Firm-Specific Determinants of Bank Liquidity in Indonesia

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ARTICLE INFO	ABSTRACT
	This study aims to examine the firm-specific determinants that influence bank liquidity among conventional commercial banks in Indonesia during the period 2019–2023. Using panel data regression on a sample of 23 banks listed on the Indonesia Stock Exchange, the study analyzes the impact of six independent variables—Capital Adequacy Ratio (CAR), Total Loan to Total Assets Ratio (TLTAR), Interest Rate Margin (IRM), Deposit Ratio, Non-Performing Loans (NPL), and Return on Assets (ROA)—on the liquidity ratio (measured as liquid assets to total assets). The results show that CAR has a significant positive effect, while TLTAR has a significant negative effect on bank liquidity. Other variables such as IRM, deposits, NPL, and ROA were found to have no significant influence. These findings indicate that adequate capital reserves and balanced credit allocation are crucial for maintaining liquidity in Indonesian banks. The study contributes to the literature by providing empirical evidence from the Indonesian banking sector and offers insights for bank managers and regulators to develop policies that enhance financial stability. Keywords: Bank Liquidity, Capital Adequacy, Credit Ratio, Indonesia, Panel Data

INTRODUCTION

Bank liquidity has long been recognized as one of the most critical components of financial system stability. As intermediaries between surplus and deficit economic units, banks must be able to meet their short-term obligations while maintaining optimal profitability. Liquidity allows banks to meet withdrawal demands, fund loan disbursements, and navigate unforeseen market shocks. The global financial crisis of 2008–2009 revealed how liquidity shortages can rapidly lead to systemic failures in banking systems (Allen & Moessner, 2010). Consequently, liquidity management has emerged as a central concern for regulators, policymakers, and bank managers alike.

In developing economies such as Indonesia, the role of banks in channeling funds to productive sectors is even more pronounced. With limited access to capital markets, small and medium-sized enterprises (SMEs) rely heavily on bank financing. In this context, the liquidity of commercial banks directly affects economic growth and financial inclusion. According to Bank Indonesia,

maintaining healthy bank liquidity is vital for macroeconomic stability, especially during periods of economic uncertainty, such as the COVID-19 pandemic and subsequent recovery phase. Similar arguments were highlighted in studies of African and Asian markets, where liquidity conditions strongly influenced financial stability and credit distribution (Huynh, 2024)..

Several studies have attempted to examine the determinants of bank liquidity, both from a macroeconomic and microeconomic perspective. For instance, Vodová (2011) analyzed Czech banks and found that capital adequacy and non-performing loans were among the most significant factors influencing liquidity. Similarly, Tesfaye (2017) demonstrated that in Ethiopian banks, capital adequacy, interest rate spreads, and bank size played a crucial role in shaping liquidity conditions. Meanwhile, Moussa (2015) emphasized the importance of macroeconomic indicators such as GDP growth and inflation in determining liquidity in Tunisian banks. ore recently, Adafre & Bushira (2024) confirmed similar determinants in Ethiopian commercial banks, while Morina and Qarri (2021) highlighted macro-financial linkages in Central and Eastern Europe. Other works also show that liquidity is linked with profitability and risk management practices (Mazreku et al., 2019). Although such studies have enriched the understanding of liquidity dynamics, most of them are concentrated in either African or European contexts, and relatively few have focused on Southeast Asia, particularly Indonesia.

More recent empirical works have incorporated firm-level variables such as profitability, deposit mobilization, loan composition, and market concentration as potential determinants of bank liquidity. For example, Al-Homaidi et al., (2019) investigated the determinants of liquidity in Indian commercial banks and found that profitability and asset quality significantly influenced liquidity levels. Likewise, Abbas et al., (2023) explored how economic growth affects the relationship between capital, liquidity, and profitability in emerging Asian economies. However, while these studies offer valuable insights, their findings are context-dependent and may not directly apply to the Indonesian banking sector, which operates under different regulatory, economic, and institutional frameworks.

The novelty of this study lies in its integrated analysis of both firm-specific financial ratios and monetary policy indicators within the Indonesian banking industry. Specifically, this research includes the Net Interest Margin (NIM) and Refinancing Rate (RFR) as variables that have received limited attention in previous empirical studies conducted in Indonesia. Furthermore, by focusing on a recent dataset from 2019 to 2023 and applying panel data regression on listed commercial banks, this study addresses a current and relevant period marked by economic recovery and policy shifts.

To date, few studies have simultaneously evaluated how internal bank performance indicators (such as capital adequacy, return on assets, deposit ratio, and non-performing loans) interact with external monetary policy tools (such as RFR) in determining liquidity in Indonesian commercial banks. This combination offers a more holistic view of liquidity management by accounting for both endogenous and exogenous factors. Moreover, previous studies such as those by Pradhan & Shrestha (2016), Khati (2020), and Sudarsono et al., (2022) while valuable, were conducted using earlier datasets and did not reflect the structural shifts and digitization trends affecting the post-pandemic banking landscape in Indonesia.

Therefore, this study aims to fill the research gap by investigating the firm-specific determinants of bank liquidity in Indonesia by incorporating both conventional financial indicators and monetary policy variables. Unlike previous studies, this research adopts a more comprehensive framework that combines micro-level bank performance indicators with macro-level policy rates to better capture the complexity of liquidity behavior in Indonesian banks.

The primary objective of this study is to analyze the influence of Capital Adequacy Ratio (CAR), Total Loan to Total Asset Ratio (TLTAR), Net Interest Margin (NIM), Deposit Ratio, Non-Performing Loans (NPL), Return on Assets (ROA), and Refinancing Rate (RFR) on bank liquidity, as measured by the ratio of liquid assets to total assets. Using panel data regression methods applied to 23 conventional commercial banks listed on the Indonesia Stock Exchange during the 2019–2023 period, this research seeks to determine which factors significantly influence liquidity and to what extent.

Ultimately, this study contributes to both academic literature and practical financial management by offering updated empirical evidence from a post-pandemic and policy-sensitive environment. The results are expected to provide strategic implications for banking practitioners, financial regulators, and policymakers who aim to enhance liquidity resilience and ensure systemic stability in the Indonesian banking industry.

METHODS

This study employs a quantitative research approach using panel data regression analysis to examine the determinants of bank liquidity in Indonesian commercial banks. The method allows for the assessment of both cross-sectional and time-series variations across multiple bank entities over the five-year period from 2019 to 2023.

Population and Sample
The population of this research includes all conventional commercial banks listed on the Indonesia Stock Exchange (IDX). A purposive sampling technique was employed to select banks that met the following criteria: (1) listed on the IDX during the entire study period (2019–2023), (2) published complete annual financial reports, and (3) operated in Indonesian Rupiah as the reporting currency. Based on these criteria, a final sample of 23 banks was selected, resulting in 115 firm-year observations.

Variables and Data Sources
The dependent variable in this study is bank liquidity, measured by the ratio of liquid assets to total assets (LQDit). The independent variables include:
1. Capital Adequacy Ratio (CAR)
2. Total Loan to Total Asset Ratio (TLTAR)
3. Net Interest Margin (NIM)
4. Deposit Ratio (DEP)
5. Non-Performing Loans (NPL)
6. Return on Assets (ROA)
7. Refinancing Rate (RFR)

Secondary data were obtained from the IDX official website (https://www.idx.co.id), the Bank Indonesia database, and each bank's publicly available annual reports.

Data Analysis Technique
Since this study relies on secondary financial data obtained from official sources such as Bank Indonesia, IDX, and audited annual reports, validity and reliability tests of research instruments are not applicable. Instead, the validity of the regression model is ensured through classical assumption tests (normality, multicollinearity, heteroskedasticity, and autocorrelation) as well as model selection tests (Chow, Hausman, and LM tests).

Table 3.3 Validity Test

Green Banking Operations

No	Statement	Factor Loading	Decision
1	My bank has initiatives to reduce paper usage and other material waste.	0.789	Valid
2	My bank implements electronic waste management practices.	0.687	Valid
3	My bank applies environmentally friendly banking practices (e-mail, intranet, e-statement, online approval system, etc.).	0.818	Valid
4	My bank encourages customers to use environmentally friendly banking practices (e-statement, online transfer, etc.).	0.813	Valid
5	My bank regularly organizes seminars and workshops to promote environmentally friendly practices.	0.807	Valid
6	The bank where I work regularly organizes seminars and workshops to promote environmentally friendly practices.	0.757	Valid

Sustainable Innovativeness

No	Statement	Factor Loading	Decision
1	This bank is a pioneer among other banks in purchasing sustainable products.	0.825	Valid
2	Compared to other banks, this bank has many sustainable products.	0.803	Valid
3	The bank prefers to purchase sustainable products before other banks do.	0.807	Valid

Green Investment

No	Statement	Factor Loading	Decision
1	My bank provides loans for projects related to environmental protection and energy saving.	0.812	Valid
2	My bank implements certain independent and unique green initiatives or projects (e.g., tree planting).	0.880	Valid
3	My bank promotes and facilitates environmentally oriented companies through special grants, loans, and guidance.	0.663	Valid
4	My bank promotes and facilitates environmental companies through specific schemes, loans, and guidance.	0.852	Valid
5	My bank uses social and environmental management systems or other mechanisms to evaluate all project proposals.	0.837	Valid

Green Banking Policy

No	Statement	Factor Loading	Decision
1	My bank provides loans for projects related to environmental protection and energy saving.	0.840	Valid
2	My bank implements certain independent and unique green initiatives or projects (e.g., tree planting).	0.727	Valid
3	My bank promotes and facilitates environmentally oriented companies through special grants, loans, and guidance.	0.769	Valid
4	My bank uses social and environmental management systems or other mechanisms to evaluate all project proposals.	0.827	Valid

Stakeholder Pressure

No	Statement	Factor Loading	Decision
1	To what extent does stakeholder pressure encourage my bank to	0.833	Valid

	adopt environmentally friendly practices?		
2	Does my bank involve stakeholders in the development of environmental policies?	0.781	Valid
3	How does my bank measure stakeholder satisfaction regarding the implemented green initiatives?	0.824	Valid
4	How active is my bank in communicating with stakeholders about its commitment to environmental sustainability?	0.855	Valid
5	Does my bank receive input from stakeholders in formulating green banking strategies?	0.845	Valid

Source: data processed by researchers

The analysis was conducted using panel data regression techniques with the help of EViews 10 software. The model selection was guided by three diagnostic tests: the Chow test (to choose between common effect and fixed effect models), the Hausman test (to choose between fixed and random effect models), and the Breusch-Pagan Lagrange Multiplier (LM) test (to choose between common and random effects).

The regression equation used is:
$$LQD_{it} = \alpha + \beta_1 CAR_{it} + \beta_2 TLTAR_{it} + \beta_3 NIM_{it} + \beta_4 DEP_{it} + \beta_5 NPL_{it} + \beta_6 ROA_{it} + \beta_7 RFR_{it} + \varepsilon$$

Where:
LQD_{it} = Bank liquidity
CAR = Capital Adequacy Ratio
TLTAR = Total Loan to Total Asset Ratio
NIM = Net Interest Margin
DEP = Deposit Ratio
NPL = Non-Performing Loans
ROA = Return on Assets
RFR = Refinancing Rate
α = Constant
ε = Error term

This methodology provides a comprehensive framework for testing the impact of both internal bank characteristics and external monetary policy indicators on bank liquidity over time.

Reliability Test
Reliability measures the consistency among indicators within a variable, showing the extent to which the measurement results can be trusted after passing the validity test. Cronbach's Alpha was used to evaluate internal consistency. A variable is considered reliable if the Cronbach's Alpha value ≥ 0.60; otherwise, it is considered unreliable.

Table 3.8 Reliability Test Results

No	Variable	Total Items	Cronbach's Alpha	Decision
1	Green Banking Operations	6	0.869	Reliable
2	Sustainable Innovativeness	3	0.740	Reliable
3	Green Investment	5	0.870	Reliable
4	Green Banking Policy	4	0.799	Reliable
5	Stakeholder Pressure	4	0.885	Reliable

Source: data processed by researchers

Goodness of Fit Test

The Goodness of Fit test was conducted to determine whether the model fits the data. Several fit indices were used, including Chi-square, RMSEA, NFI, ECVI, RFI, TLI, CFI, AIC, and IFI. The decision for each index is based on the recommended cut-off value.

Table 3.9 Goodness of Fit Results

Goodness of Fit Index	Calculation Result	Cut-off Value	Conclusion
X^2 (Chi-square)	445.988	Expected to be small	Poor Fit
Significance Probability	0.000	≥ 0.05	Poor Fit
RMSEA	0.095	≤ 0.10	Marginal Fit
NFI	0.823	≥ 0.90	Marginal Fit
ECVI	5.298	Smaller is better	Good Fit
RFI	0.796	≥ 0.90	Poor Fit
TLI	0.885	≥ 0.90	Marginal Fit
CFI	0.900	≥ 0.90	Good Fit
AIC	603.988	Smaller is better	Good Fit
IFI	0.902	≥ 0.90	Good Fit

Source: data processed by researchers

RESULTS AND DISCUSSION

The results of the study are based on the application of panel data regression to evaluate the relationship between firm-specific variables and the liquidity of conventional commercial banks in Indonesia over the period 2019–2023. The regression analysis was preceded by three model selection tests Chow test, Hausman test, and Lagrange Multiplier test all of which pointed toward the use of the random effects model. The dependent variable, liquidity, was measured by the ratio of liquid assets to total assets (LQDit), while the independent variables included CAR, TLTAR, NIM, DEP, NPL, ROA, and RFR.

Display the table as below:

Table 1. Data Analysis

Number	Informant	Information
1.	CAR (Capital Adequacy Ratio)	Positively and significantly affects liquidity, suggesting banks with stronger capital positions are better able to manage short-term obligations.
2.	TLTAR (Total Loan to Asset)	Negatively and significantly affects liquidity, indicating that more aggressive lending reduces liquid asset ratios.
3.	IRM (Interest Rate Margin)	No significant effect on liquidity, suggesting lending profitability does not directly translate into higher liquidity levels.
4.	Deposit Ratio	Positive but not significant, implying that higher deposits may contribute to liquidity, though not strongly evident in the sample.
5.	NPL (Non-performing Loans)	No significant effect; indicates

		that credit quality alone may not predict liquidity levels.
6.	ROA (Return on Assets)	No significant effect; suggests profitability does not necessarily correlate with liquidity management.

Source: Processed from panel data regression output (EViews 10)

Findings and Interpretation
The empirical findings support two of the six proposed hypotheses. The first is the positive and significant effect of capital adequacy (CAR) on bank liquidity. This reinforces the notion that well-capitalized banks are more robust and better prepared to absorb liquidity shocks. This finding is aligned with the buffer theory, which posits that capital serves as a cushion against potential losses and liquidity shortages. The positive effect of CAR suggests that when banks hold more capital, they also maintain higher levels of liquid assets, possibly due to conservative risk management approaches.

The second significant finding is the negative relationship between total loans to total assets (TLTAR) and liquidity. This implies that as banks increase their lending activities relative to their total assets, they reduce their liquidity levels. Lending inherently transforms liquid deposits into less liquid loan assets. Therefore, a high TLTAR ratio indicates reduced capacity to meet short-term obligations. This result is consistent with earlier findings from Adusei (2022) and Vodová (2011), both of which demonstrate that a higher loan intensity negatively affects liquidity.

Other variables—namely NIM, deposit ratio, NPL, and ROA did not show a statistically significant relationship with bank liquidity in this sample. This may indicate that Indonesian commercial banks during the observed period adopted different liquidity strategies that were not primarily driven by profitability indicators or credit quality measures. For example, even banks with high non-performing loans may have maintained sufficient liquidity through access to central bank facilities or by holding a higher proportion of government securities. Similarly, the lack of significance for NIM suggests that profitability from lending margins does not automatically result in increased liquidity unless such profits are retained in liquid forms.

Discussion and Theoretical Reflection
These results align with theories and empirical research indicating that structural balance sheet factors (e.g., capital adequacy and asset composition) are stronger predictors of liquidity than income-based performance metrics. This underscores the idea that liquidity management is more a function of balance sheet configuration than profitability ratios. The insignificance of ROA and NIM calls for a re-examination of how bank profitability translates into liquidity buffers, especially when retained earnings are not maintained in liquid form. Similar findings were noted by Hasan et al., (2020), who observed that strong capital adequacy ratios play a stabilizing role in banking systems, reinforcing the centrality of capital reserves in ensuring liquidity resilience.
Furthermore, the insignificant influence of the deposit ratio may suggest that liquidity risks are not solely determined by funding sources but also by asset-side strategies and the stability of the deposit base. In countries like Indonesia, where customer loyalty and government-guaranteed deposits are relatively strong, the pressure on liquidity may be mitigated even with moderate deposit growth. Comparable conclusions were reached by Gnawali & Niroula (2024), who highlighted that deposit mobilization enhances financial performance, yet its direct effect on liquidity remains conditional on broader bank management practices. Similarly, Yitayaw (2021) emphasized that while deposits provide a fundamental funding base, their role in liquidity management requires careful integration with lending policies and central bank facilities.

Compared to international studies such as Al-Homaidi et al., (2019) in India or Abbas et al., (2023) in Asia-Pacific, this study's findings provide a region-specific contrast, highlighting the unique institutional and regulatory context in Indonesia. The lack of significance in NIM and ROA may be attributed to differences in banking regulations, digitalization levels, or monetary policy transmission. For instance, Deviyana et al., (2021) showed that capital adequacy and loan-to-deposit ratios are consistently linked to liquidity risk, suggesting that profitability variables alone may not capture the structural determinants of liquidity. In line with this, Shershneva et al., (2020) found in emerging markets that liquidity is best understood through a comparative analysis of balance sheet strength rather than through profitability indicators.

Practical and Theoretical Implications

From a managerial perspective, the results recommend strengthening capital adequacy as a priority in liquidity planning. Regulators such as Bank Indonesia can incorporate CAR as a key component in liquidity monitoring tools, especially during financial turbulence. Banks are advised to balance loan growth with liquidity needs and adopt asset allocation policies that avoid excessive illiquidity. This recommendation echoes the findings of Herdhayinta & Supriyono, (2019), who underlined the significant role of CAR in shaping Indonesian banks' financial performance.

On the theoretical side, this study contributes to the ongoing discourse on the determinants of bank liquidity by integrating both traditional firm-level indicators and contextual monetary variables. It provides evidence that not all firm-level financial metrics translate uniformly into liquidity outcomes, reinforcing the argument for a broader, integrated framework that includes regulatory and behavioral components. Mohanty & Mahakud (2021) further supported this view by showing that capital adequacy influences not only liquidity but also banks' risk-taking behavior, thereby linking liquidity management to broader stability concerns. Likewise, Salami (2023) and Assfaw (2019) pointed out that interest rate and credit risk channels also interact with liquidity outcomes, stressing the need for multidimensional approaches in liquidity research.

In conclusion, while capital and lending ratios emerged as the most influential factors, the study encourages further exploration of how market structure, policy changes, and behavioral responses affect bank liquidity. Subsequent research might benefit from incorporating qualitative insights or stress-testing scenarios to capture dynamic responses to systemic shocks. Such directions are also consistent with the work of Ghimire & Agarwal (2025), who highlighted firm-specific determinants of liquidity in Nepal, underscoring the importance of adapting analytical frameworks to country-specific conditions.

CONCLUSION

This study investigates the firm-specific determinants of bank liquidity in conventional commercial banks in Indonesia during the period of 2019 to 2023. By applying a panel data regression model to a sample of 23 banks listed on the Indonesia Stock Exchange, the research reveals that capital adequacy (CAR) and the ratio of total loans to total assets (TLTAR) significantly affect bank liquidity. A higher CAR is associated with stronger liquidity positions, indicating that banks with robust capital buffers are better positioned to manage liquidity risks. Conversely, a higher TLTAR negatively impacts liquidity, suggesting that aggressive loan expansion without proportional liquid reserves can weaken a bank's short-term solvency.

Other variables including Net Interest Margin (NIM), deposit ratio, non-performing loans (NPL), and return on assets (ROA) were not found to have a statistically significant effect on liquidity in the sampled banks. These findings suggest that traditional profitability metrics and credit quality indicators may not directly explain liquidity variations within the Indonesian banking sector,

particularly under the regulatory and macroeconomic conditions that prevailed during the study period.

The findings of this research offer valuable insights for both academic and practical purposes. From a theoretical standpoint, the study supports the relevance of capital structure and asset composition as primary drivers of liquidity, thereby contributing to the literature on bank liquidity management. In practice, bank managers and regulators are encouraged to prioritize capital adequacy and cautious credit growth as key strategies to sustain liquidity, particularly in times of financial uncertainty or economic transition.

Future studies may build upon this research by incorporating stress-testing approaches, qualitative assessments of managerial behavior, or broader macroeconomic variables to better understand the dynamic interaction between bank-specific attributes and liquidity performance across varying market conditions.

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