SMART INTERNATIONAL MANAGEMENT JOURNAL

Vol. 3 No. 2, June 2026
Page 23 – 31 | e-ISSN: 3048-0019

Navigating Liquidity Constraints: Assessing Bank Resilience to Deposit Volatility during Contractionary Monetary Policy Phases

Wursan [1]*

[1] Universitas Siliwangi, Indonesia

* Correspondence: wursan@unsil.ac.id

Article Information

Received: March 27, 2026
Revised: June 22, 2026
Online: June 24, 2026

ABSTRACT

This study examines the effects of Deposit Volatility (DVOL), the BI Rate, Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), and Firm Size on bank liquidity, proxied by the Banking Ratio Loan-to-Deposit Ratio (BR_LDR), in Indonesian state-owned banks (HIMBARA) listed on the Indonesia Stock Exchange during 2021–2024. A quantitative approach was employed using secondary data collected from the annual reports of PT Bank Rakyat Indonesia (Persero) Tbk, PT Bank Mandiri (Persero) Tbk, PT Bank Negara Indonesia (Persero) Tbk, and PT Bank Tabungan Negara (Persero) Tbk. Panel data regression analysis was conducted using EViews, with the Fixed Effect Model (FEM) selected based on the Chow test. The results indicate that the BI Rate and Firm Size significantly influence BR_LDR at the 10% significance level, whereas Deposit Volatility, CAR, and NPL have no significant effect. The F-test shows that the independent variables jointly have a significant effect on BR_LDR. The coefficient of determination (R^2) of 35.2% indicates that the model moderately explains variations in bank liquidity, while the remaining variation is attributable to other internal and external factors. These findings provide insights for banks in strengthening liquidity management and offer a reference for future studies on banking liquidity.

Keywords: *Deposit Volatility, BI Rate, CAR, NPL, Firm Size, Bank Liquidity, BR_LDR*

1. Introduction

The banking sector plays a strategic role in financial intermediation by mobilizing public funds and allocating them into productive financing activities and then distributing them in

the form of credit to other communities in need of financing for projects they are working on, whether in the form of construction projects, home loans, motor vehicle loans, or other sectors that require significant financing.

Banks essentially operate based on the economic situation of the community by assessing the level of credit received by the bank from the community. A stable credit distribution process and low default rates generally indicate favorable macroeconomic conditions. Conversely, if the disbursed credit does not reach certain targets and also experiences many bad loans, the economic situation is weak [1]. When banks carry out this function, liquidity stability becomes one of the factors of the bank's resilience and strength in facing certain possibilities that affect the bank's health [14].

The following data shows indicators of banking liquidity pressure during contractionary monetary policy [6].

Table 1.1

Indicator	Symbol	Reinforcing Data	Period
BI 7 Day Repo rate	BIRATE	Up from 3.50% to 6.25%	2021-2024
Inflation	INF	Inflation rises after economic recovery	2021-2024
Third-party funds	DPK	The DPK's growth experienced a slowdown	2021-2024
Volatility Deposits	DVOL	Deposit fluctuations increase when interest rates rise	2021-2024
Loan to deposit ratio	Long Distance Relationship	Banking LDR increases to nearly 85%-90%	2021-2024
Capital Adequacy Ratio	CAR	The banking industry's CAR remains above 20%	2021-2024
Non-Performing Loan	NPL	Credit risk is relatively well maintained but fluctuates	2021-2024
Return on Assets	ROA	Banking profitability is slowing down	2021-2024

Bank size	SIZE	Total banking assets continue to increase	2021-2024
Resilience	BR	Bank resilience tested during high interest rate phase	2021-2024

During the 2021-2024 period, Bank Indonesia increased the BI 7-day reverse deposit rate (BIRATE) from 3.50% to 6.25% as part of its contractionary monetary policy to control inflation. This situation affected Third-Party Funds (DPK) and increased banking liquidity pressure and increased liquidity pressures, reflected in the increase in the national banking loan-to-deposit ratio (LDR) during the study [13].

Over the years, the banking liquidity situation has faced various turmoil and pressure from various unstable global economic and financial sectors, prompting central banks from various countries to issue contradictory monetary policies to maintain economic stability and inflation rates [10]. Indonesia, for example, issued the BI 7-Day Reverse Repo Rate policy due to inflationary pressures, global economic turmoil, and market uncertainty. This policy significantly impacted various economic sectors, particularly the banking sector, namely the condition of banking liquidity, due to the increasing cost of funds, changes in depositor behavior, and also increased competitiveness among fund collectors [9].

Increased interest rates during periods of contractionary monetary policy can trigger deposit volatility or fluctuations in third-party funds (TPF). Customers perceive this situation as causing withdrawals from banks that collect funds and then divert them to other sectors or instruments that are more profitable for customers and considered safer [1]. This situation leads to large withdrawals from banks in a short period of time, potentially disrupting bank liquidity. This situation presents a particular challenge for each bank in maintaining its liquidity, particularly in maintaining credit disbursement funds and maintaining healthy banking liquidity [12].

Furthermore, liquidity pressures during a contractionary monetary policy phase can impact the resilience of state-owned banks. This resilience can also be measured by how well banks survive, maintain stability, and mitigate potential risks. Strong funding is key; if it's not strong enough, these banks will collapse, necessitating liquidity support from third-party customers.

Liquidity pressures due to deposit volatility have become increasingly relevant following periods of recovery and monetary policy tightening [3]. Previous research has also examined this issue, suggesting that interest rate policy influences depositor behavior and the stability of bank liquidity. There are some inconsistencies in previous research regarding the extent to which deposit volatility affects bank resilience, particularly during periods of contractionary monetary policy. However, research specifically linking deposit volatility, liquidity pressures, and bank resilience within the context of the Indonesian financial industry is still limited [11].

Based on these conditions, this research is crucial to understand and analyze the effect of deposit volatility on banking resilience during contractionary monetary policy [4].

2. Materials and Method

This study uses a quantitative, associative approach to analyze the effect of contractionary monetary policy on bank resilience within the Indonesian State-Owned Banks Association (HIMBARA). The subjects of this study are the banks affiliated with HIMBARA: Bank Rakyat Indonesia, Bank Mandiri, Bank Negara Indonesia, and Bank Tabungan Negara [15].

This study uses secondary data obtained from financial reports/annual reports and banking statistics for the period 2021-2024. Quarterly data is used to ensure a sufficient number of observations for panel data analysis.

The dependent variable is bank resilience (BR), proxied by the Loan-to-Deposit Ratio (LDR), while the independent variables are deposit volatility (DVOL), measured from third-party funds (DPK), and monetary contractivity, proxied by the BI 7-day reverse repo rate (BIRATE). This study also includes control variables, namely Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), and Firm Size (SIZE).

3. Result

This section may be divided by subheadings. It should provide a concise and precise description of the experimental results, their interpretation, as well as the experimental conclusions that can be drawn.

Based on the theory and the annual reports of each bank studied, the following data was obtained [2].

Model Testing Table

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	62.91482	24.33810	2.585034	0.0272
DVOL	-41.81734	36.00195	-1.161530	0.2724
BIRATE	4.109408	1.930316	2.128878	0.0591
CAR	-0.467190	0.996535	-0.468814	0.6493
NPL	2.261960	5.164555	0.437978	0.6707
SIZE	0.426237	0.937968	0.454427	0.6592

R-squared	0.352484	Mean dependent var	87.98688
Adjusted R-squared	0.028726	S.D. dependent var	6.285299
S.E. of regression	6.194366	Akaike info criterion	6.765154
Sum squared resid	383.7017	Schwarz criterion	7.054875
Log likelihood	-48.12123	Hannan-Quinn criter.	6.779990
F-statistic	1.088726	Durbin-Watson stat	1.056827
Prob(F-statistic)	0.423085		

The Effect of Deposit Volatility (DVOL) on BR_LDR

The study results show that DVOL has a negative but insignificant effect on BR_LDR. This indicates that fluctuations in third-party funds have not been able to directly affect the liquidity level of Himbara banks. These results align with previous research stating that volatility in third-party funds does not always affect bank liquidity if the bank has adequate risk reserves and liquidity. Large banks like Himbara banks tend to have very good and strong liquidity, so fluctuations in deposit funds are not significantly affected and can still be managed [1].

However, the results of this study are not in line with the liquidity risk theory which states that high volatility of deposits can increase the risk of large-scale withdrawals of funds which ultimately affect bank liquidity.

The Influence of the BI Rate on BR_LDR

The results of the study indicate that the BI Rate has a positive and significant effect on BR_LDR at the 10% significance level. This finding aligns with previous research showing that changes in the benchmark interest rate influence bank lending and deposit policies. When the BI Rate increases, banks tend to increase their lending and deposit interest rates, thus impacting liquidity changes [5].

This research is in line with the monetary policy transmission theory which explains that changes in BI interest rates will affect banking intermediation activities.

The Influence of CAR on BR_LDR

The results of the study indicate that CAR has no significant effect on BR_LDR. This finding aligns with previous research, which states that high capital adequacy does not necessarily directly improve a bank's liquidity. This is due to the bank's capital focus on maintaining stability and risk resilience rather than long-term liquidity management [7]. In addition, Bank Himbatra has a relatively high and stable CAR during the research period so that CAR does not have a significant impact on BR_LDR.

The Impact of NPL on BR_LDR

The study found that NPLs had no significant effect on BR_LDR. Previous research also found similar results, finding that non-performing loans do not necessarily impact bank liquidity, provided the bank is able to maintain asset stability and maintain adequate loan loss provisions [8].

Himbara banks have strong capital and government support, so the impact on NPLs during the study period remained under control and liquidity was not disrupted. However, in theory, a long-term increase in NPLs still has the potential to reduce bank liquidity and hinder cash flow [11].

Influence of Firm SIZE on BR_LDR

The results show that company size has a positive effect on BR_LDR at 10%. This finding aligns with previous research, which found that banks with larger assets tend to have better liquidity due to their broader funding sources, larger business networks, and high levels of public trust.

In addition, large banks also have greater flexibility in obtaining additional funding, making them better able to maintain their liquidity stability.

Simultaneous Test (F Test)

The following is a test table (F Test) and Determinant Coefficient Test (R2)

F Test Table and Determinant Coefficient (R2)

Effects Test	Statistic	d.f.	Prob.
Cross-section F	5.215875	(3,7)	0.0333
Cross-section Chi-square	18.786317	3	0.0003

The simultaneous test results show that all independent variables together have a significant effect on BR_LDR. This result indicates that the factors used in Elim's study fully explain changes in bank liquidity. Other factors, such as inflation, profitability, operational efficiency, and macroeconomic conditions, may also influence the strength of the research model.

In addition, the number of observations is relatively small, which is one of the factors causing the low load of the research model.

Coefficient of Determination (R2)

The R-square value of 35.2% indicates that the variables deposit volatility, BI rate, CAR, NPL, and Firm SIZE can explain 32.2% of the variation in BR_LDR, while the remainder is explained by other variables. These results indicate that banking liquidity is influenced by various factors, both internal and external to the bank. Therefore, further research should add other variables to strengthen the model's ability to explain changes in liquidity.

4. Discussion

The findings indicate that the BI Rate and Firm Size significantly affect bank liquidity resilience, while Deposit Volatility, CAR, and NPL have no significant effect. The significant influence of the BI Rate supports the monetary transmission theory, indicating that changes in policy interest rates affect banks' liquidity management. Meanwhile, larger banks tend to have stronger funding capacity and greater flexibility in maintaining liquidity during periods of monetary tightening.

The insignificant effects of Deposit Volatility, CAR, and NPL suggest that HIMBARA banks possess sufficient liquidity buffers, strong capitalization, and effective risk management to absorb temporary funding and credit risks. These findings generally support previous studies emphasizing the importance of bank size and monetary policy in determining liquidity resilience. The results also imply that maintaining diversified funding sources and prudent liquidity management is essential for sustaining banking stability during contractionary monetary policy.

5. Conclusions

This study concludes that among the variables examined, the BI Rate and Firm Size significantly influence the liquidity resilience of Indonesian state-owned banks during the 2021–2024 contractionary monetary policy period. In contrast, Deposit Volatility, Capital Adequacy Ratio (CAR), and Non-Performing Loans (NPL) do not significantly affect bank liquidity. These findings indicate that macroeconomic policy and bank characteristics play a more important role

in maintaining liquidity stability than short-term fluctuations in deposits or internal risk indicators.

From a practical perspective, the results imply that banks should strengthen liquidity management by diversifying funding sources, maintaining prudent asset-liability management, and anticipating the effects of monetary policy tightening. Policymakers should also consider the implications of interest rate adjustments on banking liquidity while ensuring financial system stability.

This study has several limitations. First, the analysis only includes four HIMBARA banks, limiting the generalizability of the findings to the entire Indonesian banking sector. Second, the observation period covers only 2021–2024, which may not fully capture long-term banking cycles. Third, the model explains only 35.2% of the variation in liquidity, indicating that other relevant determinants were not included.

Future studies are recommended to expand the sample by including private, regional development, and Islamic banks, extend the observation period, and incorporate additional variables such as profitability, operational efficiency, inflation, exchange rates, digital banking adoption, liquidity coverage ratio (LCR), and macroprudential policy indicators. Such improvements are expected to provide a more comprehensive understanding of the determinants of banking liquidity resilience under different macroeconomic conditions.

References

1. Altavilla, C. *et al.* (2025) 'Central bank liquidity reallocation and bank lending: Evidence from the tiering system', *Journal of Financial Economics*, 168, p. 104058. Available at: https://doi.org/https://doi.org/10.1016/j.jfineco.2025.104058.
2. Bahaj, S. and Malherbe, F. (2024) 'The cross-border effects of bank capital regulation', *Journal of Financial Economics*, 160, p. 103912. Available at: https://doi.org/https://doi.org/10.1016/j.jfineco.2024.103912.
3. Begenau, J. (2020) 'Capital requirements, risk choice, and liquidity provision in a business-cycle model', *Journal of Financial Economics*, 136(2), pp. 355–378. Available at: https://doi.org/https://doi.org/10.1016/j.jfineco.2019.10.004.
4. Braggion, F. *et al.* (2025) 'The value of financial intermediation: Evidence from online debt crowdfunding', *Journal of Financial Economics*, 172, p. 104113. Available at: https://doi.org/https://doi.org/10.1016/j.jfineco.2025.104113.
5. Chen, Z., He, Z. and Liu, C. (2020) 'The financing of local government in China: Stimulus loan wanes and shadow banking waxes', *Journal of Financial Economics*, 137(1), pp. 42–71. Available at: https://doi.org/https://doi.org/10.1016/j.jfineco.2019.07.009.
6. Cornett, M.M. *et al.* (2011) 'Liquidity risk management and credit supply in the financial

crisis', *Journal of Financial Economics*, 101(2), pp. 297–312. Available at: https://doi.org/https://doi.org/10.1016/j.jfineco.2011.03.001.
7. Craig, B. and Ma, Y. (2022) 'Intermediation in the interbank lending market', *Journal of Financial Economics*, 145(2, Part A), pp. 179–207. Available at: https://doi.org/https://doi.org/10.1016/j.jfineco.2021.11.003.
8. Davydiuk, T., Marchuk, T. and Rosen, S. (2024) 'Direct lenders in the U.S. middle market', *Journal of Financial Economics*, 162, p. 103946. Available at: https://doi.org/https://doi.org/10.1016/j.jfineco.2024.103946.
9. Evans, R.B. *et al.* (2026) 'Operational shorting and ETF liquidity provision', *Journal of Financial Economics*, 180, p. 104241. Available at: https://doi.org/https://doi.org/10.1016/j.jfineco.2026.104241.
10. Feghali, K., Mora, N. and Nassif, P. (2021) 'Financial inclusion, bank market structure, and financial stability: International evidence', *The Quarterly Review of Economics and Finance*, 80, pp. 236–257. Available at: https://doi.org/https://doi.org/10.1016/j.qref.2021.01.007.
11. Huang, W. *et al.* (2025) 'Constrained liquidity provision in currency markets', *Journal of Financial Economics*, 167, p. 104028. Available at: https://doi.org/https://doi.org/10.1016/j.jfineco.2025.104028.
12. Jiao, F., Sarkissian, S. and Schumacher, D. (2025) 'Liquidity picking and fund performance', *Journal of Financial Economics*, 170, p. 104085. Available at: https://doi.org/https://doi.org/10.1016/j.jfineco.2025.104085.
13. Sundaresan, S. and Xiao, K. (2024) 'Liquidity regulation and banks: Theory and evidence', *Journal of Financial Economics*, 151, p. 103747. Available at: https://doi.org/https://doi.org/10.1016/j.jfineco.2023.103747.
14. Acharya, V.; Naqvi, H. The seeds of a crisis: A theory of bank liquidity and risk taking over the business cycle. J. Financ. Econ. 2012, 106, 349–366.
15. Sugiyono. *Metode Penelitian Pendidikan (Pendekatan Kuantitatif, Kualitatif dan R&D)*; Alfabeta: Bandung, Indonesia, 2013.