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INTERDEPENDENCE OF MACROECONOMIC ENVIRONMENT AND CREDIT RISKS IN CROATIA

Abstract

Purpose: The relationship between the macroeconomic environment and banking risks is one of the basic conditions for the stability of the state financial system. The purpose of this paper is to show the interdependence between the macroeconomic environment and the financial system, i.e., to highlight the importance of various macroeconomic factors and their impact on the banking system in Croatia.

Methodology: Statistical data for the period from 2010 to 2022, obtained from publicly available databases, are analysed. Correlation analysis was performed to determine the intensity and direction of the relationship between macroeconomic and banking variables. Regression analysis was conducted to determine if macroeconomic variables could explain some of the changes in banking variables.

Results: The results of the analysis show a significant correlation between the macroeconomic variable unemployment rate and all banking variables, as well as between the macroeconomic variable inflation rate and the banking variables: non-performing loans (NPL) and bank loans. Gross domestic product (GDP) is not correlated with any of the observed variables, which is a very interesting result. The unemployment rate is the predictor that is significant for all banking variables, while the inflation rate is the predictor that is significant only for non-performing loans.

Conclusion: The conducted analyses show that economic development plays a role in the business policies of banks. These results can be particularly useful for bank management and the government, as they provide all stakeholders with important information about the role of macroeconomic policies of financial institutions in Croatia and, consequently, the Croatian economy.

Keywords: Macroeconomic variables, banking variables, banking risk, regression analysis

1. Introduction

The performance of the banking system depends on the impact and direction of macroeconomic ag-gregates. Stability problems in banking can be trig-gered by various factors, but most often they are caused by a combination of macroeconomic insta-

bility in the environment and weak business profitability (Miletić, 2008).

In a stable macroeconomic environment, banks operate with positive financial results, while in a situation with unfavourable or unstable macroeconomic trends, when the economy faces recession and high real interest rates, banks face losses due to loan repayment problems.

An increase in GDP, as one of the components of economic growth, should have a positive impact on bank profitability. Inflation can have a positive or negative impact on profitability, depending on the ability of bank management to efficiently manage the bank's funds under inflationary conditions. A decline in financial indicators triggered by the instability of the macroeconomic environment leads to an increase in the share of non-performing loans in bank balance sheets, which in turn affects bank profitability and the level of capital adequacy.

According to Miletić (2008), macroeconomic instability, i.e., high and variable interest rates, sudden upturns and downturns in economic activity, and unsustainable fiscal and foreign positions are the most obvious and direct macroeconomic factors that negatively affect the allocation of funds and cause price fluctuations. Negative trends in macroeconomic aggregates directly or indirectly affect the quality of the banking system. The profitability and stability of the financial system depend on each individual financial institution and its internal organisation, but also on macroeconomic trends.

In recent banking literature, Sovilj (2020), Lazić (2020), Antoun et al. (2021), Gregoriou et al. (2021) have analysed the relationship between the business cycle and credit risk (the so-called cyclicality of credit risk) for the needs of macro-financial stability and for micro-risk management. Since the potential impact of economic trends on bank portfolios is important for predicting and preventing bank instability under adverse economic conditions, as well as for planning potential risks within banks, this paper examines the impact of macroeconomic trends on credit risk in commercial banks. Therefore, the following hypothesis was formulated: "Macroeconomic trends affect credit risk in commercial banks."

The main objective of this paper is to identify the interdependence between the macroeconomic environment and the financial system, that is, to show the importance of various macroeconomic factors

and their impact on the banking system. Statistical data are analysed for the period from 2010 to 2022 to cover the period before, during and after the financial crisis. The sources include the databases of the Croatian National Bank (CNB) and of the Central Bureau of Statistics. In order to determine the intensity and direction of the relationship between macroeconomic variables (gross domestic product - GDP, inflation rate, unemployment rate) and banking variables (non-performing loans - NPL, interest rate margin, loans), time series analysis and correlation analysis were performed. Regression analysis was performed to determine whether the macroeconomic variables can explain part of the changes in the banking variables.

The paper is organised as follows: After the introduction, the second section reviews previous empirical research on the relationship between economic growth and the financial system. The third section explains the sample and the methods used. The fourth section presents the results of the study, and the last section concludes the paper.

2. Theoretical and conceptual background

Previous research on the relationship between macroeconomic factors and the financial system, with a focus on the banking system, presented in this paper includes the work of Levine (1997), Granville & Mallick (2009), Castro (2013), Agnello & Sousa (2013), Ashraf & Shen (2019), Karadima & Louri (2021), Tran et al. (2021), and other authors who have studied the relationship between macroeconomic variables such as GDP, inflation, unemployment rate, and financial system stability.

Numerous hypotheses assume that financial factors cause economic changes (Goldsmith (1969); McKinnon (1973); Huang & Lin (2009)) and they have therefore been the subject of numerous analyses. Danisman et al. (2020) analysed the interaction of economic policy and the banking system and its impact on credit growth. The analysis used a sample of 2,977 private and listed banks in the EU-5 countries (the United Kingdom, Germany, Spain, Italy, and France) in the period from 2009 to 2018. The paper examines economic policy uncertainties and their impact on credit growth. The results suggest that economic policy uncertainty is a drag on European banks' credit growth. The negative effect of economic policy uncertainty on loan growth in-

creases with debt maturity and weakens for banks with a larger number of employees.

Karadima & Louri (2021) examined the impact of economic policy instability on NPL growth in banks. In their study, the authors analysed data from 507 banks in four major Eurozone economies (France, Germany, Italy, and Spain) from 2005 to 2017. They found that uncertain economic policies have a positive effect on NPLs, but the effect decreases significantly in countries with higher bank concentration. Sporta (2018) confirmed the interdependence of financial performance and capital adequacy. Correlation and panel regression analyses revealed that NPLs have a significant impact on commercial banks' asset quality. The results of the study suggest a positive relationship between poor bank asset quality and poor financial performance, indicating the need to set additional guidelines for banks to prevent the proportion of non-performing loans.

Using bank-level data in 19 major economies, Hu & Gong (2019) examined theories of bank lending, economic policy uncertainty, and national prudential regulations. They found that economic policy uncertainty significantly inhibits growth, but the effect varies across banks. In particular, the negative effect of economic policy uncertainty on loan growth is bigger for large and riskier banks, while it is smaller for liquid and diversified banks. Moreover, the impact of volatile economic policies on bank lending depends crucially on national prudential regulations, so the negative effects appear to be mitigated by macro- and microprudential measures.

The impact of economic instability on bank risk was studied by Wu et al. (2020). They used bank-level panel data from 1,500 banks in 34 developing countries from 2000 to 2016 and found consistent and strong evidence that bank risk increases as economic uncertainty increases. They also examined the mechanisms through which economic uncertainty affects bank risk, and presented evidence that the relationship between uncertainty and bank risk is due to the option value of wait-and-see, return strategies, and bank behaviour rather than various side effects.

Mahmood et al. (2019) examined the effect of external factors on bank liquidity in the period from 2000 to 2017. In their analysis, they used macro-specific factors: GDP, inflation, monetary policy and unemployment, and for banking factors they used banking crises, bank size, total deposit and bank profitability. The results of the analysis reveal that macroeconomic factors significantly affect bank liquidity. Empirical results show that total deposits, GDP, bank size and unemployment have a negative effect on bank liquidity, while monetary policy, banking crisis and profitability have a positive effect on liquidity. Inflation has an insignificant relationship with liquidity.

Klein (2013) explains in his work that the level of problem loans can be attributed to macroeconomic conditions and bank-specific factors. While NPLs are found to respond to macroeconomic conditions, such as GDP growth, unemployment and inflation, the analysis also shows that there is a strong feedback loop between the banking system and the real economy, suggesting that a high proportion of NPLs in many CESEE countries has a negative effect on the pace of economic recovery.

Analysing a sample of data collected in 75 countries, Beck et al. (2013) confirm that the following variables produce an effect on NPL ratios: real GDP growth, stock prices, exchange rates and interest rates on loans.

By analysing quarterly data from banks in the euro area for the period from 1990 to 2015, Dimitrios et al. (2016) found that macro variables such as the unemployment rate and economic growth are interconnected. In addition, bank-specific variables related to management within banks affect the future movement of NPLs.

Ashraf & Shen (2019) use the economic policy uncertainty index to analyse bank-level data from 17 countries for the period from 1998 to 2012 and find that state-level economic policy uncertainty has a significant positive relationship with gross bank loans. More specifically, a one standard deviation increase in the economic policy uncertainty index leads to a 21.84 basis point increase in average interest rates on gross bank loans. It can be assumed that economic policy uncertainty increases the price of bank loans, thereby increasing the risk of loan default. The results suggest that government economic policy uncertainty is an economically important risk factor in the pricing of bank loans.

3. Methodology

Following the authors who have studied the relationship between macroeconomic variables and the financial system, including Messai et al. (2015), Ahmad et al. (2016), Mazreku et al. (2019), Levine (1997), Granville & Mallick (2009), Castro (2013), and Agnello & Sousa (2013), and others, empirical analysis was conducted of selected macroeconomic and banking variables: NPL, GDP, inflation, interest rate trends, bank loans trends, and unemployment rate.

In order to achieve the intended goal, variables from publicly available databases on the business activity of banks in Croatia in the period 2010 to 2022 were used in the analysis, as well as the trends in macroeconomic variables in the period 2010 to 2022. The sources include the Croatian National Bank (CNB) and the Central Bureau of Statistics databases. Data were collected for the period from 2010 to 2022 to cover the period before, during and after the financial crisis. This quantitative information is based on independent and dependent factors that reveal the banking, industrial and macroeconomic determinants of banking system profitability in Croatia.

For the purpose of analysis in the category of macroeconomic variables, the following variables were used:

- gross domestic product (GDP),
- inflation rate, and
- unemployment rate.

In the category of banking variables, the following indicators were used:

- share of NPLs in the total bank loans,
- trend in the interest rate margin, and
- trend in bank loans.

The data on GDP trends and the relation to the previous quarter were taken from the Central Bureau of Statistics database. For the analysis, the quarterly changes in the trend of GDP compared to the previous quarter are presented. The data on the trend of inflation on a quarterly basis were taken from the website of the Central Bureau of Statistics.

Data on the trend of the unemployment rate were taken from the website of the Croatian Bureau of Statistics, also on a quarterly basis.

Data on the trend of NPLs over the years were taken from the CNB official online statistical database on the trend of partially and fully recoverable loans relative to total loans (data available from 2008 to 2016). Data on the ratio of NPLs to total loans for the period from 2016 to 2022 were also taken from the CNB official website (the methodology changed). Quarterly NPL trends by year were used for data analysis.

A variable bank loan is a financial asset in the form of granted loans, debt instruments and other receivables, classified by a credit institution into categories of financial instruments, in accordance with its business policies, and according to the International Accounting Standard 39 Financial Instruments: Recognition and Measurement (hereinafter: IAS 39). Data on bank loan trends were obtained from the CNB official online statistical database on monetary and credit aggregate trends. Loan trends are reported on a monthly basis, and only quarterly figures are used for this analysis. The calculation was made by averaging the absolute monthly amounts.

The interest rate margin also affects bank liquidity. For the analysis in this paper, the differences in interest rates for newly approved loans and deposits were used.

After calculating the quarterly margin indicators, the changes in the margin compared to the previous quarter were calculated for the analysis of the interest margin. Data on changes in interest rates on loans and deposits were taken from the database on the CNB website.

To determine the intensity and direction of the relationship between macroeconomic variables (GDP, inflation rate, unemployment rate) and banking variables (NPL, interest rate margin, loans), time series analysis and correlation analysis were performed. Regression analysis was performed to determine if the macroeconomic variables could explain some of the changes in the banking variables. Data analysis was performed using Microsoft Office Excel and the statistical software IBM SPSS (Statistical Package for Social Sciences).

3.1 Empirical data and analysis

The movement of selected macroeconomic variables, i.e., GDP, inflation and unemployment rate in Croatia by quarters from 2010 to 2022, is shown in Figure 1. Observing the movement of the aforementioned variables in the mentioned period and comparing the individual movements gives a detailed insight into possible relationships between the individual variables and their movements.

Figure 1 Movement of macroeconomic variables in Croatia by quarter (from 2010 to 2022)
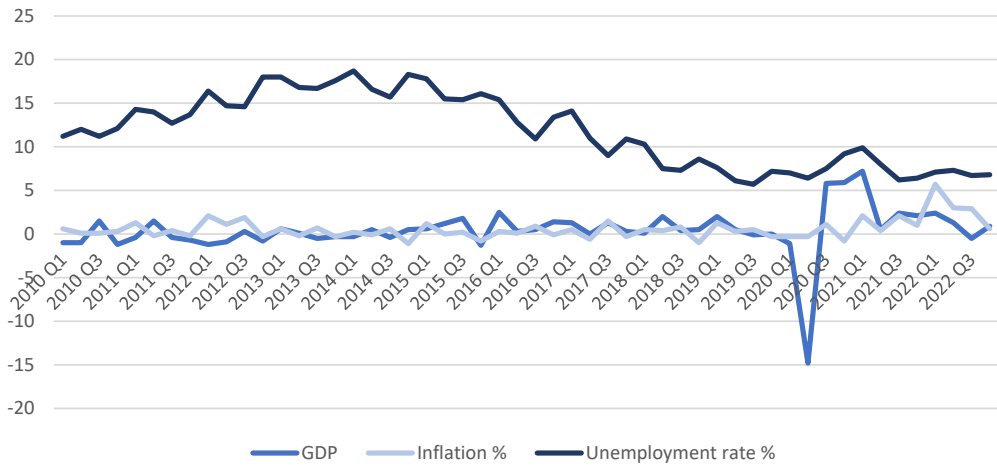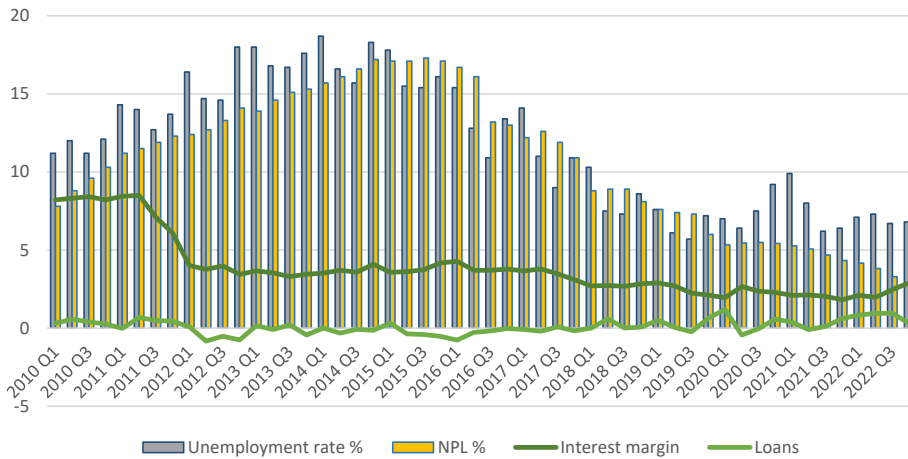

Source: Authors, 2023

A more significant deviation from the trend for all three variables was recorded in the last quarter of 2010 - a negative GDP growth rate (-1.2%), a 12.1% increase in the unemployment rate, and a 0.3% increase in inflation. After 2010, the unemployment rate recorded an upward trend (with minor deviations) and peaked in the first quarter of 2014 (18.7% growth). After 2014, a downward trend was recorded, and in the third quarter of 2019, a decrease of 5 percentage points in the unemployment rate was observed. Regarding inflation trends, the highest growth rate was recorded in the first quarter of 2012 at 2.1%, while the lowest inflation rate was measured in the fourth quarter of 2014, after the economic recovery from the global crisis. From 2014 to 2020, the inflation rate shows a relatively steady trend before rising sharply in the third quarter of 2021 and reaching its highest level in the last decade in 2022. After the third quarter of 2010, minor deviations in the movement of GDP were recorded until the first quarter of 2016, when GDP fell by 2.5%. The most significant drop was recorded in 2020, when it fell by 14.8% due to the coronavirus pandemic, but by the end of Q1 2021 it recorded the highest growth of the last decade, at 7.2%. Due to COVID-19 in 2020, many countries had to take measures to limit economic activity, and the movement of people affected quarterly national accounts aggregates and the quality and availability of many data sources commonly used to assess gross domestic product (GDP). The data show that the pandemic had a strong impact on the slowdown of the Croatian economy in 2020. In fact, 2020 was characterised by the implementation of a series of measures aimed at preserving economic activity and, in particular, measures aimed at preserving jobs due to developments in the labour market that did not follow a sharp decline in the level of overall production. This, of course, had a significant negative impact on public finances and movement of public debt in Q1, Q2 and Q3 2020. GDP growth in Q3 and Q4 2020 is partially the result of the weakening of restrictive measures caused by COVID-19 and the structure of the Croatian economy. In Croatian GDP, tourism has a major impact on the movement of GDP, which had a positive effect on the movement of GDP in Q3 2020 (Croatian Chamber of Economy, 2021). In Q4 2020 and Q1 2021, the continuation of the positive GDP growth trend was partially caused by the measures taken by the European Union to stimulate the stability of the Croatian economy.

In parallel with the movement of the macroeconomic variables over time, a time series for the movement of the banking variables was created for the same period, i.e., from 2010 to 2022, which can be seen in Figure 2.

Figure 2 Movement of banking variables and unemployment in Croatia by quarter (from 2010 to 2022)

Source: Authors, 2023

In the last quarter of 2010, significant trend deviations were observed for all four variables, especially for NPL. Since 2010, there has been an increase in NPL, with a peak in the third quarter of 2015, followed by a downward trend that is still ongoing.

In the third quarter of 2011, a significant movement of the interest rate margin in the negative direction was recorded. The main cause of an imbalance in interest rates in 2011 is the result of a sharp increase in the interest rate on kuna deposits (HRK, Croatian currency) in 2009, when the average interest rate was 9%. The consequence of this rapid increase is a reaction to the crisis that began. The deterioration of the international and domestic macroeconomic environment due to the impact of the global financial crisis had a significant impact on financial stability in 2009. To prevent the withdrawal of deposits, banks were forced to raise interest rates. These high interest rates remained in effect until the 3rd quarter of 2011.

In 2009, bank lending reached 4%, the lowest level in recent years. This is not shown in Figure 2, but it is important because it explains the movement of the variable in the coming years. After 2009, the volume of bank loans increased, as did the other observed variables. The positive trend continued until the end of the third quarter of 2015, and after 2015 it turned into a negative trend, which was also observed in the last quarter of 2019. The period from

2009 to 2015 was characterised by an economic crisis, and the demand for liquid assets was high. As of 2016, demand for bank placements decreased due to deleveraging after the Great Crisis, while the period after 2019 saw a sharp decline in interest rates, which led to an increase in investment and, consequently, an increase in placements.

Linear movements of the unemployment rate and the NPL shown in Figure 2 are fully aligned. An increase in the unemployment rate reduces liquidity and thus increases non-performing loans on bank balance sheets.

In his paper, Sam (2014) observed a relationship between the federal funds rate, business confidence, and unemployment. Reduced business confidence and a reduced federal funds rate contribute to higher unemployment rates. Reducing the unemployment rate can help businesses hire more employees, starting with lower interest rates on loans. This implicitly leads to an increase in the volume of loans granted to businesses (Hashima et al., 2021).

When unemployment is high, the population has liquidity problems, which limits bank lending. Banks do not have enough creditworthy customers because unemployment is high. Monetary policy, together with policymakers, play a dominant role in controlling the interest rate on loans, the volume of NPLs and the unemployment rate (Nițescu &

Anghel, 2023). Unemployed people are insolvent because they do not have regular income and therefore do not meet the basic criteria for borrowing, i.e., they lack creditworthiness, which is the basis for repaying the borrowed funds. Therefore, when unemployment is high, bank lending is restricted, leading to a decrease in bank loans.

4. Results

Correlation analysis was performed for the macroeconomic variables (gross domestic product - GDP, inflation rate, unemployment rate) and the banking variables (non-performing loans - NPL, interest rate margin, loans) described in the previous chapter and presented in Table 1 using descriptive statistics, as can be seen in Table 2.

Table 1 Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
GDP	52	-14.800	7.200	.448	2.764
Inflation rate	52	-1.100	5.700	.587	1.162
Unemployment rate	52	5.700	18.700	11.815	4.115
NPLs	52	3.010	17.300	10.652	4.463
Interest rate margin	52	1.817	8.497	3.838	1.904
Bank loans	52	-.830	1,190	.090	.457

Source: Authors, 2023

The gross domestic product size is not significantly correlated with any of the observed banking variables. The Pearson coefficients show that there is a statistically significant positive relationship between the variable "unemployment rate" and the variables "NPL" ($r = .890$, $p < .001$) and "interest rate margin" ($r = .361$, $p < .01$). This means that an increase in the unemployment rate leads to a significant increase in the NPL, but also in the interest rate margin. On the other hand, there is a statistically significant negative relationship between the variable "unemployment rate" and the variable "loans" ($r = -.477$, $p < .001$). This means that an increase in the unemployment rate leads to a significant decrease in loans. According to the Pearson coefficient, there is a statistically significant negative relationship between the variable "inflation rate" and the variable "NPL" ($r = -.385$, $p < .01$) and a statistically significant positive relationship between the variable "inflation" and the variable "loans" ($r = .335$, $p < .05$). This means that an increase in the inflation rate leads to a significant decrease in NPL but an increase in loans.

Table 2 Illustration of correlations between macroeconomic and banking variables

Variables	NPLs	Interest rate margin	Loans	GDP real growth rates	Inflation	Unemployment rate
Interest rate margin	.280*					
Loans	-.604***	.031				
GDP real growth rate	-.079	-.142	.221			
Inflation	-.385**	-.202	.335*	.218		
Unemployment rate	.890***	.361**	-.477***	-.050	-.290*	

Statistical significance: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Source: Authors, 2023

Regression analysis was performed to determine whether macroeconomic variables can explain some of the changes in the interest rate margin, bank loans, and NPLs. To meet the assumptions

for calculating regression analysis, the collinearity results (tolerance and the variance inflation factor) were checked and they were within acceptable values. The tolerance values ranged from .874 to .952 (according to the general rule, the assumption of collinearity of independent variables is violated when the tolerance indicator is less than 0.2 (Horvat & Mijoč, 2019)), whereas the variance inflation factor values ranged from 1.050 to 1.444 (according to the general rule, the assumption of collinearity of independent variables is violated when the variance inflation factor is greater than 10 (Horvat & Mijoč, 2019)). Although the value of the Durbin-Watson indicator depends on the number of independent variables in the model, according to the general rule, values below 1 and above 3 are assumed to indicate a violated assumption (Field, 2018). Testing the assumption about the correlation of the residuals using the Durbin-Watson criterion yielded an acceptable result of 1.20.

Three analyses were conducted in which the predictor variables were the unemployment rate, the movement of gross domestic product and the inflation rate, while the criterion variables were NPLs, bank loans, and interest rate margins (Table 3).

Table 3 Overview of the regression analysis results

	Model 1	**Model 2**	**Model 3**
	Interest rate margin	**NPLs**	**Bank loans**
GDP	-.107 (.094)	-.007 (.104)	.161 (.021)
Inflation rate	-.083 (.233)	-.137* (.258)	.179 (.051)
Unemployment rate	.331* (.064)	.850*** (.071)	-.418** (.014)
R^2	.151	.900	.543
Adjusted R^2	.098	.798	.295
F	2.852*	68.251***	6.693***

Statistical significance: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$. Standard errors are reported in parentheses.

Source: Authors, 2023

Model 1 examined the relationship between the criteria and the predictors to determine the extent to which changes in the predictors (GDP, inflation rate and unemployment rate) affect changes in the criterion (interest rate margin). A significant regression equation was found ($F(3, 48) = 2.852$, $p < .05$), with an R2 of .151. Data analysis yields a coefficient of determination of 0.151, which means that 15.1% of the variance in the interest rate margin can be explained by the variability of the predictors included in the model. The remaining variability in the criterion is likely to be explained by other factors not included in this model. The predictor found to be significant is the unemployment rate ($\beta = .331$, $p < .05$). There is a statistically notable relationship between the unemployment rate and the interest rate margin, which in turn means that there is a positive linear relationship between the unemployment rate and the interest rate margin. Specifically, for every unit by which the unemployment rate increases, the interest rate margin increases by 0.331 units, holding all other variables in the model constant. The other variables in the model do not contribute significantly to the interest rate margin. This could mean that when the unemployment rate increases, demand for loans is also lower. However, banks could respond by raising the interest rate, which would probably widen the interest rate margin compared with the period prior to the lower unemployment rate.

Model 2 examined the relationship between the criteria and the predictors to determine the extent to which changes in the predictors (GDP, inflation rate and unemployment rate) affect changes in the criterion (non-performing loans – NPL). A significant regression equation was found ($F(3, 48) = 68.251$, $p < .001$), with an R2 of .810. The analysis indicates a very high coefficient of determination, that is, 81% of the variance of non-performing loans can be

explained by the unemployment rate, the level of gross domestic product and inflation. The remaining 19% of the NPL variance remains unexplained in this model. Observing the independent contributions of individual variables, the inflation rate and the unemployment rate are significant predictors. A smaller but significant contributor to the inability to pay loans is the inflation rate (β = -.137, p < 0.05), implying that there is a negative linear relationship between inflation and NPL. Specifically, each one-unit increase in the inflation rate is associated with an expected 0.0137-unit decrease in the value of the NPL. On the other hand, as expected, the unemployment rate is a positively significant predictor and also the highest predictor in this model (β = 0.850, p < .001), which in this case means that the non-performing loan rate increases by 0.850 units when the unemployment rate increases by one unit. This result is quite expected given that the inability to repay the loan is likely indicative of a permanent income loss.

Model 3 examined the relationship between the criteria and the predictors to determine the extent to which changes in the predictors (GDP, inflation rate and unemployment rate) affect changes in the criterion (bank loans). A significant regression equation was found ($F_{(3, 48)}$ = 6.693, p < .001), with an R2 of .295. The results of the analysis show that the coefficient of determination is 0.295, which means that the independent variables (unemployment rate, GDP and inflation) explain 29.5% of the variance of bank loans in the market, while the remaining 70.5% of the variance is not explained by these variables. Looking at the independent contributions of each variable, only the unemployment rate is a significant predictor (β = -.418, p < .01). The beta weight for the unemployment rate is -0.418, indicating that there is a negative relationship between the unemployment rate and bank loans in the market. When the unemployment rate is higher, bank loans in the market will be lower, while a decrease in the unemployment rate will lead to an increase in bank loans. In addition, a beta weight of -0.418 means that bank loans change by 0.418 units for every one-unit increase in the unemployment rate.

5. Discussion and conclusion

To investigate the economic relationship between macroeconomic and banking variables, various estimates were conducted. The short- and long-term dynamics of active and passive interest rates, the movement of NPLs and bank loans, and the impact of movements in the inflation rate, GDP and unemployment rate on the business policies of banks in Croatia were examined. The aim of this paper was to show the interdependence between the macroeconomic environment and the financial system, i.e., to highlight the importance of various macroeconomic factors and their impact on the banking system in Croatia.

The analyses conducted show that some economic trends play an important role in the bank business policies. Of the total six indicators used, the empirical model showed a relationship between economic trends and the financial system for five variables. The results of the analysis show a significant correlation between the macroeconomic variable unemployment rate and all banking variables (NPL: r = .890, p <.001; interest rate margin: r = .361, p <.01; loans: r = -.477, p <.001), and between the macroeconomic variable inflation rate and the banking variables: NPL (r = -.385, p < .01) and loans (r = .335, p < .05). These findings are aligned with previous research, such as the studies of Makri et al. (2014), Beck et al. (2013), and Dimitrios et al. (2016). One macroeconomic variable, GDP, has no influence on the bank policy. None of the banking variables showed a relationship with the GDP movement which is a very interesting discovery. These findings are not aligned with previous research, such as the studies of Ashraf & Shen (2019), Castro (2013), and Mahmood et al. (2019), which examined the relationship between macroeconomic variables and the financial sector and found that GDP is an important influencing variable. In this work, no correlation was found between the movement of GDP and the movement of the banking variables. The unemployment rate is the predictor that is significant for all banking variables (interest rate margin: β = .331, p < .05; NPL: β = .850, p < .001; loans: β = -.418, p < .01), while the inflation rate is the predictor that is significant only for non-performing loans (β = -.137, p < .05).

In this analysis, no direct relationship was found between GDP movements and banking variables. This implies that internal bank policy is more likely to be affected by changes in inflation and unemployment rates than by GDP movements. Other factors like unemployment and inflation have a direct impact on bank operations, while GDP has an indirect impact through the unemployment rate and lower

economic activity, which leads to constraints on the provision of new bank loans and margins.

Since the GDP formula is composed of private consumption, gross private investment, government investment, government spending, and exports and imports, it stands to reason that all of these variables should affect banking. Whether all GDP variables or only some of them have an impact on banking variables is beyond the scope of this study. The question is how large should the variation in any one GDP variable be and how long (how many quartiles or years) it takes to affect the banking variables. This could be a recommendation for further research.

The analyses conducted show that economic development plays a role in bank business policies. The macroeconomic indicators discussed influence both the business policy of banks and the stability of the financial system. Positive, stable macroeconomic development creates financial security. In a stable economy, commercial banks, driven by the desire to maximise profits, will pursue an expansionary credit policy to increase bank assets. Due to the increased demand for credit, the expansionary credit policy leads to a decline in interest rates, which has a positive effect on investment growth and boosts economic activity, especially investment.

The analysis conducted in this paper shows that credit risk on bank balance sheets declines when certain macroeconomic conditions improve. This, in turn, helps reduce the stock of non-performing loans (NPLs) on the bank balance sheets, allowing better credit conditions for productive firms and households. Bank profitability creates additional capital, which positively affects the ability to raise additional funds to finance the economy. The success of monetary policy and its impact on real economic development depend on the quality of the credit channel. Changes in monetary policy can af-

fect prices and the availability of credit to the real sector, which directly affects economic growth and development.

The research findings contribute to the theory of the relationship between macroeconomic and banking trends in a broader context and confirm their important role in shaping the country's economic development, in which bank credit risks play a crucial role. The results can be particularly useful for bank management and the government, as they provide all stakeholders with important information on the role of macroeconomic policies of financial institutions in Croatia and, consequently, the Croatian economy. Bank management is recommended to use models for monitoring changes in the development of macroeconomic variables that have a proven direct impact on the banking system when creating and developing tools that lead to an improvement in the functioning of financial institutions and the stability of the financial system. Finally, the reader should keep in mind that the study is somewhat limited due to the specifics of the Croatian banking system, as it is based on a small sample. Future studies could overcome this limitation by using a larger sample that includes more banks from different Eurozone or Central and Eastern European countries. A potential problem with such an analysis is the wide range of comparable data that must be collected from many different sources for many different countries for which data are often not publicly available.

It would also be interesting to investigate in further research whether, conversely, changes in bank business policies affect economic development, i.e., to what extent banks as the main actors in the Croatian financial market can influence changes in macroeconomic variables with their business policies. For the purposes of analysis, it is advisable to observe the variables over a longer period of time before, during and after the economic crisis.

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