Exploring the Liquidity Risk Factors in the Balkan Region Banking System

Submitted 1/12/18, 1st revision 22/12/18, 2nd revision 24/1/19, accepted 12/2/19

Ibish Mazreku[1], Fisnik Morina[2], Valdrin Misiri[3],
Jonathan V. Spiteri[4], Simon Grima[5]

Abstract:

Liquidity as a field of study has received considerable attention from various researchers over the last few years. We have conducted this research in order to identify the factors affecting the liquidity of the banking system of nine Balkan countries, specifically Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Kosovo, Macedonia, Montenegro, Romania and Serbia for a period of sixteen years.

We collected data on factors such as capital adequacy, non-performing loans, deposit growth and bank profitability and analysed them using the following statistical techniques: a linear regression model using Pooled Ordinary Least Squares (OLS), a Fixed Effects Model, a Random Effects Model and a Hausman-Taylor regression to account for potential endogeneity, on a set of data collected from banks in nine Balkan states, during the period 2000-2015.

We also analysed the macroeconomic factors influencing the bank's liquidity, such as GDP, inflation, unemployment and marginal interest rates.

Based on panel data analysis, it is noted that specific factors and macroeconomic factors, specifically, capital adequacy, non-performing loans, deposit growth, GDP, unemployment rate and marginal interest rate, significantly affect bank liquidity. However, inflation and profitability do not.

Keywords: Liquidity, Profitability, Capital, GDP, Inflation, Balkan States.

JEL Code: E43, F65, G21.

[1]University "Haxhi Zeka" – Peja, Kosovo, Email: ibish.mazreku@unhz.eu,
[2]University "Haxhi Zeka" – Peja, Kosovo, Email: fisnik.morina@unhz.eu (corresponding author).
[3]University "Haxhi Zeka" – Peja, Kosovo, Email: valdrin.misiri@unhz.eu
[4]University of Malta – Department of Insurance, Faculty of Economics, Management and Accountancy: Email: jonathan.v.spiteri@um.edu.mt
[5]University of Malta – Department of Insurance, Faculty of Economics, Management and Accountancy: Email: simon.grima@um.edu.mt

1. Introduction

The banking sector has always been considered one of the most vital sectors for the economy to function properly. Its importance lies in the collection of deposits and the provision of loans to states, people, families and businesses. In all economic systems, banks have a leading role in planning and implementing financial policy. Liquidity for a bank means the ability to meet its financial obligations over time without loss. The core role of banks lies in the transformation of short-term maturity deposits into long-term loans. Banks across the globe are facing problems due to poor liquidity management. While any transaction or commitment relates to the liquidity of a bank, managing liquidity risks is of paramount importance. The liquidity risk has become one of the most important elements of risk management across banks (BIS, 2013).

A liquidity framework of a bank should maintain enough liquidity to withstand all kinds of events that it may face. Continuous assessment of the liquidity risk management framework and the liquidity position is an important oversight that will ensure the proper functioning of the bank. Therefore, banks should maintain the optimum level of liquidity that can maximize their profits and enable them to meet their liabilities. The minimum liquidity coverage ratio that banks must comply with, as recommended in Basel III, was 70% in 2016 and steadily increases to 100% by 2019 (within the European Union this is transposed as a regulatory requirement in the Capital Requirement Directive (CRD)). The requirements of the annual liquidity coverage ratio for 2016, 2017, 2018 and 2019 are 70%, 80%, 90% and 100% (BIS, 2013).

2. Literature Review

A bank's liquidity is a measure of the ability and ease with which short-term assets can be converted into cash to meet its short-term liabilities, such as withdrawals from depositors. Liquid assets are those assets that can be converted quickly into cash if there is a requirement to meet financial liabilities Example: cash, reserves at the respective central bank, financial investments, etc.

$$\text{Liquidity ratio} = \frac{\text{(short-term assets)}}{\text{(short-term liabilities)}}$$

Liquidity risk is the risk derived from the lack of tradability of an investment that cannot be bought or sold quickly enough to prevent or minimize a loss. That is when an individual investor, business or financial institution cannot meet its short-term liability debts (BIS, 2013). Liquidity risk is divided into two categories: financing liquidity risk (cash flow risk) and market liquidity risk (asset/product risk). Financing the liquidity risk (cash flow risk) - is the main concern of the bank's treasury, they need to continuously determine whether they can meet obligations. A

classic indicator of this type of risk is the current liquidity ratio or acid test. A classic solution to this kind of risk would be to take a credit line. The liquidity risk of the market (asset/product risk) – is the risk of non-liquidity of assets held and the inability to easily exit the situation. An example of this risk may be the possession of an asset in real estate, that would need to be sold to meet the liabilities. However, because of bad market conditions, it can only be sold at a price much lower than the real value (Kumar and Chand Yadav, 2013).

As noted below existing literature suggests that bank liquidity is a function of micro and macroeconomic factors. Micro factors include factors such as non-performing loans, bank capital adequacy, bank deposits and profitability. While macro factors are external factors that affect the bank's liquidity but are not under the management of the bank but influence the economic and legal environment affecting the bank's functioning and banks liquidity position. Macroeconomic factors that may affect the bank's liquidity include factors such as GDP, marginal interest rate, inflation rate and unemployment rate.

Non-performing loans and liquidity:
Non-performing loans are loans wherein the contractual obligations for principal and interest payments are not met by one of the parties within 90 days. These loans have a negative impact on banks and the development of the economy. The growth in the portfolio of these loans is of a significant financial concern of the banking sector. Therefore, we assume that non-performing loans negatively affect the bank's liquidity. This assumption is in line with the results studies of different authors such as Belete (2015), Horwath *et al.* (2012), Tesfaye, (2012) and Melese & Laximikantham (2003). However, Folea (2015) and Tesfaye (2012), find that non-performing loans in relation to other indicators of liquidity have resulted in a positive report.

Banking Capital Adequacy and Liquidity:
The main reason why banks maintain capital is to absorb risks if the risks take place (a cushion). This includes also the risk of liquidity failures. Although the reason why banks hold capital is motivated by their role of risk transformation, recent theories suggest that bank capital may also affect banks ability to create liquidity. This is in line with the results of authors such as Vodova (2011) and Singh & Sharma (2016). According to the recommendations in Basel III, the minimum capital adequacy ratio that banks must hold is 8%. The capital adequacy ratio measures the bank's capital in relation to its estimated assets. The maintenance of capital to risk- estimated assets ratio promotes financial stability and efficiency in economic systems all over the world.

Bank Deposits and Liquidity:
Deposits represent the amount of money held in a bank account in order to earn an amount of interest. Liquidity problems arise when bank deposits are suddenly withdrawn. In such situations, banks need to maintain adequate levels of liquidity.

Therefore, if deposits grow then the liquidity held by banks should increase. Studies by Bonner, Lelyveld and Zymek (2013), Laštůvková (2013), and Moussa (2015) have shown that deposit growth has a positive relationship with the bank's liquidity.

Bank's profitability and liquidity:
Loans are among the main source of operating income for a bank. The higher the volume of the loans, the higher will be the interest income and the potential profits of commercial banks. However, banks with a larger volume of credit could face a higher risk of liquidity. Therefore, banks will have to create a balance between liquidity and profitability. In fact, Belete (2015), Singh and Sharma (2016) in their studies showed that profitability has a positive relationship with the bank's liquidity.

GDP and liquidity:
The macroeconomic context is likely to affect banking activities, investment decisions as well as banking liquidity. For example, demand for differentiated financial products is higher during an economic boom and can improve the bank's ability to expand loan and securities portfolios to a higher level. Similarly, during the economic downturn, we have a reduction in a banks' credit facility. Based on these arguments, we can expect banks to increase their transformation activities and liquidity during an economic boom. During these periods, economic entities have more belief in their ability to profit; hence, there is an increase in investments. However, during these periods, these entities would prefer lower liquidity rates and more risky capital assets with higher returns, holding fewer liquid assets and having short-term debt with higher interest rates (Painceira, 2010). In fact, Bunda and Desquilbet, (2008) and Moussa, (2015), find that GDP had a positive impact on bank liquidity. However, the contrary was determined by Aspachs, Nier and Tiesset, (2005), Chen and Phuong, (2014) and Singh and Sharma, (2016), where they showed that GDP had a negative impact on the bank's liquidity.

Marginal interest rate and liquidity:
The marginal interest rate represents the difference between the gross cost paid by a borrower to a bank and the net return received by a depositor. The largest marginal interest rate difference forces banks to lend more and thus reduces the level of liquid assets, which will then directly affect the growth of the liquidity risk. According to Angbazo (1997) and Drakos (2003), this variable has a negative relationship with the bank's liquidity. However, Belete's (2015) findings contradict this result and show that the marginal interest rate has a positive relationship with the bank's liquidity.

Inflation rate and liquidity:
The growth in inflation rate decreases the real rate of return not only on money terms but also on assets in general. This reduction in return rates aggravates the credit market; hence, rationalization of credit becomes more severe as inflation rises. As a result, the financial sector has less credit and the resource allocation becomes less efficient. This then causes the number of liquid assets held by banks to increase

with rising inflation. Studies by Vodova (2011) and Belete (2015) show that the inflation rate has a positive relationship with the bank's liquidity. However, on the flip side, studies by Horwath, Seidler and Weill (2012) found that the inflation rate had negative relations with the bank's liquidity.

Unemployment rates and Liquidity:
According to Horwath, Seidler and Weill (2012), unemployment is negatively affected by a bank's liquidity. This relates to the fact that during turbulent economic times, banks have a reduction in solvency and thus have lower liquidity. On the other hand, contrary to this finding, studies by Munteanu (2012) and Singh and Sharma (2016) showed that the rate of unemployment growth results in increased bank liquidity.

3. Methodology and objectives of the study

As noted above, in this article we aim to lay out findings on the specific and macroeconomic factors that influence the liquidity of the banking system in the Balkan countries and at the same time analyse the impact of these factors, their importance and their relationship to liquidity in the same banking system. In order to achieve this objective, we target a sample, consisting of all banks, operating for at least sixteen years, within the Balkan region; specifically, Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Kosovo, Macedonia, Montenegro, Romania and Serbia. We focus mainly on data available in the respective bank's financial statements and on documents that had macroeconomic data on selected variables during the period between 2000 and 2015. The data are obtained from the World Bank, the International Monetary Fund and the Fred Economic Data.

Data and processing analysis were carried out using various econometric models, specifically Pooled Ordinary Least Squares, panel data analysis using country-specific Fixed Effects and Random Effects models and a Hausman-Taylor model, using STATA. For the Hausman-Taylor model related to the bank-specific factors, the level of non-performing loans is used as the endogenous variable, because in the context of specific banking factors this is the variable which affects the liquidity of commercial banks, and is also a variable which is explained by capital adequacy, knowing that from the Basel Pillars, commercial banks should have at least 4% regulatory capital to cover the credit risk. In turn, for the macroeconomic factors regressions we used GDP as our endogenous regressor because this variable is also explained by other independent variables that are included in the econometric model. Although results and findings cannot be generalized for other entities or institutions, they remain unique in this context and for the period chosen and dealt with in this study.

4. Empirical data analysis and findings of the study

This section presents the results of the various methods used for data analysis. In the first part we present the results for the bank-specific factors the presentation of the variables used for data analysis is carried out, then the second part presents the results of the descriptive statistics and in the latter part the results of the models used to test the validity of the expected relationship.

Table 1. Description of variables

Variables	Measuring unit	Symbol	The expected relationship
Dependent variable			
Liquidity	Short term assets/Short term liabilities	LIQ	NA
Independent variables			
Bank specific variables			
Non-performing loans	Non-performing loans/Total of the loans	NPL	Negative
Capital adequacy	Capital 1 + Capital 2 /Estimated assets in risk	CAP_ADEQUACY	Positive
Deposits	Deposits(n)-Deposits(n-1)/ Deposits (n)	Depos_Growth	Positive
Profitability	Net profit/Total of the assets	ROA	Positive
Macroeconomic variables			
GDP per capita	GDP/ Population	GDP	Positive/Negative
Inflation	Consumer Price Index	INF	Positive
The marginal rate of interest	The interest rate in loans/The interest rate in deposits	IRM	Negative
Unemployment	Unemployment rate	UNEM	Positive/Negative

4.1 Testing of expectations on the specific banking factors

In this section we present results for the following regression model:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \varepsilon_{it}$$

Where:
Y_{it} – *Liquidity for country i at time t;*

X_{1it} – *Non-performing loans (NPL) for country i at time t;*
X_{2it} – *Capital-Adequacy Ratio (CAP_ADEQUACY) for country i at time t;*
X_{3it} – *Deposit Growth (Depos_Growth) for country i at time t;*
X_{4it} – *Profitability (ROA) for country i at time t;*
ε_{it} – *Random error term*

Table 2. *Results of five econometric models of relationships between specific factors and liquidity*

	Linear Regression	GLS Random Effects	Fixed Effects	Hausman - Taylor
NPL	-0.4925*** (0.001)	-0.4950*** (0.001)	-0.5445*** (0.004)	-0.4948*** (0.002)
Capital adequacy	0.6304*** (0.005)	0.6306*** (0.004)	0.6229** (0.012)	0.6270*** (0.005)
Deposit growth	0.6257*** (0.000)	0.6267*** (0.000)	0.6374*** (0.000)	0.6224*** (0.000)
ROA	0.2268 (0.795)	0.2113 (0.809)	-0.0345 (0.973)	0.2396 (0.786)

Source: *Authors' estimates*
Notes: *p-values shown in parentheses. *** denotes statistical significance at the 1% level; ** denotes statistical significance at the 5% level.*

Table 2 lays out the results of the econometric models of liquidity as a dependent variable and bank-specific factors such as non-performing loans, capital adequacy, profitability and deposit growth from the sample of nine banking systems in the Balkans. The results obtained under each specification are remarkably similar in all cases, both in terms of statistical significance and coefficient magnitude. Accordingly, non-performing loans, capital adequacy and deposit growth are statistically significant factors that affect the bank's liquidity, while profitability is not statistically significant.

We now turn to interpreting the coefficient values obtained. A one percentage point growth in non - performing loans is associated with a drop in the liquidity level of 0.4925-0.5445 percentage points, meaning that there is a negative relationship between non - performing and liquidity loans. For a one percentage point increase in capital adequacy, we observe a liquidity increase of 0.6229-0.6306 percentage points, meaning that there is a positive relationship between capital adequacy and liquidity. Finally, a 1 percentage point increase in deposits is linked to liquidity growth of 0.6224-0.6374 percentage points, meaning that there is a positive relationship between deposit growth and liquidity. These findings are thus in line with our a priori expectations set out in Table 4.1. Note that we do not find a statistically-significant relationship between profitability and liquidity across all specifications.

4.2 Testing of macroeconomic factors

We now look at the various macroeconomic factors that may have an impact on liquidity within banks. We estimate the following model:

$$Y_{it} = \alpha_0 + \alpha_1 X_{1it} + \alpha_2 X_{2it} + \alpha_3 X_{3it} + \alpha_4 X_{4it} + u_{it}$$

Where:
Y_{it} – *Liquidity for country i at time t;*
X_{1it} – *Real GDP per capita (GDP) for country i at time t;*
X_{2it} – *Consumer Price Index (INF) for country i at time t;*
X_{3it} – *Interest rate on loans/interest rate on deposits (IRM) for country i at time t;*
X_{4it} – *Unemployment rate (UNEM) for country i at time t;*
u_{it} – *Random error term*

Table 3. *Results of the five econometric models of the relationship between macroeconomic and liquidity factors*

	Linear Regression	GLS Random Effects	Fixed Effects	Hausman - Taylor
GDP	2.1193*** (0.000)	1.9874*** (0.000)	1.7988*** (0.000)	1.8799*** (0.000)
INF	-0.0299 (0.911)	0.0203 (0.942)	0.0368 (0.902)	0.0757 (0.791)
IRM	2.3727*** (0.000)	2.6118*** (0.000)	2.8412*** (0.000)	2.8245*** (0.000)
UNEP	0.2624** (0.038)	0.3179** (0.044)	0.7605** (0.017)	0.4297** (0.026)

Source: *Authors' estimates.*
Notes: *p-values shown in parentheses. *** denotes statistical significance at the 1% level; ** denotes statistical significance at the 5% level.*

In Table 3 we present the results of the linear regression model between liquidity as a dependent variable and the macroeconomic factors as independent variables, specifically GDP per capita, inflation, marginal interest rate and unemployment rate. According to the results, GDP, the marginal interest rate and unemployment emerge as the key determinants of bank liquidity, with statistically-significant and positive coefficients obtained across all model specifications. Conversely, inflation is not statistically significant across all specifications. Moreover, in this table we also show the resultant coefficients, where one can note that a 1% growth in GDP per capita is associated with an increase in the liquidity level of 1.77-2.12%, meaning that there is a positive and relatively strong relationship between GDP per capita and liquidity. In

turn, a 1% increase in the marginal interest rate is related to a 2.37-2.86% increase in liquidity, which also denotes that the relationship between these two variables is strong. Finally, a 1% increase in the unemployment rate, yields a 0.2624-0.7605% growth in liquidity, meaning that there is a positive relationship between unemployment rate and liquidity.

4.3 Discussion

In line with our expectations, the empirical findings highlighted that capital adequacy, deposit growth, GDP, marginal interest rate and unemployment, have a positive relationship on banks' liquidity, while the level of non-performing loans has a negative relationship with the bank's liquidity. Based on this we can say that capital adequacy, deposit growth, GDP, marginal interest rate, unemployment and non-performing loans have a significant impact on the level of liquidity. However, the findings also show that profitability is not statistically significant in relation to the liquidity of the bank.

Table 4. *The results of specific banking factors and macroeconomic factors in the liquidity of commercial banks*

Variables	The expected relationship	Linear Regression	Fixed Effects	Random Effects	Hausman Taylor
Bank specific variables					
Non-performing loans	Negative	accepted	accepted	accepted	accepted
Capital adequacy	Positive	accepted	accepted	accepted	accepted
Profitability	Positive	Not significant	Not significant	Not significant	Not significant
Deposits	Positive	accepted	accepted	accepted	accepted
Macroeconomic variables					
GDP per capita	Positive	accepted	accepted	accepted	accepted
GDP per capita	Negative	Refused	Refused	Refused	Refused
Inflation	Positive	Not significant	Not significant	Not significant	Not significant
The marginal norm of interest	Negative	Refused	Refused	Refused	Refused
Unemployment	Positive	accepted	accepted	accepted	accepted
Unemployment	Negative	Refused	Refused	Refused	Refused

Source: *Prepared from the authors.*

Like the findings by Belete Folea (2015), Horvath (2012), Tseganesh Tesfaye (2012), Melese and Laximikantham (2015), our findings show that bank liquidity

decreases with an increase in the level of non-performing loans. However, the findings of this study contradict the results of Belete Folea (2015) and Tseganesh Tesfaye (2012), where their findings on non-performing loans have shown a positive relationship with liquidity. The negative relationship between these two variables is explained by the fact that these loans have a negative impact on banks in the development of the economy and that the growth of the portfolio of these loans significantly affects the financial turmoil in the banking sector, thus affecting the reduction of liquidity in banking sectors. The level of the capital adequacy showed a statistically positive effect on liquidity, which means that there is a positive relationship between the capital adequacy ratio and bank liquidity. This is in line with our expectations and the results of Vodova (2011) and Singh and Sharma (2016). This can be explained by the fact that a high level of capital gives the bank more room for the creation of liquidity (a "passport" to taking more risks).

Also, as expected, deposit growth showed a positive impact on liquidity. Similar results were also reported by authors such as Bonner (2013), Jana Lastuvkova (2013) and Moussa (2015). This result can be explained by the fact that with the increase in deposits the risk of withdrawing those assets increases, so banks need to increase their liquid assets to cover this risk.

GDP per capita, as expected, showed a statistically positive impact on liquidity. Authors such as Bunda and Desquilbet (2008) and Moussa (2015) also reported similar results. This result can be explained by the fact that when there is an increase in the level of GDP, we have an increase in economic well-being, which in the banking context is related to the fact that during this period clients maintain a higher level of deposits in banking institutions and the likelihood of withdrawal of these deposits during economic growth is very small. However, the results of this study contradict the findings of Painceira (2010), Aspachs et al (2005), Chen and Phuong (2014) and Singh and Sharma (2016), who found that GDP has a negative impact on the bank's liquidity. Contrary to our expectations, the findings of this study showed that the relationship between the marginal interest rate and liquidity is positive. The findings of this study are like the results obtained by Belete Folea (2015), while contradicting the results of Angbazo (1997) and Drakos (2003). Based on these results we can say that higher interest rates do not encourage banks to lend more, but on the contrary, encourage them to hold more liquid assets.

As expected, findings show that there is a positive relationship between the level of unemployment and liquidity. This result is in line with the findings by Munteanu (2012), while contradictory to the results of Horváth et al. (2012). This positive relationship between increasing the unemployment rate and increasing liquidity can be justified by the fact that during the period when there is an increase in unemployment, the credit risk of borrowers increases, which then causes banks to reduce the volume of loans offered and, in this way, increase the level of liquidity. Banks, therefore, tend to maintain liquidity over this time because depositors tend to withdraw their deposits from banks. This result is related to the fact that the

countries included in this study, i.e. the Balkans, have a high level of unemployment, but despite this fact, the banking system is well regulated and is very stable.

5.   Conclusions and recommendations

The main purpose of this study was to identify the key bank-specific and macroeconomic factors that could affect the liquidity of the banking system in the Balkans. Studies reviewed have shown that bank liquidity is usually expressed as a function of internal and external factors. This study analysed data drawn from macroeconomic and bank-specific factors, which relate to their liquidity during the period 2000 to 2015, in nine Balkan countries. The bank-specific factors used in this study include such variables as non-performing loans, capital adequacy, deposit growth and profitability. On the other hand, the four indicator variables of macroeconomic conditions used in this study were GDP, marginal interest rate, inflation and unemployment rate.

The empirical findings on the impact of bank liquidity on Balkan banks resulted in the following conclusions: (1) a negative relationship between rising non-performing loans and liquidity, showing that the growth of non-performing loans reduces the level of liquid assets held by banks, (2) capital adequacy and deposit growth both had a positive relationship with liquidity, (3) the marginal interest rate had a positive and statistically significant impact on the liquidity of the banking system in the Balkans, (4) GDP per capita had a positive impact on liquidity, and (5) a positive relationship between the level of unemployment and liquidity. The strength of the bank's capital, the reduction of non-performing loans, and the increase in the level of deposits are the main important determining factors of liquidity in the commercial banks of the Balkan countries. A closer monitoring of these factors could improve the efficiency in the liquidity management of these institutions.

Moreover, macroeconomic factors as GDP per capita, the marginal interest rate and the level of unemployment emerged as very important factors in the liquidity of Balkan banks. This clearly indicates that macroeconomic indicators should not be overlooked when drafting a strategy for improving the liquidity position. Thus, banks in the Balkan countries should not be concerned only with internal factors such as policies and procedures but should consider both sets of factors, that is both the internal environment and the macroeconomic environment in the development of strategies to efficiently manage their liquidity position.

References:

Angbazo, L. 1997. Commercial bank net interest margins, default risk, interest-rate risk, and off-balance sheet banking. Journal of Banking & Finance 21.

Aspachs, O., Nier, E. & Tiesset, M. 2005. Liquidity, Banking Regulation and the Macroeconomy Evidence on Bank Liquidity Holdings from a Panel of UK-resident banks. London School of Economics.

Belete, F. 2015. Factors Affecting Liquidity of Selected Commercial Banks in Ethiopia. Addis Ababa University.

Basel Committee on Banking Supervision (BIS). 2013. Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools. January, https://www.bis.org/publ/bcbs238.pdf and https://www.bis.org/publ/bcbs238.pdf

Bonner, C., Lelyveld, I., Zymek, R. 2013. Banks' Liquidity Buffers and the Role of Liquidity Regulation. Working Paper, No. 393.

Bunda, I., Desquilbet, J. 2008. The bank liquidity smile across exchange rate regimes. International Economic Journal, Vol. 22, No. 3.

Chen, I., Phuong, N. 2014. The Determinants of Bank Liquidity Buffer.

Drakos, K. 2003. Assessing the success of reform in transition banking 10 years later: an interest margin analysis. Journal of Policy Modeling, 25.

Horwath, R., Seidler, J., Weill, L. 2012. Bank Capital and Liquidity Creation. European Central Bank, Working Paper Series, No 1497.

Kumar, M. and Chand-Yadav, G. 2013. Liquidity risk management in the bank: a conceptual framework. AIMA Journal of Management & Research, 7(2/4), ISSN 0974 – 497. https://apps.aima.in/ejournal_new/articlesPDF/Manish-Kumar.pdf.

Laštůvková, J. 2013. Dimensions of Liquidity and their Factors in the Slovenian Banking Sector. Mendel University in Brno Faculty of Business and Economics Department of Finance.

Melese, N., Laximikantham. 2003. Determinants of Banks Liquidity: Empirical Evidence on Ethiopian Commercial Banks. Journal of Economics and Sustainable Development, ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online) Vol. 6, No.15.

Moussa, M. 2015. The Determinants of Bank Liquidity: Case of Tunisia. International Journal of Economics and Financial Issues, Vol. 5, No. 1.

Munteanu, I. 2012. Bank liquidity and its determinants in Romania. Procedia Economics and Finance 3.

Painceira, J.P. 2010. The Financial Crisis of 2007-9 and Emerging Countries: The Political Economy Analysis of Central Banks in the Brazilian and Korean Economies. Research on Money and Finance Department of Economics, SOAS Discussion Paper no 22.

Singh, A., Sharma, K. 2016. An empirical analysis of macroeconomic and bank-specific factors affecting the liquidity of Indian banks. Science Direct Future Business Journal, 2.

Tesfaye, T. 2012. Determinants of Banks Liquidity and their Impact on Financial Performance: an empirical study on commercial banks in Ethiopia. Addis Ababa University.

Vodova, P. 2011. Liquidity of Czech Commercial Banks and its Determinants. International Journal of Mathematical Models and Methods in Applied Sciences, 10(3).