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DOES LIQUIDITY AND BANK CAPITAL AFFECT COMMERCIAL BANKS PROFITABILITY? EVIDENCE FROM COUNTRIES OF SOUTHEAST EUROPE

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Abstract: *Commercial banks are profit seeking organizations, but at the same time, they take care of their liquidity and safety, due to the reason to satisfy the withdrawal needs of its customers. Taking this into the account commercial banks always face the issue of trade off between liquidity, safety, and profitability and they try to find a balance between them as they contradict each other. The paper analyses the relationship between profitability on one side and liquidity and bank capital on the other site in the commercial banks in several countries of Southeastern Europe. Apart from the relationship between the variables of interest, we determine the strength and direction of that relation.*

Keywords*: Southeast Europe, commercial banks, profitability, liquidity, bank capital.*

1. Introduction

It is well known that maximum level of liquidity can be attained only if banks keep a high amount of cash against the deposits they have held. However, keeping a high amount of cash funds will not bring any profits for the banks. Thus, if the banks seek for maximum safety then they will have to sacrifice their profitability. Similarly, if they try to increase the profitability investing all the money invested they will have the problem if customers demands for cash. Bank capital is another factor which affects profitability. The

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higher level of capital is considered to be an expense for the bank and reduces its profitability. But, on the other hand, high level of bank capital reduces the risk of bankruptcy.

The issue of trade off among liquidity, safety, and profitability of commercial banks is widely considered and analyzed in both theoretical and empirical literature.

A number of empirical literature confirms that some banks went bankrupt, not because they were not profitable, but because they were not liquid. Some studies proved the negative relation between liquidity and profitability, i.e. high level of liquidity decreases bank profitability: (Osborne, et. al, 2012); (Molyneux & Thorton, 1992) etc.

However, high level of cash guarantees the undertaken of highly profitable investments that demand immediate payment, which may result in an increase in revenue and capital. Due to this reason, there are studies which confirm a positive relationship between liquidity and profitability: (Bordeleau & Graham, 2010); (Holmstrom & Tirole, 1998); (Bourke, 1989) etc.

Higher capital is often supposed costly for banks, implying that higher capital reduces profitability, but according to the "trade-off" theory, it may also reduce bank's risk and possibilities of bankruptcy. There are studies which confirm positive relations between the amount of bank capital and bank profitability. This happens in the period of instabilities when a high level of capital increase investor confidence and profitability: (Berger, 1995); (Pennacchi, 2005); (Goodhart, 2008) etc.

2. Data and methodology

For the purpose of our survey quarterly data for the period from 2010 to 2016 are used. We examine several countries from Southeastern Europe: Serbia, Macedonia, Bulgaria, Greece, Slovenia, Romania and Bosnia and Herzegovina For all countries except for Serbia, we use financial soundness indicators taken from the IMF database. Due to the lack of data, for Serbia we use annual data taken from the National Bank of Serbia. As a measure of profitability, we use the Return on Assets (ROA), as a liquidity measure we use liquid assets to total assets (liquid asset ratio), and as a measure of bank capital we use the regulatory capital to risk weighted assets.

In order to determine the relationship between profitability on one side and liquidity and the amount of capital on the other side, as well as the strength and direction of that relationship we use the following hypotheses:

H1: No relation exists between the profitability and liquidity

H2: There is significant relationship between profitability and liquidity

H3: No relation exists between the profitability and bank capital

H4: There is significant relationship between profitability and bank capital

In order to test these hypotheses, we use the coefficient of linear correlation or Pearson coefficient, which is the covariance of the two variables divided by the product of their standard deviations. Pearson coefficient can be calculated using the formula below:

$$r = \frac{n\,\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{n(\Sigma x^2) - (\Sigma x)^2}\ \sqrt{n(\Sigma y^2) - (\Sigma y)^2}} \quad (1)$$

Where n is a number of data; y is dependent variable and x is the independent variable. The coefficient is a value between +1 and −1, where +1 indicates a perfect positive relationship, -1 indicates a perfect negative relationship and a 0 indicates that no relationship exists.

For a more precise determination of the correlation strength in our paper, we use the classification of the correlation intervals made by Evans (Evans, 1996)[1].

The first step in our research is the presentation of the descriptive statistics (mean and standard deviation) of all variables in selected countries. The results are presented in table no. 1

Table 1:Descriptive statistics of ROA, liquidity ratio and bank capital in the countries of interest

	ROA		Liquid asset ratio		Regulatory Capital to Risk-Weighted Assets	
	Mean value	Standard deviation	Mean value	Standard deviation	Mean value	Standard deviation
Macedonia	.59	.45	25.74	2.02	16.52	.61
Bulgaria	1.11	.41	27.92	4.56	20.64	2.61
Greece	-.81	3.00	31.37	3.80	13.10	2.81
Slovenia	-.40	1.95	20.33	6.13	14.72	3.26
Romania	.23	.75	57.00	1.87	16.33	1.94
Bosnia and Herzegovina	.68	.61	26.38	1.63	16.37	.84
Serbia	.37	.41	57.27	4.02	20.36	.89

*Source***:** Author's own calculations

From the table above, we can analyze mean value and central tendency of ROA, liquidity and bank capital in the selected countries.

As we can see the highest mean value of ROA has Bulgaria, while the lowest (negative) has Greece. We can notice the negative mean value of ROA also in Slovenia. The highest mean value of liquidity ratio have Serbia and Romania, and the lowest Slovenia, while the highest mean value of regulatory capital to risk-weighted assets have Serbia and Bulgaria, and lowest Greece. In relation to standard deviation, we can notice a

[1] r 0-0.19 very weak correlation
r 0.20-0.39 weak correlation
r 0.40-0.59 moderate correlation
r 0.60-0.79 strong correlation
r 0.80-1.0 very strong correlation

high variation on ROA variable in Greece, on liquidity variable and bank capital in Slovenia.

For estimating Pearson coefficient we use statistical package PSPP. In addition to the strength and the way of correlation between analyzed variables, we have tested the statistical significance of the relations.

The condition to use Pearson correlation is that both variables should be normally distributed. For this purpose at the beginning, we apply Kolmogorov-Smirnov test for normal distribution of all the variables. Results from the test are presented below.

Table 2. One-Sample Kolmogorov-Smirnov Test for normal distribution

Country	Regulatory Capital to Risk-Weighted Assets	ROA	Liquid asset ratio
Macedonia	.86 (.452)	.77 (.950)	.90 (.394)
Bulgaria	1.11 (.155)	.66 (.776)	1.22 (.084)
Greece	1.13 (.135)	1.15 (.120)	.72 (.686)
Slovenia	1.20 (.095)	1.59 (.008)	1.44 (.022)
Romania	.99 (.279)	.49 (.969)	1.13 (.138)
Bosnia and Herzegovina	.77 (.557)	.91 (.379)	.87 (.431)
Serbia	.60 (.865)	.49 (.968)	.51(.959)

*(Asymp.Sig)

Source: Author's own calculations

We can see from the above table that variables in all country except in Slovenia (variables ROA and liquidity) are normally distributed because the significance value of all of them is greater than 0.05, which provides direction to continue with Pearson correlation test.

For the variables in Slovenia which are not normally distributed we use Spearman's correlation coefficient, which does not require a normal distribution of the series (StatSoft, 2010). This coefficient is a non-parametric statistic measure of correlation between two series. Just like Pearson's coefficient, Spearman coefficient ranges from -1 to 1, and have a similar interpretation of its values. The Spearman's correlation coefficient is calculated using Wessa's free Statistic software.

3. Research results

By applying Pearson correlation coefficient and Spearman coefficient in the case of Slovenia we made tests on the following alternative hypotheses:

H1: No relation exists between the profitability and liquidity

H2: There is significant relationship between profitability and liquidity

The results of the tests are presented below:

Table 3. Results of correlation analysis: Hypothesis 1 and 2

Macedonia	Pearson Correlation	-.31
	Sig. (1-tailed)	.040
Bulgaria	Pearson Correlation	.85
	Sig. (1-tailed)	.000
Greece	Pearson Correlation	-.02
	Sig. (1-tailed)	.452
Slovenia	Spearman Correlation	.63
	p-value	.000
Romania	Pearson Correlation	-.49
	Sig. (1-tailed)	.004
Bosnia and Herzegovina	Pearson Correlation	-.77
	Sig. (1-tailed)	.000
Serbia	Pearson Correlation	-.50
	Sig. (1-tailed)	.125

Source: Author's own calculation

As we can see on the table number 3 the highest correlation between ROA and liquidity As we can see on the table number 3 the highest correlation between ROA and liquidity exists in Bulgaria and lowest in Greece. According to Evans (Evans, 1996), the correlation between these two variables is very strong in Bulgaria, strong in Slovenia and Bosnia, moderate in Romania and Serbia, while weak in Macedonia and very weak in Greece.

The results of the estimation represented above suggest the statistical significance of 5% in all countries except in Greece and Serbia.

The coefficient sign is negative in the case of Macedonia, Greece, Romania, Bosnia and Herzegovina and Serbia, which means that increase in liquidity will result in a decrease in bank profitability. The coefficient sign in Bulgaria and Slovenia is positive, which means positive relations between these two variables, i.e. increase in liquidity will increase profitability and vice versa. This can be explained by the fact that higher amount of working capital would mean a reduction of the risk, and according to the economic theory, profits are a direct and positively related to risk.

By applying Pearson correlation coefficient and Spearman coefficient in the case of Slovenia we made tests on the following alternative hypotheses:

H3: No relation exists between the profitability and bank capital.

H4: There is significant relationship between profitability and bank capital

The results of the tests are presented below:

Table 4. Results of correlation analysis: Hypothesis 3 and 4

Macedonia	Pearson Correlation	-.81
	Sig. (1-tailed)	.000
Bulgaria	Pearson Correlation	.82
	Sig. (1-tailed)	.000
Greece	Pearson Correlation	.07
	Sig. (1-tailed)	.361
Slovenia	Spearman Correlation	.77
	p-value	.000
Romania	Pearson Correlation	.48
	Sig. (1-tailed)	.005
Bosnia and Herzegovina	Pearson Correlation	.11
	Sig. (1-tailed)	.261
Serbia	Pearson Correlation	.12
	Sig. (1-tailed)	.396

Source:Author's own calculations

As we can see on the table number 4 the highest correlation between ROA and bank capital exists in Bulgaria and Macedonia, and lowest correlation in Greece. According to Evans (Evans, 1996), the correlation between this two variables is very strong in Bulgaria and Macedonia, strong in Slovenia, moderate in Romania, while very weak in Greece, Bosnia and Herzegovina and Serbia.

The results of the estimation represented above suggest the statistical significance of 5% in all countries except in Greece, Bosnia and Herzegovina and Serbia.

An interesting fact is that the coefficient sign is negative just in the case of Macedonia. In all other countries of interest the coefficient sign is positive, which means positive relations between these two variables, i.e. increase in regulatory capital to risk weighted assets will increase profitability and vice versa.

4. Conclusion

High liquidity is considered to be a sign of financial strength in commercial banks due to the reason that holding cash provides the payment for daily expenses. Furthermore, take into account that future cash flows are uncertain, holding cash gives a safety margin for eventual downturns. But on the other site, current assets are usually the less profitable than the fixed assets, because the money invested in current assets generates fewer returns than fixed assets, thus representing an opportunity cost, which leads in reducing the profitability.

Higher capital reduces profitability because it is costly for the banks, but it may also reduce a bank's risk and hence the possibilities of bankruptcy.

In this paper, we try to find the interdependence between liquidity and profitability, as well as between profitability and regulatory capital to risk-weighted assets in commercial banks for a selected group of Southeastern European countries and to

observe the direction and the strength of this relationship. We explore whether the level of liquid assets and bank capital have an influence on bank profitability. For this purpose, we use data for commercial banks for several countries from SEE in the period from 2010-2016.

The results show that relationship between profitability on one side and level of liquidity and bank capital on the other side is differing among different countries. In some countries the relation is positive in some of them negative. Countries also differ in the strength of direction, and in the statistical significance of the interpreted results. However, the relationship between profitability and liquidity is positive just in a case of Bulgaria and Slovenia, in all other countries is negative. The relationship between bank capital and profitability is negative just in a case of Macedonia, and in all other countries is positive. In general, this shows that increases in liquidity will result in decreasing in profitability while increasing bank capital will result in increasing in profitability.

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DA LI LIKVIDNOST I KAPITAL BANKE UTIČU NA PROFITABILNOST KOMERCIJALNIH BANAKA? SLUČAJ ZEMALJA JUGOISTOČNE EVROPE

Apstrakt: Komercijalne banke su organizacije koje traže profit, ali istovremeno vode računa o svojoj likvidnosti i sigurnosti da bi zadovoljile potrebe povlačenja svojih kupaca. Uzimajući ovo u obzir, komercijalne banke se uvek suočavaju sa problemom usaglašavanja likvidnosti, sigurnosti i profitabilnosti i pokušavaju da pronađu ravnotežu između njih dok se one suprotstavljaju jedna drugoj. Rad analizira odnos između profitabilnosti, s jedne strane, i likvidnosti i kapitala banke s druge u komercijalnim bankama u nekoliko zemalja Jugoistočne Evrope. Osim odnosa između varijabli kamate određuje se snaga i pravac tog odnosa.

Ključne reči: Jugoistočna Evropa, komercijalne banke, profitabilnost, likvidnost, kapital banke.