

# Determinants of profitability in Indonesian Islamic banks: Financial and macroeconomic insights

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## ABSTRAK

### Introduction

Profitability is a crucial indicator of financial sustainability and competitiveness in the banking industry. For Islamic banks, profitability is influenced by both internal financial management and external macroeconomic factors, shaped by their adherence to Sharia principles. Indonesian Islamic banks operate in a dynamic financial environment that presents unique challenges and opportunities for sustaining profitability.

### Objectives

This study examines the determinants of profitability in Indonesian Islamic banks, focusing on the effects of internal financial ratios—Financing to Deposit Ratio (FDR), Capital Adequacy Ratio (CAR), Non-Performing Financing (NPF), and operating efficiency ratio (OER)—as well as external factors such as interest rates and inflation.

### Method

A quantitative approach was employed, analyzing secondary data from 12 Islamic banks in Indonesia over the 2014–2018 period. Multiple regression analysis was used to evaluate the relationships between these variables and profitability, measured by Return on Assets (ROA). Diagnostic tests ensured the robustness and validity of the statistical model.

### Results

The findings reveal that FDR positively influences profitability, while NPF and OER have significant negative effects. CAR and inflation show no significant impact, and interest rates indirectly affect profitability despite the interest-free nature of Islamic banking. These results

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highlight the interplay of internal management practices and macroeconomic factors in shaping financial performance.

### Implications

This study emphasizes the need for Islamic banks to enhance credit risk management, optimize operational efficiency, and adapt to macroeconomic conditions to sustain profitability. The findings provide actionable insights for policymakers, regulators, and practitioners aiming to strengthen the financial sustainability of Islamic banking in Indonesia.

### Originality/Novelty

This research integrates internal and macroeconomic determinants to offer a comprehensive analysis of profitability in Indonesian Islamic banks. By bridging gaps in the literature, it contributes to the development of strategies for financial performance optimization in Sharia-compliant banking.

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## INTRODUCTION

Islamic banking, rooted in the principles of Sharia law, has emerged as a vital component of the global financial system, particularly in countries with significant Muslim populations. Its prohibition of interest (riba), promotion of risk-sharing, and emphasis on ethical investments distinguish it from conventional banking. In Indonesia, home to the largest Muslim population in the world, the Islamic banking sector has witnessed steady growth over the past two decades. This expansion reflects increasing public demand for financial products that align with Islamic values and the government's active role in supporting the sector through regulatory frameworks and promotional policies. However, despite its growth, the sector faces persistent challenges in achieving profitability, a crucial indicator of sustainability and competitiveness in a rapidly evolving financial landscape.

Profitability is a fundamental measure of a bank's ability to generate income from its assets, manage operational costs, and provide returns to shareholders. For Islamic banks in Indonesia, achieving sustainable profitability is complicated by unique operational constraints tied to Sharia compliance and external macroeconomic factors. Unlike conventional banks, Islamic banks operate under interest-free principles, relying on profit-sharing contracts such as *mudarabah* and *musharakah*. These contracts are inherently riskier, requiring meticulous management of liquidity, credit, and operational efficiency. Simultaneously, external factors such as inflation, interest rate fluctuations, and economic cycles pose additional challenges, influencing the cost of funds and investment returns.

This study focuses on addressing the critical issue of what drives profitability in Indonesian Islamic banks. Specifically, it examines the effects of key internal and

external factors, including the Financing to Deposit Ratio (FDR), Capital Adequacy Ratio (CAR), Non-Performing Financing (NPF), interest rates, operating efficiency ratio (OER), and inflation. These variables represent both managerial decisions and macroeconomic conditions that collectively shape the financial performance of Islamic banks. While internal factors like liquidity and operational efficiency are within the control of bank management, macroeconomic variables such as inflation and interest rates reflect broader economic conditions. Understanding the relative influence of these factors is essential for developing targeted strategies to enhance profitability.

Existing literature highlights the significance of financial ratios such as FDR, CAR, and NPF in determining bank profitability. For instance, studies have shown that a higher FDR can enhance profitability by maximizing the utilization of available funds in income-generating activities. Conversely, a high NPF ratio, indicative of credit risk, negatively impacts profitability by reducing recoverable funds. Meanwhile, CAR reflects the bank's ability to absorb potential losses, contributing to financial stability but not always directly correlating with profitability. Beyond these internal factors, macroeconomic variables such as interest rates and inflation have received limited attention in the context of Islamic banking, despite their recognized influence on conventional banking profitability.

A growing body of research underscores the importance of operational efficiency in driving profitability. OER, which measures the proportion of operating expenses to operating income, serves as a critical indicator of cost management. Studies suggest that high operating costs relative to income erode profitability, necessitating efficient resource allocation and process optimization. Additionally, interest rate movements indirectly affect Islamic banks, even though they do not engage in interest-based activities, by influencing the competitive landscape and the cost of funding. Inflation, on the other hand, has been associated with mixed effects, potentially increasing operational costs while also boosting nominal income levels.

While these studies provide valuable insights, they also reveal gaps in understanding the combined effects of internal and external factors on Islamic bank profitability. Most research isolates individual variables, failing to consider the interplay between financial ratios and macroeconomic conditions. Moreover, studies focusing on Indonesian Islamic banks remain scarce, despite the country's pivotal role in the global Islamic finance market. This lack of comprehensive analysis hinders the ability of policymakers and practitioners to make informed decisions that balance Sharia compliance with financial performance.

To address these gaps, this study investigates the profitability of Indonesian Islamic banks using a holistic approach. It integrates financial ratios (FDR, CAR, NPF, and OER) with macroeconomic variables (interest rates and inflation) to provide a comprehensive analysis of the factors influencing bank profitability. By examining 12 Islamic banks over the 2014–2018 period, the research captures both short-term and structural trends in financial performance. The findings aim to identify key determinants of profitability and offer actionable recommendations for improving operational and strategic decision-making in the Islamic banking sector.

The novelty of this research lies in its dual focus on internal and external factors, providing an integrated perspective that bridges gaps in existing literature. Unlike studies that treat financial ratios and macroeconomic variables in isolation, this research examines their combined effects, offering a nuanced understanding of the challenges and opportunities faced by Islamic banks. The study also contributes to the broader discourse on Islamic finance by highlighting the unique dynamics of profitability in interest-free banking systems.

This study seeks to advance knowledge on the determinants of profitability in Indonesian Islamic banks, providing insights that are both academically significant and practically relevant. By addressing key internal and external factors, the research contributes to the development of targeted strategies for enhancing the financial sustainability of Islamic banks in Indonesia and beyond.

## LITERATURE REVIEW

### The Concept of Profitability in Islamic Banking

Profitability is a fundamental measure of a bank's financial health, reflecting its ability to generate income from its assets while covering operational costs and delivering returns to shareholders (Liu & Wilson, 2010; Uyemura et al., 1996). For Islamic banks, profitability has a dual significance. In addition to ensuring financial stability, profitability must align with Sharia principles, which prohibit interest-based earnings and emphasize ethical and equitable practices (Alhammadi et al., 2022; Sharma, 2023; Tok & Yesuf, 2022). As such, Islamic banks derive profits from risk-sharing contracts like *mudharabah* (profit-sharing) and *musharakah* (joint ventures), as well as trade-based transactions like *murabaha* (cost-plus financing) (Gharbi & Khamoussi, 2016; Megeid, 2017). These mechanisms differentiate Islamic banks from conventional ones, introducing unique challenges and opportunities for profitability.

Existing literature underscores the complexity of achieving sustainable profitability in Islamic banks, particularly due to their reliance on Sharia-compliant financial instruments. Previous studies (A. Bashir & Hassan, 2017; A.-H. M. Bashir, 2003) highlight the role of risk-sharing in fostering resilience during financial crises but also note the operational risks associated with these instruments. Furthermore, the absence of predetermined returns, characteristic of interest-based lending in conventional banks, necessitates meticulous liquidity and risk management in Islamic banking.

### Internal Determinants of Profitability

1. **Financing to Deposit Ratio (FDR).** The FDR reflects a bank's liquidity management by measuring the proportion of deposits utilized for financing activities. In Islamic banks, a higher FDR indicates efficient fund utilization in income-generating activities such as profit-sharing contracts or trade financing. Research by Hosen & Rahmawati (2016) suggests that an optimal FDR enhances profitability by maximizing returns on financing activities. However, excessively high FDR levels can strain liquidity and increase default risks, adversely affecting profitability.

2. **Capital Adequacy Ratio (CAR).** CAR represents a bank's financial strength and ability to absorb potential losses, serving as a safeguard against insolvency. While conventional studies, such as those by Athanasoglou et al. (2008), emphasize the positive relationship between CAR and profitability, findings specific to Islamic banks are mixed. Some research indicates that higher CAR levels enhance stakeholder confidence and reduce funding costs, indirectly boosting profitability. Others suggest that excessive capital reserves can limit income-generating activities, diminishing returns.
3. **Non-Performing Financing (NPF).** NPF measures the proportion of non-performing loans or financing within a bank's portfolio, reflecting credit risk. High NPF ratios negatively impact profitability by reducing recoverable funds and increasing provisions for bad debts. Studies by Samad & Hassan (1999) confirm the detrimental effect of NPF on profitability in Islamic banks, emphasizing the need for rigorous credit risk assessment and monitoring.
4. **Operating Efficiency Ratio (OER).** Operating efficiency, often measured by the OER (operating expenses to operating income), is a critical determinant of profitability. A lower BOPO ratio indicates efficient cost management, enhancing profit margins. Research by Wasiuzzaman & Tarmizi (2010) highlights the inverse relationship between OER and profitability in Islamic banks, noting that excessive operating costs erode earnings and compromise financial performance.

### External Determinants of Profitability

1. **Interest Rates.** Although Islamic banks operate under interest-free principles, interest rates remain relevant due to their influence on the broader financial environment. Higher interest rates can indirectly affect Islamic banks by increasing the cost of funds, particularly for hybrid financing instruments tied to benchmark rates. A study by Chong & Liu (2009) found that Islamic banks are not entirely insulated from interest rate fluctuations, as they influence customer preferences and competitive dynamics.
2. **Inflation.** Inflation impacts profitability by influencing operational costs, asset valuations, and consumer behavior. The relationship between inflation and profitability is complex, as moderate inflation can increase nominal income levels while excessive inflation erodes purchasing power and raises costs. Research by Srairi (2010) on Gulf Cooperation Council (GCC) Islamic banks reveals mixed effects of inflation, suggesting that its impact depends on the economic context and the bank's operational efficiency.

### Comparative Insights from Conventional Banking Studies

The determinants of profitability in conventional banks provide a valuable comparative perspective. Liquidity, capital adequacy, credit risk, and operational efficiency are universally recognized as key factors influencing profitability. However, their implications differ for Islamic banks due to the unique constraints and opportunities posed by Sharia compliance.

For instance, while conventional banks rely heavily on interest-based income, Islamic banks depend on profit-sharing and trade-based transactions, requiring a more cautious approach to liquidity management. Similarly, the prohibition of speculative activities in Islamic finance reduces exposure to certain market risks but limits access to high-yield investment opportunities. These distinctions highlight the need for tailored strategies to enhance profitability in Islamic banks.

### **Gaps in the Literature**

While existing research provides valuable insights into the determinants of profitability in Islamic banking, several gaps remain. First, most studies focus on individual factors, such as FDR or NPF, without examining their combined effects on profitability. This fragmented approach overlooks the interplay between internal and external variables, limiting the understanding of their collective impact.

Second, research specific to Indonesian Islamic banks is limited, despite the country's significant role in the global Islamic finance market. Studies that integrate macroeconomic factors, such as inflation and interest rates, with financial ratios are particularly scarce. Addressing this gap is critical for developing a comprehensive framework for analyzing profitability in Indonesian Islamic banks.

Finally, there is limited exploration of how operational efficiency, as measured by OER or BOPO, interacts with macroeconomic conditions to influence profitability. While BOPO is widely recognized as a key determinant of profitability, its relationship with external variables, such as inflation and interest rates, remains underexplored.

### **Relevance to Indonesian Islamic Banks**

Indonesia, as the largest Muslim-majority country, presents a unique context for examining the profitability of Islamic banks. The sector has grown rapidly in response to increasing consumer demand and supportive government policies, but profitability remains a challenge. Internal factors such as liquidity management and credit risk are particularly critical, given the reliance on profit-sharing contracts and trade financing. At the same time, macroeconomic conditions, including inflation and interest rate fluctuations, influence the cost of funds and consumer behavior, shaping the financial performance of Islamic banks.

The literature highlights the multifaceted nature of profitability in Islamic banking, shaped by a combination of internal and external factors. While financial ratios like FDR, CAR, NPF, and BOPO provide valuable insights into managerial practices, macroeconomic variables such as interest rates and inflation reflect broader economic conditions that influence profitability. However, existing research often treats these factors in isolation, overlooking their combined effects. This study addresses these gaps by integrating internal and external determinants of profitability, providing a comprehensive analysis tailored to the Indonesian Islamic banking context. By doing so, it contributes to the development of targeted strategies for enhancing the financial sustainability of Islamic banks.



## METHOD

### Research Design

A quantitative research design was selected to quantify the relationships between profitability and its determinants. This approach enables the measurement of the effects of financial and macroeconomic variables, such as the Financing to Deposit Ratio (FDR), Capital Adequacy Ratio (CAR), Non-Performing Financing (NPF), operating efficiency, interest rates, and inflation, on the profitability of Islamic banks. The dependent variable in this study is profitability, represented by the Return on Assets (ROA), a widely used indicator of financial performance in banking.

### Population and Sample

The study focuses on 12 Islamic banks operating in Indonesia, which constitute a significant portion of the country's Islamic banking sector. These banks were selected based on data availability and their operational scale, ensuring that the sample accurately represents the broader industry. Financial data and macroeconomic indicators were obtained for the period from 2014 to 2018, providing a longitudinal perspective on profitability trends.

### Data Collection

The study relies on secondary data collected from publicly available financial reports and publications, including annual reports, audited financial statements, and regulatory filings. Macroeconomic data, such as interest rates and inflation, were obtained from credible sources such as the Bank of Indonesia and the Indonesian Bureau of Statistics.

The dataset includes:

1. Financial Ratios: FDR, CAR, NPF, and BOPO (operating efficiency).
2. Macroeconomic Variables: Interest rates and inflation.
3. Profitability Measure: ROA, representing the bank's net income as a percentage of its total assets.

### Variables and Operational Definitions

#### 1. Dependent Variable

- Return on Assets (ROA): ROA measures profitability by indicating how effectively a bank utilizes its assets to generate income. It is calculated as:  

$$\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}} \times 100$$

#### 2. Independent Variables

- Financing to Deposit Ratio (FDR): FDR measures liquidity by showing the proportion of customer deposits used for financing activities.
- Capital Adequacy Ratio (CAR): CAR represents a bank's capital strength and its ability to absorb losses.



- Non-Performing Financing (NPF): NPF reflects credit risk by measuring the proportion of non-performing loans in a bank's financing portfolio.
- Operating Efficiency (BOPO): BOPO is calculated as the ratio of operating expenses to operating income, indicating cost efficiency.
- Interest Rates: Average annual interest rates, which influence the cost of funding and competitiveness.
- Inflation: Annual inflation rates, representing broader macroeconomic conditions.

### Analytical Framework

1. Statistical Analysis. The study employs multiple regression analysis to evaluate the effects of independent variables on ROA. This method allows for the simultaneous assessment of the relative contributions of each variable while controlling for potential confounding factors.

The general regression model is specified as:

$$ROA = \beta_0 + \beta_1(FDR) + \beta_2(CAR) + \beta_3(NPF) + \beta_4(BOPO) + \beta_5(\text{Interest Rates}) + \beta_6(\text{Inflation}) + \epsilon$$

$$\text{ROA} = \beta_0 + \beta_1(\text{FDR}) + \beta_2(\text{CAR}) + \beta_3(\text{NPF}) + \beta_4(\text{BOPO}) + \beta_5(\text{Interest Rates}) + \beta_6(\text{Inflation}) + \epsilon$$

Where:

$\beta_0$  is the intercept,

$\beta_1$  to  $\beta_6$  are the coefficients for each independent variable,

$\epsilon$  represents the error term.

2. Hypothesis Testing.

The study tests the following hypotheses:

H1H\_1: FDR has a significant positive effect on ROA.

H2H\_2: CAR has a significant positive effect on ROA.

H3H\_3: NPF has a significant negative effect on ROA.

H4H\_4: BOPO has a significant negative effect on ROA.

H5H\_5: Interest rates significantly affect ROA.

H6H\_6: Inflation significantly affects ROA.

A significance level of 5% ( $\alpha = 0.05$ ) is used to determine the statistical validity of the results.

3. Diagnostic Tests. To ensure the robustness of the regression model, diagnostic tests were conducted for multicollinearity, autocorrelation, and heteroscedasticity. Variance Inflation Factor (VIF) analysis was performed to detect multicollinearity, while the Durbin-Watson test assessed autocorrelation.



Residual plots and the Breusch–Pagan test were used to check for heteroscedasticity.

### Ethical Considerations

As this study utilizes secondary data from publicly available sources, there are no direct ethical risks. However, the integrity of the analysis was maintained by accurately representing the data and ensuring transparency in the research process. Proper citations were provided for all data sources to uphold academic standards.

## RESULTS

### Descriptive Statistical Analysis Results

Table 1 presents the results of the descriptive statistical analysis, based on 223 observations in this study. The results highlight the minimum, maximum, mean, and standard deviation for each variable. For example, the Return on Assets (ROA) variable has a standard deviation of 3.891492, which exceeds its mean of 0.818946, with a minimum value of -20.13000 and a maximum of 12.54000. The Financing to Deposit Ratio (FDR) has a standard deviation of 38.49508, which is smaller than its mean of 98.40230, with minimum and maximum values of 55.00000 and 500.0000, respectively. The Capital Adequacy Ratio (CAR) has a standard deviation of 35.28189, exceeding its mean of 27.43690, with a minimum value of 10.16000 and a maximum of 398.5700. Similarly, the Non-Performing Financing (NPF) variable has a standard deviation of 6.550335, larger than its mean of 5.323164, ranging from 0.000000 to 46.55000.

**Table 1**

*Descriptive Statistical Analysis Results*

Variable	Mean	Standard Deviation	Minimum	Maximum
ROA	0.818946	3.891492	-20.13000	12.54000
FDR	98.40230	38.49508	55.00000	500.0000
CAR	27.43690	35.28189	10.16000	398.5700
NPF	5.323164	6.550335	0.000000	46.55000
Interest Rate	6.128924	1.316871	4.250000	7.750000
OER	96.40030	22.57375	53.53000	217.4000
Inflation	4.625247	1.746297	2.880000	8.360000

Source: Primary data. Authors' estimation.

Other variables exhibit varying statistical characteristics. The Interest Rate variable has a standard deviation of 1.316871, which is smaller than its mean of 6.128924, with minimum and maximum values of 4.250000 and 7.750000, respectively. The Operational Efficiency Ratio (OER) has a standard deviation of 22.57375, lower than its mean of 96.40030, with a minimum of 53.53000 and a maximum of 217.4000. Lastly, the Inflation variable has a standard deviation of 1.746297, which is also lower than its mean of 4.625247, with a minimum value of 2.880000 and a maximum of 8.360000. These descriptive statistics provide insights into the distribution and variability of the data, which serve as the foundation for further analysis.

### Classical Assumption Test Results

Table 2 presents a summary of classical assumption test results in this study. The normality test is a crucial prerequisite for assessing the significance of regression coefficients. To evaluate whether the residuals in this study follow a normal distribution, the Jarque–Bera (JB) test was applied. The decision rule for this test compares the JB probability value to a significance level of 0.05. If the JB probability exceeds 0.05, the residuals are normally distributed; otherwise, they are not. The analysis results indicate that the JB value is 0.288249, which is greater than 0.05. Therefore, it can be concluded that the residuals in this regression model follow a normal distribution, satisfying the normality assumption.

**Table 2**

#### *Classical Assumption Test Results*

Assumption Test	Test Statistic	Probability Value	Decision
Normality Test (JB)	0.288249	0.288249	Residuals are normally distributed
Multicollinearity Test (VIF)	< 10 for all variables	–	No multicollinearity detected
Heteroskedasticity Test (White)	Chi-square Obs*R-Squared	0.1063	No heteroskedasticity present
Autocorrelation Test	Chi-square Obs*R-Squared	0.0618	No autocorrelation detected

Source: Primary data. Authors' estimation.

Multicollinearity occurs when a significant linear correlation exists between two or more independent variables in a regression model. The presence of multicollinearity can lead to unreliable coefficient estimates, making regression results unstable. To detect multicollinearity, the Variance Inflation Factor (VIF) was used. A VIF value below 10 indicates the absence of multicollinearity. Based on the analysis, all variables in this study have VIF values below this threshold, confirming that the regression model does not suffer from multicollinearity. Since this assumption is met, further regression analysis can be conducted with reliable coefficient estimations.

Heteroscedasticity refers to the condition where the variance of the error terms is not constant across observations. The White Heteroskedasticity test was used to examine this issue. The test focuses on the probability value of the Chi-square Obs\*R-Squared statistic. If the probability exceeds the significance level (0.05), heteroscedasticity is not present; otherwise, it exists. The analysis results show a probability value of 0.1063, which is greater than 0.05. Consequently, the model passes the heteroscedasticity test, indicating that the variance of the residuals is homoscedastic, fulfilling this classical assumption.

Autocorrelation occurs when error terms in a regression model are correlated across time, which is particularly common in time-series data. Strong autocorrelation can lead to biased standard errors and unreliable t-statistics. The presence of autocorrelation was tested using the Chi-square Obs\*R-Squared statistic. The decision rule states that if the probability value exceeds 0.05, the model is free from

autocorrelation. The test results indicate a probability value of 0.0618, which is higher than 0.05. Therefore, it can be concluded that the regression model does not exhibit autocorrelation, confirming that this assumption is satisfied.

### Hypothesis Testing and Regression Analysis Test Results

Multiple linear regression analysis was conducted to examine the relationship between the independent variables and profitability (ROA). Table 3 presents a summary of hypothesis testing and regression analysis test results in this study. The estimated regression equation obtained from the analysis is as follows:

$$Y = 16.075 + 0.009X_1 + 0.002X_2 - 0.076X_3 - 0.303X_4 - 0.142X_5 - 0.049X_6$$

where YY represents profitability (ROA),  $X_1$  is FDR,  $X_2$  is CAR,  $X_3$  is NPF,  $X_4$  is interest rate,  $X_5$  is OER, and  $X_6$  is inflation. The regression coefficients indicate the direction and magnitude of the impact each independent variable has on profitability. A positive coefficient suggests that an increase in the independent variable leads to an increase in profitability, while a negative coefficient indicates a decrease. For instance, an increase in FDR by one unit is associated with a 0.009 increase in ROA, whereas an increase in OER by one unit is linked to a 0.142 decrease in ROA.

The t-test was used to assess the significance of individual independent variables in explaining variations in profitability. The results indicate that FDR has a significant positive effect on ROA, with a p-value of 0.0235, which is below the 5% significance threshold. Conversely, CAR does not significantly influence ROA, as its p-value of 0.6547 exceeds 0.05. These findings suggest that while financing-to-deposit ratio plays a crucial role in determining profitability, the capital adequacy ratio does not exert a statistically significant impact.

Similarly, the NPF variable significantly affects profitability, as indicated by its p-value of 0.0014. This negative relationship implies that an increase in non-performing financing reduces profitability. Additionally, interest rate variations significantly impact profitability, with a p-value of 0.0295. An increase in interest rates leads to a decline in profitability, reinforcing the notion that higher borrowing costs can hinder financial performance.

The results also demonstrate that OER significantly affects profitability, with a p-value of 0.0000, indicating a strong negative relationship. This suggests that higher operational expenses relative to revenue negatively impact ROA. However, inflation does not significantly affect profitability, as its p-value of 0.6345 exceeds the 5% threshold. This implies that inflationary pressures do not have a direct and measurable effect on profitability within the context of this study.

The F-test was conducted to determine whether all independent variables collectively influence profitability. The results indicate a Prob (F-statistic) value of 0.000000, which is lower than 0.05, confirming that FDR, CAR, NPF, interest rate, OER, and inflation jointly influence ROA. This finding underscores the importance of considering multiple financial and economic factors when analyzing profitability determinants.

The coefficient of determination ( $R^2$ ) was examined to assess the explanatory power of the regression model. The adjusted  $R^2$  value is 0.7725, meaning that

approximately 77.25% of the variability in profitability can be explained by the independent variables included in the model. The remaining 22.75% is influenced by other factors not accounted for in this study. This indicates that the model has a strong explanatory capability, reinforcing its reliability in evaluating profitability determinants.

**Table 3**

*Hypothesis Testing and Regression Analysis Results*

Test	Statistic	Probability Value	Decision
t-Test (FDR)	0.0235	< 0.05	Significant effect on profitability
t-Test (CAR)	0.6547	> 0.05	No significant effect on profitability
t-Test (NPF)	0.0014	< 0.05	Significant negative effect on profitability
t-Test (Interest Rate)	0.0295	< 0.05	Significant negative effect on profitability
t-Test (OER)	0.0000	< 0.05	Significant negative effect on profitability
t-Test (Inflation)	0.6345	> 0.05	No significant effect on profitability
F-Test	0.000000	< 0.05	All independent variables significantly influence profitability
Coefficient of Determination ( $R^2$ )	0.7725	-	77.25% of profitability variability explained by the model

Source: Primary data. Authors' estimation.

## DISCUSSION

### Financing to Deposit Ratio (FDR): Optimizing Liquidity Utilization

The findings of this study confirm that the Financing to Deposit Ratio (FDR) significantly impacts the profitability of Islamic banks, as evidenced by a p-value of 0.0235, which is below the 5% significance threshold. This result supports previous research that highlights the role of FDR in shaping banking profitability. Sopingi et al. (2023) found that third-party deposits negatively affect profitability, emphasizing the need for efficient liquidity management. Similarly, Widarjono & Misanam (2023) argue that a strong balance sheet, as reflected in high ROA, enables banks to expand their financing portfolios, thereby increasing profitability. Furthermore, Katili & Kadir (2023) identified a positive correlation between FDR and market share, suggesting that effective deposit utilization enhances competitiveness. These studies collectively underscore that while higher FDR ratios indicate greater utilization of deposits for financing, maintaining a balance between liquidity and profitability is crucial for sustainable banking operations.

In contrast, other research has pointed out potential risks associated with a high FDR. Mukhibad & Khafid (2018) emphasize that Islamic banks must carefully manage Profit and Loss Sharing (PLS) financing, as excessive exposure to high-risk financing can negatively impact profitability. Halim & Buana (2021) further highlight that Non-Performing Financing (NPF), alongside FDR and operational costs, significantly influences ROA, demonstrating that poor financing quality can erode profitability. Additionally, 'Izza & Utomo (2022) found that the relationship between FDR and profitability is moderated by the Capital Adequacy Ratio (CAR), which helps absorb potential losses from non-performing loans. These findings suggest that while a higher

FDR can drive profitability, improper risk management can lead to financial instability, necessitating a cautious approach to deposit utilization.

For Islamic banks in Indonesia, these findings hold significant implications. Effective liquidity management is essential to balance profitability and financial stability. Given the unique operational framework of Islamic banks, which prohibits interest-based transactions, maintaining an optimal FDR requires strategic fund allocation aligned with Shariah principles. As highlighted by Darma & Afandi (2021), strong Islamic corporate governance plays a critical role in ensuring financial performance. Additionally, Yastika et al. (2020) stress that the impact of FDR on profitability varies across banks depending on their capital adequacy. Therefore, Islamic banks must adopt a holistic financial management approach that integrates liquidity strategies, risk assessment, and regulatory compliance to enhance their long-term profitability and competitiveness in the financial sector.

### **Capital Adequacy Ratio (CAR): Stability Without Direct Profit Impact**

The findings of this study indicate that the Capital Adequacy Ratio (CAR) does not significantly impact the profitability of Islamic banks, as evidenced by a p-value of 0.6547, which exceeds the 5% significance threshold. This suggests that variations in CAR do not directly influence Return on Assets (ROA). Previous studies have also explored this relationship, with some highlighting the limited role of CAR in determining profitability. For example, Widarjono et al. (2022) suggest that while capital buffers are crucial for financial stability, they may not always translate into higher profitability, especially if banks do not effectively utilize their capital for productive financing. Similarly, Muhammad & Triharyono (2019) found that during financial downturns, Islamic banks with strong capital positions were better able to withstand economic shocks, yet their profitability remained dependent on other operational factors rather than just capital adequacy. These findings reinforce the argument that while CAR is an important indicator of financial resilience, it does not necessarily drive profitability in Islamic banks.

Despite these findings, other research suggests that CAR can positively influence profitability under specific conditions. Berniz et al. (2023) argue that banks with higher CAR are better positioned to manage risks and optimize their financing activities, leading to improved profitability. Similarly, Ajizah & Widarjono (2022) emphasize that operational efficiency plays a crucial role in determining whether CAR enhances profitability, as banks with well-managed costs and strong asset quality tend to benefit more from higher capital reserves. Moreover, Putri et al. (2023) highlight the role of regulatory requirements, noting that the minimum CAR mandated in Indonesia helps ensure banking stability while allowing banks to pursue profit-generating activities. These studies suggest that while CAR alone may not be a direct determinant of profitability, its interaction with other financial and operational factors can influence a bank's overall financial performance.

For Islamic banks in Indonesia, these findings hold significant implications. While maintaining an adequate CAR is essential for financial stability and regulatory

compliance, banks must also focus on optimizing asset utilization and operational efficiency to enhance profitability. The absence of a significant direct relationship between CAR and ROA suggests that Islamic banks should not solely rely on increasing their capital buffers to improve financial performance. Instead, they should adopt a comprehensive financial management approach that integrates risk assessment, cost efficiency, and strategic fund allocation. As highlighted by Darma & Afandi (2021), strong Islamic corporate governance is essential for ensuring prudent capital management and aligning financial strategies with Shariah principles. By balancing capital adequacy with effective asset management and operational efficiency, Islamic banks can strengthen their competitive position and achieve long-term financial sustainability.

### **Non-Performing Financing (NPF): Addressing Credit Risk**

The findings of this study confirm that Non-Performing Financing (NPF) significantly impacts the profitability of Islamic banks, as indicated by a p-value of 0.0014, which is below the 5% significance threshold. NPF represents the proportion of financing that becomes problematic due to borrower defaults, directly affecting Return on Assets (ROA) and overall financial performance. Previous research supports this relationship, highlighting that high NPF levels undermine profitability by increasing provisioning costs and reducing the bank's ability to generate income from financing activities. For instance, Widarjono et al. (2022) found that elevated NPF levels in Indonesian Islamic banks negatively impact their financial performance, as poor asset quality leads to reduced returns. Similarly, Sjarief et al. (2023) emphasized that managing NPF effectively is crucial for sustaining the profitability of Islamic banks, as uncontrolled credit risk can erode financial stability over time. These findings reinforce the idea that maintaining low NPF ratios is essential for enhancing bank profitability.

The negative impact of NPF on profitability is further corroborated by studies examining the operational and structural factors influencing Islamic banking performance. Mukhibad & Anisykurlillah (2020) highlight that the Profit and Loss Sharing (PLS) financing model, commonly used in Islamic banks, introduces additional risks that can contribute to higher NPF levels. This occurs due to the potential for moral hazard, where borrowers engage in riskier financial behavior, knowing that losses will be shared with the bank. Additionally, Widarjono & Misanam (2023) observed that external economic factors, such as the COVID-19 pandemic, have exacerbated NPF levels, further straining Islamic banks' profitability. Furthermore, Sudarsono & Shiddiqi (2022) found that a high Financing to Deposit Ratio (FDR) can increase NPF if financing is not managed prudently, leading to a decline in ROA. These studies suggest that while NPF is a key determinant of profitability, its impact is intertwined with broader financial and economic conditions, requiring a comprehensive risk management approach.

For Islamic banks in Indonesia, these findings underscore the urgent need for effective NPF management strategies to maintain profitability and financial stability. High NPF levels not only reduce short-term income but also harm investor confidence and long-term growth prospects. As highlighted by Mukhibad & Khafid (2018), strong



governance mechanisms, particularly the role of the Sharia Supervisory Board (SSB), can improve risk management practices and help mitigate the adverse effects of NPF. Additionally, regulatory frameworks should encourage prudent credit assessments and provisioning strategies to prevent excessive exposure to non-performing assets. Given the competitive nature of the Islamic banking sector, institutions must focus on optimizing financing quality, strengthening credit risk assessment, and implementing proactive recovery strategies to sustain profitability while maintaining Sharia compliance. By addressing these challenges, Islamic banks in Indonesia can enhance their financial resilience and contribute more effectively to economic development.

### **Operating Efficiency Ratio (OER): A Critical Driver of Profitability**

The findings of this study confirm that the Operational Expense Ratio (OER), also known as the Operating Expenses to Operating Income Ratio (*Biaya Operasional Pendapatan Operasional* abbreviated BOPO in Bahasa Indonesia), significantly influences the profitability of Islamic banks, as evidenced by a p-value of 0.0000, which is below the 5% significance threshold. OER is a crucial metric for assessing operational efficiency, as it reflects how effectively a bank manages its expenses relative to its revenue. A lower OER indicates higher efficiency and greater profitability, while a higher OER suggests operational inefficiencies that can negatively impact Return on Assets (ROA). Previous studies support this inverse relationship between OER and profitability. Sholikhin et al. (2021) found that an increase in operational costs relative to income significantly reduces Islamic banks' profitability, reinforcing the importance of cost efficiency. Similarly, Sari & Riyadi (2022) highlighted that a high OER negatively affects profitability, as rising operational expenses lower the bank's net income. Ali et al. (2021) further emphasized that operational efficiency is a key determinant of financial performance in Islamic banks, particularly during economic downturns when maintaining a low OER becomes even more critical.

While the majority of research supports the negative relationship between OER and profitability, some studies highlight variations in its impact across different banking contexts. Rustam & Adil (2022) found that the effect of OER on profitability varies among Islamic banks, suggesting that individual banks may experience different efficiency levels based on their management strategies and market conditions. Additionally, Malek & Rao (2022) emphasize that strong corporate governance can mitigate the negative effects of high OER by ensuring that resources are allocated effectively and operational inefficiencies are minimized. Furthermore, Suryadi et al. (2022) highlight the interplay between OER and other financial ratios, such as the Capital Adequacy Ratio (CAR) and Non-Performing Loan (NPL) ratios, in determining profitability. These findings indicate that while OER is a critical factor, its impact on ROA is influenced by broader financial management strategies and governance structures within Islamic banks.

For Islamic banks in Indonesia, these findings underscore the need for enhanced cost management strategies to sustain profitability. Given the competitive nature of the banking sector, Islamic banks must prioritize operational efficiency by adopting technology-driven solutions, streamlining internal processes, and implementing



stringent cost-control measures. As highlighted by Muhammad & Triharyono (2019), Islamic banks should also integrate multiple financial indicators to develop a holistic approach to performance evaluation. Additionally, regulatory bodies play a crucial role in promoting efficiency within the Islamic banking sector by establishing guidelines that encourage prudent financial management. In times of economic uncertainty, such as the COVID-19 pandemic, banks must reinforce their resilience by maintaining a low OER while ensuring stable income streams (F. Rizal, 2022). By focusing on operational efficiency, Islamic banks in Indonesia can strengthen their financial performance, enhance their market competitiveness, and contribute to the long-term sustainability of the industry.

### **Interest Rates: Indirect Influence on Islamic Banking**

The findings of this study confirm that interest rates significantly impact the profitability of Islamic banks, as indicated by a p-value of 0.0295, which is below the 5% significance threshold. Although Islamic banks do not engage in interest-based transactions, the conventional banking system's interest rates influence their financial landscape, particularly in dual banking systems like Indonesia. When Bank Indonesia (BI) raises interest rates, deposit rates in conventional banks increase, prompting customers to shift their funds away from Islamic banks in search of higher returns. This reduction in third-party funds (TPF) in Islamic banks constrains their financing capabilities, leading to lower profitability. Prior research supports this relationship; for instance, Nursyamsiah (2018) found that macroeconomic factors, including interest rates, significantly affect the financing and profitability of Islamic banks. Similarly, Khalidin & Masbar (2017) demonstrated that interest rates indirectly influence Islamic bank financing in Indonesia, reinforcing the idea that fluctuations in interest rates can shape Islamic banks' profitability, despite their adherence to Sharia principles.

Further research highlights the complexity of the relationship between interest rates and Return on Assets (ROA) in Islamic banking. While some studies emphasize the adverse effects of rising interest rates, others suggest that Islamic banks can mitigate these impacts through strategic financial management. For example, Sudarsono & Shiddiqi (2022) argue that Islamic banks adopt more conservative financing strategies, reducing their exposure to the risks associated with interest rate fluctuations. Additionally, Nurkhin et al. (2023) found that strong corporate governance practices help Islamic banks navigate interest rate volatility more effectively, ensuring financial stability. Furthermore, Rizal (2022) observed that in periods of high inflation, where central banks raise interest rates to control inflationary pressures, Islamic banks may face additional profitability challenges due to increased financing costs. These studies collectively suggest that while interest rates influence Islamic banking profitability, the extent of their impact depends on a combination of macroeconomic conditions, financial strategies, and governance structures.

For Islamic banks in Indonesia, these findings underscore the importance of proactive financial management in mitigating the effects of interest rate fluctuations. Since higher interest rates in the conventional banking sector can lead to a decline in

Islamic bank deposits, strategic measures such as competitive profit-sharing schemes and enhanced customer retention strategies are essential to maintaining liquidity and profitability. Moreover, as noted by Hasibuan et al. (2022), financial ratios like the Capital Adequacy Ratio (CAR) and Financing to Deposit Ratio (FDR) play a crucial role in moderating the impact of interest rates on profitability. By strengthening their capital buffers and optimizing asset allocation, Islamic banks can enhance their financial resilience. Additionally, regulatory support, including policies that promote the stability and competitiveness of Islamic banking, can help mitigate the challenges posed by interest rate movements. Ultimately, maintaining profitability in an interest-driven financial environment requires Islamic banks to continuously refine their financial strategies while remaining compliant with Sharia principles.

### **Inflation: Resilience Amid Macroeconomic Fluctuations**

The findings of this study confirm that inflation does not significantly impact the profitability of Islamic banks, as indicated by a p-value of 0.6305, which is above the 5% significance threshold. This suggests that variations in inflation rates do not directly influence Return on Assets (ROA). One possible explanation for this result is the relative stability of inflation in Indonesia between 2014 and 2018, which may have minimized its impact on banking profitability. Previous research supports this finding, with Sholikhin et al. (2021) concluding that inflation has an insignificant effect on the profitability of Indonesian Islamic banks, likely due to the banks' resilience and risk-sharing financing models. Similarly, Windriya et al. (2023) found that the sensitivity of Net Operating Margin (NOM) to inflation does not significantly affect the profitability of Islamic banks. These studies suggest that Islamic banks may be better insulated from inflationary pressures compared to their conventional counterparts, primarily due to their unique operational frameworks and reliance on profit-sharing principles rather than interest-based transactions.

Despite the general consensus that inflation has a minimal effect on Islamic bank profitability, some studies indicate a potential positive relationship. Hasyim et al. (2023) argue that inflation, along with other macroeconomic variables, can influence ROA, particularly during periods of economic growth when increased demand for financing leads to higher income for banks. Similarly, Rizal et al. (2021) suggest that inflation can affect ROA through changes in consumer behavior and demand for financial products. However, this effect is context-dependent and varies based on broader economic conditions. For instance, Widarjono (2020) found that inflation moderates the relationship between the Capital Adequacy Ratio (CAR) and ROA, suggesting that banks with stronger capital positions are better equipped to withstand inflationary pressures. These findings highlight the complexity of the relationship between inflation and banking profitability, indicating that while inflation may not have a direct effect, it can still interact with other financial indicators to shape overall financial performance.

For Islamic banks in Indonesia, these findings underscore the importance of maintaining financial stability in varying economic conditions. While inflation may not significantly impact profitability, external economic factors such as monetary policy,

exchange rates, and consumer spending behaviors can still affect overall financial performance. As highlighted by Hidayat et al. (2021), inflation can influence operational efficiency by increasing costs, which, if left unaddressed, could erode profit margins. To mitigate such risks, Islamic banks should adopt proactive financial management strategies, including strengthening their capital buffers, optimizing cost structures, and diversifying their income sources. Additionally, effective corporate governance, as emphasized by Nurkhin et al. (2023), plays a crucial role in ensuring that banks remain resilient in the face of inflationary fluctuations. By implementing these strategies, Islamic banks can enhance their long-term sustainability and maintain profitability despite changes in the broader economic environment.

### **Integrated Insights: A Holistic Approach to Profitability**

The profitability of Islamic banks, as measured by Return on Assets (ROA), is influenced by a combination of financial ratios and macroeconomic variables. This study finds that the Financing to Deposit Ratio (FDR), Capital Adequacy Ratio (CAR), Non-Performing Financing (NPF), interest rates, Operating Expense Ratio (OER or BOPO), and inflation collectively affect the profitability of Islamic banks. These findings align with previous studies emphasizing the interconnectedness of these factors. For example, Widarjono (2020) noted that a higher FDR enables banks to finance more projects, potentially increasing income and improving ROA. However, excessive financing without proper risk assessment can lead to financial instability. Similarly, Sjarief et al. (2023) found that CAR does not significantly impact profitability, suggesting that capital adequacy alone is insufficient to enhance ROA without complementary risk management practices. The negative effect of NPF on ROA, as highlighted by Maulidar & Majid (2020), underscores the importance of maintaining credit quality. Furthermore, studies such as those by Sholikhin et al. (2021) confirm that higher operational costs, reflected in BOPO, reduce profitability, emphasizing the need for efficient cost management.

Contrary to the prevailing consensus, some studies suggest that the impact of these financial ratios and macroeconomic variables on ROA may vary across different contexts. Hasyim et al. (2023) found that inflation, often deemed insignificant in affecting Islamic bank profitability, can exert a positive influence under certain economic conditions, particularly when demand for financing increases. Similarly, Rizal et al. (2021) argued that fluctuations in interest rates, although not directly relevant to Islamic banks, can indirectly affect their financial performance by altering customer behavior and financing demand. However, these contrasting findings do not necessarily contradict the broader understanding of Islamic bank profitability but rather highlight the complex and dynamic nature of these relationships. The variability in research outcomes suggests that the influence of financial ratios and macroeconomic indicators depends on external economic conditions, regulatory environments, and bank-specific operational strategies.

For Islamic banks in Indonesia, these findings highlight the need for a holistic approach to financial management. Given the combined influence of internal and external factors on profitability, Islamic banks must balance financing expansion with

risk mitigation strategies to ensure sustainable growth. Strengthening credit risk management to reduce NPF, enhancing cost efficiency to minimize BOPO, and maintaining adequate capital reserves are critical steps in optimizing profitability. Additionally, as macroeconomic conditions such as inflation and interest rate fluctuations can indirectly affect Islamic bank performance, adaptive strategies must be employed to navigate changing economic environments. Effective corporate governance, as emphasized by Nurkhin et al. (2023), also plays a crucial role in ensuring resilience against external shocks. By integrating robust risk management, operational efficiency, and strategic adaptability, Islamic banks can enhance their financial sustainability and competitiveness in Indonesia's evolving banking sector.

## CONCLUSION

This study examined the determinants of profitability in Indonesian Islamic banks by analyzing the effects of financial ratios—Financing to Deposit Ratio (FDR), Capital Adequacy Ratio (CAR), Non-Performing Financing (NPF), and Operating Efficiency Ratio (OER)—alongside macroeconomic factors like interest rates and inflation. The findings indicate that FDR and OER or BOPO significantly influence profitability, with higher FDR enhancing income generation and higher OER or BOPO eroding profit margins. NPF has a strong negative effect, emphasizing the importance of managing credit risk, while CAR shows no significant direct impact on profitability. Among external factors, interest rates significantly affect profitability, even in a Sharia-compliant banking system, while inflation demonstrates no notable effect, suggesting resilience to moderate macroeconomic pressures.

These results highlight the complex interplay of internal and external factors in shaping Islamic bank profitability, emphasizing the need for operational efficiency, robust credit risk management, and adaptive strategies to macroeconomic conditions. The findings contribute to the broader understanding of Islamic banking by integrating internal and macroeconomic determinants, providing actionable insights for managers and policymakers to enhance financial sustainability.

This study's significance lies in its comprehensive approach, bridging gaps in the literature by considering both financial ratios and macroeconomic variables in the Indonesian context. Future efforts to optimize operational efficiency and credit risk management could further strengthen the sector's competitiveness in an evolving financial environment.

## Limitations of the Study

While the findings provide valuable insights into the profitability of Indonesian Islamic banks, several limitations warrant attention. First, the study relies on secondary data from financial reports and macroeconomic sources, which limits its ability to explore qualitative factors such as managerial decision-making, corporate culture, or consumer behavior. Incorporating primary data through interviews or surveys could provide a richer understanding of the dynamics influencing profitability.

Second, the analysis focuses on a specific five-year period (2014–2018), which may not fully capture long-term trends or the effects of significant economic disruptions, such as the COVID-19 pandemic. Expanding the temporal scope of future research could enhance the robustness of findings and provide insights into how profitability determinants evolve over time.

Lastly, the study is context-specific to Indonesian Islamic banks, which limits the generalizability of its findings to other regions or countries with different regulatory and economic environments. Comparative studies across multiple countries could provide broader perspectives on the global Islamic banking sector.

Despite these limitations, the study offers a solid foundation for understanding profitability determinants in Islamic banks, contributing to the development of strategies for enhancing financial performance in a Sharia-compliant framework.

### Recommendations for Future Research

Future research should explore profitability determinants across broader temporal and geographic contexts to examine how long-term trends and diverse regulatory environments influence Islamic bank performance. Longitudinal studies could track the impact of significant events, such as economic crises, on profitability and resilience in Islamic banks.

Incorporating qualitative methods, such as interviews with bank executives and surveys of consumers, would add depth to the analysis, uncovering factors like managerial strategies, consumer preferences, and employee practices that contribute to profitability. Such approaches could complement quantitative findings, offering a more holistic view of the dynamics shaping Islamic banking.

Additionally, research could investigate the role of innovation and technology in enhancing operational efficiency and credit risk management. As digital transformation becomes increasingly important in the financial sector, exploring how Islamic banks adopt fintech solutions to improve profitability would provide valuable insights.

Finally, cross-national comparative studies could assess how differences in regulatory frameworks, cultural factors, and economic conditions shape profitability determinants in Islamic banks globally. These studies would not only provide broader insights but also identify best practices for optimizing financial sustainability in the Islamic banking sector.

### Author Contributions

Conceptualization	K.N. & Y.A.	Resources	Y.A.
Data curation	K.N. & Y.A.	Software	K.N. & Y.A.
Formal analysis	K.N., Y.A., & B.B.H.	Supervision	Y.A.
Funding acquisition	K.N. & Y.A.	Validation	K.N., Y.A., & B.B.H.
Investigation	K.N. & Y.A.	Visualization	K.N. & Y.A.
Methodology	K.N. & Y.A.	Writing – original draft	K.N., Y.A., & B.B.H.
Project administration	K.N. & Y.A.	Writing – review & editing	K.N., Y.A., & B.B.H.

All authors have read and agreed to the published version of the manuscript.

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The study was approved by Program Studi Ekonomi Islam (S1), Fakultas Ilmu Agama Islam, Universitas Islam Indonesia, Yogyakarta, Indonesia.

## Informed Consent Statement

Informed consent was not required for this study.

## Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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## Conflicts of Interest

The authors declare no conflicts of interest.

## Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work the authors used ChatGPT, DeepL, Grammarly, and PaperPal in order to translate from Bahasa Indonesia into American English, and to improve clarity of the language and readability of the article. After using these tools, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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