic has negatively affected the economy and, in particular, the credit activity of the Romanian banks, but the latter have

continued to support through credits both the needs of the population and the business activity affected by the restrictions that were necessary to limit the spread of the coronavirus. Romanian banks have provided support to customers and authorities in limiting the negative effects on individual economic well-being, the Romanian economy and public health and safety in the context of the pandemic caused by the new coronavirus. In the lending area, in addition to the measures to suspend payment obligations for customers affected by the COVID 19 pandemic, credit institutions continued to support through loans both the needs of the population and the activity of companies affected by restrictions necessary to limit the spread of coronavirus.

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