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NON-PERFORMING LOANS AND ECONOMIC GROWTH IN SOUTHEAST EUROPE

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Abstract: *The main purpose of this research is to analyze the impact of non-performing loans on the economic growth of Southeast European countries for the period 2012-2022. This research has a sample of 10 countries, part of South-Eastern Europe, which includes countries such as Kosovo, Albania, Montenegro, Macedonia, Romania, Slovenia, Bulgaria, Greece, Croatia, and Bosnia and Herzegovina. The scientific methodology that has been applied in this study is the quantitative method. The data used in the research are secondary data and were generated from official data published by the World Bank and the Kosovo Statistics Agency. Based on the results of this research, we can conclude that the increase in the level of non-performing loans has a negative impact on the economic growth of the countries of Southeast Europe for the period 2012-2022. While there is a positive relationship between the rate of unemployment and GDP, it should be noted that the rate of unemployment, as an independent variable of this research, has turned out to be statistically insignificant. However, there is a positive relationship between inflation and GDP.*

Keywords: *Non-performing loans, GDP, economic growth, lending interest rate.*

1. INTRODUCTION

This study analyzes how non-performing loans influence the economic growth of Southeast European countries during the period 2012–2022. The analysis is based on several key macroeconomic variables, including Gross Domestic Product (GDP), Non-Performing Loans (NPL), the Unemployment Rate (UN), Inflation (INFL), and the Loan Interest Rate (IR). Non-performing loans, also known as bad loans, are loans that indicate the borrowers' inability to repay their debts. In a perfect banking system, each borrower would pay their debts, but this banking system does not exist in reality. Also, during various financial crises, the situation with non-performing loans becomes even more difficult. The level of non-performing loans affects the banking system, and as such, the banking system affects the financial system. Also, the increase in the level of NPLs reduces the profitability of banks because the cost of NPLs is higher than that of ordinary loans, which affects banks ' ability to offer loans to businesses and individuals. The countries included in this research are: Kosovo, Albania, Montenegro, Macedonia, Romania, Slovenia, Bulgaria, Greece, Croatia, and Bosnia and Herzegovina.

Research conducted by Ristevska (2020) explores the problem of non-performing loans in the banking sectors of Southeast European countries following the 2008–2009 financial crisis. The study identifies the main determinants of non-performing loans and evaluates their impact on the broader financial environment. The results indicate that higher profitability is associated with lower levels of non-performing loans, whereas loan growth and the capitalization rate have a positive and statistically significant influence on the NPL portfolio. Whereas the study by Klein (2013) investigates non-performing loans (NPLs) in Central, Eastern, and Southeastern Europe (CEE) over the period 1998–2011. The study concludes that elevated levels of NPLs, which many CEE countries currently face, hinder the pace of economic recovery. Furthermore, NPLs were found to be responsive to macroeconomic indicators, including GDP growth, unemployment, and inflation. The findings of the researchers Tanasković and Jandrić (2015) show a negative correlation between GDP growth and the growth of the NPL ratio. The ratio of foreign currency loans, GDP, and the level of the exchange rate are positively related to the increase in the ratio of non-performing loans (NPL).

2. LITERATURE REVIEW

A research conducted by Gashi, Tafa, and Bajrami (2022) found that annual GDP growth, final government consumption, the real interest rate, gross domestic savings, and the unemployment rate all observed to affect the level of non-performing loans. In the Western Balkans, NPLs have shown a rising trend following the global financial crisis, with the highest levels observed in Serbia and Albania, followed by Montenegro, Bosnia and Herzegovina, and Macedonia, while Kosovo recorded the lowest levels. These patterns highlight the varying credit risk across the region and the need for country-specific banking policies to effectively manage non-performing loans (Tmava, Avdullahi, & Sadikaj, 2018). The findings of the empirical analysis conducted in Turkey show a causal relationship between the volume of domestic credit provided by Turkish banks and non-performing loans. Granger causality tests demonstrate the dual nature of these interactions. According to Erdoğdu (2016), the most important components of economic growth are non-performing loans, GDP at constant prices, public and private sector expenditures at constant prices (PS and PSE), the volume of domestic credit (CV), and total income from interest on loans. Another expectation is that the sub-items of economic growth, NPL, GDP, PE, PSE, CV, and I, are causally related to each other.

A research conducted by Morakinyo and Sibanda (2016) shows that the joint determination of long-term economic growth by non-performing loans (NPL) and other factors, such as bank credit to the economy, gross enrollment in secondary school, the growth rate of government expenditure and the rate of inflation in Nigeria using the bank-based approach, is estimated in this paper using the endogenous growth model. The quarterly data sample covers the years 1998 to 2014. The results of the restricted test imply that these factors and economic growth have long-run co-movements. In the long run, every variable in the model has statistical significance. Economic growth was directly affected by the amount of non-performing loans (NPL) and negatively by bank credit to the economy.

In the case of exchange rates, the direction of the effect depends on the extent of foreign currency lending to vulnerable borrowers, which is particularly high in countries with pegged or managed exchange rates. In the case of stock prices, the impact turns out to be greater in countries that have a large stock market relative to GDP. According **to** Beck, Jakubik, and Piloiu (2013)**,** these results are robust to alternative econometric specifications. However, according to Balgova, Nies, and Plekhanov (2016)**,** the economy benefits in the medium term from the reduction of non-performing loans (NPLs). Moreover, economies that are actively working to resolve non-performing loans (NPLs) perform equally well, although countries that see an inflow of new credit expand faster. Neglecting the issue of NPLs has a negative impact on the performance of the economy.

The purpose of the research by Zhang, Zhang, Zhou, and Zaidi (2020**)** was to identify the links between economic growth, non-performing loans (NPLs), and financial inclusion. Large panel data from 21 Organization for Economic Co-operation and Development (OECD) countries were used for dynamic panel estimation using Driscoll-Kraay fixed-effect standard errors. Their findings showed a long-term correlation between financial inclusion, non-performing loans, and economic growth. Financial inclusion reduces non-performing loans (NPLs), which boosts economic growth. NPLs also have a negative effect on economic growth and financial inclusion. The increase in the level of non-performing loans may have negatively impacted the economy by reducing banks' ability to disburse loans or making them reluctant to extend loans to the productive sector. This study supports established findings that money supply and economic growth are positively related. It also showed that government spending and economic growth in Nigeria are positively related **(**Osunnaiye & Alymkulova, 2022). The results of research conducted in 2014 suggest that the main cause of high levels of NPLs is the economic slowdown, which is evident from statistically significant and economically large coefficients on GDP, unemployment, and the inflation rate **(**Škarica, 2014**).**

NPLs are an essential barometer of the health and fragility of the banking system, and as recent events have shown, they can affect the stability of the economy as a whole **(**Kastrati, 2011**).** Both lenders and borrowers bear the cost of non-performing loans (NPLs), which reduce the availability of

credit, skew credit distribution, erode consumer confidence, and hamper economic expansion. According to Balgova, Nies, and Plekhanov (2016)**,** the economy benefits in the medium term from the reduction of NPLs, and economies that actively resolve NPLs perform well, although countries that see an inflow of new credit expand faster. Neglecting the issue of NPLs harms economic performance. Finally, Algara, Pascual, Polido, and Villareal III (2017**)** found that credit growth and NPLs move inversely, indicating countercyclical behavior, though the effect is not statistically significant. Their results also show strong persistence of NPLs, a positive effect of the real interest rate on NPLs, and a negative effect of the banks' funding structure (non-BSP borrowings to total assets). No structural break was detected in the model's coefficients.

3. META-ANALYSIS

Table 1 presents an overview of the studies examined in this research through a meta-analytic approach. It outlines the essential elements of each study, such as the time frame analyzed, the variables applied, the methodological frameworks, and the main empirical outcomes. By bringing these components together, the table helps illustrate the areas of alignment and divergence among previous studies, as well as the methodological trends within the existing body of literature.

Table 1. Meta-analysis of the paper

Author	Years	Variables	Methods	Findings
(Osunnaiye, A. V., & Alymkulova, N., 2022)	2011-2020	Non-performing loans, economic growth, bank credit to the private sector, money supply, and government spending	Autoregressive Distributed Cointegrated Model (ARDL)	The findings revealed a negative long-term relationship between NPLs and economic growth. This suggests that higher levels of NPLs can constrain economic performance by limiting banks' lending capacity or making them more cautious in extending credit to productive sectors.
(Szarowska, 2018)	1999-2015	NPL, GDP, Unemployment rate, nominal effective exchange rate, general government debt in % of GDP, interest rate on lending Inflation,	Panel Regression with Fixed Effects Analysis, Granger Causality Test	Panel regression with fixed effects identifies unemployment as the most influential macroeconomic determinant of non-performing loans (NPLs), showing a direct and proportional relationship between the two. The results also confirm that inflation, economic growth, and exchange rate movements exert negative effects on NPL levels. In contrast, the loan interest rate demonstrates a positive and expected impact. Additionally, the study highlights a clear and significant influence of the financial crisis on the increase in problem loans.
(Louzis, D. P., Vouldis, A. T., & Metaxas, V. L, 2012)	2003Q1-2009Q3	GDP, NPL, unemployment, interest rates, and managerial caliber	Dynamic date panel	The findings of this research done in Greece show that macroeconomic factors such as GDP, unemployment, interest rates, public debt and managerial caliber account for the majority of non-performing loans (NPL) in the Greek banking system in all loan categories.
(Radivojević, N., Cvijanović, D., Sekulic, D., Pavlovic, D., Jovic, S., & Maksimović, G., 2019)	2000-2015	GDP, final consumption expenditure unemployment, inflation rate, bank capital for active, interest rate on loans	GMM Model, Ordinary Least Square (OLS), via Dynamic Fixed Effect (DFE) and Random Effect (RE),	The paper aims to highlight the theoretical benefits of GMM over other (often used) panel data estimators for the analysis of non-performing loans (NPLs) and to illustrate these benefits in the context of emerging markets in Latin American countries. To show how important macro and microeconomic factors affect bad loans, the study requires an appropriate econometric model. The significance of the relationship

				between the inflation rate and the microeconomic variables under consideration in this paper was not supported by any data.
(Zhang, P., Zhang, M., Zhou, Q., & Zaidi, S. A. H., 2020)	2008-2018	Financial inclusion, non-performing loans (NPL), inflation, unemployment, trade, infrastructure	Driscoll-Kraay fixed-effect standard errors.	The findings showed the long-term correlation between financial inclusion, non-performing loans and economic growth. Financial inclusion reduces non-performing loans (NPLs), which boosts economic growth. NPLs also have a negative effect on economic growth and financial inclusion.
(Ghosh, 2017)	1984Q1-2016Q2	Real GDP growth, Employment rate	Vector autoregression (VAR)	An increase in overall non-performing loans (NPLs) dampens real GDP growth in the United States, with the effect being especially pronounced in the construction sector. Likewise, higher levels of NPLs substantially reduce employment growth in the banking and construction industries, as well as overall and non-agricultural employment, with the latter showing greater sensitivity.
(Beck, R., Jakubik, P., & Piloiu, A., 2013)	2000-2011	Real GDP growth, Employment rate GDP, Non-Performing Loans NPL, Nominal Effective Exchange Rates, Loan Interest Rates, Stock Prices and Total Bank Credit	Dynamic panel estimation	Dynamic panel analysis indicates that real GDP growth, stock prices, exchange rates, and credit interest rates all significantly influence the level of non-performing loans (NPLs). The impact of the exchange rate depends on the extent of foreign currency lending to vulnerable borrowers, which tends to be higher in countries with fixed or pegged exchange rates. Regarding stock prices, their effect on NPLs is more pronounced in countries where the stock market constitutes a substantial share of GDP.

Source: Data processed by the author (2025)

4. METHODOLOGY

The main purpose of this research is to analyze the Impact of non-performing loans on the economic growth of the countries of Southeast Europe for the period 2012-2022. So this research shows what impact non-performing loans have on the economic growth of Southeastern European countries. The main variables of this research are: Gross Domestic Product (GDP), Non-Performing Loans (NPL), Unemployment Rate (UN), Inflation (INFL), and Lending Interest Rate (IR).

The data that will be used in the research are secondary data and have been generated from official data published by the World Bank and the Kosovo Statistics Agency. These data are mainly annual data presented also in the form of a time series expressed in percentage. The results of this study will be analyzed through the Stata program.

The research questions of this study are:

1. How does the change in the level of non-performing loans affect the growth of the GDP of the Southeast European countries for the period 2012-2022?
2. How does the change in the lending interest rate affect the GDP of South-East European countries for the period 2012-2022?
3. What is the relationship between inflation, unemployment rate, and GDP for the countries of the European Union for the period 2010-2020?

The main hypotheses of this research are:

H0 *- the increase in the level of non-performing loans has a negative impact on the GDP of Southeast European countries.*

H1 *- The increase in the level of non-performing loans does not negatively affect the GDP of the countries of South-Eastern Europe.*

Table 2. Description of the variables included in the econometric models

Variables	Variable description	Source
Dependent Variable (Y)	Gross Domestic Product (GDP)	Annual reports of the World Bank, time series (2012- 2022) https://data.worldbank.org/
Independent variable (X1)	Non-performing loans (NPL)	Annual reports of the World Bank, time series (2012- 2022) https://data.worldbank.org/
Independent variable (X2)	Unemployment rate (UN)	Annual reports of the World Bank, time series (2012- 2022) https://data.worldbank.org Kosovo Statistics Agency https://ask.rks-gov.net/
Independent variable (X3)	Inflation (INFL)	Annual reports of the World Bank, time series (2012- 2022) https://data.worldbank.org/
Independent variable (X4)	Lending interest rate (IR).	Annual reports of the World Bank, time series (2012- 2022) https://data.worldbank.org/

Source: Data processing by author (2025)

To test the hypotheses of this study, the econometric model must be built to prove these hypotheses. This econometric model will look like the following:

$$GDPit = \beta_0 + \beta_1 NPLit + \beta_2 UNit + \beta_3 INFLit + \beta_4 IRit + \gamma it$$

Where:
GDP - Gross Domestic Product
NPL – Non-performing loans
UN - Unemployment rate
INFL – Inflation
IR - Lending interest rate
stochastic variables (other factors not considered in the model)
i – code and t – time period.

5. RESULTS OF ECONOMETRIC MODEL

During this chapter, the results of descriptive analysis, correlation analysis will be analyzed, and the hypotheses of this study will be tested to test the research questions. The data used in this study are secondary data processed in the STATA program and are presented within the panel data. These data were obtained from the database of the World Bank and the Statistics Agency of Kosovo. The time period along which this study extends is the period 2012-2022. The countries included in this study are: Kosovo, Albania, North Macedonia, Bosnia and Herzegovina, Romania, Bulgaria, Slovenia, Greece, Montenegro, and Croatia. Here, the results of descriptive statistics, correlation analysis, and hypothesis testing will be analyzed. This testing will be done using standard multiple regression analysis, fixed effect model, random effect model, Hausman Taylor Estimation, GMM Model, Arellano Bond Estimation, GEE model.

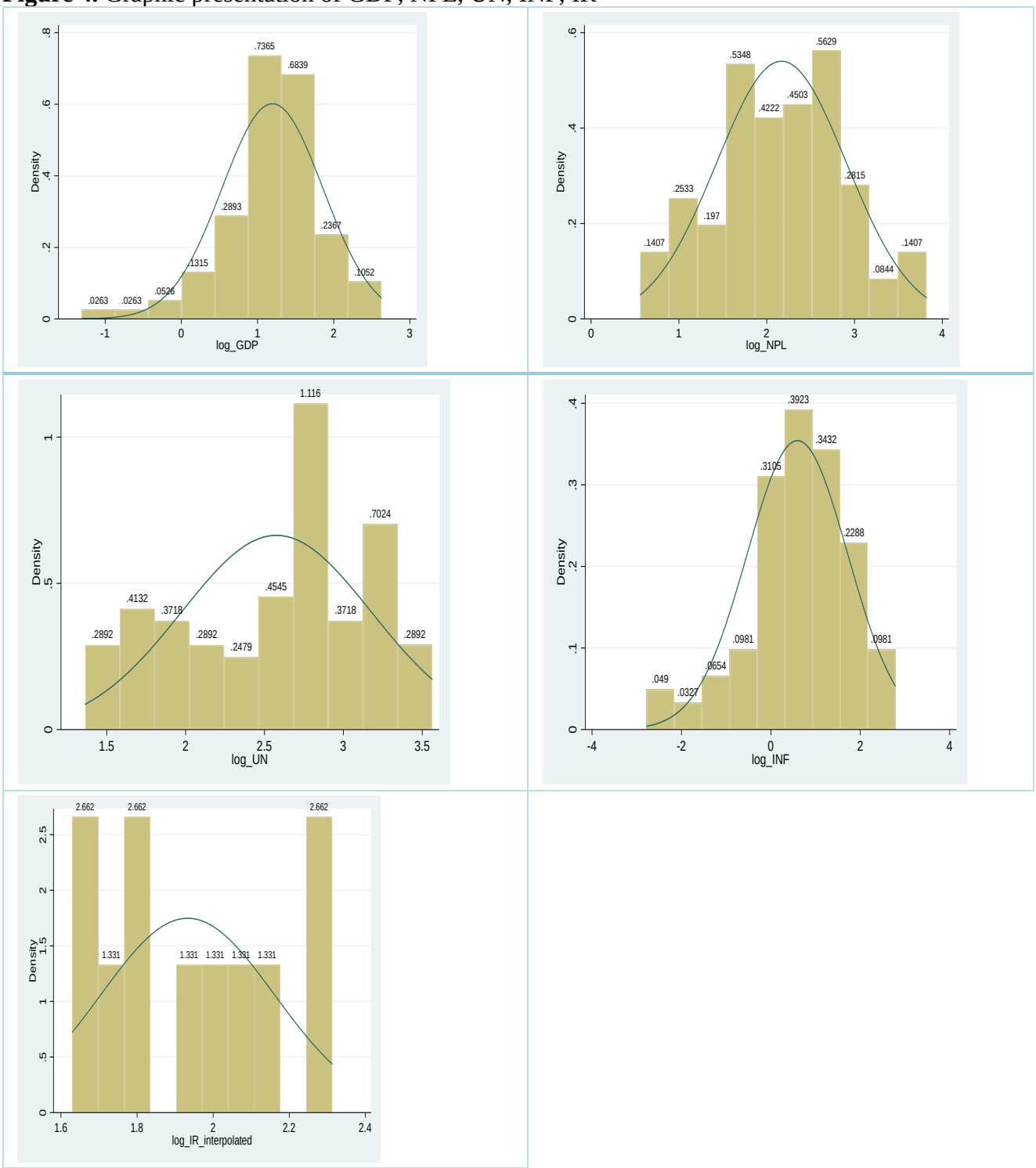
Table 3. presents the descriptive statistics for the variables of this econometric model.

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP	87	1.195569	.6634592	-1.309467	2.623577
NPL	109	2.168643	.7386305	.5597465	3.8193
UN	110	2.575716	.6007112	1.363537	3.563883
INF	99	.5945533	1.126233	-2.778324	2.783897
IR	110	1.93297	.2282555	1.629694	2.312825

Source: Author's calculations in Stata (2025)

From the descriptive statistics, we can see that the GDP variable has an average of 1.19, a minimum value of -1.3, and a maximum value of 2.62. The UN variable has an average of 2.57, a minimum value of 1.3, and a maximum value of 3.5. Whereas INFL has an average of 1.12, a minimum value of -2.77, and a maximum value of 2.7. The IR variable has 110 observations, an average of 1.93, a minimum value of 1.6, and a maximum value of 2.3. Whereas NPL has an average value of 2.1, a minimum value of 0.5, and a maximum value of 3.8.

Figure 4. Graphic presentation of GDP, NPL, UN, INF, IR



Source: Author's calculations in Stata (2025)

From the graphical presentation of the histogram, we can see that between GDP as a dependent variable and NPL, UN, INF, and IR as independent variables, a normal distribution exists.

5.1 CORRELATION ANALYSIS

Table 4 shows the general correlations between the dependent variable and the independent variables of this study.

Table 4. Correlation analysis results

	GDP	**NPL**	**UN**	**INF**	**IR**
GDP	1.0000				
NPL	-0.5644	1.0000			
UN	-0.0903	0.1694	1.0000		
INF	0.3543	-0.4722	-0.3850	1.0000	
IR	-0.5700	0.5025	0.2608	-0.2182	1.0000

Source: Author's calculations in Stata (2025)

From the results of the correlation analysis, we can see that there is a negative correlation between GDP, NPL, IR, and UN. While an average correlation exists between GDP and INF.

6. EMPIRICAL SUMMARY OF ECONOMETRIC MODEL RESULTS

This section presents a summary of the key empirical findings obtained from the estimated econometric model.

Table 5. Summarizes the empirical results from the econometric model.

Variables	**Linear Regression**	**Random Effeccts Generalized Least Squares (GLS) Regression**	**Fixed Effects Regression**	**Hausman Taylor Regression**	**GEE Model**	**GMM Model**
GDP	-	-	-	-	-	-
NPL	-.2740041 (0.009) **	-.2664591 (0.020) **	-.2931447 (0.176)	-.2240009 (0.161)	-.2738477 (0.006) **	-.1520023 (0.580)
UN	.1440274 (0.150)	.1518951 (0.191)	.4692666 (0.230)	.2196543 (0.262)	.1441543 (0.135)	.3917149 (0.772)
INFL	.1163411 (0.090) *	.1281902 (0.074) *	.2004789 (0.053) *	.1587362 (0.094) *	.1166029 (0.076) *	.0162989 (0.514)
IR	-1.31567 (0.000) ***	-1.317227 (0.000) ***	-1.388863 (0.001) ***	-1.408226 (0.000) ***	-1.315672 (0.000) ***	- 1.366691 (0.369)
R Square	0.4263					
Adj. R^2	0.48879					

Source: Author's calculations in Stata (2025)
* significance level 10%
** significance level 5%
*** 1% significance level

These results will be commented on through Standard Multiple Regression Analysis. Based on the results of the standard multiple regression analysis and the regression equation, we see that all the variables of this study are significant at a confidence level of 10%, except for the variable of the Unemployment Rate (UN), which exceeds the allowed significance. The correlation coefficient between dependent and independent variables is 45.5%. So there is an average correlation or connection between the variables of this study. Whereas the coefficient of determination between the independent and dependent variables is moderately high at 42.6%, so for 42.63% the independent variables explain the dependent variable. These results prove that this model is statistically stable.

β_0 - if all factors are constant, then the GDP value is 3.85.

β_1NPL – if non-performing loans (NPL) increase by one unit, holding other factors constant, then GDP will decrease by 0.27 units. This statement is true because the significance level is 0.009 < 0.05.

β_2UN- if the unemployment rate (UN) increases by one unit, keeping other factors constant, then GDP will increase by 0.14 units. This statement is not true because the significance level exceeds the 10% significance level, i.e., 0.15 > 0.10

β_3INFL- if inflation increases by one unit, keeping other factors constant, then GDP will increase by 0.11 units. This statement is true at a significance level of 10%, i.e., 0.09 < 0.10.

β4IR - if the lending interest rate (IR) increases by one unit, keeping other factors constant, then GDP will decrease by 1.13%. This statement is true because the significance level is 0.000 < 0.05.

We can conclude that all independent variables are significant, statistically significant and prove the validity of the hypotheses of this study, with the exception of the variable of the Unemployment Rate (UN), which is not significant at the 10% confidence level.

In this section, the research questions and hypotheses of the study are addressed based on the empirical results. The analysis indicates that the increase in the level of non-performing loans has a negative impact on the GDP of Southeast European countries during the period 2012–2022, confirming the acceptance of the null hypothesis (H0) and the rejection of the alternative hypothesis (H1). Similarly, the results show that rising lending interest rates exert a negative effect on GDP across the region. Regarding the relationship between inflation, unemployment, and GDP, the findings suggest a positive relationship between inflation and GDP, while the unemployment rate, although positively associated with GDP, was not statistically significant. Economically, moderate inflation in some Southeast European countries during 2012–2022 may have stimulated export growth and tourism, increased actual consumption due to expectations of rising prices, and alleviated the burden of indexed debt, thereby supporting economic activity. These results, derived from multiple regression analysis, provide a clear empirical basis for understanding the macroeconomic determinants of GDP growth in the region.

6. CONCLUSIONS/ RECOMMENDATIONS

From this research, we conclude that the increase in non-performing loans has negatively affected the economic growth of South-Eastern European countries during the period 2012–2022. Similarly, rising lending interest rates exert a negative impact on GDP across the region. The findings also indicate a positive relationship between the unemployment rate and GDP; however, it should be emphasized that unemployment was not statistically significant as an independent variable in this study. In addition, the results show a positive relationship between inflation and GDP.

Since this research concludes that rising levels of non-performing loans negatively affect the GDP of Southeast European countries, it is essential that policymakers in the region prioritize measures aimed at reducing these loans. This can be achieved through closer supervision of financial institutions and by promoting sound financial policies that strengthen risk assessment practices. Additionally, tightening lending criteria would help prevent the accumulation of high-risk loans in the future. Creating new jobs and stimulating economic activity are also crucial, as improved income stability enables businesses and individuals to better manage their financial obligations.

Furthermore, enhanced regional and international cooperation among Southeast European countries is necessary to address shared financial challenges and develop joint strategies for reducing non-performing loans. Finally, the development of programs that support banks and borrowers in managing non-performing loans - including assistance with repayment negotiations and debt restructuring - would contribute significantly to mitigating the issue.

7. DISCUSSION

The relationship between non-performing loans (NPLs) and economic growth in Southeast Europe carries important implications for policymakers, financial institutions, and investors. Elevated NPL levels can undermine bank balance sheets, reducing their capacity to provide credit to households and businesses. This limitation in credit supply can, in turn, restrict investment and slow down overall economic growth. The findings of this study are largely consistent with the results of previous research, which generally indicate that non-performing loans have a negative impact on the economic growth of countries in the Western Balkans. High levels of non-performing loans are shown to constrain the credit supply, limit investment opportunities, and reduce overall economic activity, thereby slowing down the growth process in the region. Previous studies, including Nkusu (2011), Klein (2013), and Louzis et al. (2012), Annual GDP growth, final government consumption, the real interest rate, gross domestic savings, and the unemployment rate all affect the level of non-performing loans (Gashi, Tafa, & Bajrami, 2022). In the Western Balkans, NPLs have shown a rising trend following the global financial crisis, with the highest levels observed in Serbia and Albania, followed by Montenegro, Bosnia and Herzegovina, and Macedonia, while Kosovo recorded the lowest levels. These patterns highlight the varying credit risk across the region and the need for country-specific banking policies to effectively manage non-performing loans (Tmava, Avdullahi, & Sadikaj, 2018).

Several studies report that increases in unemployment negatively affect economic growth. Quantitatively, a one-percentage-point increase in the unemployment rate corresponds to a 0.5-percentage-point decrease in GDP (Kukaj, 2018). In the context of the six Western Balkan countries examined, the findings suggest that GDP growth does not exert a significant effect on the unemployment rate. Nevertheless, from a policy standpoint, these results provide important guidance for regional policymakers, emphasizing that fostering sustainable economic growth remains a key consideration in the development of strategies aimed at mitigating unemployment. (Arifi, Xhixha, & Aliu, 2023). The analysis of inflation and economic growth in the Western Balkans highlights a nuanced relationship. Moderate inflation can have a positive or neutral effect on GDP, whereas higher levels of inflation, beyond certain thresholds, tend to reduce economic growth (Misiri & Fetai, 2022). The impact of inflation is also influenced by complementary fiscal policies, such as government spending, which can amplify or mitigate its effects (Krasniqi Markaj & Haxhimustafa, 2024).

These findings underscore the importance of maintaining price stability through well-calibrated monetary and fiscal policies. Policymakers in the region need to balance efforts to control excessive inflation with measures that support sustainable growth, as both elements are crucial for long-term economic development in the Western Balkans (Malenković, 2023)

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