

UNEMPLOYMENT AS A MAIN DETERMINANT OF NON-PERFORMING LOANS: THE CASE OF WESTERN BALKAN COUNTRIES

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Abstract

Non-performing loans are a crucial determinant of the stability of the banking and financial sector within an economy. Their mismanagement can often lead to numerous financial problems and even banking crises. The level of non-performing loans is influenced by many factors, especially macroeconomic variables. Given the importance of the financial system in financing a country's economic activities, as well as the role of reducing unemployment in socio-economic well-being, this paper aims to examine the impact of macroeconomic factors—including GDP, unemployment, and inflation—on non-performing loans in the Western Balkan countries. For the empirical analysis, this study employs OLS panel regression models, fixed effects (FE), and random effects (RE) models, using data from the World Bank covering the period 2000–2024. The findings highlight a positive and significant relationship between the unemployment rate and non-performing loans in the Western Balkans during this period. Conversely, GDP has a negative impact on non-performing loans, while inflation does not show any statistically significant effect.

This study fills an empirical gap regarding the Western Balkan countries by suggesting that improvements in macroeconomic factors can contribute to the strengthening of the banking and financial system.

Keywords: *Unemployment rate, Non-performing loans, Financial system, Western Balkan countries*

1. Introduction

Global and macroeconomic developments have caused new pressures and challenges for the financial system which have influenced the increase in borrowing and deposit costs. As a result, banks face a more challenging financial environment, changing their investment and funding structure to remain competitive and better manage the risks associated with fluctuations in interest rates and other economic factors in general.

The question of non-performing loans persists to be in the middle of consideration in the banking systems of all economies, particularly the Western Balkan countries, lowering the profitability and use of the banks' possessions. Despite concerns about the credit risk caused by macroeconomic changes, its materialization was low and the deterioration of the credit portfolio, banks reacted by increasing reserves, classifying the most affected sectors and tightening lending criteria.

The increase in non-performing loans in the nations of the Western Balkans can more indicate the banks' perceptions of the increase in uncertainty in the actual subdivision of the frugality on account of the belongings of the crisis, that influences the credit risk Professional paper.

Non-performing loans are a main investment warning to almost all country in the experience cause they unfavorably influence the monetary stability and appropriateness of the investment whole. Non-performing loans can influence banks' strength to loan and increase borrowing costs. This will make it more difficult for businesses and individuals to obtain financing, leading to stagnation in the nation's overall economic activity.

Non-performing loans, apart from having a negative affect the fiscal cohesion and appropriateness of banks in a country's frugality, they further show a concern for the economic development of those nations. Countries facing economic growth have lower levels of non-performing loans and on the contrary, countries facing economic recessions have higher levels of non-performing loans. This happens because a number of macroeconomic factors such as GDP, unemployment, inflation, interest rate, etc. affect the level of non-performing loans.

Unemployment is a very important factor in the level of these loans, since unemployment can directly affect the ability of borrowers to repay loans. On the other hand, banks may be reluctant to grant loans to this category, which leads to a slowdown in the economic activity of a country in general, as well as making it difficult for businesses to invest in new profitable projects. Considering these problems that problem loans can bring to the economy of a country and bearing in mind the weak governance structures especially in developing countries, it is very essential to complete activity studies to recognize the main causes of these loans and present the necessary pieces of advice for their decline and administration.

Various studies in different countries have found significant impacts of macroeconomic factors on non-performing loans (Kosovska et al. 2019; Nkusu, 2011; Ristić & Jemović, 2021; Gashi et al. 2022))

Although similar studies exist in the literature from different countries around the world, research focusing on the Western Balkan countries is significantly lacking. A related study by Gashi et al. (2022) found a statistically significant impact of macroeconomic factors on non-performing loans during the period 2000–2019; however, the authors noted the need for a longer study period. Furthermore, recent crises have sparked interest in studies in this area, especially for developing countries.

Therefore, the purpose of this study is to analyze the impact of macroeconomic factors on non-performing loans in the Western Balkan countries, including Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, Kosovo, and Serbia, over the period 2000–2024. The macroeconomic factors selected for the study are GDP, unemployment, and inflation.

This study raises several research questions, to which we will try to provide answers through data analysis:

What impact do macroeconomic factors have on one of the banking indicators, namely non-performing loans?

Does GDP growth reduce non-performing loans?

What is the relationship between unemployment and non-performing loans? Does unemployment influence the increase of non-performing loans?

What impact does inflation have on non-performing loans?

The study is structured into five parts: an introduction; a literature review related to the study variables; methodology; empirical analysis; and conclusions, where the results, study limitations, and recommendations for future research are discussed.

2. Literature review

The correlation and impact of the unemployment rate and problem loans has been analyzed by many researchers, and in particular for the countries of the Western Balkans, in which countries the economic transition presents a unique common challenge. The following literature review shows key findings on how rising unemployment rates affect NPLs in these countries.

The literature shows us that macroeconomic indicators have a significant impact on non-performing loans and the indicators that have the greatest influence is the rate of economic growth, the rate of unemployment, the rate of inflation, the interest rates, etc. Also, certain research shows the influence of fiscal indicators (level of public debt and budget deficit) as significant determinants of NPLs (Louzis et.al.2012; Makri et.al.2014a; Foglia 2022; Orfia &

Mucciardi, 2022). (Nkusu, 2011) at the study about non-performing loans and macrofinancial vulnerabilities in advanced economies shows that poorer macroeconomic performance creates conditions for the increased levels of NPLs.

Of the various macroeconomic studies, most studies show that unemployment is the most important determinant of NPLs. Looking at this, it is also resulting that there is a positive correlation between these variables, taking in consideration that the growth of unemployment affects the growth of NPLs (Salas & Suarina 2003; Bofondi & Ropele 2011). Louizis et al. (2010) looked at the key determinants of NPLs in the Greek banking sector between 2003 and 2009. The results of their study indicate that unemployment and general macroeconomic conditions have a big influence on NPLs. The importance of unemployment as a determinant of NPLs in the banking sector of Greece was confirmed by research conducted by Charalambakis et al. (2017) for the period 2005-2015 years. The results of the study concluded that high unemployment rates and political insecurity are important factors in the sudden increase in NPLs after 2012.

For the countries of the Western Balkans, several studies have identified the importance of unemployment as a determinant of non-performing loans. Gashi et al. (2022) found out that, in addition to other macroeconomic variables (economic growth, government spending, real interest rates, and domestic savings), the unemployment rate has more influence on the level of NPLs.

This aligns with the observations of Turan and Koskija (2014), who discussed similar trends in Albania; they noted how economic crises, coupled with high unemployment rates, perpetuate the growth of NPLs.

Mazrek et al. have analyzed the factors of NPLs in the economies of transition countries, in which study they see that in Albania and other Balkan countries macroeconomic circumstances affect the financial situation of borrowers, thus implying the increase of problem loans. In this study, they emphasize unemployment as an important macroeconomic factor on the financial and banking stability of these countries. (Mazreku et al., 2018).

The research of K Josevski et al. (2019) analyzes the impact of macroeconomic factors on the level of NPLs in the banking sector of North Macedonia. This research highlights a positive and statistically significant impact of unemployment on bad loans. The coefficients obtained show that an increase in unemployment of 1% will lead to an increase of 0.41% in non-performing loans and emphasizes that the increase in unemployment has a large impact on the increase in non-performing loans for enterprises, since the increase in unemployment results in a decrease in effective demand, negatively affecting production.

Kozarić & Žunić-Dželihodžić (2020) have analyzed the relationship between unemployment and non-performing loans for Bosnia and Herzegovina where they have seen a significant impact of the unemployment rate on non-performing loans in the economy of this country. The results of the study show that an increase in unemployment by 1% leads to an increase in bad loans by 0.73%. Agić & Jeremić (2018) and Džidić et al. (2022) found similar results for Bosnia and Herzegovina.

Another research on Serbia by Ristić & Jemović (2021) considers unemployment as an important factor of non-performing loans in the Serbian banking sector and that macroeconomic conditions such as the decline in economic growth and devaluation of the dinar have an impact on the level of non-performing loans. We can conclude that the literature review in general for the countries of Western Balkans gives us a significant correlation between unemployment and non-performing loans.

The employment crisis exacerbates financial instability in the region, leading to higher NPL rates, which, in turn, threatens the overall health of the banking sector. Understanding this relationship is critical for policymakers aiming to stabilize economies and mitigate financial risk in the face of rising unemployment.

3. Research Methodology and Data

To examine the impact of macroeconomic factors on non-performing loans, annual panel data were used for six countries in the Western Balkans region: Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, Serbia, and Kosovo, covering the years 2000 to 2024. For the empirical analysis, OLS, fixed effects, and random effects models were applied, and the most appropriate model was selected. The Hausman test was used to select between fixed and random (Gujarati, 2002; Greene, 2005; Clark & Linzer, 2015). The panel is strongly balanced, meaning that data are available synchronously for all countries included. Non-performing loans (NPL) serve as the dependent variable, while the independent variables include the unemployment rate (UNEMP), GDP, and inflation rate (INF).

To balance the data and make it suitable for this analysis, we used the linear interpolation method to fill in some missing values. This method helped maintain the continuity of the data without changing the data structure.

In this regard, the following basic regression equation has been developed:

$$npl = \beta_0 + \beta_1 unemp + \beta_2 gdp + \beta_3 inf + \varepsilon$$

where:

β_0 – intercept

X1- unemployment rate

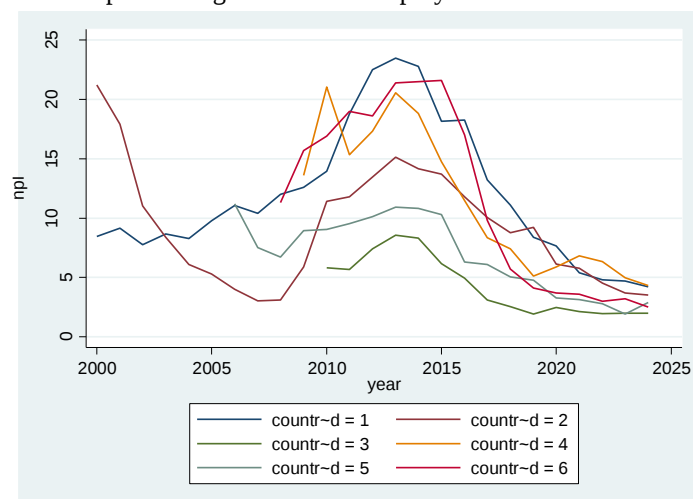
X2 – GDP

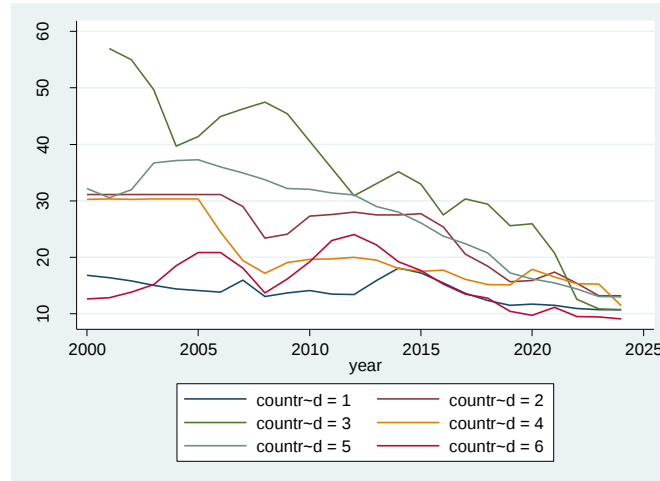
X3-inflation

ε - error term

In addition, Figure 1 represents the performance of the variables selected for study for the period 2000-2024, on an annual basis, using data collected from World Bank indicators.

Figure 1. Non-performing loans and unemployment rates of Western Balkans





Source: Authors' source (World Bank data).

Table 1 presents the descriptive statistics of the data, including the number of observations, mean values, standard deviations, minimums and maximums.

Table 1. Descriptive statistics

Variables	Observations	Mean Value	Standard Deviation	Minimum Value	Maximum Value
Npl	150	9.469858	4.123586	3.233333	16.67682
Unemp	150	22.38623	5.695543	11.34583	29.68833
Gdp	150	3.391003	2.595151	-5.426	8.721167
Inf	150	4.294211	4.785648	-.1263333	17.85817

Source: Authors' calculations.

3. Empirical Findings

This study uses several econometric models to support the data analysis. Table 2 presents the results of the simple OLS, fixed effects, and random effects regression models.

The Hausman test, the results of which are provided in the appendix, was used to see if there are systematic differences in the coefficients due to the association between fixed effects and variables. This test helps determine the most appropriate model by comparing the consistency of parameter estimates between the two approaches (Clark & Linzer, 2015).

In this case, we have similar results between the fixed effects model and the random effects model, meaning that the variation between countries is limited and that most of the variation occurs within countries over the time period analyzed. The Hausman test also confirms the lack of systematic differences between the coefficients of the two models, supporting the validity of using the random effects model as an appropriate alternative.

Thus, if the Hausman test has a p-value less than 0.05, then H_0 is rejected and H_a is accepted, choosing the fixed model as the most appropriate (Greene, 2005). Given the results of our test, we proceed with the random effects model as the basis for interpreting the findings. Therefore, based on the results of the random effects model, unemployment has a positive impact on non-performing loans in the Western Balkan countries. A 1 percentage point increase in unemployment increases non-performing loans by 0.402 percentage points. While a 1 percentage point increase in GDP growth leads to a 0.406 percentage point decrease in non-performing loans, if all other factors remain constant. Inflation, on the other hand, does not show a statistically significant impact on non-performing loans. These findings are consistent

with theory and with what most researchers have found empirically (Messai & Jouini, 2013; Szarowska, 2018)

Table 2. Regression results: OLS, fixed and random effects

VARIABLES	(1) OLS	(2) FE	(3) RE
gdp	-0.406*** (0.111)	-0.406*** (0.113)	-0.406*** (0.111)
unemp	0.402*** (0.0491)	0.402*** (0.0499)	0.402*** (0.0491)
inf	0.0949 (0.0598)	0.0949 (0.0609)	0.0949 (0.0598)
Constant	1.438 (1.146)	1.438 (1.166)	1.438 (1.146)
Observations	150	150	150
R-squared	0.344	0.344	
Number of country_id		6	6

Source: Author's calculations.

In order to check for multicollinearity among the independent variables, the VIF was used. Regarding table 3. all VIF values are well below the threshold of 5, indicating no multicollinearity issues.

Table 3. VIF

Variable	VIF	1/VIF
gdp	1.08	0.921957
inf	1.07	0.931479
unemp	1.02	0.978335
Mean VIF	1.06	

5. Conclusions and Recommendations

The goal of any economy is to achieve overall economic and social well-being. One of the main macroeconomic objectives to achieve this is to reduce the unemployment rate, which reflects the broader macroeconomic situation. On the other hand, unemployment constitutes a significant problem in the accumulation of new loans. Non-performing loans not only represent a major challenge to a country's investment and fiscal framework but also affect the overall financial stability of the nation. Many studies have shown that non-performing loans depend on various macroeconomic factors, with the unemployment rate being one of the most important. This study focuses on the determinants of non-performing loans, especially the impact of unemployment.

The main objective of this research is to examine the relationship between non-performing loans and unemployment rates in the Western Balkan countries, including Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, Kosovo, and Serbia, using the latest data from

the World Bank indicators covering the period 2000-2024. The results reveal a positive and significant relationship between non-performing loans and unemployment rates in the Western Balkans for the period 2000–2024. On the other hand, a negative impact of GDP on NPLs is found, meaning that with increasing GDP, non-performing loans decrease.

These findings suggest that financial markets and banks should consider macroeconomic factors as important determinants of non-performing loans. Banks can mitigate the negative impact of unemployment on loan performance by implementing stricter lending conditions and improving credit risk assessments. Meanwhile, governments can help by adopting active labor market policies, promoting job creation, supporting businesses, and investing in educational development, which are essential for improving economic growth.

Appendix

Table. A1 Hausman test

Test	Chi2	Prob>Chi2	Results
Fixed Effects vs Random Effectts	0.00	1.0000	Accept Ho

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