



## Determinants of Liquidity and its Relationship with Profitability – The Case of Macedonian Banking Sector

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### Abstract

This paper deals with the liquidity and profitability of the Macedonian banking sector and attempts to identify the determinants of liquidity mainly focusing on the relationship between profitability and liquidity. First, we analyzed the level of liquidity and profitability and we found that the Macedonian banking system is characterized by high liquidity and relatively high profitability compared with the banking systems of the countries in the region and the more developed economies. Furthermore, the paper examines the determinants of liquidity. The empirical analysis is carried out through the use of the dynamic panel analysis based on the generalized method of moments (GMM) methodology on a dataset of overall banking sector operating in Macedonia in the period from 2007 to 2017. The study uses seven factors as potential determinants of banks liquidity, five of them are internal banks variables (lagged value of liquidity, bank profitability, size of the bank, capital adequacy and non-performing loans) while two of them are macroeconomic variables (GDP growth rate and Central bank reference interest rate). The study showed that profitability is one of the most important factors influencing liquidity in the Macedonian banks. The other determinants with important positive effects on liquidity are lagged value of liquidity, non-performing loans and Central bank interest rate but, to a somewhat lower extent. On the other hand, only the size of the bank is significantly inversely associated with bank liquidity. The capital adequacy and GDP growth rate are not statistically significant factors of Macedonian banks liquidity.

**Keywords:** Liquidity, Profitability, Determinants, Macedonian commercial banks, Panel data analysis, GMM model.

**JEL Classification:** G21; C33; E52.

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### Contribution of this paper to the literature

This study contributes to the existing literature by identifying the determinants of liquidity and focusing on the relationship between profitability and liquidity.

## 1. Introduction

Liquidity and profitability are two important principles in modern banking nowadays. Banks work with other funds - deposits of the public (primarily of natural persons) - and they have an obligation to repay those funds in accordance with the agreed terms and conditions. It is understandable that banks do not keep these funds however they invest them throughout giving loans, buying securities, fixed assets, depositing in other banks, etc.

Liquidity is the ability of a bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses (Basel Committee, 2008). The most liquid assets available to the banks are the cash they have and the funds they have on their accounts at the Central bank. These assets are called super-liquid assets or primary reserve. All other assets that banks have at their disposal are with a lower degree of liquidity, depending on the time and costs needed for their conversion.

The principle of profitability requires the bank to allocate the funds in financial instruments with a higher rate of return. The bank's profitability analysis is mainly performed by Return on assets (ROA) and Return on equity (ROE) indicators. Regardless of the accepted strategy for liquidity-profitability, each bank attempts to achieve satisfying yield rate, bearing in mind to not jeopardize its liquidity.

Profitability and liquidity as performance indicators are very important to the major stakeholders: shareholders, creditors, and tax authorities. The shareholders are interested in the profitability of banks because it determines their returns on investment. Depositors are concerned with the liquidity position of their banks because it determines the ability to respond to their withdrawal needs, which are normally on-demand or on short notice as the case may be. The tax authorities are interested in the profitability of the banks in order to determine the appropriate tax obligation (Olagunju *et al.*, 2011). The contradictory nature of liquidity and profitability can be explained by intuitive reasoning. In that sense, a bank operating with high liquidity, in the process tying down investable funds, may have a low insolvency risk, but followed by low profitability. Conversely, a bank operating at a low liquidity level, thus freeing investable funds, may encounter with high insolvency risk, but the potential for higher profitability.

The aim of this paper is to analyze the level of liquidity and level of profitability of Macedonian banks by comparative quantitative analysis with several selected countries in the region and Germany, which should serve as a benchmark for drawing conclusions about the level of liquidity and profitability in our banking system. Besides comparative analysis, additionally, the paper tries to test various determinants of variable liquidity in the Macedonian banking sector including profitability as one of the independent variables. Various determinant variables can be grouped into two groups: internal and external factors. Internal factors consist of the lagged value of liquidity, profitability, capital adequacy, the share of non-performing loans, and bank size. External factors consist of, gross domestic product (GDP) growth and interest rate of Central bank bills (CBB). Throughout testing various determinants of variable liquidity in Macedonia, the results of this study are expected to provide information about the impact of the available variety of variables toward the bank liquidity. Another benefit of this research is to add empirical evidence on the determinants of bank liquidity in the Macedonian banking sector, especially how profitability is correlated with and influencing the liquidity. Also, the empirical evidence can be used as a source of knowledge, bearing in mind the lack of studies that provide empirical evidence related to the bank liquidity – profitability correlation and determinants of banks liquidity in the Macedonian banking sector. The rest of the paper is organized as follows: Section 2 provides an overview of the empirical literature, Section 3 describes some stylized facts about liquidity and profitability in the Macedonian banking sector, Section 4 describes data and methodological issues, while Section 5 discusses the empirical findings. The final section concludes.

## 2. Review of the Empirical Literature

This section provides a brief review of empirical literature that explores the determinants of banking sector liquidity, the used statistical methods, and in particular the relationship between liquidity and profitability.

Vodova (2011) investigated the determinants of Check bank's liquidity using panel data regression. She found that capital adequacy, non-performing loans and lending interest rates (including interbank transaction) had a positive effect on bank liquidity, while inflation rate, business cycle and financial crisis had a negative influence on liquidity. The same author using panel data regression for the banks in Poland (Vodova, 2012) and Hungary (Vodová, 2013) found similar results but taking into consideration specific characteristics of individual markets. Also, Horváth *et al.* (2014) studied a sample of Czech banks between 2000 and 2010, using a dynamic General method of moments (GMM). They observed a negative relationship between the creation of liquidity and bank capital, showing that higher capital requirement according Basel III reforms reduces liquidity creation, but the creation of high liquidity can reduce bank solvency. Contrary to these conclusions, Berger and Bouwman (2009) analyzing US bank's data for the period 1993-2003 found a positive relationship between liquidity and bank capital, using regressions run with both time fixed effects and bank fixed effects.

Regarding the determinants of the bank's liquidity in Romania, Munteanu (2012) performed a study analyzing panel data of 27 banks in Romania, during the period from 2002 to 2010, through a multiple regression model. Analyzing the crises period separately (2008-2010) the author found that Z-score, as an indicator for bank stability, has a significant influence on bank liquidity in the crisis years. Moreover, results indicated that liquidity is negatively affected by capital adequacy, asset quality, and interbank funding, whereas, it is positively related to cost to income ratio, funding cost, credit risk rate and inflation. Additionally, Roman and Sargu (2015) analyzed the impact of bank-specific factors on commercial banks liquidity in Central Eastern European (CEE) countries. They analyzed data from financial statements of the banks in seven CEE countries for the period 2004-2011 using Ordinary Least Square (OLS) regression. The results highlighted the negative impact that the depreciation of the loans portfolio had on the overall liquidity of the analyzed banks. Another empirical research for CEE commercial bank's liquidity was conducted by Trenca *et al.* (2012). They analyzed 30 banks from CEE countries for the period

2001-2011 using General method of moments (GMM). Using four liquidity ratios and analyzing three bank-specific factors and ten macroeconomic factors they found that bank's liquidity is significantly affected by the following factors: capital, total assets, lending interest rate, interest rate spread, credit flow to the private sector, private debt, and current account balance.

Regarding the relationship between liquidity and profitability, Molyneux and Thornton (1992) examined the determinants of bank's performance in a pooled sample of eighteen European countries in the period 1986-1989 using simple linear regression. Their results showed that the ratio of liquid assets to total assets is negatively related to return on assets (ROA). The same negative relationship was also supported by Guru *et al.* (1999) who considered a linear model to analyze the determinants of commercial bank's profitability in Malaysia. They stressed out that liquid assets are often associated with lower returns and thus high levels of liquid assets would be expected to be associated with lower profitability. In addition, Barth *et al.* (2003) examined the impact of the structure, the scope and the independence of bank supervision on the bank profitability. They employed a sample of 2300 banks from 55 countries, using regression analysis and found that liquidity ratio has a negative and highly significant relationship with the profitability (ROA). On the other hand, Bourke (1989) analyzing the internal and external determinants of bank profitability in Europe, North America and Australia using generalized least squares (GLS), found a significant positive relationship between liquidity ratio and banks' profitability. Furthermore, the same positive significant coefficient between profitability and liquidity was found by Lartey *et al.* (2013) analyzing the banks listed on the Ghana Stock Exchange for the period 2005-2010, using linear model. Also, Singh and Sharma (2016) analyzing data of 59 Indian banks for period from 2000 to 2013 and using fixed effect and random effect showed that profitability measured by ROA, as well as capital adequacy, deposits and inflation have a statistically significant positive impact on bank's liquidity. Interesting conclusions about this relationship are given by the former governor of the FED, who points out that profitability is better in banks that hold liquid assets, but there is a point in which further increase in liquid assets reduces the bank's profitability, Bernanke (2008).

### 3. Liquidity and Profitability in the Macedonian Banking Sector – Some Stylized Facts

In recent years the Macedonian banking system is characterized by high liquidity and relatively satisfying profitability. Structural surplus of liquidity, which is present in the Macedonian banking system for more than 15 years, determines the design of the Central bank's monetary policy. Hence, the main instrument of National Bank of the Republic of North Macedonia is Central Bank bills auction, an instrument used to withdrawn instead to create liquidity in the banking system. This is totally opposite from the practice of the largest number of central banks, especially the practice of the central banks of developed countries, where usually the main instruments are those that create liquidity in the banking system, which provides greater efficiency in the transmission mechanism of the monetary policy.

High liquidity in the Macedonian banking sector is confirmed with a comparative quantitative analysis of the ratio of liquidity. Figure 1 shows the share of the super-liquid assets in the total assets of the banking systems of selected countries for the period from 2003 to 2016. The highest value of this indicator is in Macedonia, with an average value of around 14%, which is higher than Croatia (with an average value of 13%) and significantly higher compared to Slovenia (average value of 4%) and Germany with an average value of 1.5%. In general, this indicator has lower values in the banking systems of developed countries, due to more rational and more efficient liquidity management. Dynamically analyzed, the Macedonian banking system especially after the global financial crisis accomplished high values of this liquidity indicator. Unlike Croatia and Slovenia, which faced liquidity reduction during the financial crisis, the banking sector in Macedonia maintained its high liquidity value and did not face any consequences. In recent years, almost all developed economies have tendency of increasing the liquidity in the banking systems under the pressure of the tightened liquidity requirements in accordance with the international Basel standards for supervision.

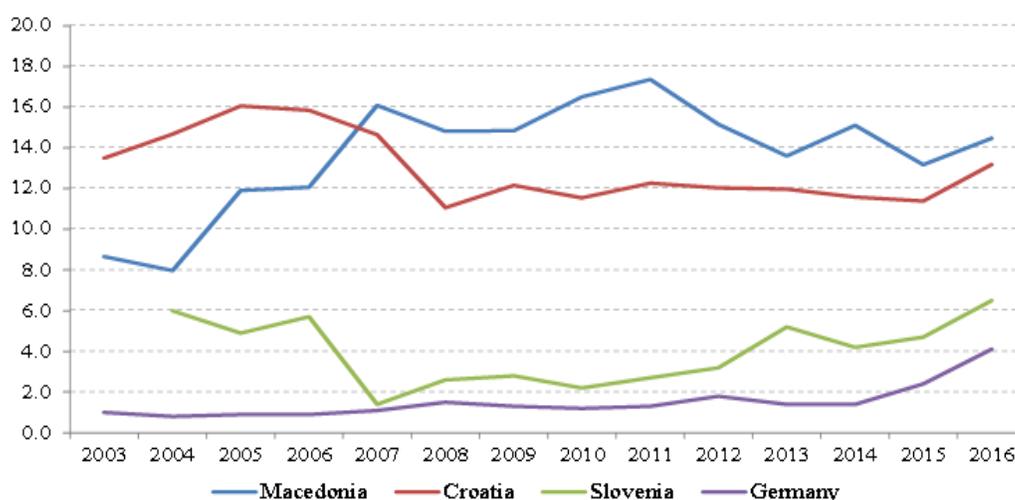


Figure-1. Liquidity in the banking systems of selected countries (in %).

Source: NBRM, World Bank, IMF, central banks of the analyzed countries.

Apart from high liquidity, the Macedonian banking sector is characterized by relatively satisfying profitability. Figure 2 presents data on profitability in the banking systems of several selected countries, measured through the return of average assets (ROAA) for the period from 2003 to 2016. Data shows that Macedonia has the highest profitability in the analyzed period, with an average ROAA of 1.4%, followed by Croatia, with an average of 1.1%.

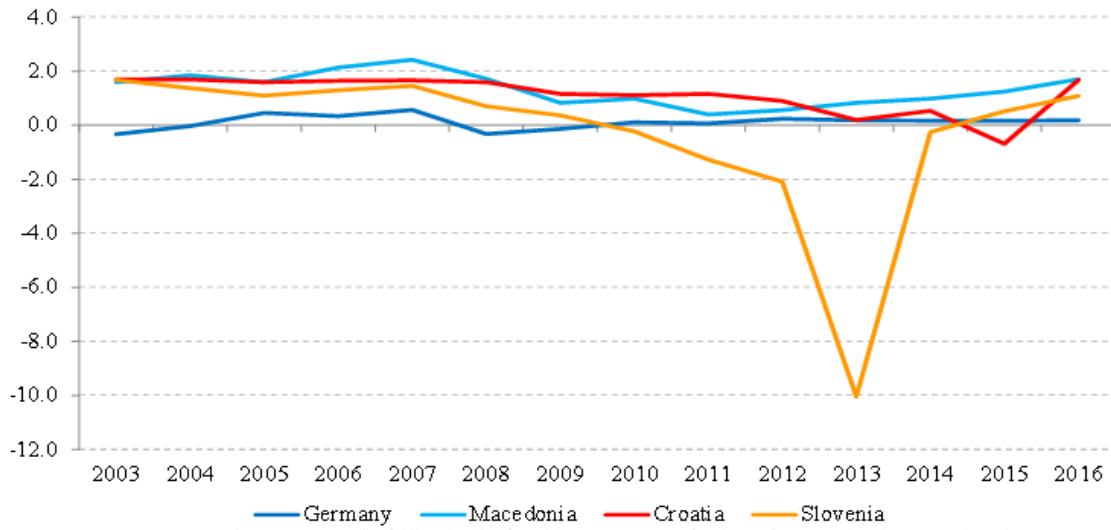


Figure-2. Profitability in the banking systems of selected countries (ROAA, in %)

Source: NBRM, World Bank, IMF, central banks of the analyzed countries

In addition to the relatively high values, the ROAA in the Macedonian banking system is characterized by relatively stable values (the standard deviation in the analyzed period is 0.5). Also it is evident that the Macedonian banking system was least affected by the global financial crisis, with a relatively small and short decrease in the ROAA. Unlike the Macedonian banking system, the banking systems of other countries were much more affected by the crisis, recording more significant reductions in their profitability, even losses in some years. Hence, the profitability rate is permanently higher in less developed countries (Macedonia, Croatia) compared to the banking systems of more developed economies (Germany).

The state of high liquidity and at the same time satisfying profitability is contrary to numerous theoretical and empirical researches that indicate the conflicting and negative relationship between these two important principles of banking operations. As it shows in this section in the case of the Macedonian banking system, high liquidity does not limit its profitability. This is especially noticeable in the period before the crisis (2003-2007), when the increase in liquidity did not cause a decrease in profitability, but also after the crisis when high liquidity was followed by increasing profitability. One of the explanatory factors for this situation is the relatively high net interest margin, due to the higher difference between active and passive interest rates (interest margin). As it shows in Figure 3, contrary from the Macedonian banking system, in Croatia and Slovenia, especially in Germany, the profitability of the banking sector is a result of the high volume of interest-bearing assets (loans, securities), while the difference between active and passive interest rates are significantly lower. This comes from the greater operating efficiency, but also from competitiveness within the banking systems in those countries. In other words, high-interest rates, when global interest rates are at historically lowest levels, indicates weaker efficiency and competitiveness in the Macedonian banking system, as well as the non-elasticity of credit demand.

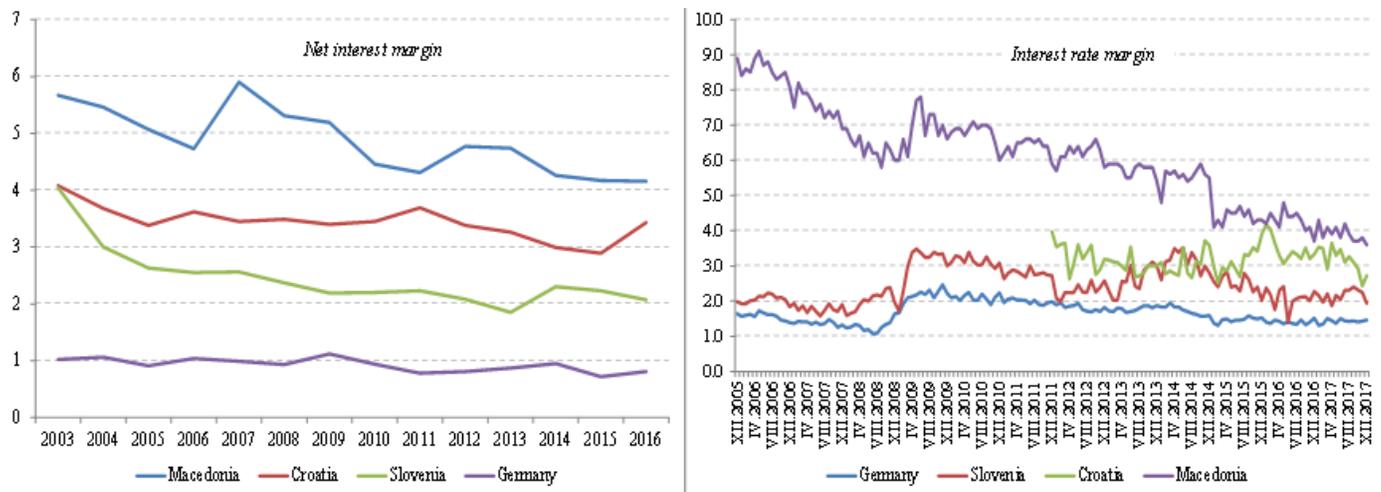


Figure-3. Net interest margin and interest rate margin (in %).

Source: NBRM, World Bank, central banks of the analyzed countries.

In the last few years, there has been a tendency of reorientation of Macedonian banks towards more substantial lending to households. Therefore, net interest income from households as registered a significant increase and is promoted as the main source of profitability of Macedonian banks. This is due to significantly reduced expenditures to households (due to reduced passive interest rates), with simultaneously increased interest income (due to increasing lending and proportionally lower decline in the active interest rates).

#### 4. Data and Methodology

In this section, an empirical study is based on panel data set covering 14 banks (out of 15) operating in Republic of North Macedonia over the period from 2007 to 2017. The data sources are balance sheets and income statements from annual reports, audit reports and financial statements of Macedonian banks published on their official websites and the Central bank database. Determinants of a bank's liquidity are grouped into two groups: internal factors and external factors. Bank specific variables are used as internal determinants of liquidity and macroeconomic variables are used as external determinants of liquidity. In that sense, five internal variables,

including the lagged value of liquidity and two external variables are used as independent variables. Each measurement of internal and external variables as well as the expected effect on liquidity is given in Table 1.

**Table-1. Description of variables.**

Variables	Notation	Measurement	Expected impact
<i>Dependent variable:</i>			
Liquidity	LA	Liquid assets/Total assets	/
<i>Independent variables:</i>			
Lagged value of liquidity	LA <sub>-1</sub>	Liquid assets/Total assets <sub>(-1)</sub>	Positive
Profitability	ROA	Net income/Total assets	Positive/Negative
Equity	CAP	Equity/Total assets	Positive/Negative
Log total assets_ proxy for size of bank	Log TA	Natural logarithm of total assets	Positive/Negative
Non-performing loans	NPL	Non-performing loans/Total assets	Positive
Growth of gross domestic product	GDP_GR	Annual growth rate of GDP (%)	Positive/Negative
Central bank bills interest rate	CBB_IR	Central bank bills interest rate (%)	Positive

Source: Author's Compilation.

The studies that assess the determinants of the liquidity of banks are presented by a large array of methodologies. Economic relationships which are included in this paper are dynamic in their nature, and their current behavior depends on their past behavior. Therefore, a dynamic panel model was required. The dynamic nature of the model disallows using standard Ordinary Least Squares (OLS) estimators, which might be biased and inconsistent due to the correlation between the unobserved panel-level effects and the lagged dependent variable (Hasanovic and Latic, 2017). Thus, the use of panel data with fixed or random effects does not solve econometric problems inherent in dynamic models. In order to overcome a problem of endogeneity that makes biased results and unobserved heterogeneity between banks that cannot be accurately measured, Arellano and Bond (1991) proposed a new generalized method of moments (GMM) estimator for dynamic panel model (Difference GMM). Their proposal was to include additional instruments in the dynamic panel model and to use the different transformation. Later, Arellano and Bover (1995) and Blundell and Bond (1998) proposed an improvement of the Arellano and Bond estimator by imposing additional restrictions to the initial conditions, which allow the introduction of more instruments in order to improve efficiency. It combines the first difference in equations with equation at the level in which the variables are instrumented by their first differences. It builds a system of two equations (System GMM), the original and transformed one.

According to Roodman (2006) Difference and System GMM estimators can be seen as a part of a broader historical trend in econometric practice toward estimators that make fewer assumptions about underlying data – generating process and use more complex techniques to isolate useful information. They are designed for panel analysis, and embody the following assumption about the data–generating process:

- 1) “small T, large N” panels, meaning few time periods and many individuals;
- 2) a linear functional relationship;
- 3) a single left-hand-side variable that is dynamic, depending on its own past realizations;
- 4) independent variables that are not strictly exogenous, meaning correlated with past and possibly current realizations of the error;
- 5) fixed individual effects and
- 6) heteroskedasticity and autocorrelation within individuals, but not across them.

According to Bond (2002) the unit root property makes the Difference GMM estimator biased, while System GMM produces more precise results. This study uses System GMM. The general model to be estimated is of the following linear form:

$$y_{it} = \alpha + \delta y_{it-1} + \beta_j X_{it}^j + \beta_k X_{it}^k + u_{it}$$

$$u_{it} = v_i + e_{it}$$

$y_{it}$  is a dependent variable which is bank liquidity of bank  $i$  at time  $t$ , with  $i = 1, \dots, N, t = 1, \dots, T$ ,  $\alpha$  is a constant,  $\delta_i$  denotes fixed effects in bank  $i$ ,  $y_{it-1}$  is lagged value of the dependent variable,  $X_{it}^j$  is a vector of internal explanatory variables for bank  $i$  in the time  $t$ ,  $X_{it}^k$  is a vector of external explanatory variables for bank  $i$  in the time  $t$ ,  $\beta'$  are coefficient which represents the slope of variables,  $u_{it}$  is the error term which follows  $N \sim (0,1)$ , where  $v_i$  is the unobserved bank-specific time-invariant effect, while  $e_{it}$  is a disturbance term which is independent across banks.

To test the multicollinearity we estimate the relationships between the independent variables used in the model. Correlations between the potential determinants of banks liquidity are shown in Table 2. All coefficients are inferior to 80%, so there is no problem of multicollinearity (Kennedy, 1985).

**Table-2. Test of multicollinearity.**

	ROA	CAP	Log_TA	NPL	GDP_GR	CBB_IR
ROA	1.0000					
CAP	-0.4500	1.0000				
Log_TA	0.6127	-0.5968	1.0000			
NPL	-0.5323	0.5723	-0.4685	1.0000		
GDP_GR	0.1459	0.1340	-0.0913	-0.0599	1.0000	
CBB_IR	-0.1714	0.3020	-0.1966	0.0896	-0.0408	1.0000

Another useful test for detecting multicollinearity is variance inflation factors (VIF). If a VIF is greater than 10, there is a high multicollinearity and the variation will seem larger and the factor will appear to be more influential than it is. If VIF is closer to 1, then the model is much stronger, as the factors are not impacted by

correlation with other factors. Table 3 shows that VIF for independent variables are very low which indicates that the model is not facing multicollinearity problem.

**Table-3. Variance inflation factors (VIF).**

Variable	VIF	1/VIF
CAP	2.08	0.480959
Log_TA	2.07	0.483898
ROA	1.94	0.516299
NPL	1.78	0.561386
CBB_IR	1.13	0.883675
GDP_GR	1.12	0.892791

## 5. Research Results

The results of testing the effect of various determinants of liquidity with the System GMM are shown in Table 4. Based on the results of the test it can be seen that the System GMM with lag (3, 3) gives good results. Hansen test shows that the model has been feasible,  $P(x^2) = 0,427$ , so we cannot reject null hypothesis that all the restrictions of over-identification are valid. Also, Arellano-Bond test for autocorrelation in first differences is greater than 5% ( $AR(2) = 0.092$ ), which indicates that the errors term are not serially correlated.

**Table-4. Panel-data estimation, Results.**

Explanatory variables	System GMM, lag(3,3)
Cons	0.14213404** (0.000)
LA <sub>-1</sub>	0.55420281*** (0.100)
ROA	0.38348227* (0.700)
CAP	0.0175876 (0.040)
Log_TA	-0.00652671** (0.079)
NPL	0.25927951* (0.183)
GDP_GR	0.00227096 (0.021)
CBB_IR	0.00334537** (0.020)
Number of observation	140
Number of instruments	21
Arellano-Bond test for AR(1) in first differences:	$z = -2.49$ $Pr > z = 0.013$
Arellano-Bond test for AR(2) in first differences:	$z = -1.68$ $Pr > z = 0.092$
Hansen test of overid. restrictions. $\chi^2(13) = 13.27$	$Prob > \chi^2 = 0.427$

\*\*\*statistically significant at 1% level.

\*\*statistically significant at 5% level.

\*statistically significant at 10% level.

Based on the analysis results, explanatory power of the model is very high. The results of the analysis show that only capital adequacy (CAP) and GDP growth rate (GDP\_GR) are not statistically significant at level of 1%, 5% and 10%. It means that Macedonian banking sector display small sensitivity to economic circle, indicating that Macedonian banks are not affected by the risk of insolvency which arose from economic downturns. This could be due to the relatively high regulations as well as the conservative nature of Macedonian banks behavior. The positive sign of CAP is consistent with the assumption that a bank with sufficient capital adequacy should be liquid as well. The positive sign of GDP\_GR might signal that companies and households with higher profits and income during expansionary phases prefer to rely more on internal sources of finance and intend to reduce their debt level and vice versa.

The significant coefficient of lagged dependent variable proves the dynamic model. The lag of liquidity has a positive impact on the current level of liquidity. It is consistent with our expectations as we assumed that banks tend to maintain higher levels of liquidity from the past into forthcoming period.

The relation between profitability and liquidity in this model is statistically positively significant at 10% level. Significant positive effect of profitability on liquidity shows that profitability is one of sources of liquidity creation. The greater the profitability of a bank is, the greater the ability of bank to meet the liquidity needs is. This is partly due to the structural surplus of banks liquidity that determines the central bank to pay interest for banks funds placement in Central bank bills. Additionally, the monetary strategy of Macedonian central bank is based on pegged exchange rate, so the interest rates of CB bills are unconventionally high and the positive relationship between these two indicators is becoming inevitable.

Another explanatory variable which has statistically significant influence on the liquidity is the size of bank, measured by logarithm of total bank assets. This relation is statistically significant at 5% level of significance. The impact of the size of the bank on its liquidity is negatively, so liquidity is decreasing with the sizing of the bank. In Macedonian banking system, with excess liquidity, this relation occurs because of more effective liquidity management among big banks and high concentration in banking system - especially a large portion of deposits are located in a few big banks balance sheets. However, this relation is too ambitious and it could be useful for further studies to estimate determinants of liquidity separately for small, medium-sized and large banks.

Share of non-performing loans to total loans in this study was used as asset quality. The greater the ratio is means the worse quality of the assets owned by a bank is and conversely, the lower the ratio is, the better quality of a bank's assets is. Influence of asset quality on liquidity in this study shows a positive significant relationship at 10% level of significance. It means that a bank with higher NPLs is more cautious about investing and it rather keeps more funds in the account as the excess liquidity.

The results also showed a positive statistically significant impact of the interest rate of Central bank bills (CBB) on bank liquidity, at 5% level of significance. So, when Central bank decides to raise interest rates on CBB, the market responds that condition by shifting some of its assets into central bank account (CB bills) and the ratio of liquidity assets to total assets becomes more significant. It is also a signal to commercial banks to increase their interest rates, active and passive ones and normally demand for bank loans is decreasing, while deposit accounts become more attractive because of the interest gained. Hence, in the Macedonian banking sector the higher the interest rate of Central bank bills is, the greater the share of liquidity asset to total assets is.

## 6. Conclusions

The main objective of the study was to identify the bank-specific and macro-economic factors that can affect Macedonian banks liquidity mainly focusing on the relationship between profitability and liquidity. According to the review on empirical literature and liquidity and its determinants area theories, the current study chosen and investigated the impact of five bank-specific and two macro-economic factors on the liquidity of the Macedonian commercial banks over the period of 2007 to 2017. The bank-specific factors that were used in this study include variables such as profitability, non-performing loans, capital adequacy, bank size, and lagged value of liquidity. On the other hand, the two macroeconomic conditions indicator variables employed in this study were real GDP growth and Central bank reference interest rate.

One of the main features of the Macedonian banking system is the existence of structural excess of liquidity. Surplus liquidity, simply put, means that commercial banks persistently hold excess reserves. In other words, banks continuously have more deposits than the credits they provide and therefore keep large liquid instruments on the assets side. Structural surplus of liquidity, which is present in Macedonian banking system for more than 15 years, determines the design of the Central bank's monetary policy - because commercial banks do not need to borrow from the central bank. Hence, the main instrument of National Bank of the Republic of North Macedonia is Central Bank bills auction, an instrument used to withdrawn instead to create liquidity in the banking system. Apart from high liquidity confirmed through quantitative comparative analysis, the Macedonian banking sector is characterized by relatively high profitability. The comparative analysis shows that the Macedonian banking sector has the highest profitability, calculated through the return of average assets (ROAA). This means that in the case of Macedonian banking system, high liquidity does not limit its profitability. One of the explanatory factors for this situation is the relatively high net interest margin, due to the higher difference between active and passive interest rates indicating weaker efficiency and competitiveness as well as non-elasticity of credit demand in the Macedonian banking system.

Furthermore, this paper examined the determinants of liquidity of the Macedonian banking sector using the dynamic panel analysis based on the generalized method of moments (GMM) methodology. The results showed that bank liquidity increases with higher lagged of liquidity, higher bank profitability, higher monetary policy interest rates and a higher share of non-performing loans. It is very important to mention that our model shows that profitability is one of the significant sources of bank's liquidity creation pointing out that banks not only are comfortable in the commodity of high amount of cash and funds placed at account in National Bank of the Republic of North Macedonia, simultaneously they are achieving a relatively high net profits. On the other hand, only the size of the bank is significantly inversely associated with bank liquidity confirming that bigger banks use more effective liquidity management compared to smaller banks. We also found that capital adequacy and GDP growth rate have no statistically significant effect on the liquidity of Macedonian commercial banks meaning that Macedonian banking sector displays small sensitivity to economic circle. This confirms the relatively high regulations as well as the conservative nature of Macedonian banks behavior.

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