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THE IMPACT OF BANK-SPECIFIC FACTORS ON THE LIQUIDITY OF COMMERCIAL BANKS IN SERBIA

Uticaj specifičnih bankarskih faktorana likvidnost komercijalnih banaka u Srbiji

Abstract

The aim of this work is to identify internal factors that affect the liquidity of commercial banks in Serbia. Research results in the observed period from 2008 to 2013 using regression analysis indicate that the liquidity of banks is positively correlated with capital adequacy ratios and interest income to total assets ratio, while negative and statistically significant relationship exists between the indicators of liquidity and the size of the bank (measured by bank assets), expense ratios compared to interest income and return on equity ratios. This research represents the first step in achieving optimization model of liquidity, because many financial institutions, although profitable, are faced with the problem of maintaining liquidity. Research question that arises is the following: Which of the observed indicators affect the liquidity of commercial banks in Serbia the most? The survey used unconsolidated balances of 23 commercial banks in the period from 2008 to 2013. In particular, using ordinary least squares technique, author takes two different measures of liquidity risk into consideration. After obtaining an answer to the main question of this work regarding the key indicators of impact on the liquidity of the banking sector in Serbia, one can define the strategies and model for improvement of the operation of banks in financial markets. The results highlight that size, capitalization and profitability of banks can have an impact on liquidity risk management.

Keywords: *commercial banks, determinants of liquidity, liquidity ratios, financial indicators, regression analysis*

Sažetak

Cilj ovog rada je da identifikuje interne faktore koji utiču na likvidnost komercijalnih banaka u Srbiji. Rezultati istraživanja dobijeni korišćenjem regresione analize, u posmatranom periodu od 2008. do 2013. godine, ukazuju na to da je likvidnost banaka u pozitivnoj korelaciji sa pokazateljem adekvatnosti kapitala i racijom kamatnih prihoda prema ukupnoj aktivi, dok negativna, statistički značajna veza postoji između pokazatelja likvidnosti i veličine banke (merene bankarskom aktivom), racija rashoda od kamata u odnosu na prihod od kamate i racija prinosa na kapital. Ovaj istraživački rad predstavlja prvi korak u postizanju optimizacije modela likvidnosti jer su mnoge finansijske institucije, iako profitabilne, suočene sa problemom održavanja likvidnosti. Istraživačko pitanje koje se nameće jeste koji od posmatranih indikatora najviše utiču na likvidnost komercijalnih banaka u Srbiji. U istraživanju su korišćeni nekonsolidovani bilanci 23 komercijalne banke u periodu od 2008. do 2013. godine. Konkretno, koristeći tehniku običnih najmanjih kvadrata, autor razmatra dve različite mere rizika likvidnosti. Dobijanjem odgovora na pitanje koji su ključni indikatori od uticaja na likvidnost bankarskog sektora Srbije, može se definisati strategija i model poboljšanja poslovanja banaka na finansijskom tržištu. Rezultati ističu da veličina, kapitalizacija i profitabilnost banke mogu uticati na upravljanje rizikom likvidnosti.

Ključne reči: *komercijalne banke, determinante likvidnosti, racio likvidnosti, finansijski indikatori, regresiona analiza*

Introduction

In developing countries, such as the Republic of Serbia, banks are the most important financial institutions. By turning savings into investments, they stimulate economic growth, which is why it needs to be emphasized that their stability is one of the prerequisites for successful operation of the economy itself. Liquidity is the bank's ability to meet its financial obligations within maturity period. The risk of liquid funds represents bank's failure to respond to expected and unexpected current and future needs of cash flows. The basic rule for preserving liquidity is good synchronization of liabilities' maturity periods with debt collection maturity. Recent financial crisis has shown that the lack of liquidity in the banking system is the trigger of negative events. Under these circumstances, the identification of liquidity determinants is essential for a better understanding of the concept and also for the appropriate positioning of liquidity risk in relation to other financial risks. This paper is structured as follows: Section 2 provides an overview of the literature on the concept of liquidity, Section 3 describes data and methodology, as well as the econometric model, while Section 4 outlines empirical results, followed by the conclusion of this work.

Literature review

Literature on determinants of liquidity provides limited empirical evidence on the impact of internal, bank-specific factors and external, macroeconomic factors on the bank's liquidity.

Dinger analyzed the liquidity position of foreign-owned banks in ten Central and Eastern European economies (Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia) in the 1994–2004 period. The results showed that transnational banks hold a higher relative volume of liquid assets only in case of aggregate liquidity shortages. In normal conditions, the liquidity of banks operating in a single country is higher. This is caused by the fact that transnational banks have access to foreign sources of liquidity. Larger banks hold less liquid assets than smaller ones. Bank liquidity is

increasing with better capitalization, a higher interbank rate, a lower deposit rate, a lower growth rate of GDP and a lower GDP per capita [7].

Munteanu analyzed the factors that influence bank liquidity through a multiple regression model, a panel of 27 commercial banks in Romania over the 2002-2010 period, emphasizing the differences between the precrisis years (2002-2007) and the crisis years (2008-2010). The results reflect both common and differing determinants for the two liquidity rates analyzed and are consistent with the results in literature [10].

In his study, Vodová included Czech commercial banks in the period from 2001 to 2009, analyzing determinants of liquidity risk measured by various indicators of balance sheet. Study results show that the liquidity of commercial banks in the Czech Republic is higher when capital adequacy is higher and when interest rates on loans are higher. Measures of liquidity showed a positive relationship with capitalization and the size of the bank measured by bank assets. The author has also presented that larger banks maintained lower levels of liquidity which is positively correlated with the theory of "too big to fail". He also pointed out that the level of unemployment, interest margin, reference interest rate and profitability have no significant impact on liquidity of commercial banks in the Czech Republic [13].

In his work about the determinants of liquidity of commercial banks in Slovakia, Vodová included four specific and eight macroeconomic indicators in the period from 2001 to 2010. The research results have pointed out that liquid assets of the bank decreased with increasing profitability, higher capital adequacy ratio and size of the bank. Liquidity, measured by the share of loans in total assets and in deposits and short-term borrowings, increases with the growth of gross domestic product. Clients reduce their debt in the expansion phase and increase demand for loans in the recession phase. This fact is precisely the reason why banks tend to borrow more (and in this way reduce their own liquidity), even in the period of higher unemployment and lower profitability. Author also pointed out that interest rates (on loans, interbank transactions and monetary policy of interest rates), interest margin and share of problem loans and rate of inflation are not

statistically important for the liquidity of commercial banks in Slovakia [12].

In his work about the determinants of liquidity of commercial banks in Poland in the period from 2001 to 2010, Vodová included over thirty banks. The research results have pointed out that the liquidity of banks is strongly determined by economic conditions and consequences of the financial crisis. Liquidity of a bank decreases with increasing profitability, interest rate margins and the size of bank assets. Conversely, liquidity increases with the increase in capital adequacy rate and inflation rate [14].

In the study of the determinants of liquidity of commercial banks in Hungary in the period from 2001 to 2010, Vodová showed that the bank liquidity is positively related to capital adequacy ratios, interest rates on loans and interest rates on interbank transactions and correlates negatively with the size of the bank, interest margins, monetary policy of interest rates and interest rates on interbank transactions. The correlation between gross domestic product and banking liquidity is ambiguous [15].

Roman and Sargu included 11 banks in Bulgaria and 15 banks in Romania in their study of the determinants of liquidity risk of commercial banks in Romania and Bulgaria in the period from 2003 to 2011. They focused only on internal factors, as these can influence the overall liquidity of banking institutions. The obtained results underline that the capital adequacy ratio and the impaired loans to gross loans ratio have a statistically significant impact on the liquidity risk of the banks operating in Bulgaria and Romania [11].

Data and methodology

For the purpose of this study, the following liquidity indexes were used. Ratio of funds provides information on available liquid funds to secure liquidity in case of withdrawal of deposits.

$$L1 = \frac{\text{cash} + \text{income} + \text{foreign exchange} + \text{reserves account} + \text{marketable securities}}{\text{total assets}}$$

Descriptive statistics indicates relatively extreme values of liquidity ratio (minimum and maximum) held

by the banks in the reporting period, from 2008 to 2013. That is to say, the lowest liquidity ratio in the reporting period amounted to 1.16, which UniCredit Bank made in 2008 and Credit Agricole in 2012, while the highest level of liquidity indicators amounted to 11.08 in Opportunity Bank in 2009.

$$L2 = \frac{\text{loans}}{\text{total assets}}$$

L2 is the share of loans in total assets. It shows that the percentage of assets is converted into illiquid assets, loans. High value of this indicator indicates the existence of lower liquidity potential for banks.

Descriptive statistics indicates relatively extreme values of the share of loans in total assets indicator (minimum and maximum) held by the banks in the reporting period from 2008 to 2013. The L2 indicator is actually inverse indicator of liquidity. Higher value of this indicator suggests lower liquidity of a specified bank. The highest indicator value of 85.72% belonged to Raiffeisen Bank in 2009. Raiffeisen Bank, as measured by assets, belongs to the group of large banks, as evidenced by the fact that large banks maintain lower liquidity buffer. In 2009, Postal Savings Bank, as measured by assets, belonged to the group of small banks and maintained this ratio at 20.78%, which suggests keeping high levels of liquidity buffers.

Table 1: Descriptive statistics – L1

N	Valid	120
	Missing	0
Mean		2.6349
Median		2.1150
Std. deviation		1.69988
Minimum		1.16
Maximum		11.08

Source: Author.

Table 2: Descriptive statistics – L2

N	Valid	120
	Missing	0
Mean		60.7589
Median		62.1700
Std. deviation		12.37069
Minimum		20.78
Maximum		85.72

Source: Author.

Negative correlation between the observed indicators confirms the theoretical assumptions that the increase in the share of loans in total assets influences the liquidity reduction, i.e. the indicator L1.

Many authors have analyzed determinants of liquidity risk. Four groups of influential factors were used as explanatory variables: macroeconomic factors, bank performance, bank characteristics and size of the bank [3], [8], [5], [1], [16] and [17]. In the analysis, we used variables that represent the impact of bank-specific performance on liquidity. Bearing in mind the conflicting objectives of liquidity and profitability, negative relationship between these performances is assumed. Banks are forced to seek the optimum which would be the result of a nuanced equilibrium of profit and liquidity rate. As regards the rate of return of commercial banks, we can state that Serbian commercial banks in 2013 had to engage more capital to earn the same as in 2008 or less.

Despite major losses, Serbian banking system is adequately capitalized and highly liquid. The problem in Serbia does not lie on the side of sources, but on the side of investments. Because of the extraordinary liquidity on the one hand, and higher credit risk on the other, with not so aggressive demand for loans, there is a downward trend in interest rates on deposits and savings.

Liquidity ratio measured by the ratio of loans in total assets indicates the percentage of the funds that the bank bound to illiquid assets or loans. Higher ratio indicates lower liquidity of the bank. Positive relationship of capital adequacy and liquidity is in connection with the assumption that banks with sufficient capital adequacy should be more liquid. If the banks see themselves as too big (size measured by total assets-action capital) to fail, their motivation for holding highly liquid assets of active capital is limited. Methodology applied in the analysis is

Table 3: Correlations between L1 and L2

	L1	L2
Pearson correlation coefficient	1	-.247**
Sig. (2-tailed)		.006
N	120	120
Pearson correlation coefficient	-.247**	1
Sig. (2-tailed)	.006	
N	120	120

**Correlation is significant at the 0.01 level (2-tailed).
Source: Author.

OLS (Ordinary Least Squares) regression used to identify determinants of liquidity of commercial banks in Serbia. The following formula was used for each liquidity ratio.

$$L_{it} = \alpha + \beta_1 CAP_{it} + \beta_2 ROE_{it} + \beta_3 CIR_{it} + \beta_4 YOA_{it} + \beta_5 TOA_{it} + \beta_6 EIR_{it} + \epsilon_{it}$$

Where:

L_{it} – one of the two indicators

X_{it} –vector of explanatory variables for bank i in time t

α – constant,

β – coefficient which represents the slope of variables

ϵ_{it} – the error term

In order to investigate the influence of factors on liquidity, two multiple regression analyses for each indicator of liquidity were made. Table 5 provides an overview of internal variables that influence the dependent variable – liquidity. The basis for the selected independent indicators represents the previously conducted research on this topic by numerous authors. The table shows a list of variables that are used in the regression analysis.

Six internal banking factors were observed in this paper, as presented in the above table. It is expected that three factors should have positive influence on liquidity, while the rest of the above factors should have negative impact. The survey used unconsolidated balances of 23 commercial banks in the period from 2008 to 2013.

Results and discussion

The correlation of the observed variables is calculated using 120 observations of internal independent variables that impact dependent variable –liquidity. A preliminary analysis was carried out to confirm the assumptions about normality, linearity and homogeneity of variances. The connections within the whole group of variables were investigated by Pearson correlation. Table 6 shows the correlation of variables.

Table 4: Review of return of commercial banks

ROE	2008	2009	2010	2011	2012	2013	Index
Banca Intesa	14.59	13.41	14.76	13.29	11.44	9.32	63.88
Komercijalna Banka	11.9	12.05	12.27	13.89	15.05	11.46	96.30
UniCredit Bank	17.44	14.23	14.4	13.57	11.17	7.68	44.04
Raiffeisen Bank	19.22	7.62	6.14	10.61	12.01	11.36	59.11
Societe General	10.88	8.68	8.13	5	0.3	3.64	33.46

Source: Author.

Table 5: Variables definition

Variables	Source	Expected impact on liquidity
Independent variables		
CAP: the share of equity in total assets of the bank	Annual reports	+
ROE: return on equity	Annual reports	-
CIR: the ratio of operating expenses to income from interest and fees	Annual reports	-
YOA: the ratio of interest income to total assets	Annual reports	+
TOA: logarithm of total assets of the bank	Annual reports	+
EiR: the ratio of interest expense to interest income	Annual reports	-
Dependent variables		
L1: liquidity cash ratio	Annual financial statements of commercial banks (2008-2013)	
L2: share of loans in total assets	Annual financial statements of commercial banks (2008-2013)	

Source: Author.

The study has shown that there is a strong positive and statistically significant relationship between the indicators of liquidity and capital adequacy amounting to 0.569. The size of a bank also represents a statistically significant liquidity indicator, which has a negative impact on liquidity. There is a strong negative link between liquidity and size of a bank presented in the value of -0.561. A negative and statistically significant relationship was observed between the ratio of interest expense to interest income and liquidity ratio (-0.306).

The data in Table 7 indicate that there is no problem of multicollinearity because the value of the VIF is lower than the reference value 10. The mean value of VIF is 1.972, below 10, which confirms the absence of multicollinearity and the VIF test for individual variables does not exceed

the maximum value 10. The values of the tolerance test and variance inflation factor in the VIF test are significantly below the critical values which is why it can be concluded that the assumption of the nonexistence of multicollinearity for model was not impaired. Further diagnostic tests are executed to ascertain the validity of the model.

This model explains 44.3% (41.3) of liquidity variance. The above table shows the highest importance of liquidity determinants measured by L1 liquidity ratios. Liquidity is determined by capital adequacy ratios and size of bank assets. If we measure liquidity L1, we find that the most significant liquidity determinants of commercial banks in Serbia are shown in Table 8. The size of the bank measured

Table 7: Multicollinearity statistics - Tolerance test and variance inflation factor (VIF)

Independent variable	Tolerance (1/VIF)	VIF (>10 collinearity problem)
CAP	.633	1.580
TOA	.352	2.838
ROE	.650	1.538
EiR	.567	1.762
YOA	.540	1.852
CIR	.442	2.262
		Mean VIF: 1.972

Source: Author, SPSS output.

Table 6: Correlation of variables

	L1	CAP	TOA	ROE	EiR	YOA	CIR
Pearson correlation	1	.569**	-.561**	-.073	-.306**	.348**	.142
L1 Sig. (2-tailed)		.000	.000	.425	.001	.000	.123
N	120	120	120	120	120	120	120

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Source: Author, SPSS output.

Table 8: Determinants of the L1 liquidity ratio in Serbia

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	Quality model
	B	Std. error	Beta			
(Constant)	12.383	3.991		3.103	.002	No. of obs 120
CAP	.064	.015	.377	4.267	.000	R-squared .443
TOA	-1.361	.425	-.379	-3.204	.002	Adjusted R-squared .413
L1 ROE	-.007	.007	-.090	-1.031	.305	F 14.969
EiR	-.009	.013	-.062	-.664	.508	p .000
YOA	-.004	.079	-.005	-.051	.959	Durbin Watson statistic:
CIR	-.003	.005	-.054	-.510	.611	1.860731

Source: Author, SPSS output.

by the logarithm of assets (-.379) and capital adequacy (.377) are variables that give statistically significant and unique contribution to the equation. Indicator of negative correlation between bank size and liquidity is statistically significant. Liquidity drops with the size of the bank. This means that large banks provide liquidity in the interbank market or rely on the help of a lender as a last resort. This view completely corresponds to the famous hypothesis: too big to fail.

Breusch-Godfrey serial correlation test was used to investigate the presence or absence of autocorrelation. The F-statistic and Obs*R-squared probability values are higher than 0.05 (5% level of confidence), which indicates the absence of autocorrelation in the model.

The validity tests of the L1 model, i.e. the F, Durbin-Watson, ANOVA, VIF and LM, confirm that the results are robust. In addition, the adjusted R2 (41.3%) is relatively high, indicating that the explanatory variables have a significant ability to explain the change in the dependent variable.

Liquidity indicators of small and large banks in the reporting period from 2008 to 2013 are shown in Figure 1. Banks are classified as “large”, “small” and “medium-sized”. In this segment, conclusions were drawn regarding the legality of moving liquidity indicator at “small”, “medium-sized” and “large” banks. Differentia specifica according to which banks are classified as “small”, “medium-sized” and “large” is the size of assets. The rank (minimum and maximum value) for “medium-sized” banks is determined on the basis of the total share of assets in the banking sector, which ranges from 2% to 6%. The banks with the share of assets above the limit value for “medium-sized” banks (over + 6%) are classified as “large” banks. The banks whose assets are below the lower limit value for “medium-sized” banks (less than 2% of the total assets of the banking sector) have been marked as “small” banks [9, p. 73].

This study observes that, in the specified period of time, the number of large banks ranged from 5 to 6, medium-sized banks from 7 to 9 and small banks from

Table 9: Breusch-Godfrey serial correlation LM test for L1 model

F-statistic	0.794160	Prob. F(2,111)	0.4545
Obs*R-squared	1.692879	Prob. Chi-Square(2)	0.4289

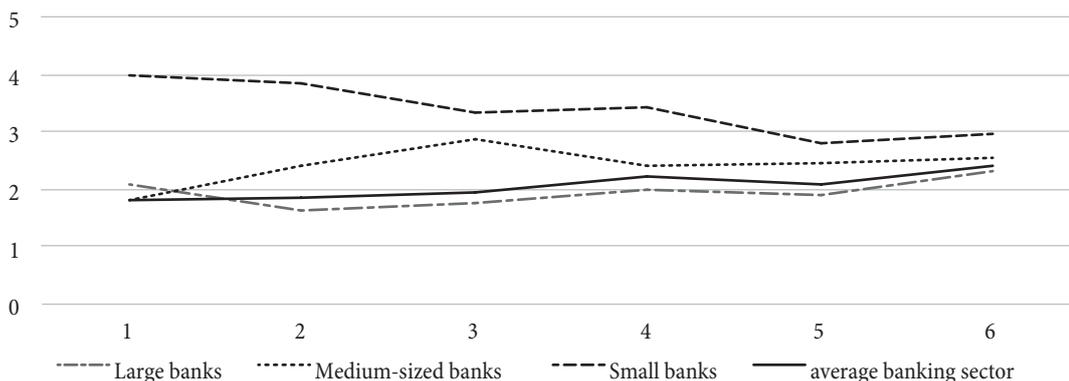
Source: Author, EViews output.

Table 10: Determinants of L1 liquidity ratio in Serbia from 2008 to 2013

Liquidity	'08	No.	'09	No.	'10	No.	'11	No.	'12	No.	'13	No.
Large banks	2.07	5	1.63	6	1.77	5	2	6	1.89	5	2.3	5
Medium-sized banks	1.81	7	2.42	8	2.85	7	2.4	7	2.47	9	2.56	8
Small banks	3.98	7	3.85	7	3.33	8	3.42	7	2.87	6	2.98	6
Average banks	2.68	19	2.67	21	2.77	20	2.64	20	2.44	20	2.62	19
Average banking sector	1.81	35	1.86	34	1.96	34	2.2	33	2.08	31	2.41	30

Source: Author based on Milošević Avdalović and Kalaš [9, p. 73].

Figure 1: L1 liquidity - according to the size of banks in Serbia



Source: Author based on Milošević Avdalović and Kalaš [9, p. 73].

6 to 8. Average liquidity ratios and the number of banks surveyed are shown in Table 10.

Figure 1 shows that small banks hold the largest liquidity buffer in the reporting period. The liquidity of large banks had the lowest, constantly below-average value in the banking sector (the exception being 2008). Mid-sized banks have to maintain their liquidity at and above the level of average liquidity indicator of the banking sector in Serbia. On the basis of the analysis, it can be concluded that large banks in Serbia strongly rely on the interbank market or on liquidity of the lender helping them.

The correlation for the observed variables was calculated from 120 observations for internal independent variables influencing the dependent variable – liquidity, measured by the loans to assets ratio. First, a preliminary analysis was carried out to prove that assumptions of normality, homogeneity and linearity of variances are confirmed. This indicator of the relation between loans and assets is actually an inverse indicator of liquidity. A large share of loans in assets indicates a lower level of liquidity. Pearson correlation investigated connections within the whole group of variables.

Table 11 depicts the correlation of variables. Correlation of variables has shown that there is negative and statistically significant relationship between the inverse indicators of liquidity L2 and capital adequacy and the ratio of operating expenses to income from interest and fees. The size of a bank and return on equity also represents a positive statistically significant inverse liquidity indicator, which has a impact on liquidity. Actually, this indicator can be interpreted as follows: with the growth of the size of bank assets and increase in profitability – ROE, the liquidity of the banking sector is reduced. Increase in bank liquidity follows the growth of capital adequacy and ratio of operating expenses to income from interest and fees.

If we measure L2 liquidity, we find that the most significant determinants of liquidity of commercial banks in Serbia are shown in Table 12. Capital adequacy ratio (-.477) and return on equity (.205) are variables that give statistically significant and unique contribution to the equation. The reason is that the joint contribution to the observed variables is included in the overall model. This model explains 30.3% of liquidity variance. Ratio of

Table 11: Correlation of L2 variables

	L2	CAP	TOA	ROE	EiR	YOA	CIR
Pearson correlation	1	-.455**	.255**	.196*	.168	-.005	-.221*
L2 Sig. (2-tailed)		.000	.005	.032	.067	.953	.015
N	120	120	120	120	120	120	120

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Source: Author, SPSS output.

Table 12: Determinants of L2liquidity ratio in Serbia

Model	Unstandardized coefficients		Standardized coefficients Beta	t	Sig.	Quality model
	B	Std. error				
(Constant)	68.294	32.489		2.102	.038	No.of obs 120 R-squared .303 Adjusted R-squared .266 F 8.787772 (p .000) Durbin Watson statistic: 2.288084
CAP	-.590	.122	-.477	-4.834	.000	
TOAlog	-.217	3.459	-.008	-.063	.950	
ROE	.113	.054	.205	2.106	.037	
L2 EiR	.113	.105	.113	1.079	.283	
YOA	.882	.645	.146	1.368	.174	
CIR	-.046	.041	-.133	-1.123	.264	

Source: Author, SPSS output.

Table 13: Breusch-Godfrey serial correlation LM Test for L2 model

F-statistic	1.728367	Prob. F(2,111)	0.1823
Obs*R-squared	3.624147	Prob. Chi-Square(2)	0.1633

Source: Author, EViews output.

loans to assets is determined by capital adequacy ratios and return on equity.

Breusch-Godfrey serial correlation test was used to investigate the presence or absence of autocorrelation. The F-statistic and Obs*R-squared probability values are higher than 0.05 (5% level of confidence), which indicates the absence of autocorrelation in the model.

The validity tests of the L2 model, i.e. the F, Durbin-Watson, ANOVA, VIF and LM, confirm that the results are robust. In addition, the adjusted R2 (26.6%) indicates that the explanatory variables have a significant ability to explain change in the dependent variable.

The percentage of the share of loans in assets of large banks observed in the period from 2008 to 2013 was roughly the same, the average being 66.35%. A higher proportion of loans (illiquid assets) in total assets indicates that banks hold less liquidity. This indicator proves that small banks hold higher liquidity buffer compared to big banks.

Figure 2 shows that large banks have the largest relative share of loans in total assets. Big banks sell more

loans to medium-sized and small banks. Credit placements represent the most insolvent kind of assets and therefore this indicator can be taken as an inverse indicator of liquidity. A high share of loans in assets through credit risk can jeopardize the indicator of liquidity.

Conclusion

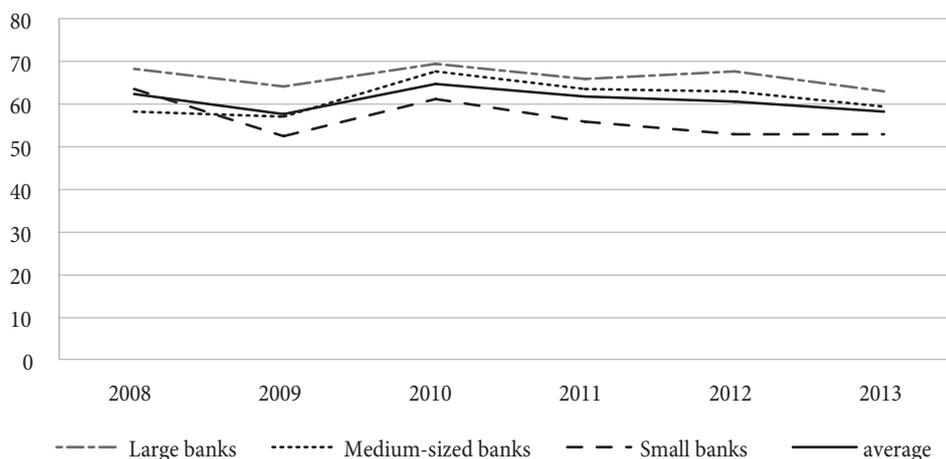
The aim of this study is to identify the determinants of liquidity of commercial banks in Serbia, using multiple regression analysis for two indicators, namely the cash ratio (liquidity ratio) and the loans in total assets ratio. The results highlight that size, capitalization and profitability of banks can have an impact on liquidity risk management. The results of the proposed model lead to the following conclusion: bank liquidity is strongly determined by the size of the bank's assets. Liquidity decreases with the increasing size of banks: big banks actually rely on the interbank market or the help of a lender in the last instance, while medium-sized and small banks maintain

Table 14: Analysis of the share of loans in total assets, as a measure of liquidity, and the size of bank assets

Banks	Large	No.	Medium-sized	No.	Small	No.	Average
2008	68.28	5	58.13	7	63.48	7	62.24
2009	64.29	6	56.80	8	52.40	7	57.47
2010	69.38	5	67.51	7	61.15	8	64.51
2011	65.77	6	63.44	7	55.64	7	61.41
2012	67.44	5	62.61	9	52.83	7	60.80
2013	62.92	5	59.39	8	52.81	6	58.24
Average	66.35		61.31		56.39		

Source: Author.

Figure 2: L2 - Loans in total assets ratio according to the size of banks in Serbia



Source: Author.

larger liquidity buffer. Increase in the capital adequacy ratio has a positive impact on the liquidity of the bank, while the bank's profitability indicates a negative impact on the level of liquidity of the banks surveyed. The findings of this study are similar to the results of some variables utilized by Arif [2], Vodová [13], [14] and [15], Bonfim and Kim [4] and Cucinelli [6]. This study paves the way for more detailed studies into controlling liquidity risk in banks in Serbia. Further research may extend the proposed model to incorporate other causes of liquidity risk and economic factors.

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