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Impact of macroeconomic indicators on non-performing loans in the Balkan countries

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Abstract. Non-performing loans can be the result of a lack of sound lending policies, as well as a lack of sound credit judgment by management when approving loans. In addition to the bank's internal factors, the macroeconomic environment of a country can also affect the NPL. The NPL can be affected by the GDP of that country, then unemployment, inflation, etc. The purpose of this research is to extract the impact of macroeconomic indicators such as GDP, unemployment and inflation on non-performing loans of each country in the Balkan Peninsula. The research was conducted through multivariate regression, whereas dependent variable we have non-performing loans (NPL) and as independent variables we have Gross Domestic Product (GDP), Unemployment and Inflation. Based on the linear regression model, it is found that two variables have a negative impact, while one is positive, while in terms of the significant, two variables are more significant than one..

Keywords: Macroeconomic indicators, NPL, GDP, Inflation, Unemployment.

Presentation

According to the Regulation on non-performing exposures and restructuring (2019) of the Central Bank of the Republic of Kosovo, the bank will classify exposures as non-performing exposures if one or both of the following criteria are met: Material exposures are more than ninety (90) days late; the borrower is assessed as insolvent to repay his credit obligations in full, without the realization of collateral, regardless of the amount or days in arrears;

Despite the fact that banks in Kosovo from year to year record an increase in the number of loans issued, they face in very rare cases bad or non-performing loans. According to the data of the Central Bank of Kosovo, the level of non-performing loans in Q1 2020 was only 2.5%, while 2019 closed with a percentage of 2.0%.

During the period 2014-2018 Kosovo compared to the Balkan countries, has a low rate of non-performing loans. It is noted that Greece has the highest percentage of performing loans, as a result of the recent crisis 2007-2008. Greece reached the highest level in 2017, where approximately half of the loans issued or 45% were non-performing loans. Kosovo from 2014 where the percentage of non-performing loans was 8.31%, reached 2.51% as it is in 2018. In Albania, the level of non-performing loans decreased by 50% from 2014 when it was 22% to 11% in 2018. A large decline is observed in Serbia, where it fell from 21% to 5.70%.

Non-performing loans can be the result of a lack of sound lending policies, as well as a lack of sound credit judgment by management when approving loans. Non-performing loans can be loans issued to new businesses, loans for speculative purchases of goods, loans covered by collateral without an adequate insurance margin, loans issued to borrowers with bad credit reputation, etc.

In addition to the bank's internal factors, the macroeconomic environment of a country can also affect the NPL. NPL can be affected by the GDP of that country, then unemployment, inflation, etc.

Literature review

In the last decade NPL has had a greater emphasis almost all over the world because an uncontrolled and high growth of NPL would lead to a possible failure of the banking system as a whole.

The authors Louzis, Vouldis, and Metaxas (2010) tested the impact of macroeconomic and bank-specific determinants on non-performing loans in the banking sector in Greece. Their study presents an analysis of the nine largest banks, using quarterly data for the period 2003 to 2009. Their findings show that GDP growth has a negative impact on the growth of all types of non-performing loans, while unemployment and the key interest rate on loans have a positive impact. From the specific determinants of the bank, the loan-to-deposit ratio has a statistically significant negative impact on the growth of non-performing loans, while

solvency has a positive impact on the growth of non-performing loans for enterprises, but a negative impact on mortgage loans.

On the other hand, Bofondi and Ropele (2011) examine how macroeconomic indicators affect the quality of the entire credit portfolio of the banking system in Italy during the period 1990-2012, using aggregated data while applying a simple linear regression model. The results obtained in their study show that real GDP growth rates and house prices have an opposite impact on non-performing loans for households, while the unemployment rate and nominal interest rate have a positive impact. The increase in non-performing loans is associated with an increase in the unemployment rate and the key interest rate, while with the increase in sustainable consumption, non-performing loans decrease.

Nkusu (2011) investigates the determinants of non-performing loans in 26 developed countries during the period 1998-2009 and finds that deteriorating macroeconomic conditions such as: economic growth and higher unemployment led to higher non-performing loans.

Shingjergji (2013) in his research on the impact of macroeconomic indicators in Albania came to the conclusion that GDP growth will affect the growth of NPL, which is the opposite of what is known in the world, then inflation is negatively related to NPL and interest rates are positively related to NPL, and from this link Shingjergji recommends to the state that when formulating monetary policy to take this relationship into account. One of the most important findings, according to the author, in this research is the positive correlation between the Euro / All exchange rate and NPL, this is because more than 50% of loans in this country are in Eur currency.

Clichici and Colesnicova (2014), during their research in the Moldovan banking system, concluded that NPLs increase when GDP, exports, remittances decrease and unemployment increases.

Beck, Jakubik, and Piloiu (2015) examine the macroeconomic determinants of non-performing loans (NPLs) in 91 countries and find that non-performing loans are significantly affected by real GDP growth, stock prices, the exchange rate, and the loan interest rate. .

Kjosevski, Petkovski and Naumovska (2019) researched the impact of bank-specific determinants and macroeconomic indicators. Regarding macroeconomic determinants in both specifications, the results show that there is a negative correlation between economic growth and the growth of non-performing loans, while the real exchange rate is a statistically significant determinant only to corporate loans. Of the macroeconomic determinants, inflation alone was not statistically significant with the long-run dynamics model.

Kemal Kozarić K., Žunić Dželihodžić E. (2020) found that the unemployment rate and its movements due to its connection with the financial solvency of the population have the greatest impact. They concluded that regulatory authorities should focus on developing the real economy and creating new jobs to prevent possible disruptions in the functioning of the banking sector.

Research objectives and questions

Non-performing loans can be the result of a lack of sound lending policies, as well as a lack of sound credit judgment by management when approving loans. In addition to the bank's internal factors, the macroeconomic environment of a country can also affect the NPL. NPL can be affected by the GDP of that country, then unemployment, inflation, etc.

The purpose of this research is to derive the impact of macroeconomic indicators such as GDP, unemployment and inflation on non-performing loans of each country in the Balkan Peninsula.

The research questions are:

1. Does GDP have an impact on non-performing loans in the Balkan countries?
2. Does unemployment have an impact on non-performing loans in the Balkan countries?
3. Does inflation have an impact on non-performing loans in the Balkan countries?

Research methodology

In this research we have used descriptive methodology to collect data to answer research questions and test hypotheses for the impact of macroeconomic indicators on NPL. According to Salaria (2012), descriptive methodology is of great importance because it pays attention not only to the characteristics of a sample, but also to the characteristics of the entire population. It also provides information on local issues.

We obtained the secondary data using World Bank database for NPL, GDP, Unemployment and Inflation for the Balkan countries.

To analyze the research problem which is what impact macroeconomic indicators have on NPL, then the following hypotheses are made.

Research hypotheses and econometric model

Three hypotheses have been constructed for the study:

H1: GDP has a negative impact on non-performing loans in the Balkan countries.

H2: Unemployment has a positive impact on non-performing loans in the Balkan countries.

H3: Inflation has a negative impact on non-performing loans in the Balkan countries.

To answer the research questions and to test the above hypotheses, I used multivariate regression as a research model:

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

y- Dependent variable; β_0 - constant which indicates the expected value of the dependent variable if all independent variables take the value equal to zero; β_1 , β_2 dhe β_3 - are the parameters, or coefficients, that determine the effect that independent variables have on the dependent variable; ε - residual error estimation variable in period t .

In our research this model is done as follows (for each country separately):

For example, for the state of Kosovo

$$NPL(Kosova) = \beta_0 + \beta_1 GDP(Kosova) + \beta_2 Unemployment(Kosova) + \beta_3 Inflation(Kosova) + \varepsilon$$

Empirical findings

In this research empirical findings include correlation analysis and linear regression analysis. In the context of regression and correlation analysis we have analyzed the movements for the dependent variable "Non-performing loans (NPL)" and the independent variables which are included in the regression model and are GDP, Unemployment and Inflation. Correlation analysis was done through Excel, while regression analysis was done through SPSS.

In the following I will describe all the empirical findings for each independent model variable, while the tables with numerical data, are shown in the appendix.

- Gross Domestic Product-GDP

Gross domestic product (GDP) is an economic indicator that represents the value at market prices of all material goods and services produced within a country in a given period (usually a year).

After correlation and regression analysis, it is noticed that GDP has a strong negative correlation with NPL with a coefficient R greater than 90%, except in Greece where this coefficient has resulted in a positive correlation of 58.90%. So, in the Balkan countries, including Kosovo, and excluding Greece, any increase in GDP will affect the reduction of Non-Performing Loans.

Regarding the significant, based on P-value (Sig.), which must have values less than 0.05 in order for an impact of the independent variable to be a significant impact, we can conclude that GDP has a large impact in NPL, because in all countries except Greece, this coefficient has turned out less than 0.05.

From these two results we can say that GDP has a negative impact, and the hypothesis can be considered correct, although in Greece this is not true. Greece, in this case, may not be considered, due to the consequences of the recent crisis 2007-2008, from which it suffered the most from the Balkan countries.

- *Unemployment*

Unemployment represents the percentage of the unemployed out of the total workforce capacity in a given territory within a country or in the whole country. So, this economic indicator shows the level of unused labor force in economic processes in a geographical territory.

Based on the results from the used model, where unemployment is as an independent variable, we found that in all countries unemployment has a strong positive correlation with a coefficient R greater than 70%, so any increase in unemployment will cause increase of NPL, which is also internationally recognized, and vice versa.

In terms of significance, all countries, except Kosovo, Greece and Montenegro, resulted in greater than 0.05, which means that this positive impact is not significant.

From what was said above, ie from the analysis of correlation and regression, unemployment has a positive impact on NPL, we conclude that the second hypothesis can be considered partially correct, as the positive impact will not be significant for most of states.

- *Inflation*

Inflation is a term that indicates the overall growth of money supply in a given economy in a given period. One of the effects that can accompany inflation (and that is often confused with it) is the increase in prices of goods and services. The opposite phenomenon in effect is deflation.

Based on the correlation analysis, inflation, as the third independent variable of this model, has a strong negative correlation with the dependent variable, NPL. In all countries, except Albania and Serbia, the correlation coefficient has turned out to be over 50%. In Albania, this coefficient turned out to be only 4.70%, which means that the dependent variable has almost no correlation with the explanatory variable, while in Serbia the correlation coefficient was slightly higher than in Albania in the value of 28.50%, but even this value does not show any strong correlation between the model variables.

Although the correlation analysis showed a strong correlation between inflation and NPL, this correlation, based on the regression analysis and the P-Value coefficient, does not appear to be significant. For all countries except Bulgaria, Bosnia and Herzegovina and Northern Macedonia, the P-value turned out to be greater than 0.05.

Based on the results of correlation analysis and regression analysis, we can conclude that the third hypothesis is partially correct because a strong negative correlation is observed between the variables but this correlation did not turn out to be significant.

Conclusion

Non-performing loans can be the result of a lack of sound lending policies, as well as a lack of sound credit judgment by management when approving loans. In addition to the bank's internal factors, the macroeconomic environment of a country can also affect the NPL. NPL can be affected by the GDP of that country, then unemployment, inflation, etc. Three hypotheses have been put forward to test the impact that macroeconomic indicators have on NPL.

From these correlation and regression analyzes, the first hypothesis can be considered as correct, it turned out that GDP has a negative impact, although in Greece this is not true. Greece, in this case, may not be considered, due to the consequences of the recent crisis 2007-2008, from which it suffered the most from the Balkan countries. The second hypothesis can be considered partially correct, because although unemployment has a positive impact on the NPL, its impact will not be significant for most countries. Like the second hypothesis, the third hypothesis is partially correct because a strong negative correlation is observed between the variables but this correlation did not turn out to be significant.

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Appendix*Correlation analysis:*

<i>Albania</i>	<i>NPL</i>	<i>GDP-USD</i>	<i>Unemp.</i>	<i>Infl. / Defl.</i>
NPL	100.00%			
GDP-USD	-94.06%	1		
Unemployment	93.75%	-0.971950576	1	
Inflation / Deflation	-7.25%	0.11323594	0.018454246	1

<i>Kosova</i>	<i>NPL</i>	<i>GDP-USD</i>	<i>Unemp.</i>	<i>Infl. / Defl.</i>
NPL	100.00%			
GDP-USD	-97.31%	1		
Unemployment	75.51%	-0.684626917	1	
Inflation / Deflation	51.27%	-0.377433888	0.647119847	1

<i>Greece</i>	<i>NPL</i>	<i>GDP-USD</i>	<i>Unemplo.</i>	<i>Infl. / Defl.</i>
NPL	100.00%			
GDP-USD	58.93%	1		
Unemployment	-82.99%	-0.783042285	1	
Inflation / Deflation	87.04%	0.488143231	0.893507627	1

<i>Serbia</i>	<i>NPL</i>	<i>GDP-USD</i>	<i>Unemplo.</i>	<i>Infl. / Defl.</i>
NPL	100.00%			
GDP-USD	-96.36%	1		
Unemployment	94.69%	-0.87237724	1	
Inflation / Deflation	-28.52%	0.177821275	0.100258682	1

<i>Bulgaria</i>	<i>NPL</i>	<i>GDP-USD</i>	<i>Unemplo.</i>	<i>Infl. / Defl.</i>
NPL	100.00%			
GDP-USD	-99.86%	1		
Unemployment	97.04%	-0.971574939	1	
Inflation / Deflation	-93.81%	0.927928077	0.972120999	1

<i>Bosnia e Hercegovina</i>	<i>NPL</i>	<i>GDP-USD</i>	<i>Unemplo.</i>	<i>Infl. / Defl.</i>
NPL	100.00%			
GDP-USD	-98.35%	1		
Unemployment	98.03%	-0.96022138	1	
Inflation / Deflation	-93.92%	0.924214689	0.965789898	1

<i>Croatia</i>	<i>NPL</i>	<i>GDP-USD</i>	<i>Unemplo.</i>	<i>Infl. / Defl.</i>
NPL	100.00%			
GDP-USD	-98.59%	1		
Unemployment	99.17%	-0.993438578	1	
Inflation / Deflation	-87.04%	0.90050848	0.853213581	1

<i>North Macedonia</i>	<i>NPL</i>	<i>GDP-USD</i>	<i>Unemplo.</i>	<i>Infl. / Defl.</i>
NPL	100.00%			
GDP-USD	-93.25%	1		
Unemployment	96.11%	-0.990073367	1	
Inflation / Deflation	-98.52%	0.968854056	0.980651215	1

<i>Montenegro</i>	<i>NPL</i>	<i>GDP-USD</i>	<i>Unemplo.</i>	<i>Infl. / Defl.</i>
NPL	100.00%			
GDP-USD	-95.54%	1		
Unemployment	85.93%	-0.949448743	1	
Inflation / Deflation	-71.33%	0.535154105	-0.26484405	1

Regression analysis:

Albania	R	R squared	B	Standard Deviation	t	Sig
<i>NPL</i>			<i>Depended Variable</i>			
GDP-USD	93.20%	0.87	(0.00)	0.00	(4.45)	0.02
Unempl.	89.80%	0.81	2.00	0.56	3.54	0.04
Infl. / Defl.	4.70%	0.00	(0.00)	0.31	0.08	0.94
Kosova	R	R squared	B	Standard Deviation	t	Sig
<i>NPL</i>			<i>Depended Variable</i>			
GDP-USD	97.30%	0.95	(0.00)	0.00	(7.34)	0.01
Unempl.	75.50%	0.57	0.59	0.30	1.99	0.14
Infl. / Defl.	51.30%	0.26	1.00	0.96	1.04	0.38
Greece	R	R squared	B	Standard Deviation	t	Sig
<i>NPL</i>			<i>Depended Variable</i>			
GDP-USD	58.90%	0.35	0.00	0.00	1.26	0.30
Unempl.	83.00%	0.69	0.55	0.30	(2.57)	0.08
Infl. / Defl.	87.00%	0.76	4.24	1.39	3.06	0.05
Serbia	R	R squared	B	Standard Deviation	t	Sig
<i>NPL</i>			<i>Depended Variable</i>			
GDP-USD	96.40%	0.93	(0.00)	0.00	(6.24)	0.01
Unempl.	94.70%	0.90	2.46	0.48	5.12	0.01
Infl. / Defl.	28.50%	0.08	(3.27)	6.64	(0.52)	0.64
Bulgaria	R	R squared	B	Standard Deviation	t	Sig
<i>NPL</i>			<i>Depended Variable</i>			
GDP-USD	99.90%	1.00	(0.00)	0.00	(33.17)	0.00
Unempl.	97.10%	0.94	1.38	0.20	6.97	0.01
Infl. / Defl.	93.80%	0.88	(2.62)	0.56	(4.70)	0.02

Bosnia & Hercegovina	R	R squared	B	Standard Deviation	t	Sig
<i>NPL</i>						
<i>Depended Variable</i>						
GDP-USD	98.40%	0.97	(0.00)	0.00	(9.46)	0.00
Unempl.	98.00%	0.96	0.54	0.06	8.60	0.00
Infl. / Defl.	93.90%	0.88	(2.63)	0.56	(4.73)	0.02
Croatia	R	R squared	B	Standard Deviation	t	Sig
<i>NPL</i>						
<i>Depended Variable</i>						
GDP-USD	98.30%	0.97	(0.00)	0.00	(10.19)	0.00
Unempl.	99.20%	0.98	0.85	0.06	13.30	0.00
Infl. / Defl.	87.00%	0.76	(3.24)	1.06	(3.06)	0.06
North Macedonia	R	R squared	B	Standard Deviation	t	Sig
<i>NPL</i>						
<i>Depended Variable</i>						
GDP-USD	93.30%	0.87	(0.00)	0.00	(4.48)	0.02
Unempl.	96.20%	0.93	0.88	0.15	6.07	0.01
Infl. / Defl.	98.50%	0.97	(2.23)	0.22	10.00	0.00
Montenegro	R	R squared	B	Standard Deviation	t	Sig
<i>NPL</i>						
<i>Depended Variable</i>						
GDP-USD	95.50%	0.91	(0.00)	0.00	(5.60)	0.01
Unempl.	86.00%	0.74	3.31	1.13	2.92	0.06
Infl. / Defl.	71.30%	0.51	(2.17)	1.23	(1.76)	0.18