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## FACTORS OF CREDIT GROWTH IN THE REAL SECTOR IN BOSNIA AND HERZEGOVINA: EVIDENCE OF CERTAIN COUNTRIES OF THE WESTERN BALKANS

### ABSTRACT:

*Bank loans represent an essential source of financing for the real sector, especially in countries where the basic structure of the financial system consists of commercial banks. In the last few years, lending to small and medium-sized enterprises in Bosnia and Herzegovina has slowed down mainly due to the fact that banks do not trust enterprises, the lack of quality collateral, the poor financial performance of the company, bad bank placements and other factors. The banking system in Bosnia and Herzegovina was completely liberalized, which resulted in increased competition on one hand, and on the other hand, increased the concentration of foreign capital. The growth rate loan to the real sector will be used as the dependent variable while the growth rate of average salary, the growth rate liquidity assets according to total assets, the growth rate of EURIBOR, the growth rate of return on assets, the growth rate of capital adequacy ratio and growth rate deposit according to loans will be used as independent variables. In this paper, the STATA 13.0 software package will be used. This data analysis will include quarterly basis data for the period: 2007q1 – 2017q4 due to its higher significance. The basic results of the regression analysis also showed a positive relationship between the growth rate of loans to the real sector and a growth rate of salary, and the growth rate of EURIBOR. Similarly, there is a positive relation between the growth rate of loans to the real sector and the growth rate of return on an asset. In contrast, the weaker relationship was recorded with the following independent variables: the capital adequacy ratio and growth rate of liquidity asset to total assets.*

**Keywords:** *Credit expansion, EURIBOR, deposits, real sector, variance inflation factor.*

**JEL:** *G2, G20, G21.*

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## 1. INTRODUCTION

The growth of lending to banks is the most profitable part of the activities of each bank. This is particularly true for markets where banks are the main institutions and where the expansion of banks towards new clients can influence the increase in credit potential. Lending in developing countries has been on the rise in recent years. Factors that influenced credit growth certainly improved macroeconomic stability, availability of new forms of lending, and moderate economic growth (IMF, 2015).

In general, the overall financial structure in Bosnia and Herzegovina has a major impact on the forms of short-term and midterm financing of enterprises. On one hand, there is a very small number of large companies, while the rest are small or medium enterprises. The credit history of small and medium-sized enterprises are relatively short. On the other hand, the financial market is shallow, where there is no possibility for companies to finance the money market or the issue of debt securities of longer maturities. Also, other financial institutions are underdeveloped and do not deal with credit. The main form of financing is through banking. For banks, lending is a very risky business where they resort to the widespread use of collateral as a form of repayment of borrowings. It is important to note that many companies do not use bank loans, and a commercial loan becomes an important form of financing the working capital.

The largest share of domestic loans to the private sector in relation to GDP in Bosnia and Herzegovina amounted to 54.85% in 2013 and 53.62% in 2015. In 2010, the share of domestic loans to the private sector in relation to GDP was realized with around 52.78%. The largest share of domestic loans to private sector in relation to GDP in Serbia was recorded in 2010 of 49.90% and 49.44% in 2012. The lowest share of domestic loans to the private sector in relation to GDP was recorded in 2008 of around 38.94%. The largest share of domestic loans to the private sector in relation to GDP in Croatia amounted to 70.27% in 2011 and in 2013 about 69.96%. The lowest share of domestic loans to the private sector in relation to GDP was registered in 2016 of about 61.26% (The World Bank, Data report, 2018).

The paper is designed in six parts. The first part is about introductory considerations. The second part examines a brief overview of the relevant literature. The third part relates to the set of research hypotheses that will be tested through the obtained research results. The fourth part analyses certain business indicators for the banking sector of selected countries. The fifth part refers to the selected data and the set methodology of the research. And finally, the sixth part refers to the obtained results of the research.

## 2. A Brief Overview of Relevant Literature

According to Ryan (1994) inefficient markets aimed at maximizing profits, banks are placing loans to borrowers who are offering projects with a positive net present value. Often, in practice, the situation is that banks increase the supply of loans in line with their goals, and not as a determinant of improving the quality of their clients. According to Gross (2001), by including the financial sector in the growth model through the cost determinant, it measures part of the savings that are lost in economy and can be directed to new investments. Effective financial intermediation can affect the reduction of this loss, therefore it should be taken into account that financial intermediation is always expensive due to uncertainty, asymmetry of information and transaction costs.

Koivu (2002) examines the link between the banking sector and real GDP growth in 25 transition countries for the period: 1993-2000. According to the obtained results, private sector credit in developing countries is not accompanied by economic growth, as the causality between them is unclear, and that the value of loans from the previous period is negative in relation to the economic growth in the current period.

Salas and Saurina (2002) and Jimenez and Saurina (2006) investigated the relationship between credit growth and credit losses of banks in Spain. The results of the dynamic panel research showed a positive relationship between credit growth and credit losses. Credit losses of banks were increased with the higher credit growth, but loans that were prolonged during the period of booms and crises were riskier than those before the financial boom. Countries such as Lithuania, Estonia, Hungary, whose banks largely use foreign funds for lending had a faster decline in credit growth after 2008 ( Guo K. , Stepanyan V., 2011).

Okwo (2012) investigated the lending effect of private sector banks on economic growth in Nigeria. The results of the survey have shown that loans to the private sector have a statistically significant relationship with GDP as expected. Bank loans to the private sector influence the promotion of economic growth through capital accumulation and technological progress through the effect of increasing savings, positive investment information, and the appreciation of foreign capital inflows.

## 3. Research Hypotheses

The representation of the model will examine the calculation of the coefficient of correlation ( $r$ ), the coefficient of determination  $R^2$  and the adjusted coefficient of determination  $R^2$ .

There is also an analysis of variance (ANOVA), which will test the significance of observed variables in the model, where:

**HO1:** The null hypothesis is the reason why the independent variables do not significantly affect the dependent.

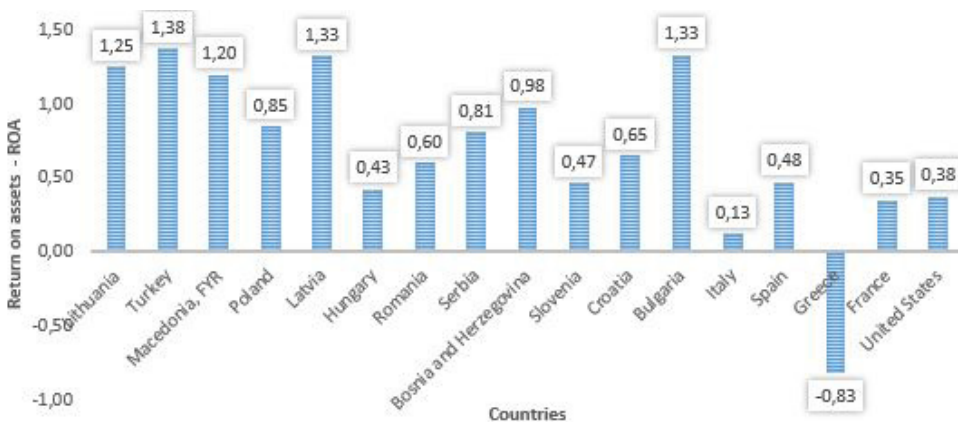
**HO2:** The alternative hypothesis is the reason why the independent variables do significantly affect the dependent.

The representation of the model will examine calculation of the coefficient of correlation ( $r$ ), the coefficient of determination  $R^2$  and adjusted coefficient of determination  $R^2$ . There is also an analysis of variance (ANOVA), which will test the significance of observed variables in the model, where the null hypothesis is the reason why the independent variables do not significantly affect the dependent.

#### 4. A Brief Overview of Certain Indicators of Banks Operations

Profitability indicators are usually a surrogate for the value of the bank shares. The behaviour of stock prices is the most striking indicator of a company's business, as it reflects the assessment of the company operations by the market. It often happens that the price of shares is not a reliable indicator of the banking business since the actions of certain banks are not traded on the official markets because they are small-sized banks. The figure below illustrates the trend of average returns on bank assets (ROA) in the region, EU member states and some developed countries (including Turkey) for the period: 2014 q4 - 2017q2.

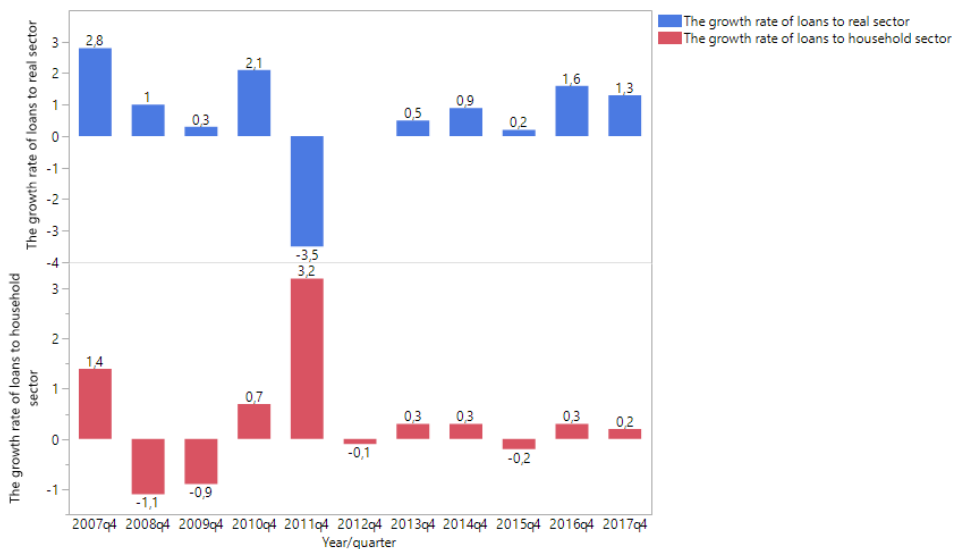
**Figure 5.** The average trend of ROA in the region, EU member and some developed countries for the period: 2014q4 – 2017q2 (in %)



Source: *www.imf.org* (Adjusted by the author)

Return on assets is an indicator of managerial efficiency in terms of management ability to convert assets into earnings. From the previous figure, it can be seen that the highest average return on assets was achieved by the following countries: Turkey (1.38%), Latvia (1.33%), Bulgaria (1.33%), Lithuania (1.25%), FYR Macedonia (1.20%). Observed, on the other hand, the lowest average return on assets was realized by the following countries: Greece (-0.83%), Italy (0.13%), France (0.35%), United States (0.38%), Hungary (0.43%) and Slovenia (0.47%). If the value of ROA is higher than 2.5%, it indicates the market in which the banking cartel is present or the risk portfolio of the observed bank (Đukić, Đ., 2011, p. 190). Given that no banking system of the observed countries has achieved the given value, we can conclude that there was no banking cartel. Countries with a value of 1% to 1.38% had a fairly good position, while countries with a value of 0.13% to 0.47% had a weak to the average position.

**Figure 1.** The growth rate of loans to real and household sector for the period: 2007q1 – 2017q4 (in %)



**Source:** Calculated by the author (STATA 13.0)

From the previous graph, we can see that lending to the household sector had a negative trend in the fourth quarter of 2008 and the fourth quarter of 2009. On the other hand, lending to the private sector had a slightly increasing trend. This is primarily due to the impact of the crisis period and the tightening of procedures for granting loans and increased interest rates. During the period from the fourth quarter of 2014 to the fourth quarter of 2017, there was a turning point in the lending policy in favour of the private sector as a result of a mild increase in economic growth, falling interest rates, and a relaxed lending policy.

Real growth in loans to the real sector, in particular, long-term loans, contributed to the growth of real GDP in almost all activities and increased export activity (The Central Bank of Bosnia and Herzegovina, 2017., p. 52-53).

## 5. Data And Methodology

In this paper, the growth rate loan to the real sector will be used as a dependent variable, while the independent variables will use the following: the growth rate of average salary, the growth rate liquidity assets according to total assets, the growth rate of EURIBOR, the growth rate of return on assets, the growth rate of capital adequacy ratio and growth rate deposit according to loans. The research period covers the period from the first quarter of 2007 to the fourth quarter of 2017. The analysis will be made using quarterly data, as the number of annual data is insufficient for econometric evaluation. The equation which is the adjusted regression model in this paper can be expressed as follows:

**Table 1.** A brief description of the dependent and independent variables in the model

Variable	Measurement	Notation	Expected effect
The growth rate of Average salary	The growth rate of Average salary	GRAS	(+)
The growth rate liquidity assets according total assets	The growth rate liquidity assets according total assets	GRLATA	(-)
The growth rate of EURIBOR	EURIBOR is based on average interest rates where the European banking system of European bank's lends funds to each other. This survey uses the rate of growth on a quarterly basis.	GREUR	(+)
The growth rate of return on assets	Return on assets is an indicator of managerial efficiency in terms of management's ability to convert assets into earnings.	GRROA	(+)
The growth rate of capital adequacy ratio	The capital adequacy ratio is a measure of available capital in relation to the risk weighted assets and services in order to protect depositors and the stability of the banking system	CAR	(-)
The growth rate deposit according loans	The growth rate deposit according loans	GRDAL	(-)

**Source:** Calculated by the author

## 6. Results

Before hypothesis are tested, basic statistic indicators; correlations and VIF values are given in table 2, 3 and 4.

**Table 2.** Basic statistics of dependent and independent variables for the banking sector of all observed countries for the period: 2007 q1 - 2017 q4

Bosnia and Herzegovina					
Variables	Obs	Mean	Std. Dev.	Min	Max
GRAS	43	1003.06	217.93	726	1.340
GRLATA	43	-0.6363	3.916	-9.5	8.2
GREUR	43	0.8821	1.524	-0.381	4.397
GRROA	43	0.725	0.623	-0.6	2.0
CAR	43	16.302	0.697	14.9	17.8
GRDAL	43	0.206	3.243	-10.4	11.5
Serbia					
Variables	Obs	Mean	Std. Dev.	Min	Max
GRAS	43	1.0039	0.3010	0.25	1.95
GRLATA	43	0.9177	0.9830	0.32	0.96
GREUR	43	0.8821	1.5245	-0.38	4.40
GRROA	43	1.4172	0.6452	-0.07	2.77
CAR	43	21.390	2.482	16.4	28.1
GRDAL	43	0.988	0.224	0.12	1.26
Croatia					
Variables	Obs	Mean	Std. Dev.	Min	Max
GRAS	43	33.575	3.910	27.7	40
GRLATA	43	0.882	1.524	-0.381	4.397
GREUR	43	1.097	0.700	-1.5	2
GRROA	43	29.904	4.826	24.2	42.2
CAR	43	18.275	2.347	14.2	21.8
GRDAL	43	0.7990	0.066	0.713	0.941

**Source:** Calculated by the author (STATA 13.0)

From the previous table, the risk of standard deviation (in case of Bosnia and Herzegovina) has achieved the following independent variables: the growth rate of average salary (217.93%), the growth rate of liquidity assets according to total assets (3.916%) and growth rate deposit according loans (3.243%). The highest volatility for the observed period was achieved with the growth rate of average salary. The lowest net wage was recorded in the first quarter of 2008 of about 371 euros, while the highest value was recorded in the fourth quarter of 2017 from 685 euros, and the average value of 512 euros.

In the case of Serbia, the highest volatility in terms of standard deviation was achieved by the following independent variables: capital adequacy ratio (2.482%), and growth rate of Euribor (1.524%). The highest capital adequacy ratio was recorded in the second quarter of 2018 (28.10%), while the lowest value was achieved in the third quarter of 2012 (16.40%) and the average value for the observed period of 21.39%, which is significantly higher than the legal minimum of 8%.

In the case of Croatia, the greatest risk of standard deviation was achieved by the following positions of independent variables: the growth rate of return on assets (4.83%), the growth rate of average salary (3.91%) and capital adequacy ratio (2.347%). The highest return on equity was recorded in the first quarter of 2007 (1.9%), while the lowest value was recorded in the third

(-1.5%) and the fourth quarter of 2015 (-1.2%). The negative value is the result of increased provisioning for credit losses that have been translated into costs and write-offs and an increase in operating costs.

**Table 3.** Partial and semi-partial correlation between the independent and dependent variables of all observed countries for the period: 2007 q1 –2017q4

Bosnia and Herzegovina					
Variables	Partial Corr.	Semi-partial Corr.	Partial Cor. $\wedge$ 2	Semi-partial Corr. $\wedge$ 2	Significant Value
GRAS	0.1329	0.1048	0.0177	0.0110	0.420
GRLATA	-0.004	-0.003	0.001	0.001	0.980
GREUR	0.600	0.587	0.361	0.345	0.001
GRROA	0.128	0.100	0.016	0.010	0.437
CAR	-0.191	-0.152	0.036	0.023	0.245
GRDAL	0.072	0.056	0.005	0.003	0.664
Serbia					
Variables	Partial Corr.	Semi-partial Corr.	Partial Cor. $\wedge$ 2	Semi-partial Corr. $\wedge$ 2	Significant Value
GRAS	0.0482	0.0448	0.0023	0.0020	0.7706
GRLATA	-0.3419	-0.3371	0.1169	0.1137	0.0331
GREUR	-0.0860	-0.0800	.0074	0.0064	0.6027
GRROA	0.0700	0.0650	0.0049	0.0042	0.6722
CAR	-0.1059	-0.0987	0.0112	0.0097	0.5211
GRDAL	0.1657	0.1557	0.0275	0.0242	0.313
Croatia					
Variables	Partial Corr.	Semi-partial Corr.	Partial Cor. $\wedge$ 2	Semi-partial Corr. $\wedge$ 2	Significant Value
GRAS	0.2591	0.0642	0.0671	0.0041	0.010
GRLATA	-0.1404	-0.0340	0.0197	0.0012	0.3938
GREUR	0.6078	0.1832	0.3695	0.0336	0.001
GRROA	0.4999	0.1382	0.2499	0.0191	0.012
CAR	-0.3053	-0.0767	0.0932	0.0059	0.0588
GRDAL	-0.8378	-0.3674	0.7020	0.1350	0.000

**Source:** Calculated by the author (STATA 13.0)

From the previous correlation matrix (in the case of banks in Bosnia and Herzegovina), it can be seen that the strongest positive correlation between growth rate of loans as dependent variable have influenced the following independent variables: the growth rate of Euribor(0.600), secondly the growth rate of average salary (0.133) and the real growth rate of deposits according to loans (0.072). On the other hand, the weakest causality is expressed between the growth rate of liquidity assets to total assets (0.04) and capital adequacy (0.191). Borrowers who use bank loans in Bosnia and Herzegovina with a variable interest rate that binds EURIBOR as a benchmark interest rate must be aware of the fact that the reference interest rate can be changed



which will certainly affect the interest rates on their loans. Changes in the ECB base interest rate will depend primarily on the economic conditions in the euro area. Both variables are related to each other or can be derived with one variable. In this case, the regression equation will have an additive effect due to similarities between the variables, the value of the predicted values can be inflated. This condition is called multicollinearity. It can be treated using variance inflation factor- VIF. The preceding VIF cutoffs are considered to be multi-collinear, which are set at the industry level. Each variable that has a VIF higher than 3 is considered to be multi-collinear and is dropped from the model. In the case of multicollinearity coefficients of the variables become unstable and standard errors are inflated.

**Table 4.** Table 4. Multi-collinear analysis via variance inflation factor for all observed countries (VIF)

<b>Bosnia and Herzegovina</b>		
Variable	VIF	1/VIF
GRAS	1.22	0.817571
GRLATA	1.84	0.542144
GREUR	1.31	0.760684
GRROA	1.34	0.747823
CAR	1.04	0.960759
GRDAL	2.08	0.481718
Mean VIF	1.47	
<b>Serbia</b>		
Variable	VIF	1/VIF
GRAS	1.32	0.759926
GRLATA	1.11	0.904728
GREUR	2.55	0.39186
GRROA	2.33	0.42951
CAR	2.71	0.36884
GRDAL	1.22	0.81646
Mean VIF	1.87	
<b>Croatia</b>		
Variable	VIF	1/VIF
GRAS	1.07	0.938087
GRLATA	2.78	0.35971
GREUR	1.46	0.686922
GRROA	1.34	0.74626
CAR	2.79	0.35842
GRDAL	2.21	0.45248
Mean VIF	1.94	

**Source:** Calculated by the author (STATA 13.0)

As it can be seen in the previous table, each individual independent variable for all observed countries have a VIF coefficient value less than 3 or 3, but not more than 3. It is clear that there is no multicollinearity between the variables, so the set model is valid.

## 6.1. Results of the ANOVA test for Bosnia and Herzegovina, Serbia and Croatia

### 6.1.1. Bosnia and Herzegovina

Regression results of Bosnia and Herzegovina are given below:

**Table 5.** The basic model of regression analysis between the independent and dependent variable for the period: 2007q1 – 2017 q4

Source	SS	df	MS	Number of observations	43
Model	23.201	5	3.867	F (5,38)	3.93
Residual	36.439	38	0.984	Prob >F	0.0039
Total	59.640	43	4.851	R-squared	0.3890
				Adj R-squared	0.2899
				Root MSE	0.9924

Variables	Coef.	Std. Err.	T	P> t	[95% Conf. Interval]	
GRAS	0.00062	0.0007	0.82	0.420	-0.0009	0.00218
GRLATA	-0.00130	0.0524	-0.02	0.980	-0.1076	0.10503
GREUR	-0.519956	0.1138	-4.57	0.001	-0.28933	0.75057
GRROA	0.22070	0.2809	0.79	0.437	-0.34859	0.79000
CAR	-0.26163	0.22141	-1.18	0.245	-0.71025	0.18699
GDAL	0.0294	0.06721	0.44	0.664	-0.10676	0.165623
_const	3.7130	3.76728	0.99	0.331	-3.92021	11.3462

**Source:** Calculated by the author (STATA 13.0)

Testing the null hypothesis of significance obtained statistically significant data which indicated that there was a significant influence of certain independent variables at a significant level of  $\alpha=5\%$  and the empirical F-ratio is 3.93. As for this study, the value of the empirical F-ratio (3.93) is greater than the theoretical value of F-ratio (2.46) for the 5-degree of freedom in the numerator and 38 in the denominator. In that case, it comes to the conclusion to reject the null hypothesis that the independent variables do not have a significant impact on the dependent variable.

The above table shows that the strongest positive link was recorded between the growth rate loan to the real sector and the following independent variables: the growth rates of return on assets (0.22), then the growth rate of average salary (0.03) and the growth rate deposit according to loans (0.029). In contrast to the positive influence of independent variables on the dependent, the negative impact of independence on the dependent variable were achieved by the following variables: the growth rate of EURIBOR (-0.519) than the growth rate of capital adequacy ratio (-0.261) and the growth rate of liquid assets to total asset (-0.001).

A positive link between the credit growth rate and the growth rate of return on assets is the result of the correct selection and composition of asset positions, i.e., the ability of management to convert assets into the bank's profit. Also, the results of the analysis show a positive link between credit growth and the growth rate of average salary. Borrowers with regular and stable income regularly pay off their loan commitments, which reduces the level of credit risk and opens a new lending cycle. In the last few years, more precisely after the post-crisis period, there was a rise in deposits due to the bank's cautiousness in approving loans, lack of alternative forms of investment, and a pronounced risk of credit placements. The deposit structure in 2017 consisted mostly of domestic private sector deposits and Government deposits as a result of stable revenues from indirect taxation (The Central Bank of Bosnia and Herzegovina, 2017, p. 53).

### 6.1.2. Serbia

Banking assets of the banking sector of the Republic of Serbia at the end of 2017 amounted to about 3.4 billion dinars, which makes a relative increase from 3.9% in relation to the previous year. Given that the business model of banks is oriented towards traditional credit and deposit operations, most of the assets were related to loans and deposits. Most of the loans and receivables, i.e. about 91.6% referred to placements to customers, and the rest to banks and other financial institutions. (The National Bank of Serbia, 2017, p.38). Regression results of Serbia are given below:

**Table 6.** The basic model of regression analysis between the independent and dependent variable for the period: 2007q1 – 2017 q4

Source	SS	df	MS
Model	0.551	5	0.091
Residual	3.345	38	0.090
Total	<b>3.896</b>	43	0.181

Number of observations	43
F (5,38)	2.63
Prob >F	0.430
R-squared	0.241
Adj R-squared	0.1122
Root MSE	0.3007

Variables	Coef.	Std. Err.	T	P> t	[95% Conf. Interval]	
GRAS	0.1388	0.4727	0.29	0.771	0.8189	1.0967
GRLATA	-1.0853	0.4903	-2.21	0.033	0.0917	2.079
GREUR	-0.0252	0.0480	-0.53	0.603	-0.1225	0.072
GRROA	0.0462	0.1084	0.43	0.672	0.2659	0.173
CAR	-0.019	0.0304	-0.65	0.521	-0.0419	0.081
DAL	0.2317	0.2266	1.02	0.313	0.6910	0.227
_const	0.100	0.7170	0.14	0.889	1.5534	1.352

**Source:** Calculated by the author (STATA 13.0)

In the case of Serbia, the value of the empirical F test was 2.63. Unlike the empirical F test, the value of the theoretical F test for the 5-degree of freedom in the numerator and 38 in the denominator is 2.46. Therefore, the zero hypothesis is rejected while the alternative hypothesis assumes that certain independent variables influence the dependent variable in the model.

In terms of the relationship between dependent and independent variables, the strongest correlation with the growth rate loan to the real sector was achieved by the following independent variables: growth rate deposit according to loans (0.232), then the growth rate average salary (0.138) and growth rate return on equity (0.05). The increase in deposits in 2017 was 4.8% more than in the previous year, based on an increase in transaction deposits of households and companies.

The greatest negative causality was achieved with the following independent variables: the growth rate of a liquid asset to total assets (-1.085) then the growth rate of Euribor (-0.02) and capital adequacy ratio (-0.01). The increase in liquidity potential has a direct impact on the reduction of credit placements to the household and economy sector due to the increase in the level of uncertainty and credit risk, as well as the increase in the prudence of banks when approving loans. The capital adequacy of banks in Serbia at the end of 2017 was 22.6%, which is well above the regulatory minimum of 8%. Even narrower definitions of capital adequacy are in line with Basel III standards. The basic capital adequacy ratio was 6%, while the share capital adequacy ratio was 4.5%. Increasing capital adequacy in addition to legal regulations, by automation, creates a prudence for banks when approving loans.

### **6.1.3. Croatia**

The total bank placements in domestic sectors in Croatia in 2017 amounted to 2.9%, and a year later the growth was only 1.1%. A large contribution to the growth of total loans contributed to loans to the household sector by about 4.0%, as well as state subsidies from the state due to falling interest rates (The Croatian National Bank, 2017., p. 35). Regression results of Croatia are given on the next page.

**Table 7.** The basic model of regression analysis between the independent and dependent variable for the period: 2007q1 – 2017 q4

Source	SS	df	MS
Model	619.85	5	103.309
Residual	37.684	38	1.01850
<b>Total</b>	<b>657.53</b>	<b>43</b>	<b>104.327</b>

<b>Number of observations</b>	43
F (5,38)	101.43
Prob >F	0.000
R-squared	0.9427
Adj R-squared	0.9334
Root MSE	1.0092

Variables	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
GRAS	0.0884	0.0542	1.63	0.111	0.198	0.0213
GRLATA	-0.1694	0.1963	-0.86	0.394	-0.567	0.2284
EURIBOR	1.2345	0.2651	4.66	0.001	0.697	1.771
GRROA	0.204	0.0582	3.51	0.001	0.086	0.323
CAR	-0.3076	0.1577	-1.95	0.059	-0.627	0.012
DAL	-38.536	4.127	-9.34	0.000	-46.900	-30.172
_const	62.717	2.802	22.38	0.000	57.039	68.395

**Source:** Calculated by the author (STATA 13.0)

In the case of Croatia, the value of the empirical F test was 101.43. Unlike the empirical F test, the value of the theoretical F test for the 5-degree of freedom in the numerator and 38 in the denominator is 2.46. Therefore, the zero hypothesis is rejected while the alternative hypothesis assumes that certain independent variables influence the dependent variable in the model. In terms of the relationship between dependent and independent variables, the strongest correlation with the growth rate loan to the real sector was achieved by the following independent variables: the growth rate of Euribor (1.234), the growth rate of average salary (0.088) and growth rate of return on equity (0.204).

## 7. CONCLUSION

In this research, endogenous and exogenous factors those affect the credit growth loans to the real sector were tested. Therefore, the growth rate of loans was used as a dependent variable. In addition, the growth rate of average salary, the growth rate liquidity assets according to total assets, the growth rate of EURIBOR, the growth rate of return on assets, the growth rate of capital adequacy ratio and growth rate deposit according to loans were used as endogenous variables. For this purpose, in this study investigation took place for Bosnia Herzegovina, Serbia and Croatia because of common characteristics on the period of 2007q1 -2017q4 in the research part of the paper through the basic regression model, null and alternative hypothesis testing by empirical and theoretical F test. The results showed that a zero hypothesis was re-

jected and an alternative hypothesis accepted in terms of some independent variables those have a significant influence on the credit growth rate. The strongest positive link between the three countries observed with the growth rate of loans to the real sector was achieved with the growth rate of average salaries than with the growth rate of return on equity. On the other hand, the strongest negative causality for all three countries observed was achieved with the following independent variables: capital adequacy ratio, and growth rate deposit according to loans. In the coming period, banks of the observed countries should reconsider their lending strategies in terms of reversals in their credit policies and the need for long-term and quality projects in order to preserve their placements.

Also, for the purpose of good governance and management, the banks should take into account controlling and improving performance. New research will certainly depend on the availability of the database for a longer time series. Choosing a wider range of variables can affect the improvement of the results obtained.

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## FAKTORI KREDITNOG RASTA REALNOG SEKTORA U BOSNI I HERCEGOVINI: EVIDENCIJA ODREĐENIH ZEMALJA ZAPADNOG BALKANA

### SAŽETAK:

*Bankarski krediti predstavljaju suštinski izvor finansiranja realnog sektora posebno u zemljama u kojima osnovnu strukturu finansijskog sistema čine komercijalne banke. Poslijednjih godina kreditiranje malih i srednjih preduzeća u Bosni i Hercegovini usporeno je uslijed nepovjerenja banaka prema preduzećima, nedostatak kvalitetnog kolaterala, loših finansijskih performansi banaka, loših plasmana banaka i drugih faktora. Bankarski sistem u Bosni i Hercegovini bio je potpuno liberalizovan, što je dovelo do povećanja konkurencije s jedne strane, a sa druge strane povećanje koncentracije stranog kapitala. Stopa kreditnog rasta prema realnom sektoru biće korištena kao zavisna varijabla, dok stopa rasta prosječne plate, stopa rasta likvidne aktive prema ukupnoj aktivi, stopa rasta EURIBOR, stopa rasta povrata na aktivu, stopa rasta koeficijenta adekvatnosti kapitala, stopa rasta depozita prema kreditima biće korištene kao nezavisne varijable. U ovom radu će se koristiti softverski paket STATA 13.0. Ova analiza podataka će obuhvatati podatke na kvartalnoj osnovi za period: 2007 k1 - 2017 k4. zbog većeg stepena signifikantnosti. Osnovni rezultati regresione analize pokazali su da postoji pozitivna veza između stope rasta kredita prema realnom sektoru sa stopom rasta prosječnih zarada, kao i sa stopom rasta EURIBOR-a. Slično tome, postoji pozitivna veza između stope rasta kredita realnom sektoru i stope rasta prinosa na aktivu. Suprotno navedenom, slabija odnos (negativna korelacija) zabilježena je sa sljedećim nezavisnim varijablama: koeficijent adekvatnosti kapitala i stopa rasta likvidne aktive prema ukupnoj aktivi.*

**Ključne riječi:** kreditna ekspanzija, EURIBOR, depoziti, realni sektor, faktor inflacione varijanse.