

The Impact of Liquidity Risk on Commercial Bank's Profitability Albanian Banking Sector

Dhurata KOSIQI¹

Albina HYSAJ²

¹MSc, Intesa Sanpaolo Bank, dkosiqi19@epoka.edu.al

²PhD, Epoka University, albinahysaj@gmail.com, <https://orcid.org/0000-0001-9632-316X>

Abstract: This study examines how liquidity risk affects the profitability of commercial banks in Albania during the 2013–2023 period. Using panel data regression analysis, it explores the relationship between key liquidity-related factors—funding gaps, liquidity holdings, cash reserve ratios, and bank size—and profitability indicators, including Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM). The results show that higher liquidity holdings positively contribute to profitability, suggesting that maintaining adequate liquidity can improve financial performance. However, larger bank size negatively affects profitability, likely due to higher operational costs and challenges in managing complex operations. Cash reserves and funding gaps, were found to have less influence on profitability in this study.

These findings highlight the importance of effective liquidity management in ensuring stable financial performance and minimizing risks. Policymakers and bank managers are encouraged to adopt strategies that balance liquidity needs with operational efficiency to maintain financial resilience. While the study offers valuable insights, it is limited to the Albanian banking sector and does not consider broader economic factors or qualitative variables such as management practices. Future research could expand on these findings by including additional variables and examining other banking systems.

Key Words: liquidity risk, commercial banks, financial performance, Albanian Banking sector.

1. INTRODUCTION

Financial intermediaries connect economic agents aiming to invest their excess funds and those who lack funds. The main role of the banking system is to generate liquidity by linking these two economic poles - specifically, by lending out money to some economic agents sourcing from the deposits of other economic agents. Therefore, liquidity and its impact on banks profitability is an important study area. While the growing interconnections in the banking sector have undoubtedly brought economic benefits, they also carry risks and can serve as a dangerous channel of contagion within the system (Peltonen et al., 2015).

Acharya and Naqvi (2012) emphasize that the transformations in banking practices in recent years have significantly increased the sector's vulnerability compared to the past. Moreover, the American mortgage crisis played a pivotal role in this fragility, as its associated financial products were distributed to investors globally, expanding systemic risks. Illiquidity affected all operators, and this situation lasted for an extended period, requiring the injection of liquid resources from central banks. What happened shed light on how problems affecting liquidity do not remain isolated within a subject but can affect the activity and stability of those who are interconnected. Consequently, it has become clear how liquidity risk can influence systemic risk. It is therefore necessary for the supervisory bodies to verify which subjects

are most exposed to this risk in order to be able to intervene with measures before these deficiencies can affect other subjects; by knowing which banks represent a possible source of systemic risk, supervisory bodies can be in a position to guarantee a certain degree of financial stability.

The global financial crisis started in 2007 emphasized the vulnerabilities of businesses mostly dependent on short-term financing sources to support long-term assets, as outlined in the 2009 report by the Senior Supervisors Group. This led to difficulties in enduring market stresses, resulting in losses and needing central bank support. The report highlights the increased liquidity risk during periods of financial stress, forcing banks to raise interest rates to maintain sufficient liquidity. This can negatively affect efficiency, especially when banks are pressured to offer funds at lower costs to generate cash quickly. The crisis emphasized the significance of liquidity risk, showing how rapidly and severely it can emerge, even in environments that appear liquid, and the serious consequences it can cause.

The Albanian economy has consistently been influenced by global economic developments, with regional events having a particularly strong impact due to the country's close economic and trade relations within the region (Sheqeri, 2003). The Albanian economy has experienced three significant financial shocks to date. The first shock dates back to 1997 with the problems that came

from the informal economy market. The reason for its creation was the inability of the banking sector to meet the credit needs of the private sector, as a result of problems with the payment system and the high level of non-performing loans in the lending portfolio. The loss of savings in the pyramidal schemes led to the loss of confidence of the public in the banking system, its efficiency, and safety. The second shock occurred in 2002. This was characterized by a bank run and was accompanied by massive withdrawals in the country's two largest banks. As reported by the Bank of Albania in 2003, the total withdrawal value in just two months was ALL 21.4 billion, which clearly shows how quickly bank panic has its effects.

The global financial crisis of 2008 impacted Albanian economy as well. The Bank of Albania implemented several measures to relieve the negative consequences of the crisis, providing stability to the financial systems, and addressing the market's need for liquidity. Increasing the number of securities confirmed as collateral for repurchase agreements and switching the essential liquidity infusion sell-off from a fixed amount to a fixed-price sale off were two of the actions followed by the central bank.

During the period from 2011 to 2014, Albania's economy faced significant challenges, including high uncertainty, unfavorable financing conditions, and reduced demand. Despite this, positive developments were observed in the trajectory of the capital adequacy ratio, as regulatory capital outpaced the growth of risk-weighted assets. Continuous monitoring of the banking system is essential to safeguard depositors and the public's interests. In Albania, the Supervisory Department of the Bank of Albania is the responsible unit for the supervision of the liquidity risk management of commercial banks.

This paper aims to investigate impact of liquidity risk on the profitability of commercial banks in Albania during the 2013–2023 period. It aims to identify key liquidity-related variables such as funding gaps, liquidity holdings, cash reserve ratios, and bank size that affect financial performance, particularly through metrics like Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM).

2. LITERATURE REVIEW

Following the 2007-2009 financial crisis, the COVID-19 pandemic, and the rapid development of technology, which have a significant impact on the financial industry, especially in the financial systems, have shifted the attention of academics and researchers to bank liquidity considering its crucial impact in the banks' wellbeing and

profitability. Many research papers on finance and economics during the 20th century have been focused on liquidity management by providing several models for evaluating and managing the risks involved.

2.1 Profitability ratio

A company's ability to turn a profit based on its income, equity, assets, and other financial factors is assessed using profitability ratios, which are crucial financial metrics. An understanding of a company's operational efficiency and financial health can be obtained by examining these ratios. Ongore & Kusa (2013) investigate the determinants of banks' profitability by using Net Interest Margin, Return on Equity, and Return on Assets as indicators of profitability. Several authors such as Arif and Anes (2012), and Dietrich and Wanzenried (2011) have investigated the crucial impact of liquidity on the bank's profitability. According to the authors, even banks with high earnings and great asset quality might fail if they lack liquidity. Similarly, Nikolaou (2009) discovers the impact of liquidity on financial performance indicators, such as Return on Equity (ROE), Return on Assets (ROA), and Net Interest Margin (NIM), and finds that liquidity management problems negatively affects both profitability of the banks.

Ly (2015) highlighted the significant effects of liquidity risk on the performance of European banks. The analysis carefully considered factors such as liquidity risk, regulatory capital requirements, and other bank-specific considerations. The finding of the study revealed that liquidity risk had a significantly negative impact on both return on assets and return on equity, indicating that the higher exposure to liquidity risk the lower the bank's profitability. Additionally, the study emphasized the positive impact of regulatory capital requirements, indicating that the stringent regulatory frameworks improved bank performance by reducing risk and maintaining stability.

2.2 Bank-specific factors

The performance of commercial banks is influenced by several internal and external factors. Internal determinants include a wide range of financial and non-financial variables (Al-Tamimi, 2010).

2.2.1 Funding gap measures

The funding gap ratio concept is universally acknowledged and extensively utilized in the global banking industry. It serves as a crucial measure of a bank's exposure to interest rate risk and its

significant impact on both profitability and risk management. It is calculated as net loans minus total deposits on which the bank pays interest, over total assets held by the bank. Funding liquidity estimate a bank's ability to raise funds quicker to meet obligations, (Brunnermeier & Pedersen, 2009).

Agur, I. (2013) discovered that bank financing significantly affected credit rationing. In particular, a drop in credit rationing was linked to an increase in wholesale bank financing, suggesting that banks that had more access to extensive funding were able to provide credit to more borrowers and were less disposed to participate in credit rationing practices. Another study by Khrawish (2011) had similar results of determinants on commercial banks performance. A ten-year frame from 2000 to 2010 was used for the study. The study revealed a significant and positive relationship between return on equity and funding gap, bank size, total liabilities/total assets, net interest margin.

According to a study by Kumar and Yadav (2013) the contemporary concept of liquidity predicts a bank's ability to raise funds in assets and fulfill obligations as they shift to due, without facing extreme losses. In this context, liquidity encompasses both the capability to fulfill immediate obligations and to fund future expansion initiatives. Thus, a bank is considered liquid when it can generate necessary funds as required. The potential threat to this capability constitutes liquidity risk. Liquidity and liquidity risk pertain to distinct timeframes. Liquidity pertains to a specific moment and is a binary concept: either the bank can fulfill its obligations at that moment or it cannot. In contrast, liquidity risk is a forward-looking term that covers a longer time horizon and is used to estimate future inflows and outflows in order to evaluate the ability to satisfy obligations in the future (Nikolaou, 2009).

Furthermore, Kumar & Yadav (2013) emphasize that effective management of the funding gap is vital for sustaining liquidity and ensuring profitable operations. A strategic balance in funding and asset management can mitigate the adverse effects of a high funding gap ratio on ROE, ROA, and NIM. It is of vital importance for banks to evaluate the costs of external funding and ensure that the returns on funded assets justify these costs to maintain robust financial performance indicators. By managing the funding gap, banks can strengthen their liquidity position, stabilize their income, and safeguard against unwarranted financial risks, ultimately paving the way for improved ROE, ROA, and NIM outcomes. There is a significant interaction between a bank's borrowing from other banks and

its return on assets. Furthermore, it is evident that banks that have to borrow from the interbank market suffer negative effects on their financial performance and these results were also in line with (Agarwal et al., 2018).

2.2.2 Liquidity holding ratio

A higher proportion of holding in liquid assets usually indicates a more secure position for the bank in meeting short-term commitments. However, it may lead to lower returns, as these assets typically yield lower returns compared to more illiquid resources such as credits. As a result, ROE and ROA might be adversely affected. NIM might also decrease as a significant section of the assets is held in low-yield liquid securities. Liquidity is broadly defined by Drehmann & Nikolaou (2013) as the ability to settle obligations promptly and encompasses funding liquidity and asset liquidity.

Baselga et al., (2015) demonstrate the complexity of bank risk and its relations with financing stability, liquidity measures, and economic conditions. The study's identification of these crucial elements offers insights that might support the development of risk management procedures and regulatory frameworks intended to strengthen European banks' resilience against future financial crises. The study suggests that lower risk was linked to a larger liquidity holding percentage.

Effective liquidity management also contributes to having high returns on assets and equity however, maintaining excessively higher liquidity can potentially impact in a negative way profitability (Bonfim, Dias, & Richmond, 2012).

2.2.3 Cash reserve ratio

The reserve cash ratio serves as a critical regulatory instrument incorporated by central banks to effectively manage the funds that commercial banks claim to carry in reserve. Orji et al., (2022) investigate the effect of the cash reserve ratio on credit access for micro, small, and medium-sized enterprises. Banks are mandated to maintain a specific portion of their deposits in reserve, and this requirement significantly influences their overall profitability.

Maccarthy (2016) highlights the substantial influence of reserve pressures on the financial outcomes and corporate social responsibility of commercial banks. The study analyzes the 2013 annual reports of 20 commercial banks in Ghana and identifies an optimal relationship between the cash reserve ratio and financial performance. Notably, the cash reserve ratio emerges as a robust and influential forecaster of commercial banks'

performance, particularly in terms of return on retained earnings.

According to Athanasoglou et al., (2005), inner components that influence bank profitability include bank reserves, bank size, efficiency management, and risk capacity management. Bank reserves seemed to have a positive effect, but in that study period was insignificant. Liquidity depends on two main aspects: the ability to liquidate assets as needed and to accomplish that at a reasonable cost. In order to reduce liquidity risk, adequate cash resources must be maintained (Arif & Anes, 2012; Hartlage, 2012). Sah (2023) and Chhetri (2023) also demonstrate that the cash reserve ratio has a significant effect on the ROA, ROE, and NIM models.

2.2.4 Bank size

Ali (2013) has conducted an in-depth investigation of liquidity management techniques in Islamic financial institutions (IFIs). The study emphasizes how larger Islamic banks have more favorable effects on their liquidity management due to economies of scale, superior risk diversification, and better access to a variety of funding sources. Larger institutions may have difficulties with monitoring and coordination due to their greater complexity.

Another study conducted in Bangladesh from 2005 to 2019 by Hossain & Ahamed (2021) revealed compelling findings. Among other factors, bank size is found to have a significant impact on NIM. Moreover, the impact of market share in ROE emphasizes the essential role of customer base and pricing control in driving equity return. Similarly, Rani & Zergaw (2017) evaluates the factors that determine profitability in Ethiopian commercial banks over a ten-year period, from 2005 to 2015. The authors found that net interest margin is significantly affected by bank size and earnings ratios. Furthermore, liquidity ratios were among the other internal factors that significantly impacted return on equity. Also, Gwachha (2023) found that the bank stability is positively and significantly impacted by the bank's size. Furthermore, as per Mukhiya (2024), it has been observed that the size of a bank have a significant impact on its profitability.

3. MATERIAL AND METHODS

3.1 Data and Methodology

The main goal of this research is to investigate the relationship between Albanian commercial banks' profitability and their liquidity. The dependent variables are the three most significant indicators of

commercial banks' profitability: return on assets (ROA), return on equity (ROE), and net interest margin (NIM). The funding gap measure, liquidity holding ratio, cash reserve ratio, and bank size are all considered independent factors based on the literature assessment.

The funding gap ratio is a crucial measure of a bank's interest rate exposure and its impact on profitability. It serves as a measure of liquidity risk and is determined by dividing the money gap (the difference between total loans and total deposits) by total assets. The liquidity holding ratio is known as liquidity ratio. This ratio measures a bank or any financial institution's ability to meet different short-term obligations through liquid assets. It estimates the alteration of liquid assets to short-term liabilities such as deposits. The Cash Reserve (CR) ratio represents the proportion of a bank's cash holdings relative to the total cash and cash equivalents maintained by other commercial banks. Bank size is quantified by taking the natural logarithm of its total assets.

The study utilizes secondary data, such as bank-specific information from the certified financial statements of selected commercial banks in Albania. The data is extracted from the balance sheets and income statements, covering the period from 2013 to 2023. The sample includes eight largest banks considering their capital, as the most important representatives of the Albanian banking system. The 10-year data span provides a sufficient number of observations, allowing for the establishment of relationships between variables based on 88 observations.

The study employs pooled OLS with panel data regression analysis, a system extensively employed by researchers to establish significant connections between variables. To examine the connection between banks' liquidity and their financial performance, a regression model is employed, represented by the following equation:

$$Y_{it} = \alpha + \beta x_{it} + U_{it}$$

Building on the equation and variables outlined above, the econometric model is defined as follows:

$$ROA_{it} = \beta_0 + \beta_1(GAP_{it}) + \beta_2(LH_{it}) + \beta_3(CR_{it}) + \beta_4(BSZ_{it}) + u_{it}$$

$$ROE_{it} = \beta_0 + \beta_1(GAP_{it}) + \beta_2(LH_{it}) + \beta_3(CR_{it}) + \beta_4(BSZ_{it}) + u_{it}$$

$$NIM_{it} = \beta_0 + \beta_1(GAP_{it}) + \beta_2(LH_{it}) + \beta_3(CR_{it}) + \beta_4(BSZ_{it}) + u_{it}$$

Where: ROA denotes the return on total assets ratio, ROE refers to the return on equity, and NIM

indicates the net interest margin for bank *i* at time *t*.

3.2 Empirical Analysis

This chapter includes the statistical and econometric analysis to gain insights into the correlation among dependent and independent variables.

3.2.1 Unit Root Test

The unit root test is essential for determining the stationarity of variables, as it investigates whether

they are dependent on time shifts. The ADF Fisher individual root test has confirmed that all our variables are stationary at the first difference, with a probability close to zero for each variable. This result, leads to rejection of the null hypothesis and suggests that the data are stationary. This has significant implications for our subsequent analyses.

Table 1. Summary of ADF Fisher individual unit root test results

Variable	Method	Statistic	Prob.**
GAP	ADF - Fisher Chi-sq	47.3361	0.0001
CR	ADF - Fisher Chi-sq	38.6191	0.0012
BSZ	ADF - Fisher Chi-sq	74.5578	0.0000
LH	ADF - Fisher Chi-sq	28.8459	0.0254

Source: Authors calculations

3.2.2 Multicollinearity

Upon completing the assessment of variable stationarity, the subsequent crucial step involves conducting a multicollinearity test to ensure the absence of correlation between the explanatory variables. It is imperative that the independent variables exhibit no correlation with each other in Table 2. Correlation matrix of explanatory variables

order to be deemed suitable for inclusion in the model. The correlation matrix table effectively demonstrates that each set of variables possesses a value lower than 0.8, indicating the absence of significant correlation. This test validates that the model remains unbiased and unaffected by multicollinearity.

Variables	LH	GAP	CR	BSZ
LH	1.000			
GAP	-0.053	1.000		
CR	0.201	0.009	1.000	
BSZ	0.412	-0.024	0.107	1.000

Source: Authors calculations

3.2.3 Hausman Test

Upon confirming the stationarity and lack of correlation among the variables, the next step

involves generating the equation using the pooled OLS estimation method for Panel Data. This will help evaluate whether a fixed or random effect model is more appropriate for running the regression.

Table 3. Hausman Test - - Cross-section random effects

Depended Variable	Chi Sq Stat	Probability	Conclusion
ROA	4.203	0.379	Random effects model is appropriate
ROE	3.322	0.271	Random effects model is appropriate
NIM	3.154	0.284	Random effects model is appropriate

Source: Authors calculations

For all dependent variables (ROA, ROE, NIM), the p-values are greater than the significance level (e.g., 0.05), meaning that the random effects model is the suitable approach for this analysis.

correlation between residuals and explanatory variables. The Normality of Residuals is satisfied due to the large sample size. There is no evidence of Serial Correlation in the model, and the Heteroskedasticity test confirms constant variance in the error term, ensuring the model's reliability.

The regression model assumptions were completely tested and confirmed. The Zero Conditional Mean assumption holds, as there is no significant

3. RESULTS AND DISCUSSION

After demonstrating that the random effect model is optimal for our regression, the generated model is shown below.

Table 4. *Estimated Equations ROE*

Variable	Coeff	Std Error	t-stat	Prob.
LH	1.605	0.724	1.671	0.072
GAP	-0.015	0.131	-0.116	0.082
CR	0.065	0.215	4.303	0.003
BSZ	-0.012	0.009	-3.369	0.024
C	-0.379	0.197	-1.922	0.058
R - squared	0.435		F -Stat	19.42
Adj R-squared	0.395		Prob (F stat)	0

Source: Authors calculations

$$ROE = -0.379 + 1.605 * LH - 0.015 * GAP + 0.065 * CR - 0.012 * BSZ$$

The regression results indicate that cash reserve and bank size significantly impact return on equity (ROE) at a 5% significance level, with cash reserves positively influencing ROE and larger bank sizes negatively affecting it. However, liquidity

holding and funding gap ratio are not statistically significant predictors of ROE. The model explains approximately 43.5% of the variation in ROE, and the overall model is highly significant, as indicated by the F-statistic.

Table 5. *Estimated Equations ROA*

Variable	Coefficient	Std Error	T-stat	Prob
LH	0.157	0.91	4.172	0.035
GAP	0.051	0.093	0.546	0.091
CR	-0.147	0.151	0.969	0.065
BSZ	-0.034	0.006	-7.13	0.002
C	2.32	0.472	-0.179	0.000
R - squared	0.425		F -Stat	12.55
Adj R-squared	0.389		Prob (F stat)	0.000

Source: Authors calculations

$$ROA = -2.32 + 0.157 * LH + 0.051 * GAP - 0.147 * CR - 0.034 * BSZ$$

The regression analysis reveals that liquidity holdings and bank size significantly influence return on assets (ROA), with liquidity holdings positively impacting ROA and larger bank sizes negatively affecting it. Conversely, cash reserves and the

funding gap ratio are not statistically significant predictors. The model explains 42.5% of the variation in ROA and is statistically significant overall, as indicated by the F-statistic.

Table 6. *Estimated Equations NIM*

Variable	Coefficient	Std Error	t-stat	Prob.
LH	1.075	8.66	6.276	0.021
GAP	1.399	0.833	0.679	0.070
CR	0.453	1.352	0.735	0.057
BSZ	-0.009	0.054	-6.167	0.004
C	-0.239	0.986	-0.242	0.809
R - squared	0.415		F -Stat	20.203
Adj R-squared	0.378		Prob (F stat)	0.000

Source: Authors calculations

$$NIM = -0.239 + 1.075 * LH + 1.399 * GAP + 0.453 * CR - 0.009 * BSZ$$

The regression analysis reveals that liquidity holdings and bank size significantly influence return on assets (ROA), with liquidity holdings positively

impacting ROA and larger bank sizes negatively affecting it. Conversely, cash reserves and the funding gap ratio are not statistically significant

predictors. The model explains 42.5% of the variation in ROA and is statistically significant overall, as indicated by the F-statistic.

The findings of this study are supported by the findings of Baselga et al. (2015) which have found that fluctuations in the liquidity holding ratio impact profitability indicators such as return on equity (ROE) and return on assets (ROA). A higher liquidity holding ratio may equip a bank with more accessible funds to address unforeseen withdrawals or crises, potentially bolstering its financial resilience. Murthy (2003) findings reveal that larger banks have statistically significant negative effects on ROA, ROE, and NIM.

Mukhiya (2024) concludes that larger banks consistently exhibit a lower return on assets (ROA), supporting the findings of this paper. This observation aligns with established trends in banking literature, which highlight the challenges encountered by larger banks, such as elevated operational costs, stringent regulatory requirements, and difficulties in sustaining productivity relative to smaller institutions. Additionally, larger banks may deal with a higher proportion of low-yielding assets and face challenges in managing interest rate risk, ultimately leading to a diminished Net Interest Margin (NIM).

5. CONCLUSIONS AND LIMITATIONS

The finding of the study suggests that larger banks have lower profitability possibly associated with a lack of efficiency, the complexity of the operations, and the regulatory burden. Liquidity holding has a significant positive impact on the banks' Return on Assets and Return on Equity. However, other liquidity indicators such as cash reserves and funding gaps demonstrated a lower correlation with profitability, implying their limited predictive power of the performance of banks. This study highlights the significant influence of liquidity risk on the profitability of commercial banks in Albania during the 2013–2023 period.

The results emphasize how crucial good liquidity management techniques are to maintaining financial stability. Banks should implement measures to keep their liquidity holdings at an ideal level since too much liquidity can tie up resources in low-yield assets and lower profitability, while too little liquidity puts banks at danger of financial hardship. Furthermore, it seems that smaller banks are better positioned to sustain profitability, indicating that larger institutions must innovate and simplify their processes to get beyond size-related

obstacles. To strengthen the stability of the banking industry, policymakers and regulators should prioritize measures that support balanced liquidity management.

The limitations of this study primarily relate to its scope, data, and methodology. Focusing solely on the Albanian banking sector limits the ability to apply the findings to other regions, while reliance on secondary financial data may overlook qualitative factors such as management practices. The study's 2013–2023 time frame, although informative, could be expanded to capture evolving dynamics, particularly post-pandemic. Additionally, broader macroeconomic factors like inflation and GDP growth were not included, which might influence profitability.

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