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ANALYSIS OF INTEREST RATES AND BANKING SECTOR PROFITABILITY

JEL CLASSIFICATION: E49, G21

ABSTRACT:

Global low interest rate environment enforced banks to lower interest rates what should directly affect their profitability. Thus, this paper focuses on analysis of bank interest rate and profitability movement and their relation. Return on equity is used as measure of bank profitability. Paper presents differences and similarities between selected Western Balkan countries in terms of banking interest rates and profitability. In empirical part of research different scientific methods were used. For that purpose, data from Central Bank of Bosnia and Herzegovina for period 2008-2018 were used. At the beginning of analysis Pearson coefficient of correlation between analyzed variables was performed. After that regression analysis was implemented. Results indicate on positive relation of long-term interest rates and negative relation of short term-interest rates with banking sector profitability.

**KEYWORDS:****PROFITABILITY, INTEREST RATE, SPREAD**

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1. INTRODUCTION

Key risk to financial stability of Western Balkan countries is pressure on banking profitability, which could threaten banking sector's capacity in financial intermediation. During 2018 banks continued to strengthen their lending activities, asset quality has improved significantly, but stronger profitability growth has been lacking. Low interest rates still represent limitation for increase of net profit margin and profitability. On the other hand, the pressure on bank profitability puts additional capital requirements on securities trading risks due to significant volatility in financial asset prices as a result of rising risk premiums in Italy and emerging markets, and the introduction of additional capital buffers for globally important systemic banks.

This paper analyses movement of interest rates on deposits and loans, as well as profitability of banking sector. Empirical part of paper focuses on Bosnia and Herzegovina banking sector. For that purpose, data from Central bank of Bosnia and Herzegovina was used. Analyzed period was 2008-2018. In order to gain better insight into this area, and to emphasize importance of this problem, a comparison between selected Western Balkan countries for period 2015-2018 is presented. This is especially important since significant number of banks that operates in those countries have same parent bank. Therefore, comparison between those countries indicate on different or similar parent bank interest rate policies in different countries.

2. LITERATURE REVIEW

A lot of papers consider a banking profitability and its determinants. It has become specially interesting after latest financial crisis. So, authors have analyzed bank bank-specific, industry-specific and macroeconomic determinants of bank profitability in Macedonia banking sector. Results showed the most significant impact of operating expense management, solvency risk and liquidity risk. (Curak, Poposki, & Pepur, 2012) Further, authors investigate impact of bank's characteristics, financial structure and macroeconomic indicators on bank's net interest margins and profitability in the Tunisian banking industry for the 1980-2000 period. It was shown that bank characteristics explain a substantial part of the within-country variation in bank interest margins and net profitability. On the other hand, inflation and growth rates does not have impact on interest margins and profitability. (Naceur, 2013)

Following study used Johansen and Juselius cointegration test for bank specific and macroeconomic factors that affect the profitability of commercial banks in Turkish banking sector. Findings suggest that bank specific determinants have more effect on bank profitability, than macroeconomic factors. (Acaravci & Calim, 2013) Main goal of following paper was to analyze the impact of interest rates changes on the profitability of commercial banks in Pakistan. It was found that there is strong and positive correlation between interest rate and commercial banks profitability. (Khan & Sattar, 2014) After that authors analyzed market interest rate effect on the bank's profitability in public and private sectors of Pakistan. Results showed that interest rate has stronger impact on Return on equity and

Return on asset of private banks than public sector banks. (Malik, Khan, Khan, & Khan, 2014) Following study examines impact of interest rates on profitability of deposit money banks in Nigeria. Results show that banking sector profitability is function of changing interest rates. (Ogunbiyi & Ihejirika, 2014) Other authors investigated banks' profitability in selected Central and Eastern European Countries. It was disclosed that management efficiency and capital adequacy growth influence the bank profitability, while credit risk and inflation determine ROAA and ROAE. Also, it was concluded that banks with higher capital adequacy are more profitable. (Capraru & Ihnatov, 2014)

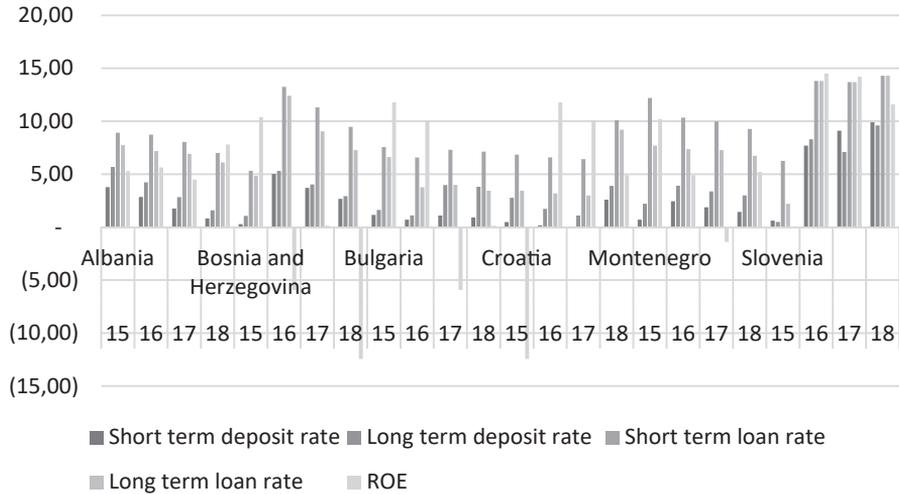
Following paper researched determinants of bank profitability in Europe. Results indicate on significant impact of size, capital ratio and loan loss provisions on bank profitability. Findings also suggest that banks with higher deposits and loans ratio tend to be more profitable but the effects on profitability are statistically insignificant in some cases. (Menicucci & Paolucci, 2016) Further, authors have investigated impact of low interest rate environment on the soundness of the United States banking sector in terms of profitability and risk-taking. It was disclosed that low interest rate environment impairs bank performances and lowers net interest margins. (Bikker & Vervliet, 2017)

Effects of unconventional monetary policy on banks profitability was also analyzed. Results showed that net interest margin models underestimate the impact of negative rates. Authors also furcated that hypothetical reference rate close to -2% poses a substantial burden to banks' profitability. (Kerbl & Sigmund, 2017) Following research showed that one percentage point interest rate drop implies an 8 basis points lower net interest margin. Low rates also adversely affect bank profitability, but with more variation. And for each additional year of "low-for-long", margins and profitability fall by another 9 and 6 basis points, respectively. (Claessens, Coleman, & Donnelly, 2018) On the other hand, authors showed that monetary policy easing, a decrease in short-term interest rates and/or a flattening of the yield curve, does not affect bank profits. But accommodative monetary conditions asymmetrically affect the main components of bank profitability, with a positive impact on loan loss provisions and non-interest income offsetting the negative one on net interest income. A protracted period of low monetary rates has a negative effect on profits that, however, only materializes after a long time period and is counterbalanced by improved macroeconomic conditions. (Altavilla, Boucinha, & Peydro, 2018) Further, authors investigated impact of intellectual capital on the profitability of commercial banks in Serbia. Results of the analysis show that the significance of the impact of the efficient use of intellectual capital on the profitability of banks operating in Serbia depends on the selected profitability measure. (Radić, 2018)

3. INTEREST RATES AND PROFITABILITY AMONG WESTERN BALKAN COUNTRIES

As result of low interest rates on international financial market and efforts of banks to gain more market share in conditions of intense competition in the banking market, interest rates continued to record decline trend. Situation is very similar across Western Balkan countries as we can see from following graph.

▶ **GRAPH 1. INTEREST RATES AND ROE IN SELECTED WESTERN BALKAN COUNTRIES**



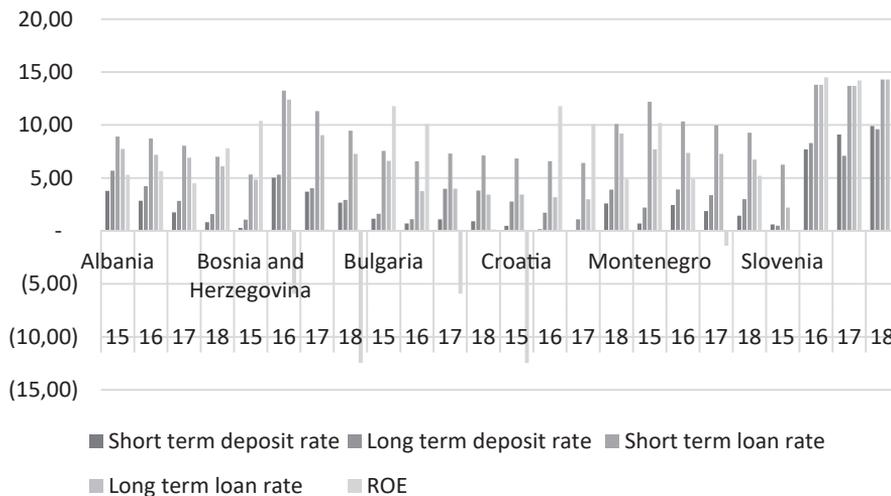
Source: Authors calculation

As we can see from above graph Albania has recorded decline trend at observed period for both, short and long, term deposit interest rates. Followed by that loan interest rates, short and long-term, also have declined. Return on equity slightly decline at the beginning of observed period and at the end of 2018 it has increased. On the other hand, Bosnia and Herzegovina recorded increase of both deposit interest rates in 2016, followed by decrease till end of observed period. Loan interest rates, short-term as well as long-term have recorded increase in 2016, but till the end of observed period it has declined. Return on equity was volatile during observed period with negative values for some years. It is important to emphasize that this negative ratio is mainly caused by huge non-performing loans write-offs.

Bulgaria has recorded increase of long-term deposit rate in 2017, but short-term deposit rates remain at low levels. Loan interest rates have been on similar level among observed period. What is important to notice, in Bulgaria banking sector long-term loan interest rate and long-term deposit interest rate are almost equal. Return on equity was volatile with negative values in 2017. Croatia has recorded slightly increasement at the end of 2017 in both, short and long-term deposit interest rates. On the other hand, loan interest rates increased at the end of 2018. Return on equity during observed period has declined trend, but it is above average for Western Balkan countries. Short-term as well as long-term deposit interest rates in Montenegro during observed period have recorded declined trend. Loan interest rates for observed period were almost not changed. Return on equity has declined in 2017 and recorded negative values, followed by increasement in 2018. Slovenian banking sector has not recorded any significant changes of deposit interest rates among observed period. It is important to mention that deposit interest rates in Slovenian banking sector are significantly above other Western Balkan countries deposit interest rates. Loan interest rates was not significantly changed during observed period, but return on equity recorded a slightly decrease. In order to get better insight and

to disclose possible relations and effects of interest rates on banks profitability, interest rate spread have been presented on following graph.

▶ **GRAPH 2. INTEREST RATES SPREADS AND ROE IN SELECTED WESTERN BALKAN COUNTRIES**



Source: Authors calculation

Interest rate spreads, as we can see from above graph, was mainly positive among observed period. Short-term interest rate spreads were larger at most observed countries. Only Bulgaria recorded negative spread in 2018. Interest rates spreads, short-term as well as long-term, recorded increasing trend during observed period in Albania banking sector. On the other hand, Bosnia and Herzegovina banking sector recorded increase of interest rates spread in 2016, followed with slight decrease till the end of 2018. Another interesting fact seen from graph refers to Slovenian banking sector. Namely, only this country has larger long-term than short-term interest rates spreads. Also, it has the greatest values of return on equity. Generally speaking, at the level of observed countries, from the graph it is noticeable negative relation of profitability with short-term interest rates spreads and positive with long-term spreads.

4. RESEARCH METHODOLOGY

In order to analyze data and test hypothesis, different scientific methods were used. At the beginning, methods of analysis were used in order to decompose aspects of Western Balkan banking sector into simple parts to gain a clearer understanding of the condition and functioning this field. The synthesis method was used for the purpose of scientific research and explaining the situation in the banking market in such a way that the results obtained by the method of analysis were used as a basis for drawing conclusions based on logical reasoning and on the basis of scientific research postulates. Then, methods of

compilation were used in order to formulate hypothesis and other scientific assumptions. During the desk research methods of analysis and synthesis, inductive and deductive, as well as method of generalization and specialization were used.

For empirical part of the research, data from Central bank of Bosnia and Herzegovina were used. Following variables were analyzed: short-term and long-term deposit and loan interest rate at banking sector level, short-term and long-term interest rate spread, return on equity (ROE) at banking sector level. Data were downloaded from Central bank of Bosnia and Herzegovina web site and used in form as it is without any customization. For the purpose of analysis we used period 2008-2018 in order to cover pre-crisis, crisis as well as recent period.

Primarily, in order to test correlations between analyzed variables correlation analysis through Pearson coefficient of correlation was employed (Somun-Kapetanović, R. 2008. p.128).

$$r = \frac{SS_{xy}}{\sqrt{SS_{xx} \cdot SS_{yy}}}$$

Where :

$$SS_{xy} = \sum (X_i - \bar{X})(Y_i - \bar{Y})$$

and

(1)

$$SS_{xx} = \sum_{i=1}^n (X_i - \bar{X})^2$$

and

$$SS_{yy} = \sum_{i=1}^n (Y_i - \bar{Y})^2$$

Further, in order to measure impact of interest rates spreads on Return on equity as measure of banking sector profitability a standard multiple regression model was used, which can be presented in the following form (Somun-Kapetanovic, 2012, p.140):

$$Y = a + b_1 X_1 + b_2 X_2 + \dots + b_k X_k + e \quad (2)$$

The dependent variable Y is expressed as a function of K independent variables, where parameter a is a free, constant term representing the expected value when the value of all K independent variables is 0. The parameter b_i ($i = 1, 2, \dots, K$) or the regression coefficient shows the average change in the dependent variable Y conditioned by the unit increase of the independent variable X_i , provided that the other independent variables remain unchanged.

5. RESEARCH RESULTS

At the beginning of analysis Pearson coefficient of correlation between analyzed variables was performed. Namely, the purpose of this part of analysis is to detect potential correlation between interest rates such as: (short-term deposit rate, long-term deposit rate, short-term loan rate and long-term loan rate). Following table presents correlation analysis results.

▶ **TABLE 1. CORRELATION MATRIX**

	SHORT-TERM DEPOSIT RATE	LONG-TERM DEPOSIT RATE	SHORT-TERM LOAN RATE	LONG-TERM LOAN RATE	ROE
Short-term deposit rate	1				
Long-term deposit rate	0.9889*	1			
Short-term loan rate	0.8579*	0.9579*	1		
Long-term loan rate	0.9246*	0.9628*	0.8952*	1	
ROE	-0.0297*	0.3968*	-0.3155*	0.4750*	1

*confidence level 0.05

Source: Authors calculation

At the above table, correlation is visible as well as its direction and intensity between variables. Therefore, it is noticeable relatively strong positive correlation between long-term loan rate and Return on equity. This relation was expected since higher loan rates increases bank profit margin. According to intensity of correlation next variable is long-term deposit rates with correlation of coefficient 0.3968. On the other hand, short-term rates (deposits as well as loans) have negative correlation with return on equity. This means that increase of these interest rates leads to decrees in ROE. It is important to emphasize that correlation coefficient of short-term deposit rate is small and almost not so meaningful. Correlation matrix gave just brief inside into relation between interest rates and banking sector profitability. Therefore, a regression analysis was employed in order to make a model interest rate impact on banking sector profitability. Since correlation coefficients for different maturities are significantly different, for the purpose of regression analysis and in order to get some clearer answers about observed relation, interest rates spread for long and short-term were used. Firstly, descriptive statistics for observed variables is presented.

▶ **TABLE 2. DESCRIPTIVE STATISTIC**

	ROE	SHORT-TERM SPREAD	LONG-TERM SPREAD
Mean	3.8332	6.4688	3.2309
Standard Error	1.1129	0.3500	0.3746
Median	4.9	6.36	3.8339
Mode	-5.92	6.41	5.5
Standard Deviation	6.6770	2.1001	2.2479
Minimum	-12.45	-0.49	-1.84
Maximum	14.5	11.5	7.1

Source: Authors calculation

Before presenting regression result result of ANOVA analysis are presented. As it can be seen, F – test shows us that the model is good.

▶ **TABLE 3. ANOVA**

	SUM OF SQUARES	MEAN SQUARE	F	SIGNIFICANCE F
Regression	435.2613	217.6306	5.7653	0.0067
Residual	1358.924	3.7479		
Total	1794.186			

Source: Authors calculation

Regression analysis require meeting of some assumptions regarding variables included in analysis. Therefore, before running regression analysis these assumptions were tested. Firstly, Kolmogorov – Smirnov test was conducted. Its value shows as that all variables are normally distributed with significance less than 0.05. Analysis of multicollinearity was than implemented. Obtained results show absence of multicollinearity and that model is good. The assumption of homoscedasticity was, also, tested. It was done by Whites' test which has shown that this assumption is satisfied. Outliers have been checked by the help of standard deviation and histograms. The results of this analysis didn't show any special outliers, so there was no necessary to cope with them. The regression results are given in following table.

▶ **TABLE 4. REGRESSION RESULTS**

	COEFFICIENTS	STANDARD ERROR	T STAT	P-VALUE
Intercept	0.1373	3.2626	2.2862	0.0282
Short-term spread	- 0.1703	0.5756	2.3853	0.0225
Long-term spread	0.7459	0.5125	-3.3219	0.0021
R Square	0.4925			

Source: Authors calculation

From the R-square for the first model it can be concluded that with this model we explain 49.25% changes in banking sector profitability. Durbin Watson test is 2.15 what is acceptable value. Results show that increase in short-term spread for one unit leads to decrease in profitability for 0.1703 units. On the other hand, increase in long-term spread for one unit leads to increase in profitability for 0.7459 units. These results were expected, since correlation matrix showed negative correlation of short-term rates and positive correlation of long-term rates with Return on equity (ROE). Practical explanation of this research results is reflected in higher volatility of short-term interest rates and its faster reflection to revenues and financial result. Recent years have been characterized by extremely low interest rates, what is especially emphasized for short-term part of banking portfolio. On the other hand, from accounting standing point, short-term part of portfolio faster comes to collection what at the end reflects on profit. Also, interest rates spread is significant due the high negative interest rates on global financial markets and tendency of banks to preserve their profits and capital as much as they can – by giving minimum, in some cases even negative deposit rates.

6. CONCLUSION

Recent years are characterized by extremely low interest rate on global financial markets. Banking sector affected by this situation suffer from low profits. Banks were forced to find ways to place their funds by low interest rates. On the other hand, client savings have suffered also, due the extremely low deposit interest rates that banks started to offer. All those factors led to slowing credit growth as well as deposit withdraws. As result banks have recorded low profits.

This paper presented situation at banking sectors of selected Balkan Countries for period 2015-2018. It can be concluded that situation is pretty similar at all observed countries with minor deviation. Deposit rates, both short and long-term were similar during observed period among analyzed countries moving between 0 and 5%. On the other hand, loan rates recorded more volatile moving, al level of individual countries as well as at level of all observed countries. Thus, their values vary between 4% and 13%. Interest rate spreads was mainly positive among observed period. Short-term interest rate spreads were larger at most observed countries. Generally speaking, at the level of observed countries, it is noticeable negative relation of profitability with short-term interest rates spreads and positive with long-term spreads.

Empirical results showed relatively strong positive correlation between long-term loan rate and Return on equity in Bosnia and Herzegovina banking sector. On the other hand, short-term rates (deposits as well as loans) have negative correlation with return on equity. This means that increase of these interest rates leads to decrees in ROE. Regression analysis results show that increase in short-term spread for one unit leads to decrease in profitability for 0.1703 units. On the other hand, increase in long-term spread for one unit leads to increase in profitability for 0.7459 units. Based on all listed above, it can be concluded that key for banking success in time of extremely low interest rates is balancing between short and long-term portfolio. Namely results have shown negative, but not so intensive, impact of short-term interest rates and positive and intensive impact of long-term interest rates. This research in the future could be expanded with additional variables (reference interest rate and bank-specific determinants), and panel data analysis could be conducted among Western Balkan countries for some longer time horizon.

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