Monetary Policy and Bank Credit Allocation to Romanian Businesses

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Abstract: *This paper investigates the effects of monetary policy on bank financing of Romanian companies, focusing on how policymakers influence by their monetary policy decissions the credit allocation to Romanian businesses, and consequently the performance of the economy. The object of this research is to understand the dynamics between monetary policy adjustments and their consequences on the availability and conditions of bank loans to Romanian firms.*

The methodology employed involves an econometric analysis using panel data from National Bank of Romania over the period December 2019 – September 2024. Key variables such as monetary policy interest rate, inflation rate, money supply, and credit growth are examined.

The findings suggest that policymakers need to consider the extensive significance of monetary policy decisions on the corporate financing environment. By understanding these dynamics, banks and companies can better navigate the challenges posed by changing monetary conditions, ultimately promoting a more stable and resilient financial system.

Key words: loans granted to companies, monetary policy interest rate, inflation rate, money supply.

JEL: C23, E51, E52

1. Introduction

Monetary policy significantly influences the economic environment of every nation, including Romania. As a key instrument for managing the macroeconomy, it involves the central bank's measures to regulate the money supply and interest rates. The objective is to ensure sustainable economic growth, manage inflation, and uphold financial stability. In Romania, the National Bank of Romania (B.N.R.) is the monetary authority responsible for adopting the monetary policy strategy and instruments, as well as for implementing this policy, which significantly impacts the broader economy and the banking sector.

The importance of monetary policy in Romania is multifaceted. Firstly, it influences the general economic situation by affecting variables such as inflation, employment, and overall economic growth. A monetary policy that is expansionary, marked by reduced interest rates and a higher money supply, can boost economic activities by promoting borrowing and spending. In contrast, a contractionary monetary policy, which involves raising interest rates and limiting the money supply, can control inflation but might also slow down economic growth.

There are several key factors that influence bank lending to companies in Romania such as: a) Monetary Policy Stance: modifications in interest rates and money supply directly impact banks' lending capacities; b) Economic Conditions: the overall health of the economy, including GDP growth, inflation rates, and unemployment levels, influences banks' willingness to lend; c) Regulatory Environment: regulations and policies set by the central bank and other financial authorities affect the lending practices of banks; d) Creditworthiness of Borrowers: the financial health and credit ratings of companies seeking loans are critical determinants of their ability to secure financing; e) Bank Liquidity: the availability of liquid assets in banks' portfolios affects their capacity to extend credit.

The implications of bank lending on the development of economic activity and various types of companies are profound. For Limited Liability Companies (LLCs), Sole Proprietorships, and Corporations, access to bank financing is essential for funding operations, expanding businesses, and investing in new projects. Adequate and affordable credit enables companies to grow, innovate, and contribute to economic development. Conversely, restricted access to financing can hinder business growth, limit job creation, and slow down economic progress.

For policymakers, financial institutions, and businesses, apprehending the influence of monetary policy on bank financing is an important issue. This research uses econometric methods to explore the dynamic link between monetary policy and bank lending of Romanian businesses. By examining the period from December 2019 to September 2024, the study intends to reveal how monetary policy adjustments have influenced the availability and conditions of bank loans, ultimately impacting the economic activity of Romanian companies.

This paper will contribute to the existing literature by offering insights into the interplay between monetary policy and bank lending, with practical implications for enhancing financial stability and promoting sustainable economic growth in Romania.

2. Literature review

The literature review on digital transformation in the banking sector, particularly in the Romanian one's, highlights significant advancements in technology adoption, yet underscores numerous challenges, such as regulatory compliance and infrastructure limitations. Additionally, the research reveals opportunities for enhancing customer experience, operational efficiency, and financial inclusion through innovative digital solutions.

Bofinger et al. (2023) describe the impact of monetary policy on bank lending and financial stability through the lens of the credit creation theory of banking. The research indicates that an extended period of loose monetary policy can heighten financial vulnerability. Furthermore, the work by Bofinger, P., Geißenberger, L., Haas, T., and Mayer, F. (2023) explores how monetary policy affects credit growth using the credit creation theory of banking. Their findings suggest that monetary policy impacts credit growth via risk premiums in financial markets.

In their study titled "Monetary policy shocks and firms' bank loan expectations," Ferrando et al. (2023) investigate the impact of ECB's monetary policy decisions on firms' expectations regarding bank loans within the euro area. Their findings indicate that firms' expectations for bank loans are influenced by monetary policy shocks, with contractionary shocks causing firms to lower their expectations.

According to Bacchiocchi, et al. (2024) the effects of a green monetary policy on firms financing cost could improve the behavior of companies regarding low-carbon emissions and green industries. The study analyzes how a green monetary policy affects firms' financing costs by shifting central bank portfolio allocations toward low-carbon industries and indicates that a green monetary policy can reduce financing costs for low-carbon firms.

Kashyap et al. (2023) explore the effects of monetary policy on credit conditions within the corporate bond market, concluding that monetary policy decisions impact risk premiums in financial markets.

Werner, R. A. (2014) in the paper „Can banks individually create money out of nothing? The theory of endogenous money and the empirical evidence" discusses the theory of endogenous money and how banks can create money. This provides empirical evidence supporting the theory that banks can create money independently of private saving.

Recent research of Grimm, U., & Schmidt, T. (2023) examines how monetary policy affects bank lending in Germany and shows in what way the monetary policy induces a major influence on bank lending of corporations, with contractionary policies reducing loan volumes.

The study of Ille, S., & Giombini, G. (2023) analyzes the impact of central bank acquisitions of assets in influencing bank lending in the euro area and finds that central bank asset purchases increase bank lending by improving banks' balance sheets.

Regarding bank lending to Romanian companies, the specialized literature is reflected in the references below.

Drăgoi, et al. (2023) examine the impact of the National Bank of Romania's monetary policy during the Covid-19 pandemic on bank lending. The research confirms "that the increasing bank lending channel for global monetary policy was active during the pandemic crisis" (Drăgoi, et al., 2023).

Verga, G., and Vasilcovschi, N. (2019) examine how the monetary authority of Romania affects interbank interest rates and their subsequent influence on bank lending. They identify that the monetary policy rate and the liquidity available to banks are essential factors in the movement of interbank rates.

Badea, C., & Popescu, D. (2018) in their paper titled „The Impact of Monetary Policy on Bank Lending in Romania: An Empirical Analysis" conduct a data-driven examination of the impact of monetary policy on bank lending in Romania, showing that changes in monetary policy significantly influence bank lending practices.

Another study by the same authors, Popescu, D., and Badea, C. (2017), utilizes panel data in their analysis and their findings suggest that changes in monetary policy have a significant influence on bank lending.

In the paper „The Influence of Monetary Policy on Bank Lending in Romania", Mănescu, A., & Mănescu, D. (2016) explores how monetary policy influences credit allocation in Romania. The study demonstrates that monetary policy has a direct effect on the availability and cost of bank loans.

Ionescu, R., and Popescu, D. (2015) carried out a study employing time-series analysis to reveal the importance of monetary policy decissions on bank lending in Romania. Their findings reveal that changes in monetary policy have a significant effect on bank lending practices.

Petrescu, M. and Popescu, D. (2014) examine how monetary policy influences bank lending in Romania, using empirical data to analyze the relationship between policy changes and lending practices. Similar results was achieved by the authors Badea, C., & Popescu, D. (2013) in their paper titled „The Impact of Monetary Policy on Bank Lending in Romania: A Panel Data Approach" using panel data to analyze the influence of monetary policy on credit allocation in Romania.

3. Research methodology

The methodology employed involves an econometric analysis using panel data from National Bank of Romania and the National Institute of Economic Statistics over the period December 2019 – September 2024. Key variables such as monetary policy interest rate, inflation rate, money supply, and credit growth are examined.

To present an econometric equation of linear relationship between the dependent variable (loans granted to companies expressed in RON - CLC) and the independent variables (monetary policy interest rate - RDPM, inflation rate - RI and money supply - MM), we can formulate a multiple linear regression equation.

$$CLC = \beta_0 + \beta_1 \times RDPM + \beta_2 \times RI + \beta_3 \times MM + \varepsilon$$

where: CLC = value of loans granted to companies expressed in RON (dependent variable); RDPM = monetary policy interest rate; RI = inflation rate; MM = money supply; Beta0 = intercept (constant); Beta1, Beta2, Beta3 = regression coefficients for each independent variable; g = error term (residual).

The next step involved data exploration and cleaning by examining the data to identify and treat missing values or anomalies, as well as performing descriptive analysis to understand the

distributions and preliminary relationships between variables as to be seen in Fig.1. Based on these actions, the model specification was carried out, i.e. the clear definition of the regression equation and the choice of independent and dependent variables.

Figure 1: Definition of the regression equation using statistical software R

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Call:
lm(formula = CLC ~ RDPM + RI + MM, data = Book1)
Residuals:
    Min         1Q        Median      3Q          Max
-1.522e+09 -6.289e+08 -5.465e+06  4.629e+08  1.589e+09
Coefficients:
                              Estimate     Std.Error    t value  Pr(>|t|)
(Intercept)                  -1.413e+09   1.089e+09   -1.297   0.200
RDPM                         -2.001e+08   8.272e+07   -2.419   0.019 *
RI                           -1.970e+07   2.595e+07   -0.759   0.451
MM                            1.010e+01   2.374e+00    4.253   8.42e-05 ***
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 795300000 on 54 degrees of freedom
Multiple R-squared:  0.284, Adjusted R-squared:  0.2442
F-statistic: 7.139 on 3 and 54 DF,  p-value: 4e-04
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Source: Authors' own calculation in R software

The estimated regression equation is as follows:

CLC = − 1413000000 − 200100000*RDPM − 19700000*RI + 10.1*MM

Interpretation of coefficients:

If the monetary policy interest rate increases by one unit, then new loans decrease by 200100000. The relationship between the two variables is statistically significant because the probability of accepting the null hypothesis for this relationship is 0.019, lower than 0.05.

If the inflation rate increases by one unit, new loans decrease by 19700000. The relationship between the two variables is not statistically significant, so we cannot say that the inflation rate influences new loans.

If the broad money supply increases by one unit, new loans increase by 10.1. The relationship between the two variables is statistically significant so we can rely on the relationship between the two variables.

The intensity of the relationship between the variables is 28.4%. The adjusted coefficient of determination is 24.42%. The difference between the two coefficients, the simple and the adjusted one, is quite large so we cannot rely on the constructed model.

As a result, the Inflation Rate (RI) will be eliminated and the new model is as follows:

Figure 2: Definition of the new regression equation using statistical software R

Call:

lm(formula = CLC ~ RDPM + MM, data = Book1)

Residuals:

Min	1Q	Median	3Q	Max
-1.460e+09	-5.649e+08	4.792e+07	4.706e+08	1.600e+09

Coefficients:

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	-1.509e+09	1.078e+09	-1.401	0.16696
RDPM	-2.193e+08	7.845e+07	-2.795	0.00713 **
MM	1.016e+01	2.364e+00	4.299	7.08e-05 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 792200000 on 55 degrees of freedom

Multiple R-squared: 0.2763,   Adjusted R-squared: 0.25

F-statistic: 10.5 on 2 and 55 DF, p-value: 0.0001371

Source: Authors'own calculation in R software

We will compare the two regression models using the ANOVA (Analysis of Variance) procedure.

Figure 3: Analysis of Variance

Model 1: CLC ~ RDPM + MM

Model 2: CLC ~ RDPM + RI + MM

Res.Df	RSS	Df Sum of Sq	F Pr(>F)
1	55	3.4518e+19	
2	54	3.4153e+19	1 3.645e+17 0.5763 0.4511

Source: Authors'own calculation in R software

The null hypothesis is that the simpler model is adequate, and the alternative hypothesis is that the more complex model is better. If the p-value is small (typically less than 0.05), we reject the null hypothesis and conclude that the complex model provides a significantly better fit (GeeksforGeeks, 2024).

Since in our case p value = 0.4511 is greater than the 0.05 significance threshold, we will accept the null hypothesis which says that the simpler model, without the inflation rate, is better.

Descriptive statistics

The mean value of 3.316 billion lei indicates the average size for loans contracted by non-financial companies over the observed period December 2019 – September 2024, with individual values ranging between 1.651 billion lei and 5.497 billion lei. The standard deviation of 914.8 million lei suggests moderate variability in loan amounts, showing that the values are approximatively normal distributed around the mean.

The monetary policy investment rate indicates the interest rates set by monetary authorities. The mean rate of 4.129% suggests that, on average, in period December 2019 – September 2024 the policy stance leaned toward moderate rates. However, the range from 1.25% to 7% reflects significant policy fluctuations over time. The high standard deviation (2.515%) reinforces the observation of considerable variation, which could be tied to changes in economic conditions or monetary policy adjustments.

The average value of 563.98 million lei for broad money supply shows the typical size of this variable during the period December 2019 – September 2024. The range between 419.53 million lei and 698.24 million lei suggests substantial variation in monetary conditions. However, the standard deviation (83.47 million lei) indicates that, while fluctuations exist, the majority of values are relatively close to the mean.

Table 1: Descriptive statistics

Variable	Minimum	Maximum	Mean	Standard deviation	N
New loans contracted by non-financial companies	1651000000	5497000000	3316000000	914784050	58
Monetary policy investment rate	1.250	7.000	4.129	2.515	58
Broad money supply	419528785	698237447	563984133	83472851	58

Source: Authors'own calculation in R software

We want to determine the relation between the number of new loans contracted by non-financial companies, monetary policy investment rate and money supply (in broad sense). We will develop a linear regression model. We can see the results for the model in Table 2.

The constant represents the predicted value of new loans when all independent variables are zero. While this value is negative, it has a high standard error, suggesting low statistical significance. This result is less relevant for interpretation since the zero levels of the predictors may not be realistic in this context.

This negative coefficient for variable money policy investment rate indicates that a one percentage point increase in the monetary policy investment rate is associated with a decrease of 219.3 million lei in new loans contracted by non-financial companies, holding other factors constant. The result is statistically significant, implying that changes in interest rates have a substantial impact on loan amounts.

The positive coefficient of broad money supply suggests that for every 1 lei increase in the broad money supply, new loans increase by 10.16 lei, holding other factors constant. This strong statistical significance highlights the critical role of liquidity in the economy in driving new lending.

The F-statistic indicates the significance of all independent variables on dependent variable. A value of 10.5 suggests the model is statistically significant overall, meaning that at least one of the predictors is meaningfully related to the dependent variable.

The R^2 value of 0.2763 implies that approximately 27.63% of the variation in new loans is explained by variation of monetary policy investment rate and broad money supply. While this indicates small explanatory power, a large proportion of the variability remains unexplained, suggesting other factors might also influence new loans contracted by non-financial companies.

Table 2: Simple linear regression that predicts new loans contracted by non-financial companies

Variable	Model
Constant	-1509000000 (1078000000)
Monetary policy investment rate	-219300000** (78450000)
Broad money supply	10.16*** (2.364)
F-statistic	10.5
R2	0.2763
N	58

Notes: *p<0.05; **p<0.01; ***p<0.001

Source: Authors' own calculation in R software

4. Conclusions and discussions

The data reflects key financial and monetary indicators observed over period December 2019 – September 2024. The variability in each variable, as it is evidenced by the standard deviations, suggests dynamic changes in the financial landscape, influenced by macroeconomic conditions, policy decisions, and external economic factors. These insights are crucial for understanding monetary policy effectiveness, loans trends, and liquidity in the economy.

This regression model highlights that an increase in monetary policy rates significantly reduces new loans, likely reflecting higher borrowing costs and also that an increase in broad money supply significantly boosts new loans, underscoring the importance of liquidity in fostering lending activity.

While the model is statistically significant, the relatively low R^2 suggests that additional variables or factors might be included to improve explanatory power. This model offers valuable insights for policymakers aiming to balance interest rate policy and monetary supply to influence loans trends.

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