# Determinants of Liquidity in Islamic Banking: A VECM Analysis of Bank Muamalat (2008–2024)

Fitri Zaelina[1]*, Rohma Uswatun Sholekhah [2]*

[1,2] Islamic Banking Departement, Universitas Islam Negeri Sunan Kalijaga, Yogyakarta, Indonesia

*Corresponding author: fitri.zaelina@uin-suka.ac.id

## *ABSTRACT*

**Research Aims:** This research aims to examine the impact of Third-Party Funds (DPK), Capital Adequacy Ratio (CAR), Non-Performing Financing (NPF), and inflation on the liquidity of Bank Muamalat over the period 2008–2024.

**Design/methodology/approach:** This research adopts a quantitative approach. The sample comprises quarterly financial reports of Bank Muamalat and inflation data from Bank Indonesia the period from 2008 to 2024, totaling 68 observations. The hypotheses were tested using the Vector Error Correction Model (VECM) with the aid of the EViews 12 software.

**Research Findings:** The analysis shows that Third-Party Funds (DPK) consistently exert a positive and significant influence on the liquidity of Bank Muamalat in both the short and long term. This indicates that stable deposit growth is essential for maintaining and enhancing the bank's liquidity position. Additionally, a strong Capital Adequacy Ratio (CAR) significantly contributes to liquidity by improving the bank's risk management capacity and supporting sustainable growth and operational stability. Conversely, Non-Performing Financing (NPF) does not affect liquidity significantly in the short term, likely due to effective internal risk mitigation policies. However, in the long term, NPF has a positive impact on liquidity, suggesting that the bank's strategic management of credit risk helps preserve liquidity despite rising non-performing assets.

***Keywords***: DPK, CAR, NPF, *Inflation*, and *Liquidity* (FDR)

**INTRODUCTION**

A bank is a financial institution that manages funds from the public and redistributes them through various financial services. It functions as an intermediary between surplus fund holders and those in need of financing. Broadly, banks are classified into two categories: Islamic (Sharia) banks and conventional banks. Islamic banks conduct their operations in accordance with Sharia principles, which are founded upon the teachings of the Qur'an and the Hadith, whereas conventional banks conduct their operations in accordance with national legal frameworks and engage in business activities guided by regional, national, or international agreements (Adawiyah & Azifah, 2020).

As a financial institution, an Islamic (Sharia) bank conducts its operations based on a profit-and-loss sharing system, rather than relying on interest rates, speculation, or uncertainty (Prastiwi et al., 2021). Islamic banking has evolved into a reputable and inclusive financial system, offering a diverse range of banking products and services accompanied by comprehensive financial planning. In Indonesia, the Islamic banking sector has experienced substantial progress in various aspects, including institutional development, infrastructure, regulatory instruments, supervisory mechanisms, and other supporting elements (Utami & Muslikhati, 2019).

Bank Muamalat holds the distinction of being the first Islamic bank established in Indonesia. It was officially founded in Jakarta on November 1, 1991 (24 Rabi' al-Thani 1412 Hijri) under the legal basis of Act No. 1 of 1991. The initiative to establish Bank Muamalat Indonesia (BMI) originated from a coalition of Muslim entrepreneurs, the Indonesian Ulama Council (MUI), and the Association of Indonesian Muslim Academics, with subsequent support from the Government of Indonesia. The bank's establishment was a direct response to the growing demand for a financial institution operating in accordance with Sharia principles.

Islamic banks are obligated to ensure that customer funds are secure and readily accessible for withdrawal as needed. This responsibility falls under the scope of liquidity management. The liquidity ratio indicates an institution's capacity to fulfill its short-term financial commitments (Sultoni & Mardiana, 2021). Liquidity is not merely a technical component of banking operations; it also plays a crucial role in maintaining financial health and preventing potential insolvency in Islamic banks. Therefore, effective liquidity management is essential to the overall operational strategy of Islamic banking (Saputro & Wildaniyati, 2021). When liquidity is disrupted, Islamic banks face risks such as mass withdrawals (bank runs), declining customer trust, and potential default. Weak liquidity management can serve as a major trigger for the failure of Islamic banks (Ismal, 2010). Therefore, efficient liquidity management in accordance with Sharia principles is a key indicator in assessing the soundness and sustainability of Islamic banks.

Bank liquidity can be assessed using the Financing to Deposit Ratio (FDR), which indicates the proportion of a Sharia bank's third-party funds (DPK) allocated for financing activities. This ratio serves as a key metric in evaluating a bank's liquidity position (Somantri & Sukmana, 2020). A higher FDR suggests an increased disbursement of financing, which may reduce the bank's ability to maintain adequate liquidity and elevate the risk of default. Conversely, a lower FDR indicates underutilization of available funds, which may limit the bank's potential to generate income through its intermediary functions. Thus, both

excessively high and low FDR values can adversely affect the bank's operational efficiency and financial sustainability (Lestari & Rani, 2022).

This study focuses on Bank Muamalat as the object of analysis, based on the financial report data, the bank's liquidity ratio has been in consistent decline over recent years (Bank Muamalat, 2024). This downward trend in liquidity poses a significant concern, as it may undermine public trust in the institution. Furthermore, the banking sector is facing increasingly intense competition, which adds urgency to addressing this issue. In light of these challenges, the author seeks to examine the problem by investigating the financial ratios that may influence the bank's liquidity performance.

## LITERATURE REVIEW

### *Liquidity*

Liquidity is defined as a bank's ability to convert its assets into cash in order to satisfy short-term financial obligations, including the withdrawal of customer funds and the disbursement of credit to clients. From the asset side, liquidity reflects the bank's capacity to liquidate its assets efficiently. From the liability side, it indicates the bank's ability to fulfill funding demands, which is closely tied to depositor confidence and the composition of the bank's funding portfolio (Andrianto & Firmansyah, 2019). The liquidity ratio is a key financial indicator used to assess a bank's ability to meet short-term obligations as they arise (Kasmir, 2004). This encompasses the bank's capability to return depositor funds and extend financing to customers. Generally, banks with higher liquidity ratios are considered more capable of meeting these obligations promptly.

### *Third Party Fund* **(DPK)**

Third-party funds (DPK) are defined as financial resources collected by banks from the general public. These funds constitute the most reliable source of financing for banks and primarily take three forms: savings, deposits, and demand deposits (Kasmir, 2007). DPK represents the funds entrusted to the bank by the community under deposit agreements, which may include giro, deposits, or savings accounts compliant with Shariah principles. Within the operational framework of financial institutions, DPK plays a crucial role in sustaining operational performance (Rufaidah et al., 2021). Therefore, DPK is a collection of public funds that serves as a fundamental resource for the bank's operational activities (Saputro & Wildaniyati, 2021).

### *Capital Adequacy Ratio* **(CAR)**

The Capital Adequacy Ratio (CAR) is a key metric used to assess a bank's capital sufficiency in supporting risk-weighted assets, such as loans and investments (Prastiwi et al., 2021). CAR indicates the proportion of a bank's own capital that underpins its total risk-bearing assets, which include credit, equity participations, securities, and bills, in addition to external funds such as long-term financing (Ismaulina et al., 2020). his ratio evaluates the bank's ability to absorb potential losses arising from its operational activities, thereby ensuring its financial stability and solvency.

### *Non Performing Financing* **(NPF)**

In Islamic banking, the term Non-Performing Loan (NPL) is replaced by Non-Performing Financing (NPF) to reflect the distinct principles underlying Sharia-compliant financial transactions. While conventional banks use the term credit, Sharia banks adhere to

Islamic legal principles in their financing activities. The extent of problematic financing within Islamic banks is quantified using the NPF ratio (Prastiwi et al., 2021). Non-Performing Financing serves as a key risk indicator that reflects the level of financing difficulties faced by banks. NPF arises when there is a risk of failure in the repayment agreement, signaling potential default on the part of the borrower (Yusuf, 2017).

### Inflation

Inflation is defined as a general increase in prices that typically occurs as a result of market mechanisms influenced by various factors. Inflation has a significant impact on banks, primarily due to a reduced willingness among consumers to deposit funds in banking institutions (Sukirno, 2004). Specifically, inflation represents a widespread and sustained rise in the prices of goods and services across the entire economy, affecting all regions rather than being confined to a specific area.

### Hypothesis Development

### Impact of Third Party Funds (DPK) on Liquidity

Kasmir (2007) stated that Third Party Funds (DPK) are funds obtained from the public. These funds are the most reliable source of funds for banks and come in different forms: giro, deposits, and savings. This means that a certain percentage of DPK funds must be countable by banks. Therefore, the bank's liquidity will rise along with the increase in PDK. Previous research by Saputro & Wildaniyati (2021), Utami & Muslikhati (2019), and (Somantri & Sukmana (2020), which examined the relationship between Third Party Funds (DPK) and liquidity, revealed that Third-Party Funds have significantly improved liquidity.

*H1: Third Party Funds (DPK) have a positive and significant influence on liquidity (FDR)*

### Impact of Capital Adequacy Ratio (CAR) on Liquidity

The Capital Adequacy Ratio (CAR) is a ratio used to assess the ability of banks to finance assets that carry or generate risks, including funding provided (Prastiwi et al., 2021). A higher CAR ratio indicates that banks have sufficient capital to function as a liquid fund. Research findings by Siregar et al. (2023), Saputro & Wildaniyati (2021), and Rufaidah et al. (2021) suggest that the Capital Adecuacy Ratio (CAR) has a significant influence on liquidity.

*H2: Capital Adequacy Ratio (CAR) has a significant positive and significant effect on liquidity (FDR)*

### Impact of Non-Performing Financing (NPF) on Liquidity

NPF is the ratio used by sharia banks to measure the level of financing problems and reflect a bank's ability to manage credit risks arising from various loans known as lock-in loans (Utami & Muslikhati, 2019). A bank that has a large NPF, indicates that the bank has a high credit rate because of its credit transactions. Under such circumstances, the level of liquidity will decrease. According to the rules of the Bank of Indonesia, NPFs can only own no more than 5%. According to research by Siregar et al. (2023), Saputro & Wildaniyati (2021), and Prastiwi et al. (2021) Non-performing financing (NPF) does not significantly affect the level of liquidity.

*H3: Non-performing financing (NPF) has a negative and significant impact on liquidity*

### Inflation's Effect on Liquidity

Inflation, according to the Bank of Indonesia (BI), is an increase in the price of goods and services that does not stop over a certain period of time. If the price of a commodity

bucks only on one or two commodities, it is not considered inflation. The increase in the FDR ratio between Sharia banks during the inflationary period shows that there is no concern about Sharia banking. The sharia bank will continue to run the fund under these conditions. Shariah banks would be at risk of bleeding if they chose not to provide financing because there were few options to put cash. Previous Somantri & Sukmana (2020) and other Himmawan & Ninglasari (2023) studies found that inflation has a positive impact on liquidity.

*H4: Inflation has a positive and significant effect on liquidity*

## RESEARCH METHOD

This study employs a quantitative research design, grounded in the positivist paradigm. Quantitative research is a method for investigating populations or samples using numerical data. Data analysis is conducted through quantitative or statistical techniques, as the data collected are numerical and hypotheses are tested using statistical methods (Sugiyono, 2013). The focus of quantitative research is on numerical data analysis, which is subsequently examined using appropriate statistical procedures (Ahyar et al., 2020). Typically, quantitative research is utilized for hypothesis testing, where statistical tests determine the significance of relationships under investigation. Therefore, the validity of the relationships identified in this research is established not by theoretical reasoning alone but by the outcomes of statistical hypothesis testing.

The population refers to the total number of units of analysis whose characteristics are to be examined. This research encompasses all financial reports of Bank Muamalat and inflation publications spanning from 2008 to 2023. However, only a subset of the population is included in the analysis. Sampling should accurately represent the population so that the findings derived from the sample can be generalized to the entire population (Ahyar et al., 2020). This study employs a non-probability sampling method using a saturated sampling technique, meaning that all available population members are included as the sample. The data consist of inflation reports and Bank Muamalat's financial statements from March 2008 to September 2023. For data processing, this study utilizes the EViews 12 software, employing the Vector Autoregressive (VAR) model. If the data are found to be non-stationary, the analysis will proceed using the Error Correction Model (ECM), specifically the Cointegrated VAR or Vector Error Correction Model (VECM). The stages of constructing the Vector Autoregressive (VAR) model are as follows:

1. Stationarity Test: The first step in estimating the VAR model is to conduct a stationarity test. In this study, the stationarity of the data is tested using the Augmented Dickey-Fuller (ADF) Unit Root Test. If the data are found to be non-stationary at the level form, differencing is performed to achieve stationarity.

2. Stability Test: The stability of the VAR model is assessed through the VAR Stability Condition Check using the Root of the Characteristic Polynomial. This test is crucial, as an unstable VAR model renders subsequent Impulse Response Function (IRF) and Variance Decomposition (VD) analyses invalid. A VAR system is considered stable if all roots lie within the unit circle, i.e., their moduli are less than one. The results of the VAR stability test are presented accordingly.

3. Lag Length Selection: The optimal lag length for the VAR model is determined using the Akaike Information Criterion (AIC), which serves as a primary indicator in this study.
4. Granger Causality Test: This test is employed to examine whether there are causal relationships among the endogenous variables, thereby justifying the specification of the VAR model.
5. Cointegration Test: This step aims to evaluate the existence of long-run equilibrium relationships among variables by identifying common trends and long-term stability.
6. VAR/VECM Estimation: Estimation of the VAR model is carried out when no cointegration is detected. Conversely, if cointegration exists among the variables, the Vector Error Correction Model (VECM) is used. The VECM approach allows for analysis of both short-term dynamics and long-term relationships among variables.
7. Impulse Response Function (IRF): The IRF analysis is employed to observe the effect of a shock in one variable on other variables within the system, highlighting the magnitude and direction of inter-variable influences.
8. Variance Decomposition (VD): The VD analysis aims to quantify the percentage contribution of each variable in explaining the variations in other variables over time, thus providing insight into the dynamic interactions within the VAR model.

## RESULTS AND DISCUSSIONS

This study seeks to analyze the long-term and short-term relationships between the dependent and independent variables by employing the Vector Error Correction Model (VECM) for data analysis. Several stages are conducted in this analytical process, including the Stationarity Test, VAR Stability Test, Cointegration Test, Lag Length Determination, Granger Causality Test, VECM Estimation, Impulse Response Function (IRF) Analysis, and Variance Decomposition Analysis.

### *Stationarity Test*

The stationarity test is a preliminary step that must be conducted in the analysis process. This test is used to determine whether the data series is stationary, which is essential for time series analysis. The stationarity of the data is examined through a unit root test using Levin, Lin, & Chu tests. (LLC). The following section presents the results of the unit root test for each variable at the level form.

**Table 1. stationarity test result *first difference***

| Variabel | t-Statistik | Prob* |
|---|---|---|
| DPK (X1) | -11,74637 | 0,0000 |
| CAR (X2) | -7,353893 | 0,0000 |
| NPF (X3) | -13,84016 | 0,0000 |
| INFLASI (X4) | -7,320502 | 0,0000 |
| FDR (Y) | -9,371370 | 0,0000 |

**Source: EViews data output**

After performing data transformation at the first difference, the results show that all variables have probability values less than 0,05 (<0,05), indicating that all data series are stationary at the first difference level.

### VAR Stability Test

The stability test employed in this study is the VAR Stability Condition Check using the Root of the Characteristic Polynomial. Conducting the VAR stability test is essential, as an unstable VAR estimation would render the subsequent Impulse Response Function (IRF) and Variance Decomposition (VD) analyses invalid. A VAR system is considered stable when all roots of the characteristic polynomial have modulus values less than one (<1). The results of the VAR model stability test are presented as follows:

**Table 2. Results of VAR Stability Test**

| Root | Modulus |
|---|---|
| -0,559803 | 0,559803 |
| -0,414924 | 0,414924 |
| 0,297645 | 0,297645 |
| -0,219017 | 0,219017 |
| 0,018770 | 0,018770 |

**Source: EViews data output**

Based on the results of the VAR stability test, it is observed that all modulus values range from 0,018770 to 0,559803, indicating that all roots have modulus values less than one (<1).

### Optimal lag test

In the optimal lag test, it is necessary to first determine the maximum lag of the stable VAR model. In this study, the maximum lag length selected is lag 1.

**Table 3. Optimal Lag Test Results**

| Lag | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|
| 0 | NA | 3269,057 | 22,28163 | **22,45172*** | 22,34853 |
| 1 | 77.24100 | **1869.982*** | **21.72017*** | 22.74071 | **22.12156*** |
| 2 | 28.79875 | 2413.161 | 21.96000 | 23.83099 | 22.69587 |
| 3 | 20.59670 | 3579.075 | 22.31543 | 25.03687 | 23.38578 |
| 4 | **46.74239*** | 2805.060 | 21.99616 | 25.56805 | 23.40101 |

**Source: EViews data output**

### Co-integration Test

After determining the optimal lag, the next step is to conduct a co-integration test, which aims to examine whether a long-term equilibrium relationship exists—namely, the presence of a stable association and similar movement among the variables under study. Based on the co-integration test, the following results were obtained:

**Table 4. Co-integration test results**

| Hypothesized No. of CE (s) | Eigenvalue | Trace Statistik | 0.05 Critical Value | Prob.** |
|---|---|---|---|---|
| None * | 0.635837 | 194.8559 | 69.81889 | 0.0000 |
| At most 1 * | 0.526809 | 129.1958 | 47.85613 | 0.0000 |
| At most 2 * | 0.436156 | 80.55914 | 29.79707 | 0.0000 |
| At most 3 * | 0.324292 | 43.31559 | 15.49471 | 0.0000 |
| At most 4 * | 0.239971 | 17.83595 | 3.841466 | 0.0000 |

**Source: EViews data output**

Based on Table 4 above, the probability values for all variables are less than 0.05, indicating the presence of co-integration or a long-term relationship among the variables examined. In other words, the results of the co-integration test demonstrate that DPK, CAR, NPF, Inflation, and Liquidity (FDR) show a stable and balanced long-term relationship.

### *Granger Causality Test*

The Granger causality test is conducted to examine the interrelationships among variables, specifically to determine whether one variable has a statistically significant causal influence on another. This test helps to identify whether one variable can predict or dominate another. In this study, the Granger causality test is performed using an optimal lag of 1, as determined in the optimal lag selection presented in Table 3. The results of the Granger causality test are presented in the following table:

**Table 5. Grenger Causality Test Results**

| Null Hypothesis: | Obs | F-Statistik | Prob. |
|---|---|---|---|
| D(DPK) does not Granger Cause D(FDR) | 66 | 0,48615 | 0,4882 |
| D(FDR) does not Granger Cause D(DPK) | 66 | 0,78467 | 0,3791 |
| D(CAR) does not Granger Cause D(FDR) | 66 | 0,00274 | 0,9584 |
| D(FDR) does not Granger Cause D(CAR) | 66 | 1,66970 | 0,2010 |
| D(NPF) does not Granger Cause D(FDR) | 66 | 6,86079 | 0,0110** |
| D(FDR) does not Granger Cause D(NPF) | 66 | 0,45638 | 0,5018 |
| D(INF) does not Granger Cause D(FDR) | 66 | 1,15946 | 0,2857 |
| D(FDR) does not Granger Cause D(INF) | 66 | 2,28780 | 0,1354 |
| D(CAR) does not Granger Cause D(DPK) | 66 | 0,44024 | 0,5094 |
| D(DPK) does not Granger Cause D(CAR) | 66 | 1,71672 | 0,1949 |
| D(NPF) does not Granger Cause D(DPK) | 66 | 7,96758 | 0,0064*** |
| D(DPK) does not Granger Cause D(NPF) | 66 | 0,24097 | 0,6252 |
| D(INF) does not Granger Cause D(DPK) | 66 | 0,97639 | 0,3269 |
| D(DPK) does not Granger Cause D(INF) | 66 | 0,22273 | 0,6386 |

| | | | |
|---|---|---|---|
| D(NPF) does not Granger Cause D(CAR) | 66 | 6,83809 | 0,0112** |
| D(CAR) does not Granger Cause D(NPF) | 66 | 0,42199 | 0,5183 |
| D(INF) does not Granger Cause D(CAR) | 66 | 2,88996 | 0,0941* |
| D(CAR) does not Granger Cause D(INF) | 66 | 0,03568 | 0,8508 |
| D(INF) does not Granger Cause D(NPF) | 66 | 1,51564 | 0,2229 |
| D(NPF) does not Granger Cause D(INF) | 66 | 0,00178 | 0,9665 |

Significance (5%**, 1%***, 10%*)
**Source: EViews data output**

Based on the results of the Granger causality test, a variable is considered to have a causal relationship if its probability value is less than 0,05. Conversely, a probability value greater than 0,05 indicates the absence of a causal relationship between the variables.

The results of the causality analysis between DPK and FDR indicate that the DPK variable does not have a statistically significant effect on FDR, with a probability value of 0,48 (> 0,05). Similarly, the FDR variable does not have a statistically significant effect on DPK, with a probability value of 0,37 (> 0,05). Therefore, it can be concluded that there is no unidirectional causal relationship between DPK and FDR in either direction. Furthermore, the CAR variable also exhibits no statistically significant causal relationship with FDR. The probability value for the effect of CAR on FDR is 0,95 (> 0,05), and for the reverse direction, from FDR to CAR, the value is 0,20 (> 0,05). These findings indicate the absence of a causal relationship between CAR and FDR.

The NPF variable has a statistically significant effect on the FDR variable, with a probability value of 0,01 (< 0,05), while the FDR variable does not have a statistically significant effect on the NPF variable, with a probability value of 0,50 (> 0,05). This indicates a one-way causal relationship from NPF to FDR. Meanwhile, the inflation variable does not have a statistically significant effect on FDR, as indicated by a probability value of 0,28 (> 0,05), nor does FDR significantly affect inflation, with a probability value of 0,13 (> 0,05). Thus, it can be concluded that there is no causal relationship between inflation and FDR.

The CAR variable does not have a statistically significant effect on the DPK variable, as indicated by a probability value of 0,50 (> 0,05), and likewise, the DPK variable does not significantly influence the CAR variable, with a probability value of 0,19 (> 0,05). Therefore, it can be concluded that there is no causal relationship between CAR and DPK. On the other hand, the NPF variable has a statistically significant effect on the DPK variable, with a probability value of 0,006 (< 0,05), while the DPK variable does not have a statistically significant effect on NPF, as indicated by a probability value of 0,62 (> 0,05). This suggests a one-way causal relationship from NPF to DPK.

The inflation variable does not have a statistically significant effect on the DPK variable, as indicated by a probability value of 0,32 (> 0,05), and similarly, the DPK variable does not significantly influence inflation, with a probability value of 0,63 (> 0,05). Therefore, it can be concluded that there is no causal relationship between inflation and DPK. Meanwhile, the NPF variable has a statistically significant effect on the CAR variable, as shown by a probability value of 0,01 (< 0,05), while the CAR variable does not have a

statistically significant effect on NPF, with a probability value of 0,51 (> 0,05). This indicates a one-way causal relationship from NPF to CAR.

The inflation variable does not have a statistically significant effect on the CAR variable, as indicated by a probability value of 0,09 (> 0,05), and likewise, the CAR variable does not significantly influence the inflation variable, with a probability value of 0,85 (> 0,05). Thus, it can be concluded that there is no causal relationship between inflation and CAR. Similarly, the inflation variable does not have a statistically significant effect on the NPF variable, with a probability value of 0,22 (> 0,05), and the NPF variable also does not significantly affect the inflation variable, with a probability value of 0,96 (> 0,05). Therefore, it can be concluded that there is no causal relationship between the inflation and NPF variables.

### VECM Estimates

The Vector Error Correction Model (VECM) was employed to examine both the short-term and long-term relationships among the variables under study. In this context, the short term is defined as a period of less than one year, while the long term extends beyond five years. The VECM estimation in this study utilizes a lag length of one, consistent with the results of the preceding optimal lag selection tests. To assess the influence of individual variables, significance testing was conducted using the t-statistic. The tests were performed at a 5% significance level, corresponding to a critical t-value of 1,996008. A coefficient is considered statistically significant if the absolute value of the t-statistic exceeds the critical value; otherwise, the result is deemed not significant. The VECM estimation results are presented in the following table:

**Table 6. Short-term VECM Test Results**

| Variable | Coefficient | t-Statistics | Description |
|----------|-------------|--------------|-------------|
| | | **Short-term** | |
| D(Y(-1),2) | 0.114666 | 0.64019 | No Significance |
| D(X1(-1),2) | 0.552103 | 2.20877** | Positive Significant |
| D(X2(-1),2) | 1.133975 | 2.79093*** | Positive Significant |
| D(X3(-1),2) | 0.234382 | 0.36261 | No Significance |
| D(X4(-1),2) | 0.215729 | 0.41465 | No Significance |

Significance (5%**, 1%***, 10%*)
**Source: EViews data output**

Based on the results presented in the table, the t-statistic for the Third Party Funds (DPK) variable is 2,20877, which exceeds the critical t-value of 1,996008. Therefore, it can be concluded that the t-statistic is statistically significant at the 5% level (2,20877 > 1,996008), indicating that the proposed hypothesis is supported. This finding suggests that Third Party Funds (DPK) have a significant positive effect on the liquidity of Bank Muamalat in the short term.

Similarly, the Capital Adequacy Ratio (CAR) variable has a t-statistic of 2,79093, which also exceeds the critical value of 1,996008. Thus, it can be concluded that the CAR variable has a statistically significant impact (2,79093 > 1,996008), supporting the proposed

hypothesis. This implies that, in the short term, the CAR has a significant positive influence on the liquidity of Bank Muamalat.

The test results indicate a calculated t-value of 0,36261, which is less than the critical t-value of 1,996008. This suggests that the statistical evidence is insufficient to support the proposed hypothesis. Based on the results of the Vector Error Correction Model (VECM) analysis conducted by the researchers, it can be concluded that Non-Performing Financing (NPF) does not have a significant effect on the liquidity (FDR) of Bank Muamalat.

The final variable, inflation, yielded a statistical t-value of 0,41465 in the VECM test, which is lower than the critical t-table value of 1,996008. This indicates that the t-statistic falls below the threshold for significance (0,41465 < 1,996008), leading to the rejection of the proposed hypothesis. Therefore, it can be concluded that, in the short term, inflation does not have a significant effect on the liquidity (FDR) of Bank Muamalat.

**Table 7. Long-term VECM Test Results**

| Variable | Coefficient | t-Statistics | Description |
|---|---|---|---|
| **Long-term** | | | |
| D(Y(-1)) | 1,000000 | | |
| D(X1(-1)) | 1,086233 | 5,48610*** | Positive Significant |
| D(X2(-1) | 2,338567 | 9,42730*** | Positive Significant |
| D(X3(-1)) | 3,357249 | 5,92781*** | Positive Significant |
| D(X4(-1)) | -0,619096 | -1,70666 | No Significant |
| C | 0,401718 | | |

Significance (5%**, 1%***, 10%*)
**Source: EViews data output**

The table above shows that the statistical t-value for the Third-Party Funds (DPK) variable is 5,48610, which exceeds the critical t-table value of 1,996008. This indicates that, in the long term, Third-Party Funds have a statistically significant and positive effect on the liquidity of Bank Muamalat, as evidenced by the t-statistic being greater than the critical value (5,48610 > 1,996008). Based on these results, it can be concluded that a 1% increase in Third-Party Funds leads to an estimated 1,086233% increase in liquidity.

Furthermore, the results of the VECM test indicate that the t-statistical value for the Capital Adequacy Ratio (CAR) variable is 9,42730, which is significantly higher than the critical t-table value of 1,996008. This suggests that CAR has a positive and statistically significant effect on the liquidity of Bank Muamalat in the long term, as evidenced by the t-statistic exceeding the critical value (9,42730 > 1,996008).

The VECM test results for the third variable, Non-Performing Financing (NPF), indicate a t-statistical value of 5,92781, which exceeds the critical t-table value of 1,996008. This suggests that NPF has a positive and statistically significant effect on the liquidity of Bank Muamalat in the long term, as the t-value is greater than the critical threshold (5,92781 > 1,996008). In contrast, the VECM results for the inflation variable show a long-term t-statistical value of -1,70666, which is below the critical t-table value of 1,996008. These

findings indicate that inflation does not have a significant effect on Bank Muamalat's liquidity in the long term, and thus do not support the proposed hypothesis.

### *Impulse Respons Function* **(IRF)**

The Impulse Response Function (IRF) is employed to examine the dynamic impact of one variable on another within a given system. This test provides insight into the magnitude and direction of the relationships among the variables under study. The IRF estimates illustrate the response of a particular variable—either to its own shocks or to shocks originating from other variables included in the Vector Error Correction Model (VECM). The analysis also reveals whether the responses are positive or negative, thereby offering a deeper understanding of the interdependencies and adjustment mechanisms among the variables over time.
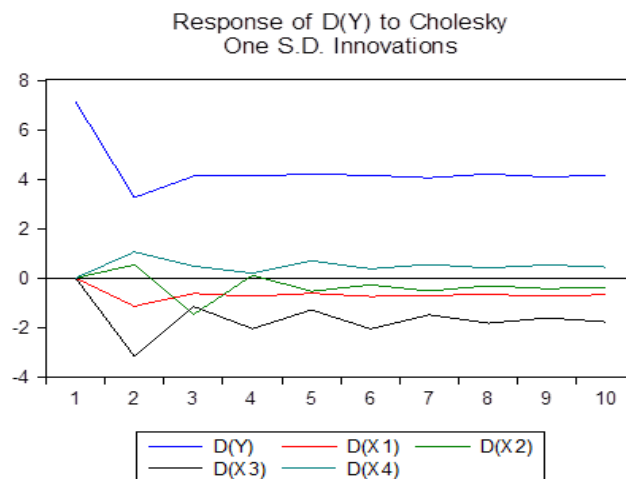


**Figure 1. Impusle Response Function of Liquidity (FDR)**
**Source: EViews data output**

Based on the table above, the liquidity response to its own past values from the first to the tenth period is consistently positive. This indicates that an increase in bank liquidity in the previous period leads to a sustained rise in liquidity over subsequent periods. The liquidity response to third-party funds is positive in the first period; however, from the second to the tenth period, the response becomes negative. This suggests that after the initial period, increases in third-party funds do not contribute significantly to further improvements in bank liquidity.

Furthermore, the Impulse Response Function (IRF) results show a positive response of liquidity to the Capital Adequacy Ratio (CAR) during the first and second periods, followed by a negative response from the third to the tenth period. The initial positive response implies that an increase in CAR is associated with higher liquidity at Bank Muamalat in the short term, while the subsequent negative response suggests diminishing or potentially adverse effects in the longer term.

The liquidity response to the Capital Adequacy Ratio (CAR) in the first period was positive. Similarly, the liquidity response to the Non-Performing Financing (NPF) variable was also positive in the first period, indicating that an increase in NPF is initially associated with a short-term rise in Bank Muamalat's liquidity. However, from the second to the tenth period, the liquidity response to NPF turns negative, suggesting that sustained increases in NPF may ultimately lead to a decline in the bank's liquidity position. In contrast, the liquidity

response to inflation remains positive throughout all ten periods. This persistent positive response indicates that rising inflation is associated with increased liquidity at Bank Muamalat over the long term.

### *Variance Decomposition* **(VD)**

The purpose of Variance Decomposition (VD) analysis is to estimate the percentage contribution of each variable in explaining the forecast error variance resulting from shocks to the variables within the Vector Autoregression (VAR) model. In this study, VD analysis is used to evaluate how both internal and external factors comparatively impact the liquidity of the Islamic bank.

**Table 9. VD Test Results**

| Period | D(FDR) | D(CAR) | D(CAR) | D(NPF) | D(INF) |
|--------|--------|--------|--------|--------|--------|
| 1 | 100.0000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 82.83418 | 1.744356 | 0.388428 | 13.52985 | 1.503189 |
| 3 | 82.28407 | 1.765498 | 2.620490 | 11.91971 | 1.410229 |
| 4 | 81.50761 | 1.902284 | 2.141894 | 13.27029 | 1.177924 |
| 5 | 82.21182 | 1.895800 | 2.036192 | 12.50694 | 1.349248 |
| 6 | 81.55924 | 1.978607 | 1.799843 | 13.41486 | 1.247442 |
| 7 | 81.74882 | 2.037442 | 1.753706 | 13.17962 | 1.280414 |
| 8 | 81.71475 | 2.039746 | 1.610878 | 13.41102 | 1.223611 |
| 9 | 81.76681 | 2.088894 | 1.547999 | 13.35843 | 1.237872 |
| 10 | 81.74296 | 2.094024 | 1.468264 | 13.48395 | 1.210798 |

**Source: EViews data output**

The EViews output indicates that the contribution of the liquidity variable to its own forecast error variance continued to increase over time and remained the most dominant, accounting for 81,74% by the end of the period. The subsequent contributors to the variance in the liquidity variable were third-party funds, the capital adequacy ratio (CAR), and non-performing financing (NPF), with contributions of 2,09%, 1,46%, and 13,48%, respectively. Among all variables analyzed, inflation had the smallest statistical contribution to liquidity fluctuations, at only 1,21%.

### CONCLUSION AND RECOMMENDATION

The results of the analysis indicate that the Third-Party Funds (DPK) variable has a positive and significant effect on the liquidity of Bank Muamalat, as measured by the Financing to Deposit Ratio (FDR), in the short term. This positive relationship implies that an increase in DPK leads to an improvement in bank liquidity. In the long term, DPK continues to exhibit a significant and positive influence on liquidity, thereby providing strong empirical support for the proposed hypothesis.

The long-term increase in DPK significantly contributes to enhancing the liquidity position of Islamic banks, reflecting the stability and reliability of these funds in meeting

future liquidity obligations. Furthermore, a sustained rise in DPK positively impacts the availability of funds, which can be effectively utilized by the bank to support its financing activities and overall financial stability.

These findings suggest that a sufficiently strong Capital Adequacy Ratio (CAR) is a critical factor in maintaining both the liquidity and long-term operational sustainability of banks. In the short term, a high CAR positively influences the liquidity position of Bank Muamalat. This relationship can be attributed to the enhanced risk management capabilities of banks with strong capital buffers. Effective risk management enables banks to mitigate potential liquidity pressures, thereby supporting a more stable short-term liquidity profile.

In the long term, CAR continues to exert a positive impact on liquidity. Banks with higher levels of capital are better positioned to pursue strategic expansion and growth. Adequate capital allows for investment in new financial products and services, the ability to reach a broader customer base, and the potential to increase market share. These factors collectively contribute to improved liquidity over the long run by strengthening the bank's financial foundation and enhancing its capacity to generate and manage funds efficiently.

The empirical results indicate that the Non-Performing Financing (NPF) variable does not have a significant effect on the liquidity of Bank Muamalat in the short term. In other words, short-term fluctuations in NPF levels do not appear to meaningfully influence the bank's liquidity. This may be attributed to the presence of effective internal mechanisms or risk management policies that enable the bank to mitigate the immediate effects of credit risk.

In the long term, however, NPF demonstrates a positive and significant impact on bank liquidity. This suggests that while an increase in NPF reflects rising credit risk within the bank's financing portfolio, the bank may have implemented strategic responses that transform this risk into manageable outcomes. Such strategies may include provisioning, restructuring, or other liquidity management practices that prevent deterioration in the bank's overall liquidity position despite elevated credit risk.

Additionally, the analysis shows that inflation does not have a significant impact on the liquidity of Bank Muamalat in either the short or long term. This finding implies that the bank has adopted effective financial strategies and operational policies to buffer the potential adverse effects of inflation on its fund availability, thereby maintaining stable liquidity under varying macroeconomic conditions.

## REFERENCES

Adawiyah, N. N., & Azifah, N. (2020). Faktor-Faktor Yang Mempengaruhi Likuiditas Pada Bank Umum Syariah Di Indonesia. *Jurnal Ilmiah Ekonomi Bisnis*, *25*(3), 238–248. https://doi.org/10.35760/eb.2020.v25i3.2663

Ahyar, H., Maret, U. S., Andriani, H., Sukmana, D. J., Mada, U. G., Hardani, S.Pd., M. S., Nur Hikmatul Auliya, G. C. B., Helmina Andriani, M. S., Fardani, R. A., Ustiawaty, J., Utami, E. F., Sukmana, D. J., & Istiqomah, R. R. (2020). *Buku Metode Penelitian Kualitatif & Kuantitatif* (Issue March).

Andrianto, & Firmansyah, M. A. (2019). Manajemen Bank Syariah ( Implementasi Teori dan Praktek ). *CV. Penerbit Qiara Media*, 536.

Dwi Putri Lestari, & Rani, L. N. (2022). Analisis Faktor Internal dan Eksternal yang Mempengaruhi Likuiditas Bank Umum Syariah di Indonesia. *Jurnal Ekonomi Syariah Teori Dan Terapan*, *9*(4), 559–572. https://doi.org/10.20473/vol9iss20224pp559-572

Himmawan, M. F., & Ninglasari, S. Y. (2023). *Analysis Of Liquidity In Islamic Banks In Indonesia : Analysis Of Capital Adequacy Ratio , Return On Asset , Inflation , And Bi Analysis Of Liquidity In Islamic Banks In Indonesia : Analysis Of Capital Adequacy Ratio , Return On Asset , Inflation , And Bi. August*. https://doi.org/10.32505/j-ebis.v8i1.5561

Ismal, R. (2010). The Management Of Liquidity Risk In Islamic Banks : The Case Of Indonesia In Islamic Banks : The Case Of Indonesia. *Doctoral Dissertation, Durham University*.

Ismaulina, Wulansari, A., & Safira, M. (2020). Capital Adequacy Ratio ( Car ) Capital Adequacy Ratio ( Car ) and Influencing Factors in Mandiri Syariah Bank. *I-Finance: A Reaserch Journal on Islamic Finance*, *06*(02), 168–184.

Kasmir. (2004). *Manajemen Perbankan*. Pt Rajagrafindo Persada.

Kasmir. (2007). *Bank Dan Lembaga Keuangan Lainnya* (Edisi Revi). Pt Rajagrafindo Persada.

Prastiwi, I. E., Tho'in, M., & Kusumawati, O. A. (2021). Faktor Internal yang Mempengaruhi Likuiditas Bank Syariah: Analisis Rasio Capital Adequacy Ratio (CAR), Dana Pihak Ketiga (DPK), Non Performing Financing (NPF). *Jurnal Ilmiah Ekonomi Islam*, *7*(2), 1107–1116. https://doi.org/10.29040/jiei.v7i2.2614

Rufaidah, I. K., Djuwarsa, T., & Danisworo, D. S. (2021). Pengaruh DPK, CAR, BOPO, dan NPF terhadap Likuiditas pada Bank Umum Syariah. *Journal of Applied Islamic Economics and Finance*, *2*(1), 187–197. https://doi.org/10.35313/jaief.v2i1.2912

Saputro, K. Y., & Wildaniyati, A. (2021). Pengaruh Dana Pihak Ketiga, Capital Adequacy Ratio (CAR), dan Non Performing Financing (NPF) Terhadap Likuiditas Perbankan Syariah Di Indonesia Tahun 2015-2019. *Jurnal Ekomaks Jurnal Ilmu Ekonomi Manajemen Dan Akuntansi*, *10*(1), 14–19. https://doi.org/10.33319/jeko.v10i1.83

Siregar, I. F., Rasyad, R., & Onasis, D. (2023). *Analsis Faktor – Faktor Yang Mempengaruhi Likuiditas Perbankan Syariah Di Indonesia*. *6*(2), 354–362.

Somantri, Y. F., & Sukmana, W. (2020). Analisis Faktor- Faktor yang Mempengaruhi Financing to Deposit Ratio (FDR) pada Bank Umum Syariah di Indonesia. *Berkala Akuntansi Dan Keuangan Indonesia*, *4*(2), 61. https://doi.org/10.20473/baki.v4i2.18404

Sugiyono. (2013). *Metode Penelitian Bisnis (Pendekatan Kuantitatif, Kualitatif, dan R&D)*. ALFABETA CV.

Sukirno, S. (2004). *Makroekonomi: Teori Pengantar*. Raja Grafindo Persada.

Sultoni, H., & Mardiana, K. (2021). Manajemen Likuiditas Pada Bank Syariah. *Jurnal Eksyar (Jurnal Ekonomi Syariah)*, *08*(02), 169–188.

Utami, M. S. M., & Muslikhati, M. (2019). Pengaruh Dana Pihak Ketiga (DPK), Capital Adequacy Ratio (CAR), Non Performing Financing (NPF) terhadap Likuiditas Bank Umum Syariah (BUS) Periode 2015-2017. *Falah: Jurnal Ekonomi Syariah*, *4*(1), 33. https://doi.org/10.22219/jes.v4i1.8495

Yusuf, M. (2017). Dampak Indikator Rasio Keuangan terhadap Profitabilitas Bank Umum Syariah di Indonesia. *Jurnal Keuangan Dan Perbankan*, *13*(2), 141. https://doi.org/10.35384/jkp.v13i2.53

This page is intentionally left blank