CREDIT RISK AND PROFITABILITY IN BANKING SECTOR IN BOSNIA AND HERZEGOVINA

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Abstract

Financial system of Bosnia and Herzegovina is bank-based system. There are twenty-eight banks in banking sector. Loans dominate in bank's assets and there is source for bank profitability. Authors in this paper will analyse credit risk expose of banks measured with non-performing loans ratio (NPL) in period 2005-2016. Changes in economic environment have impact on banks' credit risk. First aim of this paper is to test correlation between changes in economic present measured by indicators (GDP, inflation, and monetary aggregates) and non-performing loans. Second aim, is to test correlation between non-performing loans and profitability in banking sector.

Keywords: *bank, GDP, NPL, profitability, Bosnia and Herzegovina*

1. INTRODUCTION

Over the past 15 years, banking sector in transition countries has undergone a transformation characterised with reconstruction, privatisation, consolidation and stabilisation. For the most of transition sectors, within former centrally planned economy, monobank system was characteristic, with a combination of central bank and commercial bank functions. With process of transition, in Bosnia and Herzegovina also started consolidation in banking system that involve operation associated with the removal of bad loans extended before 1990 and operation to improve their capital adequacy.

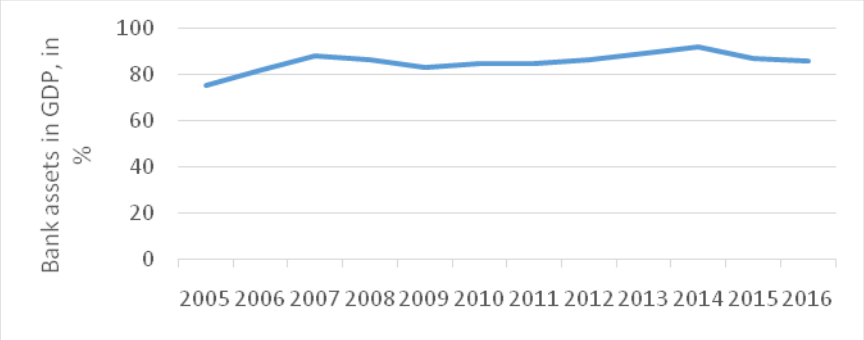
In the last decades banking sector in BH records increase of all performance and significant changes in structure of banking market (consolidation, concentration, domination of foreign capital, competition). As major part of still undeveloped BH financial system it is important to analyse stability of banking sector, specially credit risk in bank's operation. Banks in Bosnia and Herzegovina provide loans to their clients, there are expose to credit risk, and loses. Therefore, it is important to analyses non-performing loans impact on bank profitability before, during and after financial crises. As major part of still undeveloped BH financial system, it is important to analyse correlation between macroeconomic variables and non-performing loans in the banking sector in Bosnia and Herzegovina.

2. BANKING SECTOR IN BOSNIA AND HERZEGOVINA BEFORE AND UNDER FINANCIAL CRISES

Best way to evaluate impact of financial crises on the banking sector in BH is by analyzing changes in the market structure of banking sector. Therefore, it is important to research: current situation and trends in banking intermediation, ownership structures in banks, profitability and efficiency in bank activities, and concentration and competition on banking market and position of banking sector in financial system and relation with other financial institutions and markets.

Banking sector in Bosnia and Herzegovina showed positive trends in financial intermediation before financial crises. Share of banking assets in GDP reached 90.3% at the end of 2007. However, financial crises had negative impact on banking intermediation and in 2008 banks recorded decreasing share of bank assets in GDP for 9%. In 2010 banking sector recorded recover.

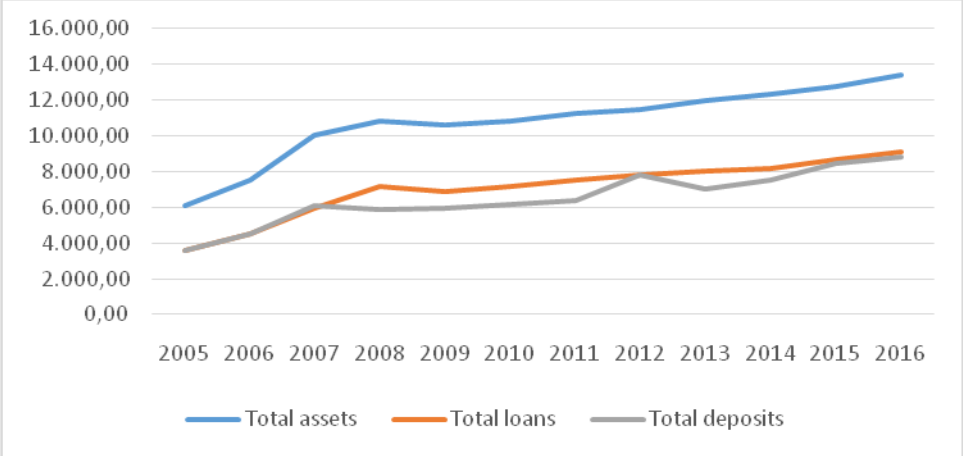
Graph 1: Banking intermediation in BH banks, 2005-2016



Sources: CBBH, Annual reports, Sarajevo, different years

Rising share of banking sector reflects the increasing size and development of this sector within the economy. Increasing banking intermediation in bank-based financial system implicates availability of financial resources to other segments of national economy that show need for it. In Bosnia and Herzegovina, banking sector pass through the period of privatisation of state-owned banks and consequently rapid consolidation. The entrance of foreign banks on the market improved the soundness of financial system. In 2008, 87 percent of total capital in banking sector was foreign-owned. All ten banks in the Republika Srpska in B&H (RS) were privately owned. In the Federation of Bosnia and Herzegovina (FBiH) 78% of banks were in private ownership (graph 2.). Banks in foreign capital ownership had share in total assets of banking sectors of 93%. More than 50% of foreign capital in B&H comes from Austrian banks.

Graph 2: Total assets, loans and deposits in banking sector of B&H, 2005-2016



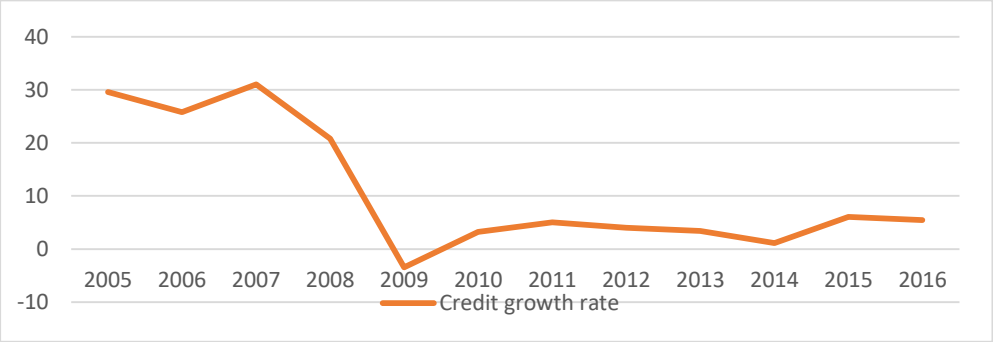
Sources: CBBH, Annual reports, Sarajevo, different years

Total banking sector asset in Bosnia and Herzegovina amounted 13 billion euros at the end 2016 what presented increase for 4% in comparison with the previous year. In the structure of banks assets credits dominate and deposits in the structure of liabilities. That structure shows that banks in Bosnia and Herzegovina are still "credit-deposit" financial institutions, without developed investment function. Total loans were 8 billion euro at the end of 2016, while total deposits reached 9.1 billion euro.

In graph 3 we can see volatility of credit activities in BH banks. It is obviously how banks recorded positive trend in years before 2008. In 2008, banks have decreased credit activities for about 23.45%

from 20% to 3.45% under effect of financial crises. After 2009, banking sector recorded slow recovering measured with growth of credit activities.

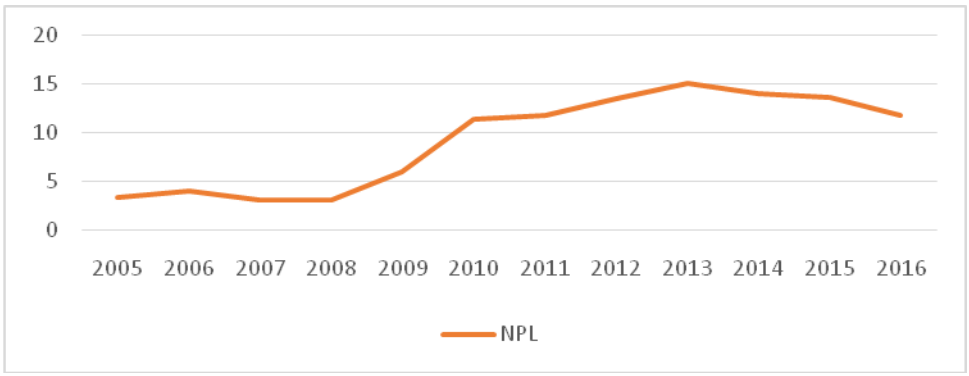
Graph 3: Growth credit portfolio in B&H banking sector, 2005-2016



Sources: CBBH, Annual reports, Sarajevo, different years

Financial crisis in 2008 had impact on credit activity in the banking sector in B&H. Result of negative impact of financial crisis was increased credit risk (non-performing loans NPL) and decreased indicators of profitability of B&H banks (graph 4 and 5).

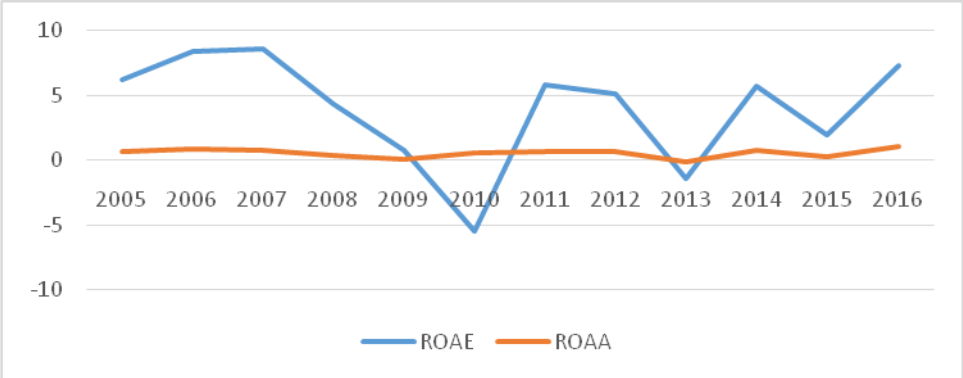
Graph 4: Non-performing loans in B&H banking sector, 2005-2016



Sources: CBBH, Annual reports, Sarajevo, different years

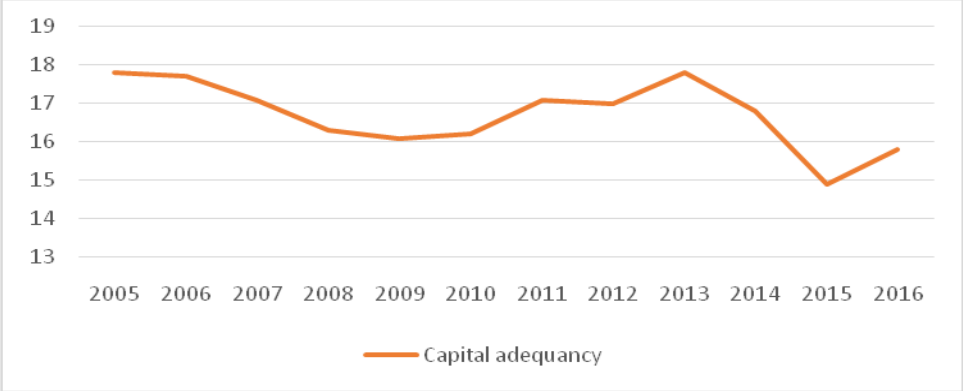
In graph 4 we can see impact of financial crisis on non-performing loans in B&H banks in period from 2008 to 2013. After 2014 quality of credit portfolio increase.

Graph 5: Profitability indicators for B&H banking sector, 2005-2016



Sources: CBBH, Annual reports, Sarajevo, different years

Graph 6: Capital adequacy rate in B&H banking sector, 2005-2016



Sources: CBBH, Annual reports, Sarajevo, different years

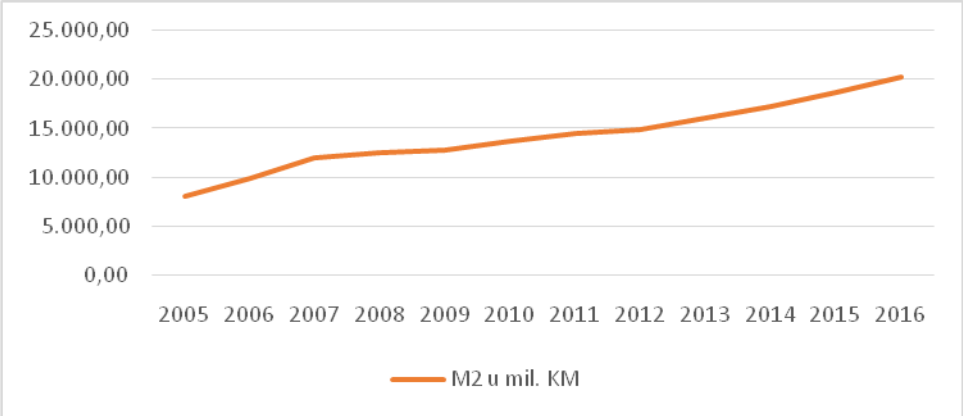
Adequacy capital rate show adequacy of capital in banking sector to cover risk weight assets. The capital adequacy rate in BH banks decreased in the last few years. Reason for decrease in 2007 was strong credit activities of banks that were not in correlation with bank capital increase. In 2008, capital adequacy rate decreased as results of strong credit risk increase. In 2013 capital adequacy decrease because regulators in B&H involve new regulation in calculation of capital adequacy.

3. MACROECONOMIC ENVIRONMENT FOR BANKS IN BOSNIA AND HERZEGOVINA

Correlation between bank credit risk and profitability and macroeconomic variables is specially analysed in industrialized economies. The illustrative list of studies for developed economies includes Schumpeter (1912), Cheung and Ng (1998), Darrat and Dickens (1999). These studies identify such factors as industrial production, inflation, interest rate, money supply and so forth as being important in explaining bank performance. To understand bank exposure to credit risk in Bosnia and Herzegovina we will analyze macroeconomic factors.

In the paper, we present selected macroeconomic indicators in B&H: monetary supply measured by monetary aggregate M2, economic activity presented by GDP growth rate and rate of inflation as measure of price stability. In figure 7, 8 and 9, we will present major macroeconomic indicators that are often used in fundamental economic analyses.

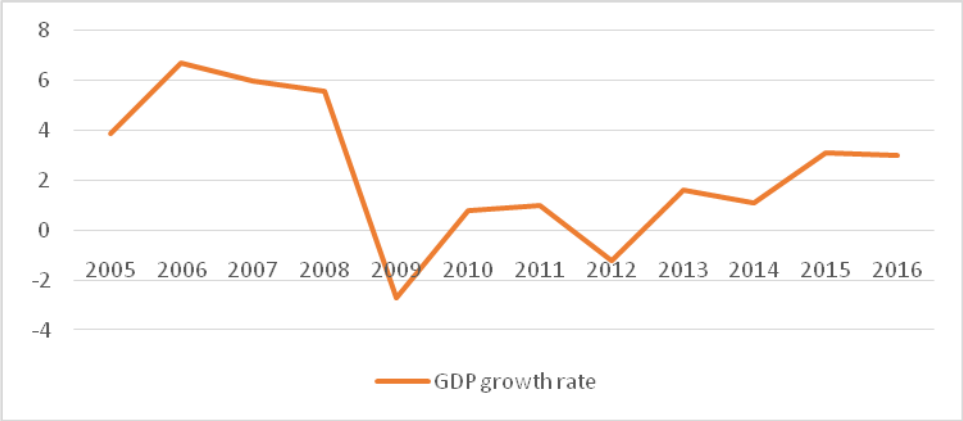
Figure 7: Monetary supply – M2 in period 2005-2015 (in million KM)



Source: Central bank of Bosnia and Herzegovina, Annual report, different years

We can see how money supply increased in Bosnia and Herzegovina as result of foreign direct investment, capital transfer in balance of payment and through monetary policy decrease of requirement reserve rate.

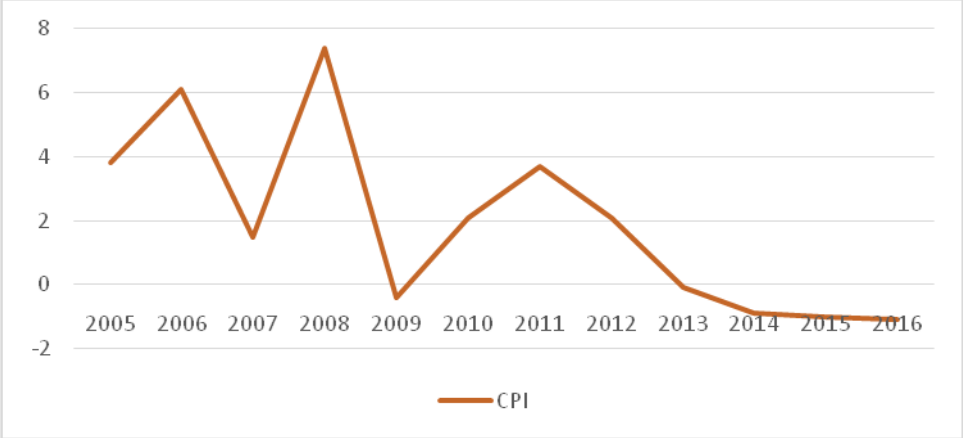
Figure 8: GDP growth rate in period 2005-2016



Source: Central bank of Bosnia and Herzegovina, Annual report, different years

From graph 8 we can see sharp decreasing GDP growth rate in 2009, after 2009 B&H pass through unstable period and fluctuation of economic activities.

Figure 9: CPI growth rate in period 2005-2015



Source: Central bank of Bosnia and Herzegovina, Annual report, different years

In period from 2009-2016 B&H record deflation in national economy.

4. CORRELATION BETWEEN MACROECONOMIC INDICATORS, CREDIT RISK AND PROFITABILITY IN BANKING SECTOR OF BOSNIA AND HERZEGOVINA

Pejić Bach, Posedel and Stojanović (2009), analyze determinates which have impact on profitability in Croatia including macroeconomic indicators. Result of research shows how profitability of banks depends in the first place on bank characteristics, while GDP growth rate has impact on ROA. Increase of credit expose has an impact on increase of reservation for credit risk loss, decreasing interest rate revenue and decreasing capital adequacy (Foss, Nordeni Weber 2010). First, we will see correlation between macroeconomic indicators and non-performing loans (table 1). Correlation coefficients shows that there is a strong connection between GDP, inflation and M2 (monetary aggregate) and non-performing loans in Bosnia and Herzegovina. Therefore, we can conclude how banking activities are sensitive on economic environment. Decrease in national economic activities results in decrease of bank credit portfolio quality and increase of non-performing loans share in total bank assets.

Table 1: Correlation between select macroeconomic indicators and NPL

		NPL	M2_MIL_KM	CPI	GDP_GROWTH_RATE
Pearson Correlation	NPL	1,000	,803	-,480	-,551
	M2_MIL_KM	**,803**	1,000	-,572	-,311
	CPI	**-,480**	-,572	1,000	,628
	GDP_GROWTH_RATE	**-,551**	-,311	,628	1,000
Sig. (1-tailed)	NPL	.	,001	,057	,032
	M2_MIL_KM	,001	.	,026	,163
	CPI	,057	,026	.	,014
	GDP_GROWTH_RATE	,032	,163	,014	.
N	NPL	12	12	12	12
	M2_MIL_KM	12	12	12	12
	CPI	12	12	12	12
	GDP_GROWTH_RATE	12	12	12	12

Source: authors

Table 2: Coefficient of determination

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,885[a]	,783	,701	2,67378

a. Predictors: (Constant), GDP_GROWTH_RATE, M2_MIL_KM, CPI

b. Dependent Variable: NPL

Coefficient of determination R^2=0,783, adjusted coefficient of determination is equal 0,701 and describes strong correlation between variables in model and confirms representativeness of model.

Table 3: F-test of significance of model

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	**Sig.**
1	Regression	206,144	3	68,715	9,612	**,005[b]**
	Residual	57,193	8	7,149		
	Total	263,337	11			

a. Dependent Variable: NPL

b. Predictors: (Constant), GDP_GROWTH_RATE, M2_MIL_KM, CPI

F-test of significance for regression coefficients gives calculated significance Sig. = 0,005<0,05 which confirms the statistical significance of the coefficients in the model.

Table 4: Coefficient of determination in correlation between ROAA and NPL

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,400[a]	,160	,076	4,07027

a. Predictors: (Constant), NPL

Sources: authors

Coefficient of correlation R^2=0,160 and it is small, so theoretical if value of R^2 3 correlation is weak. Same situation is with adjusted correlation coefficient.

Table 4: F-test of significance of regression between ROAA and NPL

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	31,618	1	31,618	1,909	,197[b]
	Residual	165,671	10	16,567		
	Total	197,289	11			

a. Dependent Variable: ROE

b. Predictors: (Constant), NPL

F-test of significance for regression coefficients gives calculated significance Sig. = 0,197>0,05, which means that regression coefficient is not statistical significance.

Table 5: Coefficient of determination in correlation between ROAA and NPL

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,164[a]	,027	-,071	,35797

a. Predictors: (Constant), NPL

Table 6: F-test of significance of regression between ROAA and NPL

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,035	1	,035	,275	,611[b]
	Residual	1,281	10	,128		
	Total	1,317	11			

a. Dependent Variable: ROA

b. Predictors: (Constant), NPL

Model and regression coefficient is not significant Sig. = 0,611>0,05

So, we can conclude how non-performing loans are not only factor which determinate profitability of banks in Bosnia and Herzegovina. We can conclude how profitability of banks is determinate with internal characteristics of each individual bank in banking system.

CONCLUSION

In the last decades banking sector in BH records increase of all performance and significant changes in structure of banking market (consolidation, concentration, domination of foreign capital, competition). As major part of still undeveloped BH financial system, it is important to analyse stability of banking sector, especially credit risk in bank's operation. Correlation coefficients shows that there is a strong

connection between GDP, inflation and M2 (monetary aggregate) and non-performing loans in Bosnia and Herzegovina. Therefore, we can conclude how banking activities are sensitive on economic environment. Decrease in national economic activities results in decrease of bank credit portfolio quality and increase of non-performing loans share in total bank assets. Results of correlation between non-performing loans and profitability we cannot conclude how non-performing loans are not only factor which determinate profitability of banks in Bosnia and Herzegovina. We can conclude how profitability of banks is determinate with internal characteristics of each individual bank in banking system.

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