FACTORS AFFECTING BANK LIQUIDITY IN REPUBLIC OF NORTH MACEDONIA

Andrijana Bojadzievska – Danevska[1], Liza Alili Sulejmani[2], Ahmet Lokce[3]

[1] *International Balkan University, andrijanab.danevska@ibu.edu.mk*
[2] *International Balkan University, liza.alili@ibu.edu.mk*
[3]*ahmet_lokce@hotmail.com*

ABSTRACT

Banks' liquidity is a critical phenomenon that must be constantly monitored and managed in order for bank to achieve an appropriate maturity transformation of liabilities into assets, while maintaining an appropriate level of profitability. Additionally, liquidity as a critical point in the management of the bank's assets indirectly affects the growth, development, but also the functioning of the banks in general.

The purpose of this research is to determine the factors that affect the liquidity of banks in the Republic of North Macedonia measured through gross loans to total assets ratio. In order to determine which factors affect the liquidity of the banks in RNM, the regression model includes secondary data on micro-factors affecting the liquidity of the banking sector, ie NPL / Gross loans (non-fin.), ROAA, Cost to income ratio, Loan growth, Deposit growth, CAR and secondary data on macroeconomic factors. ie GDP growth, inflation and unemployment. Furthermore, the empirical research continues to focus more on the individual groups of banks by size, in order to determine the micro factors that have a significant impact on the liquidity of large, medium and small size banks in the Republic of North Macedonia for the time spin 2005q1 – 2020q1.

KEYWORDS

liquidity, bank-specific factors, macro-factors, bank size, OLS.

JEL CLASSIFICATION CODES

C22; G21.

1. INTRODUCTION

Liquidity is the ability of a bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses, without incurring unacceptable losses (BIS, 2008). According to Macedonian banking law, banks should manage their assets and liabilities in a manner that ensures settlement of due liabilities at all times. The issue of liquidity arises from transformation functions of banks, i.e. maturity transformation. By borrowing short and lending long banks expose themselves to risk of not being able to meet obligations on time. In other words, and looking at the bank's balance sheet, banks transform short-term, liquid liabilities into long-term, illiquid assets. By doing so, banks provide customers with smooth and continuous consumption or investment, and protect them against liquidity problems, but simultaneously they exposed themselves to liquidity risks. Banks as liquidity provider, may

unexpectedly experience extreme shortages of liquidity which could be triggered by larger amount of standby credit drawn or/and unexpected reduction in the availability of deposits (Crockett, 2008). Therefore, efficient coordination of the cash inflows and cash outflows, in order to meet the cash flow shortfalls, requires effective risk management structure for managing liquidity (Nagret, 2009).

The concept of liquidity and its risk are essential for continuous and efficient operating of all financial institutions. This topic is especially important and crucial, and became central topic for studies and researches after the recent global financial crisis where number of banking and non-banking financial institutions faced liquidity problems. As a response to that, banking, non-banking financial institutions, regulators and monetary authorities initiate changes in liquidity measures and continuous assessment and management of liquidity risk. Additionally, many authors dedicated a large amount of their attention to seeking determinants which have influence over bank liquidity. The majority of studies, however, group factors that determine bank's liquidity into bank specific determinants, or micro factors and macro determinants. Investigated micro factors typically include factors such as non-performing loans, bank capital adequacy, deposit growth rate, bank size, loan growth rate and profitability. Macro determinants are external factors outside the control of bank's management team and they present the economic environment surrounding banking sector. Macroeconomic factors that may affect the bank's liquidity include factors such as GDP, marginal interest rate, inflation rate and unemployment rate.

For example, Agarwal (2019) conducted an empirical analysis on the commercial banks of India for the period 2005 to 2017, by investigating bank specific factors such as bank size, deposits, cost of funds, capital adequacy ratio, non-performing assets and ROE. The results showed that determinants of liquidity vary for public and private sector banks. Bank size is a significant determinant of liquidity of both public and private sectors banks. In public sector banks, the deposit growth and capital adequacy ratio have statistically significant influence over bank's liquidity, while NPLs and profitability showed insignificant results for both the sectors.

According to the panel data regression analysis that Vodova conducted among Hungarian commercial banks (for time period of 2001 to 2010) in 2013, bank liquidity decreases with the size of the bank, while small and medium sized banks hold a buffer of liquid assets which is fully in accordance with the "too big to fail" hypothesis. Liquidity is negatively influenced also by the interest margin and monetary policy interest rate. Both factors lead to higher lending activity of banks and thus reduce bank liquidity. On the other hand, bank liquidity increases with the higher capital adequacy of banks, the higher interest rate on loans and higher bank profitability. However, unemployment, share of nonperforming loans and financial crisis has no statistically significant effect on the liquidity of Hungarian commercial banks.

Dinger (2009) conducted cross border analysis within ten banking systems (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia) and points out that smaller banks have tendency to be more liquid, while foreign banks are less liquid that domestic banks, and that bank size is one of the determinant factors regarding liquidity.

The purpose of this paper is to examine the bank specific and macroeconomic determinants on banks' liquidity in RNM. This paper is trying to make a contribution towards researching and discovering which determinants have significant impact over bank's liquidity in our banking sector for better managing and monitoring bank's liquidity. Therefore, this paper is structured in three chapters. First chapter gives overview of liquidity measurement in banking sector. Second chapter focuses on explaining each of the determinants included in the research, followed by describing the methodology of the conducted research, data used and the obtained results. The last chapter provides concluding remarks.

2. BANKS' LIQUIDITY MEASUREMENT

Banks maintain appropriate level of liquidity by using several mechanisms such as: everyday planning and monitoring cash inflows and outflows; establishing and maintaining an appropriate maturity structure of assets and liabilities; monitoring significant sources of funds and their concentration, as well as establishing, ie maintaining regular communication with large depositors; maintenance of mandatory

prescribed liquidity rates, and determination and monitoring of liquidity indicators. As noted previously and according to Vodova and Moore (2009) banks maintain their liquidity by using the liquidity gap approach and/or liquidity ratios. Nevertheless, for academic purpose and for this paper liquidity ratios are employed because they are more appropriate, more available and easier to compute.

In the area of liquidity regulation, the Basel Committee proposed introduction of two liquidity indicators, LCR (Liquidity Coverage Ratio) and NSFR (Net Stable Funding Ratio). The purpose behind these two indicators is establishing minimum levels of liquidity for internationally active banks with short and long term aim of increasing banks' ability in funding liquidity.

In banks' liquidity research papers stock liquidity ratios dominate. For example, Vodova in 2012 employed two most convenient liquidity measures, i.e. loan to deposit ratio and a liquid asset to deposit ratio. Loan to deposit ratio describes what proportion from the loans, which are illiquid, are financed by deposits, while the liquid asset to deposit ratio indicates the extent to which the bank's total liquid assets are composed of deposits from customers and other financial institutions. Other scholars, such as Singh and Sharma (2015) measure bank liquidity by using liquid assets over total assets ratio.

In this research paper liquidity will be measured using gross loans to total active ratio, because of the availability of data regarding the banking sector in RNM. This ratio is considered as an important ratio which measures bank liquidity with respect to its total assets.[3] This ratio also named as capacity ratio indicates the share of bank's total assets that have been invested in loans. The higher the value of this indicator shows that the bank has undersized liquidity position, because loans are the least liquid assets in the bank balance sheet.

3. BANK SPECIFIC AND MACRO FACTORS THAT AFFECT BANKS' LIQUIDITY

Bank's liquidity presents function of many factors and authors across countries from this research area apply various explanatory variables for the purpose of determining and defining the factors that have significant impact over it. Bank specific factors include factors such as non-performing loans, bank capital adequacy, bank deposits and profitability. Macro factors are external factors that affect bank's liquidity and these are not under the management of the bank, but imply the influence of the economic and legal environment that is affecting the bank's functioning and banks liquidity position. Macroeconomic factors that may affect the bank's liquidity include factors such as GDP, inflation rate and unemployment rate.

Non- Performing Loans and Liquidity. Non-performing loans (NPLs) are loans, wherein their principal, interest, other non-interest claims have not been collected in a period longer than 90 days from the maturity date. According to International Monetary Fund's (IMF) "loans (and other assets) should be classified as the NPL when (1) payments of principal and interest are past due by 3 months (90 days) or more, or (2) interest payments equal to 3 months (90 days) interest or more have been capitalized (re-invested into the principal amount, refinanced, or rolled over (i.e. payment has been delayed by arrangements)". Bank for International Settlements (BIS) defines "a default is considered to have occurred with regard to a particular obligor when the obligor is past due more than 90 days on any material credit obligation to the banking group". Due to the fact that NPLs do not generate funding liquidity, the growth of these loans in total credit portfolio of a bank is of serious concern. Therefore, we assume that non-performing loans measures as a ratio between non-performing loans and total loans, have negative impact over bank's liquidity. According to Mazreku *et al.* (2019), Tibebu (2019), Belete (2015), Horwath *et al.* (2012), Tesfaye, (2012) and Melese & Laximikantham (2003) the growth of non-performing loans reduces the level of liquid assets of banks.

[3] Mustahsan Elahi (2017), Factors Influencing Liquidity in Leading Banks "A Comparative Study of Banks Operating in UK and Germany Listed on LSE", Imperial Journal of Interdisciplinary Research (IJIR), Vol-3, Issue-2, pp.1555 - 1575

Profitability and Liquidity. Liquidity and profitability are the key variables for any banking or non-banking business entity. In case of banks, loans are main generator of income, but on the other hand they are the most illiquid asset on the balance sheet. The higher the volume of the loans, the higher will be the interest income and the potential profits of commercial banks, but banks with a larger volume of credit face a higher risk of liquidity. Therefore, banks continuously strive for a balance between liquidity and profitability. According to Singh and Sharma (2016), Roman and Sargu (2015) and Melese (2015) profitability measured by return on asset (ROA) has a positive impact on the liquidity of banks. On the contrary, Mehdi and Abderrassoul (2014) found out that return on asset has a negative impact on the liquidity position of banks. Another indicator introduced in this research paper for banks' profitability is cost to income ratio (C/I ratio) which shows the relationship between the bank's operating expenses and revenues. This ratio gives a clear indication of how efficiently the bank works - the lower it is, the more profitable the bank is. Under these notations the assumptions are:

Loan growth and Liquidity. According to the literature, liquidity and credit risks are positively correlated. By increasing the loan supply on the market, banks expose themselves to higher liquidity risk, i.e. they invest depositors' money in more illiquid assets. The results of regression analysis that Berihun conducted in eight Ethiopian commercial banks covering the period from 2002/03 to 2013/14 showed that bank size and loan growth had negative and statistically significant impact on banks liquidity measured by liquid assets to total assets.

Deposit growth and Liquidity. Banks' liquidity decreases when deposits are suddenly withdrawn. Therefore, banks are obliged to maintain adequate levels of liquidity that monetary authority determines. If deposits grow, then the liquidity held by banks should increase. According to conducted researches by Bonner, Lelyveld and Zymek (2013), Laštůvková (2013), and Moussa (2015) deposit growth has a positive relationship with bank's liquidity. However, Moussa (2015) found that deposits have insignificant effect on bank liquidity. Bonneretal (2013) and Kashyap *et al.* (2002) argued that as demand deposits increase, liquidity asset holdings also increase. On the contrary, Dinger (2009) studied emerging economies for the period of 1994 to 2004 and found that as the deposit rate increases bank liquidity decreases.

Capital Adequacy and Liquidity. High bank's capital increases its capacity of absorbing risks and creating liquidity. The capital adequacy ratio (CAR) indicates the extent to which assets are funded by other than own funds and is a measure of capital adequacy of the deposit-taking sector. The purpose behind the CAR is to prevent banks from excessive expansion of risk assets, i.e. to protect interests of depositors and other creditors. Monetary authorities of various countries regulate the capital adequacy ratio of commercial banks in order to monitor the bank's ability to resist risks. The impact that capital adequacy had over bank liquidity was studied by Choon et al. (2013), Delechat et al. (2012), Moussa (2015), Bunda and Desquilbet (2008), Bhatiand De Zoysa (2012) and Bhati, De Zoysa and Jitaree (2015) and it was found a significant and negative impact. However, Vodava (2013) by applying panel data regression in Hungarian commercial bank showed that capital adequacy of banks affects liquidity positively.

Gross Domestic Product and Liquidity. Macroeconomic circumstances have direct effect in the overall economy, including the financial sector. According to Pana et al. 2009; Shen et al. 2010 macroeconomic conditions affect bank activities and investment decisions as the profile of bank liquidity. Gross Domestic Product presents an indicator of a business cycle, and during economic boom, banks increase their credit activities, have high degree of confidence in the financial and nonfinancial legal entities about their profitability and have higher volume of investments, and even prefer riskier investments with higher return. On the other side is the decreased preference for liquidity. Based on these arguments, banks will increase their illiquidity during economic expansion. According to Moussa (2015), Bunda and Desquilbet (2008) and Choon et al. (2013) there is a positive impact of GDP on bank liquidity while Valla et al. (2006), Dinger (2009), Vodova (2011) and Aspachs et al. (2005) discovered negative relationships

between the two. According to Aspachs et al. (2005), UK banks seemed to hold smaller amounts of liquidity when GDP increased and vice versa, for the period of 1985 to 2003.

Inflation and Liquidity. An increase in inflation lowers purchasing power and households and legal entities need more money than before to buy the same products. This macroeconomic context may increase banks' credit activities and thus lower liquidity. The empirical study of Moussa (2015) of Tunisian banks revealed that the impact of changes in inflation rates on bank liquidity is negative. According to Tseganesh (2012), inflation has positive impact on the liquidity while study by Horváth *et al*. (2014) finds insignificant effect on the banks liquid assets. Raesi *et al.* (2014) based on the survey in 18 banks of Islamic Republic of Iran revealed that inflation rate has positive effect on banks' liquidity.

Unemployment and Liquidity. During economic downturn, macroeconomic context notes increase in the unemployment rate, which additionally reflects a decrease in credit demand and an increase of NPLs and indirectly effects on lowering banks' liquidity and profitability. With the increase of unemployment rate and decrease in credit demand, banks lose the cash supply (source for liquidity funding) from monthly loan installments and future income, and net – profit as well. Economic expansion notes lowering in unemployment rates and more liquidity is created by banks. The studies by Vodova (2012) and Horváth *et al.* (2014), support the aforementioned issues by point out bank liquidity decreases with the higher unemployment rate. However, findings by Munteanu (2012) and Singh and Sharma (2016) suggested that unemployment rate had positive impact on bank liquidity, i.e. increased bank liquidity.

Unemployment rate is calculated as percentage of the unemployed population over the total number of economically active population. The rate indicates that the number of persons who are ready (aged fifteen years and above) to participate or engaged in the production of goods and services.

In general, the following table summarizes the variables, which are explained and involved in the study with its measurement and expected sign.

Table 1. Description of dependent and independent variables

Variables	***Measurement***	***Expected Sign***
Dependent Variable		
Liquidity (LIQ)	Gross loans/Total assets	
Independent Variables		
Non-performing Loans (NPLs)	NPL/Gross loans (non-fin.)	Negative
Profitability	ROAA = Net Income/Total Average Assets	Negative
	Cost to income ratio (C/I) = Operating expences/Operating income	Positive
Loan growth (LG)	[Gross loans year (n) - Gross loans year (n-1)]/Gross loans year (n-1)	Negative
Deposit growth (DG)	[Deposits year (n) - Deposits year (n-1)]/Deposits (n-1)	Positive
Capital Adequacy Ratio (CAR)	(Tier 1 Capital + Tier 2 Capital) / Risk-Weighted Assets	Negative/Positive
Gross Domestic Product (GDP)	The quarterly growth rate of real gross domestic product	Negative/Positive
Inflation (INF)	Quarterly rate of inflation (current month/same month of the previous year)	Negative/Positive
Unemployment (UNP)	Unemployment rate	Negative/Positive

Source: authors source.

3.1. Sample Data and Methodology

For the purpose of determining the internal and external factor that affect liquidity in banking sector in Republic of North Macedonia, four regression models (OLS) were constructed. Data which are used in these models are secondary and derived from publicly established reports by the National Bank of RNM and State Statistical Office.

General model equations are defined as follows:

First regression model for banking sector

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \beta_6 X_{6t} + \beta_7 X_{7t} + \beta_8 X_{8t} + \beta_9 X_{9t} + \varepsilon_t$$

Y_t- Liquidity for banking sector at time t;
X_{1t} - NPLs for banking sector at time t;
X_{2t} - ROAA for banking sector at time t;
X_{3t} – C/I ratio for banking sector at time t;
X_{4t} - LG for banking sector at time t;
X_{5t} - DG for banking sector at time t;
X_{6t} - CAR for banking sector at time t;
X_{7t} - GDP at time t;
X_{8t} - INF at time t;
X_{9t} - UNE at time t;

Second regression model for large banks

$$Y_{Lt} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \beta_6 X_{6t} + \beta_7 X_{7t} + \beta_8 X_{8t} + \beta_9 X_{9t} + \varepsilon_t$$

Y_{Lt}- Liquidity for large banks at time t;
X_{1t} - NPLs for large banks at time t;
X_{2t} - ROAA for large banks at time t;
X_{3t} – C/I ratio for large banks at time t;
X_{4t} - LG for large banks at time t;
X_{5t} - DG for large banks at time t;
X_{6t} - CAR for large banks at time t;
X_{7t} - GDP at time t;
X_{8t} - INF at time t;
X_{9t} - UNE at time t;

Third regression model for medium sized banks

$$Y_{Mt} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \beta_6 X_{6t} + \beta_7 X_{7t} + \beta_8 X_{8t} + \beta_9 X_{9t} + \varepsilon_t$$

Y_{Mt}- Liquidity for medium sized banks at time t;
X_{1t} - NPLs for medium sized banks at time t;
X_{2t} - ROAA for medium sized banks at time t;
X_{3t} – C/I ratio for medium sized banks at time t;
X_{4t} - LG for medium sized banks at time t;
X_{5t} - DG for medium sized banks at time t;
X_{6t} - CAR for medium sized banks at time t;
X_{7t} - GDP at time t;
X_{8t} - INF at time t;
X_{9t} - UNE at time t;

Fourth regression model for small banks

$$Y_{St} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \beta_6 X_{6t} + \beta_7 X_{7t} + \beta_8 X_{8t} + \beta_9 X_{9t} + \varepsilon_t$$

Y_{St}- Liquidity for small banks at time t;
X_{1t} - NPLs for small banks at time t;
X_{2t} - ROAA for small banks at time t;
X_{3t} – C/I ratio for small banks at time t;
X_{4t} - LG for small banks at time t;
X_{5t} - DG for small banks at time t;

X_{6t} - *CAR for small banks at time t;*
X_{7t} - *GDP at time t;*
X_{8t} - *INF at time t;*
X_{9t} - *UNE at time t;*

4. EMPIRICAL FINDINGS

In order to determine the internal and external factor that affect liquidity in banking sector in Republic of North Macedonia, four regression models (OLS) were constructed by using quarterly time series for the time period 2005q1 – 2020q1. In addition, in the first model, by using the OLS methodology it is determined the effect of internal and external factor on the liquidity of the total banking sector in the Republic of North Macedonia. The R^2= 0.9009, implies that 90.09% of the changes of the liquidity can be explained through the changes of the internal and external factors that are included in the first model. In addition, its results imply a negative and statistically significant relationship between the deposit growth and liquidity of the total banking sector in the Republic of North Macedonia for the time spin 2005q1 – 2020q1. Thus, by increasing 1% of the domestic growth, the liquidity will decrease by 0.18%. These results are in line with those of the Dinger (2009). Moreover, a negative association it is also present between capital adequacy ratio and liquidity of the total banking sector in the Republic of North Macedonia for the given analyzed time period. In this regard, we expect 2.04% decrease of the liquidity by 1% increase of the capital adequacy ratio of the total banking sector in the Republic of North Macedonia. The results are in line with several existing studies of Bhati, De Zoysa and Jitaree (2015); Moussa (2015); Choon et al. (2013); Delechat et al. (2012); Bhatiand De Zoysa (2012); and Bunda and Desquilbet (2008).

In order to determine the internal and external factors that affect the liquidity of the large banks in the Republic of North Macedonia, the second model was conducted by using the OLS methodology. Results imply a negative and statistically significant relationship between the non-performing loans and liquidity of the large banks sector in the Republic of North Macedonia for the time spin 2005q1 – 2020q1. Thus, by increasing 1% of the non-perorming loans, the liquidity will decrease by 0.947%. These results are in line with those of Mazreku *et al.* (2019), Tibebu (2019), Belete (2015), Horwath *et al.* (2012), Tesfaye, (2012) and Melese & Laximikantham (2003). Moreover, a negative association it is also present between profitability and liquidity of the large banks sector in the Republic of North Macedonia for the given analyzed time period. In this regard, we expect 4.973% decrease of the liquidity, , by 1% increase of the ROAA of the large banks sector in the Republic of North Macedonia. These results are in line with those of Mehdi and Abderrassoul (2014). Same results regarding the profitability can be noticed when using the cost to income ration – CIR, which has results to have a negative and significant impact on the liquidity of the large banks sector operating in the Republic of North Macedonia.

As or the effects of the internal and external factors that affect the liquidity of the medium size banks in the Republic of North Macedonia, the third model was conducted by using the OLS methodology. Results imply a negative and statistically significant relationship between the non-performing loans and liquidity of the medium size banks sector in the Republic of North Macedonia for the time spin 2005q1 – 2020q1. Thus, by increasing 1% of the non-performing loans, the liquidity will decrease by 0.495%. Moreover, a positive association it is also present between profitability and liquidity of the medium size banks sector in the Republic of North Macedonia for the given analyzed time period, by using the cost to income ratio – CIR. Further, a negative and statistically significant relationship is estimated between capital adequacy ratio and liquidity of the medium banks sector in the Republic of North Macedonia for the given analyzed time period. In this regard, we expect 0.475% decrease of the liquidity by 1% increase of the capital adequacy ratio of medium banks sector in the Republic of North Macedonia.

The last model (model4) investigates the effects of the internal and external factors on the liquidity on the small and micro size banks sector in the Republic of North Macedonia. Results imply a

negative and statistically significant relationship between the non-performing loans and liquidity of the small and micro size banks sector in the Republic of North Macedonia for the time spin 2005q1 – 2020q1. Thus, by increasing 1% of the non-performing loans, the liquidity will decrease by 0.325%. Moreover, a negative association it is also present between the deposit growth and liquidity of the small and micro sector in the Republic of North Macedonia for the time spin 2005q1 – 2020q1. Thus, by increasing 1% of the deposit growth, the liquidity will decrease by 0. 123%. Moreover, a negative effect can be seen on that of the loan growth on the liquidity of the small and micro sized banks in the Republic of North Macedonia, where by increasing 1% of the loan growth, the liquidity will increase by 0.1%. Further, a negative and statistically significant relationship is estimated between capital adequacy ratio and liquidity of the small and micro banks sector in the Republic of North Macedonia for the given analyzed time period. In this regard, we expect 0.715% decrease of the liquidity by 1% increase of the capital adequacy ratio of small and micro sized banks sector in the Republic of North Macedonia. As for the external or macro factors that affect the liquidity of the small and micro sized banks in the Republic of North Macedonia, we can notice a positive relationship between GDP growth and liquidity of small and micro sized banks, where by increasing 1% of the GDP, the liquidity will increase by 0.8%. These results are in line with those of Moussa (2015), Bunda and Desquilbet (2008) and Choon et al. (2013).

Table2. Effects of internal and external factors on the liquidity of banking sector in Republic of North Macedonia.

VARIABLES	**Model 1 (total banking sector)**	**Model 2 (large banks)**	**Model 3 (medium banks)**	**Model 4 (small and micro banks)**
Dependent variable - GLTA				
NPLs	-0.2041 (0.1832)	-0.9471 (0.2095)***	-0.4915 (0.2043)**	-0.3253 (0.1271)**
ROAA	-0.9628 (0.670)	-4.973 (0.7558)***	-1.186 (1.1047)	-0.3406 (0.8941)
CIR	0.0085 (0.0084)	-0.7193 (0.1666)***	0.2221 (0.1194)*	0.0105 (0.037)
LG	-0.1652 (0.1522)	-0.0659 (0.1744)	0.0931 (0.0944)	0.1079 (0.0500)**
DG	-0.3518 (0.1054)***	-0.1519 (0.1617)	-0.0606 (0.0976)	-0.1238 (0.0561)**
CAR	-2.0431 (0.2445)***	-0.6246 (0.6943)	-0.4756 (0.1920)**	-0.7150 (0.0530)***
GDP	-0.18527 (0.1413)	-0.3599 (0.2485)	0.1386 (0.2084)	0.8032 (0.2918)***
INF	-0.2219 (0.1510)	-0.1682 (0.2328)	-0.3709 (0.2955)	0.06194 (0.2484)
UNE	0.0135 (0.1317)	0.4704 (0.2849)	-0.0600 (0.522)	0.00475 (0.1313)
Nr. of obserations	61	61	61	61
R^2	0.9009	0.698	0.7512	0.9184
Root MSE	1.786	3.282	3.007	4.4132

Notes: *Standard errors are reported in parenthesis and *, **, *** indicate significance levels of 10 %, 5 %, and 1 %, respectively.*

Source: authors calculations.

5. CONCLUSIONS

The objective of this paper is to determine the effects of the bank specific factors and macro factors that affect the liquidity of the banking sector in the Republic of North Macedonia, by utilizing quarterly time data for 2005q1 – 2020q1. In addition, by using the OLS methodology, the first model was established to determine the effects of the internal and external factors on the liquidity of the overall banking sector on the Republic of North Macedonia, where the results implied that from the internal factors only deposit growth and capital adequacy ratio tent to have negative and significant effect on the liquidity of the banking sector in RNM, while the externals actors are shown to be insignificant in this model. As for the large banks, non-performing banks, ROAA and CIR have negative and significant impact on the liquidity of the large banks in the RNM, while at the case of the medium sized banks, from the bank specific factor a negative association can be seen between non-performing loans, capital adequacy ratio and liquidity, while a positive relationship is noticed between Cost to income ratio (CIR) and liquidity. The last model deals with the effect of the bank specific factors and macro factors on the small and micro sized banks in the Republic of North Macedonia, where a negative relationship is noticed between non-performing loans, capital adequacy ratio and liquidity. A positive nexus is seen between loan growth and liquidity, whereas for the macro factors only GDP growth tends to have a significant and positive effect on the liquidity of the small and micro sized banks, while unemployment rate and inflation tend to be insignificant in the model.

5.1. Limitations of conducted research

This research paper embodies secondary data for banking sector and three groups of banks in Republic of North Macedonia. Future research can be carried out by taking into consideration data from each separate bank's reports, i.e. by investigating several particular banks from RNM, by investigating banks from Europe and comparing them with Macedonian banks. The conducted research included loan to asset ratio to mark liquidity, while other researchers may prefer other liquidity ratios.

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