

Journal of Applied Economics in Developing Countries P-ISSN 2354 – 6417 | E-ISSN 2685 – 7448 Vol. 10 No. 1, March 2025, Page 55-64



THE EFFECT OF CAPITAL RATIOS, CREDIT RISK, AND INFLATION ON LIQUIDITY IN INDONESIAN ISLAMIC COMMERCIAL BANKS

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ARTICLE INFO

ABSTRACT

Article history

Received : 12 February 2025 Revised : 5 March 2025 Accepted : 29 March 2025

Keywords CAR; FDR; Inflation; NPF

JEL classification E51; E59 This study explores the effect of Capital Adequacy Ratio (CAR), Non-Performing Financing (NPF), and inflation on liquidity of Islamic commercial banks in Indonesia. The results of the analysis show that NPF has a significant impact on liquidity, while CAR and inflation show no significant effect. This finding implies that effective credit risk management is essential for Islamic banks to maintain liquidity. Therefore, Islamic banks should tighten the analysis of financing eligibility and conduct stricter monitoring of the financing portfolio to minimize NPF. Although CAR is important for assessing capital health, an increase in CAR does not directly improve liquidity, which suggests that Islamic banks should focus on cash flow management and asset quality. Since Islamic banks do not rely on interest rates, inflation does not have a direct impact on liquidity. In this context, recommended policies include improving staff training in risk analysis and developing strategies to diversify financing portfolios to reduce reliance on one market segment that may be more prone to risk. Thus, the main focus for Islamic banks is to strengthen credit risk management and improve risk analysis capabilities to ensure liquidity stability in the face of volatile economic challenges.

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1. INTRODUCTION

An institution capable of advancing the nation's economic development is needed to encourage modern economic progress. Conventional banks and Islamic banks are two categories of banking groupings when viewed from an operational point of view. Although their functions are similar, namely collecting, distributing, and providing services (Sudarsono et al., 2022). Nonetheless, there are differences in the rationale used. As a Shariah-compliant organisation, the bank operates in accordance with Shariah principles and does not use the interest-based aspect common to conventional banks. It uses profit sharing according to a mutually agreed ratio to set prices and payments (Somantri & Sukmana, 2020). In theory, Isla mic banks restrict their involvement in financial markets that do not adhere to sharia law. Because of this, Islamic banks are less able to manage liquidity risk than regular banks (Adi & Rifa'i, 2023). Liquidity is the bank's capacity to meet its immediate obligations. According to Bank Indonesia's provisions in PBI Number 21/12/PBI/2019, the FDR ratio can be used as a tool for measuring liquidity.



This ratio displays the percentage of the bank's overall financing (loans) that is in relation to its total deposits (Hamdi & Herianingrum, 2022). In other words, FDR is used to determine the amount of money a bank provides in the form of loans from the total funds it obtains from the public (Adawiyah & Azifah, 2020).

A high FDR indicates that the bank is disbursing more loans than it receives in deposits. A declining FDR ratio indicates that the bank is in an idle fund situation. Banks with large idle capital cannot generate income due to improper allocation of resources (Lestari & Rani, 2022). According to the latest statistics from OJK for 2020-2023, the liquidity ratio of Islamic Commercial Banks has experienced a significant decline. As per the provisions set by OJK in POJK Number 42/POJK.03/2015 regarding liquidity ratio requirements, the acceptable FDR value for banks is between 80% and 110%. This can be seen based on the following data:

Variable	2019	2020	2021	2022	2023
Inflation	2.72	2.03	1.56	4.20	2.90
CAR	22.69	27.95	29.54	29.37	28.67
NPF	1.75	1.65	0.91	1.04	1.03
FDR	88.59	97.25	78.5	77.65	75.57

Table 1. Average CAR, NPF, FDR 2019-2023 of 8 Islamic Commercial Banks

Source: Islamic Commercial Bank Financial Report (2019-2023)

The data shows that the liquidity of Islamic Commercial Banks has declined drastically between 2020 and 2021, and this decline will continue until 2023 by 75.57%. This fact shows that Islamic banks cannot effectively utilise their deposits. As a result, even if the bank disburses finance below the cap established by Bank Indonesia, it is still considered safe because the bank still has money available for distribution. Banks that have good liquidity can attract more customers to deposit funds, which contributes to profitability. Conversely, if banks are illiquid, then they are unable to fulfil customers who will take out their funds and banks will find it difficult to obtain cash reserves to disburse customer funds (Nuraeni et al., 2021). Some banks claim that in order to preserve the quality of non-performing financing (NPF), low liquidity is required. As a result, an increase in non-performing loans may reduce the bank's ability to allocate funds, potentially leading to decreased liquidity and a lower ability to fulfil short-term commitments (Prastiwi et al., 2021).

Islamic banks have experienced substantial growth over time. This crisis may affect the future growth of Islamic banks. The economy of the society depends on the stability of inflation, as the challenges faced by Islamic banks pose a significant threat to the sector in the context of globalization (Ghenimi et al., 2021). Price escalation due to inflation can reduce liquidity, as customers tend to prioritise saving for consumption over keeping funds in the bank. Excessive inflation can hamper the ability of individuals to purchase financial goods and services, particularly Islamic banking products, thereby affecting liquidity as loans become more expensive (Arfiyanti & Pertiwi, 2020).

As financial crises caused by the inability to manage liquidity often result in bankruptcy of banks, the liquidity issues of Islamic banks are very important to study. Islamic banks in Indonesia face great challenges in maintaining their financial stability amid global economic uncertainty. Rising inflation and economic uncertainty can reduce people's desire to keep funds in banks. This can reduce the amount of deposits and affect a bank's ability to fulfill its liquidity obligations (Anis & Hamdi, 2022).

In addition, a high non-performing financing (NPF) ratio indicates significant credit risk, which requires banks to set aside additional funds for reserves. It is crucial to understand the components that affect liquidity as violating the strict Financial Services Authority (OJK) regulations regarding liquidity ratios can lead to sanctions and damage the bank's reputation. Islamic banks must be able to offer competitive services in an increasingly competitive banking industry. Strong liquidity is essential to attract and retain customers (Sultoni & Mardiana, 2021).



Especially in the Islamic finance sector, Indonesia's economic growth is significantly driven by Islamic banks. The influence of Islamic banks on the overall economy can be hampered if liquidity issues are not handled properly. Therefore, research on the effect of Capital Adequacy Ratio (CAR), Non-Performing Financing (NPF), and inflation on liquidity is very important and urgent. This research provides useful insights for better strategic and policy decision-making to improve the stability and sustainability of Islamic banks in Indonesia (Maulidah et al., 2024).

According to research conducted by Nuraeni et al. (2021), the capital ratio (CAR) affects bank liquidity, but credit risk (NPF) and inflation do not affect liquidity. At the start of the COVID-19 pandemic, many banks and businesses faced economic uncertainty, the study was conducted. Under these circumstances, CAR may be more important to maintain stability and customer confidence. However, when monetary policy and economic stimulus are not tight.

Similarly, research by Gunawan & Manda (2021) concluded that NPF has no effect on bank liquidity, while CAR and inflation do. When the economy began to recover after the pandemic, this study was conducted. Since a large number of banks have successfully reduced the number of non-performing loans through loan restructuring, NPF may not have a significant impact on liquidity. During this recovery phase, the relationship between NPF and liquidity may be forgotten due to banks' focus on improving financing and risk management.

In contrast to the research of Lestari & Rani (2022) found that CAR and NPF have no significant effect on bank liquidity, but inflation has a negative effect on liquidity. This study was conducted during relatively good economic stability, with low inflation, and moderate growth. Due to the fact that Islamic banks have the ability to maintain healthy liquidity ratios, the effect of CAR and NPF on liquidity may not be so great when economic conditions change and inflation increases.

A new study shows that credit risk management (NPF) is becoming an important component affecting Islamic banks' liquidity in more volatile economic conditions and amidst the challenge of rising inflation. This shows how important it is to look at how economic conditions change when analyzing the relationship between these variables. This study differs from previous research and will build on the research that has been done previously. This study selects eight types of Islamic commercial banks as samples as they fulfill the research requirements. The study is conducted over a period of five years and is based on updating the financial statements for each Islamic commercial bank annually on their official websites.

Liquidity is defined as the bank's capacity to fulfill its immediate obligations. The purpose of this ratio is to evaluate the bank's liquidity. If a bank can accommodate its clients' requests to withdraw money, it is said to be liquid. The assessment of liquidity factors covers various elements, including the ability to meet short-term obligations, liquidity management strategies, access to financing sources, and funding stability (Setyowati et al., 2023). The provisions of Bank Indonesia in PBI Number 21/12/PBI/2019 stipulate that liquidity capability can be assessed through the Financing to Deposit Ratio (FDR). Financing to Deposit Ratio (FDR) assesses the overall financing provided by the bank in relation to the total deposits it manages (Dewi, 2022). FDR illustrates the extent to which Islamic banks can fulfil customer withdrawal requests using the funding they provide. Broadly speaking, FDR illustrates the extent to which financing to customers can alleviate the need to immediately fulfil the short-term obligations of customers who want to withdraw their assets (Fathurrahman & Rusdi, 2019). The Financing to Deposit Ratio formula is as follows:

Financing to Deposit Ratio: $\frac{Total \ Financing}{Total \ Deposits} \times 100\%$(1)

A higher FDR ratio suggests that the bank's capacity to manage liquidity is compromised. This is due to the lack of money needed to fund the next period. Increased banking competition and liquidity risk are two problems in the banking industry. A key measure of a bank's capacity to manage the credit and operational risks it encounters is the capital ratio (CAR), which is determined by dividing total capital held by total risk-weighted assets (Yayan & Putri, 2024). A robust CAR indicates that KBMI Bank can meet regulatory mandates established by authorities and assures clients and investors of the bank's long-term stability and viability.



The capital adequacy ratio (CAR) of a bank is used to underpin assets, such as finance, that include or harbor risk. The Capital Adequacy Ratio (CAR) refers to the proportion of a bank's risky assets, including financing, securities, and other claims, that are financed by equity and external sources such as loans and public funding (Utami & Muslikhati, 2019). Bank assets include current assets and fixed assets, which together secure the bank's ability to settle its liabilities. Working capital and maintaining bank liquidity are two applications of cash (capital). OJK regulation Number 11/POJK.03/2016 mandates that banks must maintain a minimum capital of 8% to be considered healthy, as assessed by risk-weighted assets reflected in the Capital Adequacy Ratio (CAR). The CAR formula is as follows:

CAR: $\frac{Capital}{ATMR} \times$: 100%	(2)
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NPF refers to the risk of loss incurred by banks stemming from the likelihood that fund users or debtors may default on their obligations at maturity. NPF is targeted at a reasonable threshold of 5% of total bank loans, in accordance with Bank Indonesia Regulation No. 23/2/PBI/2021, which amends Bank Indonesia Regulation No. 20/8/PBI/2018 concerning Loan to Value Ratio for Property Loans, Financing to Value Ratio for Property Financing, and Down Payment for Motor Vehicle Loans or Financing. A reduced NPF ratio indicates enhanced bank stability due to a reduction in funding and loan defaults. The decline in FDR levels serves as a metric for assessing the bank's liquidity, whereas defaults signify a negative portent for the organization (Yastika et al., 2020).

Thus, NPF and liquidity are interrelated, where liquidity increases as credit risk decreases. The reason is that banks must be able to process withdrawal requests from deposits, and most of the funds used for fund distribution come from deposits that can obviously be withdrawn at any time (Pasya & Putri, 2024). As a result, an increasing proportion of NPF means that the financing disbursed is getting worse. Since the bank has to return the unpaid financing funds, the bank will be stricter in disbursing financing, which will ultimately affect the performance of the bank's intermediary role (Septiana & Artati, 2022).

Inflation is an economic phenomenon characterised by an increase in the price of a commodity due to a disruption in the supply-demand balance of the market (Putri & Putri, 2023). The price index to measure the inflation rate is the Consumer Price Index (CPI), which is an index of goods that customers have purchased. Inflation, defined as the overall process of rising prices, is one of the macroeconomic forces. People will spend more on consumption in the event of inflation as it creates uncertainty in a country's macroeconomic situation (Gunawan & Manda, 2021).

From a monetary point of view, High inflation rates will result from an unchecked rise in the cost of goods, thereby reducing people's income and affecting the banking industry's ability to manage state finances. However, this will make consumers less interested in saving in the bank (Pertiwi, 2021). One of the economic areas that will be impacted by inflation, particularly in Indonesia, is the banking sector. Inflation impacts the banking sector as consumers prefer to save less, which in turn lowers the real value of bank assets.

2. RESEARCH METHODS

This study employs quantitative research methods using a quantitative descriptive approach. This research used secondary data from the websites of Bank Indonesia, the Central Statistics Agency (BPS), the Financial Services Authority (OJK), and several financial organizations. This analysis utilizes the yearly financial reports of Islamic commercial banks from 2019 to 2023.

Fourteen Islamic commercial banks were selected via careful selection to constitute the study's population. The study's sample included eight Islamic commercial banks. This research analyzes Islamic commercial banks that provide financial reports encompassing the four variables used in the inquiry. The organizations chosen for this research were Islamic commercial banks that fulfilled certain requirements and offered comprehensive reporting data.



Based on several important considerations, this study chose the variables of Capital Adequacy Ratio (CAR), Non-Performing Financing (NPF), and Inflation as its focus. These three variables have a direct relationship with risk management and the financial health of Islamic banks: CAR indicates the strength of the bank's capital, NPF indicates the quality of financing under management, and inflation is a factor that affects overall economic conditions, which can have an impact on the bank's overall finances. This study emphasizes the importance of NPF in credit risk management. NPF is a key indicator to watch. By eliminating other macroeconomic variables, researchers can explore the specific relationship between NPF and liquidity more accurately. Focusing on this variable also allows for a more in-depth and consistent analysis as economic conditions are always changing. In terms of short-term liquidity, the operational efficiency ratio may be less important than macroeconomic variables such as GDP growt.

This research employs multiple linear regression analysis due to the use of panel data, which integrates cross-sectional and time series data. The testing tool used was Eviews version 10. Various approaches were used to estimate the parameters of the panel regression model, including Common Effect, Fixed Effect, and Random Effect. Hausmann, Chow, and Lagrange There are three methods to choose the ideal approach: multiplier tests. The assessment of autocorrelation, heteroscedasticity, multicollinearity, and normalcy constitutes essential classical assumption tests. Upon concluding the conventional assumption test, hypothesis testing is conducted, including the simultaneous F test, partial T test, and coefficient of determination (R²).

3. RESULTS AND DISCUSSION

3.1. RESULTS

Table 2 presents the selection process for the best estimation model based on statistical tests. Based on the test results, the Chow Test indicates that the Fixed Effects Model (FEM) is preferred over the Common Effects Model (CEM). The Hausman Test shows a probability greater than 0.05, suggesting that the Random Effects Model (REM) is more suitable than FEM. Additionally, the Lagrange Multiplier (LM) Test results in a probability lower than 0.05, confirming that REM is the appropriate model. Therefore, the best estimation model for this study is the Random Effects Model (REM).

Table 2. Selection of the Dest Estimation Woder					
Testing	Result	Conclusion			
Chow Test	Prob < 0,05	FEM			
Hausman Test	Prob > 0,05	REM			
Lagrange Multiplier Test (LM Test)	Prob < 0,05	REM			

Table 2 Selection of the Best Estimation Model

Source: Processed Data (2025)

After selecting the estimation model, a classical assumption test was conducted, including normality, multicollinearity, and heteroscedasticity tests. The normality test results indicate that the residuals are normally distributed, as evidenced by the Jarque-Bera probability value being greater than 0.05. Additionally, the multicollinearity test shows that there are no multicollinearity issues among the independent variables (CAR, NPF, and INF), as the correlation values between them are all below 0.8. Furthermore, the heteroscedasticity test confirms the absence of heteroscedasticity problems, as the probability values for each independent variable exceed 0.05. These findings suggest that the classical assumption requirements of normality, no multicollinearity, and homoscedasticity are met, ensuring the reliability of the regression model.

Table 3 presents the results of the regression equation, which examines the relationship between the dependent variable, Financing to Deposit Ratio (FDR), and the independent variables, namely Capital Adequacy Ratio (CAR), Non-Performing Financing (NPF), and Inflation (INF). The table includes the coefficient values, t-statistics, and probability values for each variable, as well as overall model fit indicators such as R-squared, adjusted R-squared, and the F-statistic. These results help determine the significance and impact of each independent variable on FDR.



Variable	Coefficient	t-Statistic	Prob.
С	56.74295	2.920863	0.0060
CAR	0.74314	1.504576	0.1412
NPF	11.06900	3.305969	0.0022
INF	-2.57747	-0.864864	0.3928
Weighted Statistics	Value		
Adjusted R-squared	0.19859		
F-statistic	4.22148		
Prob(F-statistic)	0.01174		

Source: Processed Data (2025)

The regression model aims to analyze the relationship between the dependent variable, Financing to Deposit Ratio (FDR), and the independent variables, namely Capital Adequacy Ratio (CAR), Non-Performing Financing (NPF), and Inflation (INF). The coefficients obtained from the estimation indicate the magnitude and direction of the impact each independent variable has on FDR.

FDR = 56.74295 + 0.74314(CAR) + 11.06900(NPF) - 2.57747(INF).....(3)

The constant (56.74295) indicates that if all independent variables remain at zero, the predicted FDR value would be 56.74295. The CAR coefficient (0.74314) suggests that for every 1% increase in CAR, FDR is expected to increase by 0.74314%, assuming other variables remain constant. The NPF coefficient (11.06900) shows that a 1% rise in NPF leads to an increase in FDR by 11.069%, holding other factors constant. The INF coefficient (-2.57747) implies that for every 1% increase in inflation, FDR decreases by 2.57747%, assuming other variables remain unchanged. These results indicate that while CAR and NPF have a positive impact on FDR, inflation negatively affects it. The magnitude of the coefficients suggests that NPF has the most significant influence on FDR.

The regression results indicate that the Capital Adequacy Ratio (CAR) has no significant effect on liquidity, as evidenced by its probability value of 0.1412, which is greater than 0.05. In contrast, Credit Risk, represented by the Non-Performing Financing (NPF) variable, significantly impacts liquidity, with a probability value of 0.0022, which is less than 0.05. This suggests that changes in NPF influence liquidity. Meanwhile, Inflation does not affect liquidity, as its probability value of 0.3928 exceeds the 0.05 threshold, indicating no significant relationship in this context.

The Adjusted R-Squared value is 0.1986 or 19%, indicating that the independent variables—inflation, credit risk, and capital ratio—explain 19% of the variation in the liquidity of Indonesia's Islamic commercial banks. The remaining 81% is influenced by other factors not included in this study. This limitation highlights the need to consider additional explanatory variables, such as Gross Domestic Product (GDP), Operating Efficiency (BOPO), and interest rates, which may provide a more comprehensive understanding of liquidity determinants.

Furthermore, the F-statistic probability value (<0.05) confirms that the independent variables, when considered simultaneously, significantly impact liquidity. This suggests that capital ratio, credit risk, and inflation collectively play a role in shaping the bank's ability to meet its liquidity commitments.

3.2. DISCUSSION

According to the study's findings, the Capital Adequacy Ratio (CAR) variable's probability value is 0.1412>0.05, indicating that CAR has no discernible impact on banking liquidity. Despite being crucial for evaluating a bank's capital status, CAR has no direct effect on short-term liquidity (Isnurhadi et al., 2021). This is because Islamic banks do not only focus



on maintaining capital adequacy ratios, but also cash flow management (Christiana & Putri, 2023). The stability and performance of Islamic banks, which are heavily influenced by asset quality and risk management, are not adequately reflected by CAR in this context (Safitri et al., 2021).

It is well established from research findings that bank liquidity is significantly improved by credit risk (NPF). Liquidity is also significantly influenced by NPF, a measure of financing quality. The statistical test used to support this conclusion showed that the p-value of 0.0022 was less than 0.05. This suggests that variations in bank liquidity are statistically correlated with variations in NPF (Dani & Widyaningsih, 2024). According to these findings, NPF significantly affects the liquidity of Indonesia's Islamic commercial banks; as a result, efficient financing risk management is crucial to guaranteeing the stability and long-term viability of Islamic banks' operations (Permana & Musthofa, 2023).

NPF indicates the quality of financing provided by the bank. An increasing level of NPF indicates that more and more financing that debtors cannot return. This can lead to reduced cash flow to the bank. As a result, the bank's ability to meet its short-term obligations may be compromised. According to the literature, stable cash flow greatly affects bank liquidity. According to research by Nuraeni et al. (2021), an increase in NPF leads to a decrease in bank liquidity because banks have to allocate more resources to handle non-performing financing, such as restructuring or setting up loss reserves. As a result, banks have difficulty providing liquidity to customers who want to withdraw funds due to high NPF.

In addition, research by Adi & Rifa'i (2023) shows that high NPF levels can make banks more conservative in providing new financing, which in turn can reduce potential interest income. As banks need stable income to run their daily operations and fulfill their short-term obligations, this reduced income may affect their ability to maintain liquidity. Before providing financing, banks must conduct a rigorous financing feasibility assessment. This assessment involves a thorough analysis of the borrower's risk profile, their ability to pay, and their cash flow projections. This allows banks to identify potential risks early on and reduce the likelihood of inappropriate financing (Amelia et al., 2024). If the borrower is facing financial problems, restructuring the financing may be a solution. Banks can help borrowers by reducing interest rates, extending payments, or reducing installments. An effective supervision and monitoring system is essential to monitor financing performance. By regularly monitoring the borrower's cash flow and finances, banks can avoid financing problems (Rosiana et al., 2024).

Improving the ability of bank staff to assess risk is also an important step in risk management. This will ensure that any financing decision is based on an accurate risk assessment. Diversifying the financing portfolio can help reduce overall risk by distributing financing to different sectors and types of businesses to avoid dependence on one market segment that may be more vulnerable (Asmayaturrafaah & Hasan, 2023). Finally, banks must establish a financing loss reserve to prevent losses from non-performing loans. This reserve helps the bank remain stable and can be used in the event of default. Islamic commercial banks can maintain financial health, improve liquidity, and reduce the risk of ineligible financing (NPF).

Based on the results of the study, it is known that the variable 'Inflation' has a probability value of 0.3928>0.05 so it can be concluded that inflation does not have a significant effect on banking liquidity. Inflation does not affect FDR because Islamic banks do not use the interest rate mechanism, so the profit sharing rate or profit margin of Islamic banking products does not have to adjust to the inflation rate like conventional bank interest rates (Tiarawati & Putri, 2024).

Because inflation is a macroeconomic variable, it certainly does not have a direct impact on banking performance. When there is inflation and the price of goods rises, people tend to hold back on spending the goods they want. They prefer to save their funds because the name of inflation will affect interest rates, if inflation is high then interest rates will also be high. When interest rates are high people will be more interested in making deposits than spending on the real sector.



When the sector moves, of course, banking will also move well because people need financing, people need to withdraw their funds. Then of course this will have an impact on banking. But the impact is not direct, which must go through interest rates, through the desire of customers to withdraw funds or interest in financing in banking. Moreover, the increase in inflation did not reduce the activities of Islamic banks in channeling the funds they collected. This is because the inflation variable in this study is relatively stable and the inflation that occurs is mild inflation, which is less than 10% per year. (Gogo & Arundina, 2021).

4. CONCLUSION

This study aims to examine the effect of Capital Adequacy Ratio (CAR), Non-Performing Financing (NPF), and Inflation on Liquidity (FDR) in Islamic commercial banks. The results showed that the Capital Ratio variable had no significant effect on bank liquidity. This percentage, although significant for assessing capital health, does not directly affect short-term liquidity in Islamic commercial banks. NPF is proven to have a significant impact on liquidity. This provides recommendations for banks to tighten the analysis of financing for prospective customers. So that banks must be more selective to be able to select which customers are eligible for financing. As well as banks must also be more careful to be able to distribute financing to their customers so that NPF is maintained in a stable condition. Besides that banks must also make stricter regulations related to determining financing customers. Inflation does not have a substantial impact on the liquidity of Islamic banks. This is because Islamic banks do not use an interest rate mechanism, so the profit sharing rate is not directly affected by inflation. This analysis suggests that although CAR and inflation do not have a significant impact, NPF is critical to maintaining the liquidity of Islamic commercial banks in Indonesia. Effective credit risk management and an understanding of the additional elements that affect liquidity are critical to improving the performance of Islamic banks.

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