

Bank-Specific and Macroeconomic Determinants of Islamic Bank Profitability: Evidence from Indonesian Sharia Commercial Banks

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ABSTRACT

Keywords:

Islamic Commercial Banks; Bank Profitability; Bank-Specific Factors; Macroeconomic Determinants; Panel Data Regression;

Background: Background: The profitability of Islamic Commercial Banks in Indonesia is essential for maintaining financial stability and sustainable growth. However, increasing banking assets do not necessarily translate into improved financial performance, highlighting the importance of identifying profitability determinants.

Research Gap: Previous studies have reported inconsistent findings regarding the effects of bank-specific and macroeconomic factors on Islamic bank profitability, particularly amid structural transformations in Indonesia's Islamic banking industry.

Novelty: This study provides updated empirical evidence by simultaneously examining internal banking characteristics and macroeconomic determinants within the context of industry consolidation, pandemic-related disruptions, and post-pandemic recovery.

Method: This quantitative study employs a causal research design using secondary panel data from Indonesian Islamic Commercial Banks. Purposive sampling and panel data regression using the Random Effect Model were applied to examine profitability, measured by Return on Assets (ROA).

Results: The findings demonstrate that Capital Adequacy Ratio (CAR) and Financing-to-Deposit Ratio (FDR) positively and significantly affect profitability, whereas Operating Expenses to Operating Income (BOPO) has a significant negative effect. Non-Performing Financing (NPF), inflation, and the BI Rate exhibit no statistically significant effects. Collectively, the variables significantly explain profitability, with an adjusted R² of 78.94%.

Conclusion: Bank-specific factors, particularly capital adequacy, financing intermediation, and operational efficiency, are more influential in determining Islamic bank profitability than the examined macroeconomic indicators. These findings emphasize the importance of strengthening capital management, optimizing productive financing, and improving operational efficiency.

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INTRODUCTION

The Islamic banking industry in Indonesia has continued to demonstrate robust expansion. According to the Financial Services Authority (Otoritas Jasa Keuangan, OJK, 2020), the total assets of the Islamic banking sector increased significantly from IDR 304.0 trillion in 2015 to IDR 608.9 trillion in 2020. This positive trend continued within the Islamic Commercial Banks (Bank Umum Syariah/BUS) segment, where total assets rose from IDR 397.07 trillion in December 2020 to a peak of IDR 664.66 trillion in December 2024 (OJK, 2024), before stabilizing at approximately IDR 640–650 trillion through mid-2025 (OJK, 2025). This sustained growth reflects increasing public confidence in Islamic banking services while reinforcing the sector's role in supporting Indonesia's national financial system.

Nevertheless, rapid asset growth does not necessarily translate into a corresponding improvement in banks' ability to generate profits (Khalaf & Awad, 2024; Ubaidillah, 2024). Previous studies have shown that the profitability of Islamic banks is influenced by a combination of internal factors, including capital structure, operational efficiency, financing quality, and liquidity, as well as external factors represented by macroeconomic conditions that shape the banking business environment (Humairah et al., 2023; Nisa & Andriansyah, 2023). Therefore, profitability remains a strategic indicator for evaluating the sustainability, efficiency, and competitiveness of the Islamic banking industry (Azzabi & Lahrichi, 2023).

Profitability plays a crucial role because it reflects a bank's ability to utilize its resources efficiently to generate sustainable earnings. High profitability strengthens capital adequacy, financing capacity, and the risk resilience of Islamic banks. Conversely, low profitability constrains business expansion, reduces competitiveness, and limits the banking sector's contribution to the national economy (Ghenimi, 2026). Consistent with this view, Id et al. (2023) demonstrated that banks' financial characteristics are important determinants of profitability, whereas Wahyudi et al. (2024) emphasized that macroeconomic factors should be considered simultaneously to provide a more comprehensive explanation of profitability variations among Islamic Commercial Banks.

From a theoretical perspective, banks function as financial intermediaries by mobilizing funds from surplus units and channeling them to deficit units requiring financing (Syamlan et al., 2023). The effectiveness of this intermediation function depends on banks' ability to manage risks, allocate resources efficiently, and adapt their operational strategies to changes in economic conditions. Accordingly, bank profitability is determined not only by internal characteristics (bank-specific factors) but also by macroeconomic conditions (macroeconomic factors) (Afrin, 2024).

Recent empirical evidence indicates that capital adequacy, financing quality, liquidity, operational efficiency, bank size, inflation, and economic growth are among the most frequently examined determinants of Islamic bank profitability (Afrin, 2024; Humairah et al., 2023; Nisa & Andriansyah, 2023; Nourrein et al., 2020). A broader review of the literature further concludes that the interaction between bank-specific factors and the macroeconomic environment provides the most comprehensive framework for explaining the performance of modern banking institutions (Ullah et al., 2024).

The relationship between bank-specific factors, macroeconomic factors, and profitability has been extensively investigated in the context of Islamic banking (Afrin, 2024; Akuan et al., 2024; Al-Shaghdari et al., 2024; Kanapiyanova et al., 2022; Kharabsheh, 2026). Iqbal et al. (2026) found that the stability of Islamic banks in Asia is influenced by liquidity risk, financing risk, inflation, economic growth, and governance quality, particularly government effectiveness, the rule of law, and control of corruption. Similarly, Haryono et al. (2025) reported that bank-specific factors constitute the primary determinants of Islamic banking performance, whereas the effects of macroeconomic variables, such as inflation and exchange rates, tend to vary between the short and long run. Furthermore, Afrin (2024) examined the effects of bank-specific and macroeconomic factors on the profitability of Islamic banks in Bangladesh during the 2010–2022 period using panel data from eight Islamic banks. The study employed Pooled Ordinary Least Squares (Pooled OLS), Fixed Effects, Random Effects, and the Generalized Method of Moments (GMM). The findings revealed that asset management quality, liquidity, and credit risk positively affect profitability, whereas capital adequacy, operational efficiency, and bank size exert negative effects. Moreover, inflation and the interest rate spread positively influence profitability, while gross domestic product (GDP) growth has no significant effect.

Humairah et al. (2023) examined the factors influencing the profitability of Islamic banks in Indonesia, focusing on leverage, firm size, capital adequacy, and liquidity during the 2007–2018 period. The study employed a quantitative approach using multiple regression analysis, with profitability measured by Return on Assets (ROA). The findings indicate that leverage and liquidity have a positive and significant effect on profitability, whereas firm size has a negative and significant effect. In contrast, capital adequacy does not have a significant impact on the profitability of Islamic banks. Consistent with these findings, Jedidia and Salah (2022) investigated the effect of liquidity on the profitability of 34 Islamic banks in the Middle East and North Africa (MENA) region over the 2005–2017 period using the Panel Threshold Regression approach. Their results reveal a nonlinear relationship between liquidity and profitability. Liquidity has a negative effect on profitability when the financing-to-total-assets ratio is below the threshold value but exerts a positive effect once the ratio exceeds the threshold. Furthermore, bank size negatively affects profitability, while the Capital Adequacy Ratio (CAR) has a significant effect under both conditions. These findings suggest the existence of a trade-off between liquidity and profitability, highlighting liquidity risk management as a critical factor in enhancing the performance of Islamic banks.

Beyond emphasizing liquidity and bank characteristics, subsequent studies have expanded the analysis by simultaneously incorporating both internal and external factors. Syah et al. (2021) examined the effects of internal and external factors on the profitability of Islamic Commercial Banks in Indonesia during the 2015–2018 period using data from 14 Islamic banks. Profitability was measured using Return on Assets (ROA) and Return on Equity (ROE), while the analysis employed linear regression. The findings indicate that the Operating Expenses to Operating Income ratio (BOPO) has a positive and significant effect on profitability, Non-Performing Financing (NPF) has a negative and significant effect on ROA, and the Financing-to-Deposit Ratio (FDR) has a positive and significant effect on ROE. Meanwhile, macroeconomic variables do not exhibit a dominant influence on profitability. These findings are consistent with earlier studies emphasizing the predominance of internal factors in determining the profitability of Islamic banks. Likewise, Nahar et al. (2020) found that the profitability of Islamic Commercial Banks in Indonesia is more strongly influenced by internal bank-specific factors, such as NPF, CAR, FDR, and the Operating Expense Ratio (OER), than by macroeconomic variables, including inflation, GDP growth, and exchange rates, which do not have significant effects.

Although the relationship between bank-specific factors, macroeconomic factors, and profitability has been widely investigated, previous studies have produced inconsistent findings. Several studies conclude that internal factors, such as liquidity, financing risk, capital adequacy, operational efficiency, and bank size, are the primary determinants of Islamic bank profitability. However, other studies report differences in both the direction and statistical significance of these relationships. Similar inconsistencies are observed for macroeconomic variables, including inflation, economic growth, and interest rates. These divergent findings indicate that no clear empirical consensus has yet been established regarding the relationship between bank-specific factors, macroeconomic factors, and the profitability of Islamic Commercial Banks, thereby warranting further investigation.

In addition to these empirical inconsistencies, Indonesia's Islamic banking industry underwent substantial changes in its business environment during the 2019–2025 period. This period encompasses the COVID-19 pandemic, which affected the stability of the financial sector; the merger of Bank Syariah Mandiri, BNI Syariah, and BRI Syariah into Bank Syariah Indonesia (BSI); the post-pandemic economic recovery; as well as the acceleration of digital transformation and the expansion of Islamic financial inclusion. These developments may have altered the relationship between bank-specific factors, macroeconomic conditions, and profitability. Consequently, empirical evidence generated prior to these structural transformations may no longer adequately explain the current condition of Indonesia's Islamic banking industry.

Unlike previous studies, this research offers several novel contributions. First, it simultaneously examines the effects of bank-specific and macroeconomic factors over the 2019–2025 period, representing a transformative phase in Indonesia's Islamic banking industry, encompassing the COVID-19 pandemic, industry consolidation through the establishment of BSI, post-pandemic economic recovery, and digital transformation. Second, this study provides more recent empirical evidence regarding the consistency of the effects of each determinant on the profitability of Islamic Commercial Banks within a rapidly changing business environment. Accordingly, this research is expected to provide

a more comprehensive understanding of the determinants of profitability in Indonesia's Islamic Commercial Banks.

Based on the foregoing discussion, this study aims to examine the effects of bank-specific factors, proxied by the Capital Adequacy Ratio (CAR), Non-Performing Financing (NPF), Financing-to-Deposit Ratio (FDR), Operating Expenses to Operating Income (BOPO), and bank size, as well as macroeconomic factors, proxied by inflation and economic growth, on the profitability of Islamic Commercial Banks in Indonesia during the 2019–2025 period.

This study is expected to contribute theoretically, methodologically, and practically. From a theoretical perspective, it enriches the literature on the determinants of Islamic bank profitability by simultaneously examining bank-specific and macroeconomic factors within the context of industry transformation. Methodologically, it provides up-to-date empirical evidence based on an observation period that captures the structural changes occurring in Indonesia's Islamic banking industry. Practically, the findings are expected to serve as a reference for the management of Islamic Commercial Banks in formulating strategies to enhance profitability and for policymakers, particularly the Financial Services Authority (Otoritas Jasa Keuangan/OJK) and Bank Indonesia (BI), in designing policies that promote the stability, competitiveness, and sustainability of Indonesia's Islamic banking industry.

LITERATURE REVIEW

Financial Intermediation Theory

Financial Intermediation Theory posits that banks function as financial intermediaries by mobilizing funds from surplus units and channeling them to deficit units that require financing. Through this intermediation function, banks create value by reducing transaction costs, mitigating information asymmetry, transforming risk, and allocating resources more efficiently to productive sectors (Masrizal et al., 2022). The effectiveness of the intermediation function is reflected in a bank's ability to generate sustainable profitability, as profit serves as an indicator of the effective management of assets, liabilities, and risks in supporting the continuity of banking operations (Illahi et al., 2023).

From the perspective of Financial Intermediation Theory, profitability is determined by two primary groups of factors: internal factors (bank-specific factors) and external factors (macroeconomic factors). Internal factors reflect management's ability to efficiently manage resources, maintain asset quality, preserve capital adequacy, improve operational efficiency, and manage liquidity risk. In contrast, external factors represent macroeconomic conditions beyond the bank's control, such as inflation and economic growth, which may influence financing demand, funding costs, risk exposure, and customers' ability to meet their financial obligations (Javaid & Alalawi, 2018).

In Islamic banking, the intermediation function is conducted in accordance with Sharia principles, which prohibit *riba* (interest) and emphasize profit-and-loss sharing, fairness, and risk sharing between the bank and its customers. These characteristics imply that the intermediation process in Islamic banks is not solely oriented toward profit maximization but also toward sustainability, compliance with Sharia principles, and the stability of the financial system. Accordingly, the profitability of Islamic banks is influenced by the effectiveness of managing internal factors, such as capital adequacy, financing quality, liquidity, operational efficiency, and bank size, as well as their ability to adapt to changes in the macroeconomic environment, including fluctuations in inflation and economic growth (Sandia et al., 2025).

Based on Financial Intermediation Theory, this study assumes that the profitability of Islamic Commercial Banks is the result of the interaction between bank-specific factors and macroeconomic conditions. Accordingly, this theory serves as the conceptual foundation for explaining the relationships between the Capital Adequacy Ratio (CAR), Non-Performing Financing (NPF), Financing-to-Deposit Ratio (FDR), Operating Expenses to Operating Income (BOPO), bank size, inflation, economic growth, and the profitability of Islamic Commercial Banks in Indonesia.

Profitability of Islamic Banks

Profitability refers to a bank's ability to generate earnings from its available resources and reflects management's effectiveness in utilizing assets and managing operational activities (Sahyouni & Wang,

2019). In banking research, profitability is commonly measured using Return on Assets (ROA), as this ratio indicates a bank's ability to generate profits from its total assets. ROA is widely regarded as the most representative indicator for evaluating banking performance because a substantial proportion of bank assets is derived from public deposits, which must be managed efficiently to generate sustainable returns (Javaid & Alalawi, 2018). Furthermore, numerous studies have demonstrated that ROA effectively reflects management's efficiency in utilizing assets, making it the most widely used measure for assessing bank performance and profitability (Al-Tamimi, 2010; Widyaningrum & Siswantoro, 2014).

Effect of Capital Adequacy Ratio (CAR) on Profitability

The Capital Adequacy Ratio (CAR) is a financial ratio that measures a bank's ability to provide sufficient capital to absorb potential losses arising from operational activities and asset-related risks (Murtiyanti et al., 2015). Adequate capital enables banks to expand financing activities, enhance public confidence, and strengthen financial stability (Sutrisno, 2021). Theoretically, banks with higher capital adequacy tend to have greater flexibility to expand their business operations and absorb risks, thereby improving profitability (Belkhaoui et al., 2020). Widanta and Hermuningsih (2025) found that capital adequacy is one of the key determinants of Islamic bank profitability. Similarly, Harb et al. (2021) reported that CAR positively contributes to Return on Assets (ROA) by strengthening banks' capacity to perform their intermediation function and manage risks more effectively. Based on these arguments, the following hypothesis is proposed:

H1: Capital Adequacy Ratio (CAR) has a positive effect on the profitability of Islamic Commercial Banks in Indonesia.

Effect of Non-Performing Financing (NPF) on Profitability

Non-Performing Financing (NPF) is an indicator of financing quality that measures the proportion of problematic financing relative to the total financing extended by Islamic banks. A high NPF ratio indicates an increase in financing risk, which may reduce bank income and increase the need for impairment loss provisions, thereby adversely affecting financial performance (Widarjono & Rudatin, 2021). From a risk management perspective, an increase in non-performing financing reduces a bank's ability to generate profits because part of the financing portfolio fails to generate expected returns or is not repaid according to schedule (Muhammad et al., 2020). Several empirical studies have shown that NPF negatively affects the profitability of Islamic banks. Suprayitno and Hardiani (2021) found that an increase in NPF tends to reduce Islamic bank profitability, as measured by Return on Assets (ROA). Similar findings were reported by Aprilianto (2020) and Wahyudi (2020), who concluded that higher NPF ratios suppress ROA through increased financing risk and higher operational costs. Accordingly, the following hypothesis is proposed:

H2: Non-Performing Financing (NPF) has a negative effect on the profitability of Islamic Commercial Banks in Indonesia.

Effect of Financing-to-Deposit Ratio (FDR) on Profitability

The Financing-to-Deposit Ratio (FDR) measures the ability of Islamic banks to channel third-party funds into financing activities. This ratio reflects the effectiveness of the bank's intermediation function by indicating the extent to which mobilized funds are allocated to productive activities that generate income (Sukardi et al., 2022). Theoretically, a higher FDR indicates that a larger proportion of funds is allocated to financing, thereby increasing the bank's opportunity to earn income from financing activities. Greater productive financing is therefore expected to enhance bank profitability (Misbahul Munir, 2018). Wahyudi (2020) reported that FDR has a positive effect on the profitability of Islamic banks. Likewise, Yunitasari and Setiawan (2023) found that an increase in FDR improves Return on Assets (ROA) through a more effective intermediation function. However, several studies suggest that the effect of FDR is not always significant because the profitability of financing activities also depends on financing quality and the level of risk faced by Islamic banks (Alfianda & Widiyanto, 2020). Based on Financial Intermediation Theory, the following hypothesis is proposed:

H3: Financing-to-Deposit Ratio (FDR) has a positive effect on the profitability of Islamic Commercial Banks in Indonesia.

Effect of Operating Expenses to Operating Income (BOPO) on Profitability

The Operating Expenses to Operating Income ratio (BOPO) is used to measure a bank's operational efficiency by comparing operating expenses with operating income. This ratio reflects management's ability to control operational costs so that banking activities can be conducted efficiently while generating optimal profits. A higher BOPO ratio indicates lower operational efficiency because operating expenses are relatively greater than operating income (Safitri & Machmuddah, 2025). Consequently, rising operating expenses reduce the bank's ability to generate profits. From the efficiency theory perspective, banks that effectively control operational costs are more likely to achieve higher profitability than banks with relatively high operating expenses (Lestari & Sasmu, 2025).

Empirical evidence consistently identifies BOPO as one of the most influential determinants of Islamic bank profitability. Anik and Ningsih (2020) found that BOPO has a negative and significant effect on the Return on Assets (ROA) of Islamic banks in Indonesia. Similar findings were reported by Alfianda and Widiyanto (2020) and Lestari and Sasmu (2025), who concluded that higher BOPO ratios tend to reduce profitability because of the increased operational costs borne by banks. Accordingly, the following hypothesis is proposed:

H4: Operating Expenses to Operating Income (BOPO) has a negative effect on the profitability of Islamic Commercial Banks in Indonesia.

Effect of Bank Size on Profitability

Bank size is commonly measured using the natural logarithm ($\ln$) of a bank's total assets. Total assets are used as a proxy for bank size because they reflect a bank's operational capacity, financial strength, and ability to perform its financial intermediation function. Larger banks generally possess greater resources, broader business networks, better access to funding sources, and stronger capabilities for risk diversification (Lestari et al., 2021).

According to the theory of economies of scale, larger banks tend to achieve greater cost efficiency because fixed costs can be spread over a larger volume of business activities. In addition, large banks have greater opportunities to increase revenues through service expansion, product innovation, and broader market penetration (Yaseen & Widarjono, 2024). These advantages enable larger banks to improve their financial performance and profitability more effectively than smaller banks.

Empirical studies generally report a positive and significant relationship between bank size and profitability. Annisa and Sholihin (2018), as well as Sulistyandari et al. (2023), found that banks with larger asset bases tend to achieve higher profitability. Similarly, Yaseen and Widarjono (2024) concluded that bank size contributes to higher profitability through operational efficiency and revenue diversification. Based on the theory of economies of scale, the following hypothesis is proposed:

H5: Bank size has a positive effect on the profitability of Islamic Commercial Banks in Indonesia.

Effect of Inflation on Profitability

Inflation refers to a sustained increase in the general price of goods and services within an economy over a given period. Changes in the inflation rate may influence consumer behavior, banking operational costs, and the demand for financing and other financial products (Gazi et al., 2022). In the banking sector, inflation is one of the most frequently examined macroeconomic indicators because it affects both bank revenues and operating costs (Bastian et al., 2024).

Under conditions of moderate and stable inflation, economic activity generally expands, encouraging investment growth and increasing demand for financing, which may ultimately enhance bank revenues. Conversely, high inflation can reduce purchasing power, increase economic uncertainty, and elevate financing risk, thereby potentially reducing bank profitability. In Islamic banking, however, the impact of inflation may differ from that in conventional banking because Islamic banking operates under profit-and-loss sharing principles and is based on real economic transactions, making it relatively more adaptive to changes in economic conditions (Hidayat, 2025).

Previous studies have reported mixed findings. Nuzula (2020) found that inflation positively affects the profitability of Islamic banks because increased economic activity enhances bank income. In contrast, Ahzahra et al. (2025) and Himma and Jaya (2024) reported that high inflation reduces profitability through higher operating costs and increased financing risk. Considering the relatively

adaptive nature of Islamic banking to changes in economic conditions, the following hypothesis is proposed:

H6: Inflation affects the profitability of Islamic Commercial Banks in Indonesia.

Effect of Economic Growth on Profitability

Economic growth refers to an increase in a country's productive capacity, as reflected in the growth of real Gross Domestic Product (GDP) over time. Positive economic growth indicates expanding economic activity, rising household income, and greater investment opportunities, all of which support the development of the financial sector, including the banking industry (Bastian et al., 2024).

A growing economy generally increases demand for financing, investment, and business activities, thereby contributing to higher bank revenues. From a macroeconomic perspective, strong economic growth creates a more favorable business environment for the banking industry by improving customers' ability to meet their financing obligations and expanding opportunities for banks to channel funds into productive sectors (Himma & Jaya, 2024). For Islamic banks, stronger economic activity may also increase the volume of profit-sharing and trade-based financing, thereby enhancing profitability.

Several empirical studies have reported that economic growth positively influences bank profitability. Rahmatullah and Kartini (2025) found that economic growth contributes to improved banking performance and profitability through enhanced financial intermediation activities. Likewise, Wahyudin (2025) concluded that economic growth increases bank profitability by stimulating financing demand and improving asset quality. Nevertheless, other studies have found that the effect of economic growth on the profitability of Islamic banks is not always significant because it depends on internal bank conditions, market structure, and the characteristics of each country's financial system (Rusydiana & Prakoso, 2021). Based on the theoretical framework and previous empirical evidence, the following hypothesis is proposed:

H7: Economic growth has a positive effect on the profitability of Islamic Commercial Banks in Indonesia.

Conceptual Framework

This study examines the effects of bank-specific factors and macroeconomic factors on the profitability of Islamic Commercial Banks (Bank Umum Syariah/BUS) in Indonesia. The bank-specific factors consist of the Capital Adequacy Ratio (CAR), Non-Performing Financing (NPF), Financing-to-Deposit Ratio (FDR), Operating Expenses to Operating Income (BOPO), and bank size. Macroeconomic factors comprise inflation and economic growth. Profitability is proxied by Return on Assets (ROA).

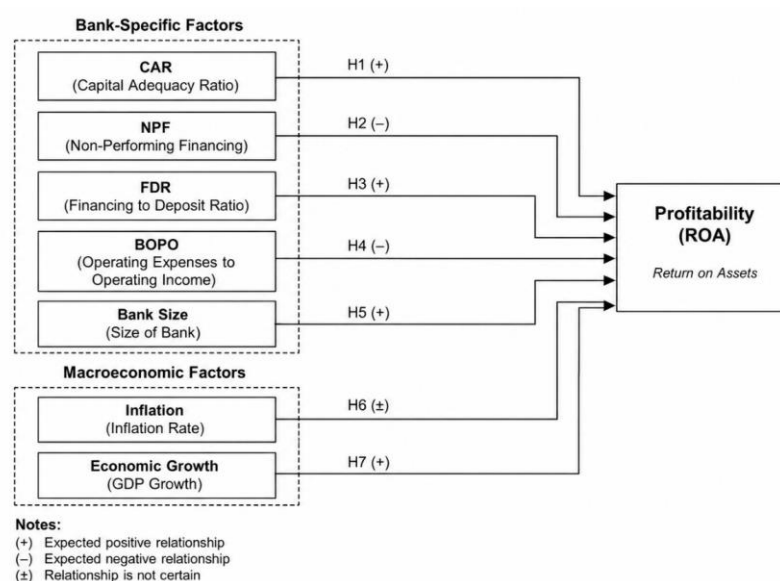


Figure 1. Conceptual Framework of the Determinants of Islamic Bank Profitability

METHOD

Research Design

This study employs a quantitative research approach with a causal research design to examine the effects of bank-specific factors and macroeconomic factors on the profitability of Islamic Commercial Banks (Bank Umum Syariah/BUS) in Indonesia. A causal approach is adopted because the study seeks to explain the cause-and-effect relationships between the independent and dependent variables based on established theories and previous empirical findings. The study utilizes secondary panel data, which combines cross-sectional and time-series observations. The use of panel data enables analysis of both inter-bank variations and changes over time, resulting in more efficient parameter estimates, reducing the problem of unobserved individual heterogeneity, and increasing both the degrees of freedom and the number of observations compared with using either cross-sectional or time-series data alone.

Population and Sample

The population of this study consists of all Islamic Commercial Banks (Bank Umum Syariah/BUS) operating in Indonesia and registered with the Financial Services Authority (Otoritas Jasa Keuangan/OJK) during the 2019–2025 period. This observation period was selected because it encompasses several major structural changes in Indonesia's Islamic banking industry, including the COVID-19 pandemic, the merger that established Bank Syariah Indonesia (BSI), the post-pandemic economic recovery, and the acceleration of digital transformation in the banking sector.

The sample was selected using a purposive sampling technique. This method was chosen because the study requires banks with specific characteristics that are relevant to the research objectives. The sampling criteria are as follows:

1. Islamic Commercial Banks that operated continuously during the 2019–2023 period.
2. Banks that published complete annual financial statements throughout the observation period.
3. Banks with complete data for all research variables.
4. Banks that were not delisted or discontinued their operations during the observation period.

Based on these criteria, all Islamic Commercial Banks that satisfied the sampling requirements were included in the study. The inclusion of all eligible banks was intended to maximize the number of observations and enhance the representativeness of the research findings.

Data Type and Sources

This study uses secondary data obtained from official and academically reliable sources. The use of secondary data is common in banking and financial research because such data are historical, measurable, and officially published by authorized institutions. The data were collected from the following sources:

1. Annual reports and financial statements of Islamic Commercial Banks.
2. Islamic Banking Statistics published by the Financial Services Authority (Otoritas Jasa Keuangan/OJK).
3. Inflation data published by Statistics Indonesia (Badan Pusat Statistik/BPS).
4. Indonesia's economic growth data published by Statistics Indonesia (BPS).
5. Publications issued by Bank Indonesia (BI).

Data was collected using the documentation method by accessing official reports and publications available through online platforms.

Operational Definition of Variables

This study employs one dependent variable and seven independent variables selected based on Financial Intermediation Theory and previous empirical studies on the determinants of bank profitability.

Dependent Variable

Profitability is proxied by Return on Assets (ROA). ROA is selected because it reflects management's ability to generate profits from the bank's total assets. Furthermore, ROA is the most widely used profitability indicator in banking research and is recommended by regulators because it measures the overall efficiency of asset utilization.

Table 1. Operational Definition of Variables

Variable	Symbol	Measurement
Profitability	ROA	Profit Before Tax / Total Assets $\times$ 100%
Capital Adequacy Ratio	CAR	Capital / Risk-Weighted Assets $\times$ 100%
Non-Performing Financing	NPF	Non-Performing Financing / Total Financing $\times$ 100%
Financing to Deposit Ratio	FDR	Total Financing / Third-Party Funds $\times$ 100%
Operational Efficiency	BOPO	Operating Expenses / Operating Income $\times$ 100%
Bank Size	SIZE	Ln (Total Assets)
Inflation	INF	Annual Inflation Rate (%)
Economic Growth	GDP	Gross Domestic Product Growth (%)

Data Analysis Technique

The data were analyzed using panel data regression. Panel data regression was selected because it simultaneously accommodates both the time-series and cross-sectional dimensions of the data, thereby producing more efficient estimates than conventional regression models. The analytical procedures consist of the following stages:

Descriptive Statistical Analysis

Descriptive statistical analysis was conducted to summarize the characteristics of the research data, including the minimum, maximum, mean, and standard deviation of each variable.

Panel Data Regression Model Selection

To determine the most appropriate panel data regression model, the following specification tests were conducted.

a. Chow Test

The Chow test was employed to determine whether the Common Effect Model (CEM) or the Fixed Effect Model (FEM) was more appropriate. Decision criteria:

- Probability $< 0.05 \rightarrow$ Fixed Effect Model (FEM)
- Probability $> 0.05 \rightarrow$ Common Effect Model (CEM)

b. Hausman Test

The Hausman test was performed to determine whether the Fixed Effect Model (FEM) or the Random Effect Model (REM) was more appropriate. Decision criteria:

- Probability $< 0.05 \rightarrow$ Fixed Effect Model (FEM)
- Probability $> 0.05 \rightarrow$ Random Effect Model (REM)

c. Lagrange Multiplier Test

The Lagrange Multiplier (LM) test was used to determine whether the Common Effect Model (CEM) or the Random Effect Model (REM) was more appropriate. Decision criteria:

- Probability $< 0.05 \rightarrow$ Random Effect Model (REM)
- Probability $> 0.05 \rightarrow$ Common Effect Model (CEM)

Research Model

The regression model employed in this study is adapted from Athanasoglou, Brissimis, and Delis (2008), who argue that bank profitability is determined by both bank-specific characteristics and macroeconomic conditions. Accordingly, the model incorporates capital adequacy (CAR), financing

quality (NPF), liquidity (FDR), operational efficiency (BOPO), bank size (SIZE), inflation (INF), and economic growth (GDP) as determinants of return on assets (ROA).

$$ROA_{it} = \alpha + \beta_1 CAR_{it} + \beta_2 NPF_{it} + \beta_3 FDR_{it} + \beta_4 BOPO_{it} + \beta_5 SIZE_{it} + \beta_6 INF_{it} + \beta_7 GDP_{it} + \epsilon_{it}$$

where:

- **ROA** = Profitability of Islamic Commercial Banks
- α = Constant
- β_1 – β_7 = Regression coefficients
- **CAR** = Capital Adequacy Ratio
- **NPF** = Non-Performing Financing
- **FDR** = Financing-to-Deposit Ratio
- **BOPO** = Operating Expenses to Operating Income
- **SIZE** = Bank Size
- **INF** = Inflation
- **GDP** = Economic Growth
- ϵ = Error term
- i = Bank i
- t = Time period t

Hypothesis Testing

Hypothesis testing was conducted using the t-test, F-test, and the coefficient of determination (R^2). The t-test was employed to examine the partial effect of each independent variable on profitability, whereas the F-test was used to assess the simultaneous effect of all independent variables on profitability. The coefficient of determination (R^2) was used to measure the explanatory power of the regression model in explaining variations in the profitability of Islamic Commercial Banks.

RESULTS

Model Selection

In panel data analysis, three estimation approaches are commonly employed: the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). To determine the most appropriate model for this study, the Chow test, Hausman test, and Lagrange Multiplier (LM) test were performed.

Chow Test

The Chow test was conducted to determine whether the Common Effect Model (CEM) or the Fixed Effect Model (FEM) was more appropriate. If the Cross-section Chi-square probability is less than 0.05, the Fixed Effect Model (FEM) is selected; otherwise, the Common Effect Model (CEM) is preferred (Napitupulu et al., 2021). The Chow test results indicate that the Cross-section Chi-square probability is 0.0000, which is lower than the 5% significance level ($0.0000 < 0.05$). Therefore, the null hypothesis is rejected, and the Fixed Effect Model (FEM) is preferred.

Table 2. Chow Test Results

Effects Test	Statistic	d.f.	Prob.
Cross-section F	26.264224	(12,72)	0.0000
Cross-section Chi-square	153.080158	12	0.0000

Source: EVIEWS 2026 Output

Hausman Test

The Hausman test was performed to determine whether the Fixed Effect Model (FEM) or the Random Effect Model (REM) provides the more appropriate specification. If the Cross-section Random probability is less than 0.05, the FEM is selected; otherwise, the REM is preferred (Napitupulu et al., 2021). The Hausman test produced a Cross-section Random probability of 1.0000, which exceeds the 5% significance level ($1.0000 > 0.05$). Accordingly, the null hypothesis is accepted, indicating that the Random Effect Model (REM) is more appropriate than the Fixed Effect Model.

Table 3. Hausman Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	6	1.0000

Source: EViews 2026 Output

Lagrange Multiplier Test

The Lagrange Multiplier (LM) test was employed to determine whether the Common Effect Model (CEM) or the Random Effect Model (REM) is more appropriate. A Breusch–Pagan probability below 0.05 indicates that the REM should be selected (Napitupulu et al., 2021). The Breusch–Pagan probability for the Both statistic is 0.0000, which is below the 5% significance level ($0.0000 < 0.05$). Therefore, the null hypothesis is rejected, confirming that the Random Effect Model (REM) is more appropriate than the Common Effect Model (CEM). Based on the results of the Chow, Hausman, and Lagrange Multiplier tests, the Random Effect Model (REM) was selected as the final estimation model for this study.

Table 4. Lagrange Multiplier Test Results

Test	Cross-section	Time	Both
Breusch-Pagan	104.5275	2.855718	107.3833
Probability	(0.0000)	(0.0910)	(0.0000)

Source: EViews 2026 Output

Panel Data Regression Analysis

Based on the estimation results of the Random Effect Model (REM), the following panel regression equation was obtained:

Table 5. Panel Data Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.389648	0.949734	4.621975	0.0000
CAR	0.026341	0.003776	6.976465	0.0000
FDR	1.75E-05	2.45E-06	7.136685	0.0000
NPF	0.263787	0.166094	1.588181	0.1160
BOPO	-0.045558	0.002907	-15.66924	0.0000
INFLASI	0.057106	0.131036	0.435805	0.6641
BIRATE	-0.094485	0.130046	-0.726549	0.4695

Source: EViews 2026 Output

$$\text{ROA} = 4.389647 + 0.026340 \text{ CAR}_{it} + 0.000017 \text{ FDR}_{it} + 0.263787 \text{ NPF}_{it} - 0.045557 \text{ BOPO}_{it} + 0.057106 \text{ INFLASI}_{it} - 0.094484 \text{ BIRATE}_{it} + \text{error}_{it}$$

The estimated regression equation indicates that CAR, FDR, NPF, and inflation have positive coefficients with ROA, whereas BOPO and the BI Rate have negative coefficients. The intercept of 4.389647 implies that, holding all independent variables constant, the estimated Return on Assets (ROA) is 4.389647%.

Hypothesis Testing

Coefficient of Determination (R^2)

The coefficient of determination (Adjusted R^2) measures the explanatory power of the independent variables in explaining variations in the dependent variable. The regression results show an Adjusted R^2

of 0.789410 (78.9410%), indicating that the Capital Adequacy Ratio (CAR), Financing-to-Deposit Ratio (FDR), Non-Performing Financing (NPF), Operating Expenses to Operating Income (BOPO), inflation, and the BI Rate jointly explain 78.9410% of the variation in Return on Assets (ROA). The remaining 21.0590% is explained by other factors not included in the research model. This relatively high Adjusted R² suggests that the model has strong explanatory power in capturing variations in the profitability of Islamic Commercial Banks.

Table 6. Coefficient of Determination (R²) Results

Statistic	Value	Statistic	Value
R-squared	0.803450	Mean dependent var	0.318245
Adjusted R-squared	0.789410	S.D. dependent var	2.529646
S.E. of regression	1.160856	Sum squared resid	113.1973
F-statistic	57.22856	Durbin-Watson stat	1.349927
Prob(F-statistic)	0.000000		

Source: Output EViews 2026

Partial Significance Test (t-test)

The t-test was conducted to examine the partial effect of each independent variable on profitability at the 5% significance level ($\alpha = 0.05$). The direction of the relationship is determined by the sign of the regression coefficient, whereas statistical significance is assessed using the probability value. A probability value below 0.05 indicates a statistically significant effect (Saluy et al., 2022).

Table 7. Partial Significance Test (t-test) Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.389648	0.949734	4.621975	0.0000
CAR	0.026341	0.003776	6.976465	0.0000
FDR	1.75E-05	2.45E-06	7.136685	0.0000
NPF	0.263787	0.166094	1.588181	0.1160
BOPO	-0.045558	0.002907	-15.66924	0.0000
INFLASI	0.057106	0.131036	0.435805	0.6641
BIRATE	-0.094485	0.130046	-0.726549	0.4695

Sumber: Output EViews 2026

Simultaneous Significance Test (F-test)

The F-test was conducted to evaluate the simultaneous effect of all independent variables on the dependent variable. A probability value below 0.05 indicates that the independent variables jointly have a statistically significant effect on profitability.

Table 8. F-test Results

Statistic	Value	Statistic	Value
R-squared	0.803450	Mean dependent var	0.318245
Adjusted R-squared	0.789410	S.D. dependent var	2.529646
S.E. of regression	1.160856	Sum squared resid	113.1973
F-statistic	57.22856	Durbin-Watson stat	1.349927
Prob(F-statistic)	0.000000		

Source: EViews 2026 Output

The F-test yielded an F-statistic of 57.22856 and a probability of 0.000000 (Table 8), indicating that the six independent variables are jointly statistically significant at the 5% level. The model reports R-squared of 0.803450 and adjusted R-squared of 0.789410.

DISCUSSION

The positive effect of the Capital Adequacy Ratio (CAR) on profitability is theoretically consistent with the role of capital as the primary buffer against potential losses while supporting business expansion. Strong capital adequacy provides banks with greater flexibility to allocate funds to productive assets, particularly financing activities that generate higher returns. Moreover, a high CAR signals sound

financial health, thereby enhancing public confidence and reducing the cost of funds, which ultimately improves profitability (ROA). This finding is consistent with Anik and Ningsih (2020) and Rahmatullah (2025), who reported that well-capitalized banks tend to achieve higher profitability because they face lower financial distress costs. These findings suggest that bank management should maintain capital adequacy above the regulatory minimum to support sustainable business expansion while preserving financial stability.

The positive relationship between the Financing-to-Deposit Ratio (FDR) and profitability indicates that the financial intermediation function of Islamic banks operated effectively during the observation period. According to Financial Intermediation Theory, banks generate value by channeling surplus funds into productive financing activities. A higher proportion of third-party funds allocated to financing increases the opportunity to earn profit-sharing income and financing margins while minimizing idle funds. This empirical evidence supports the findings of Wahyudi (2020), suggesting that optimizing the intermediation function through productive financing contributes positively to bank profitability. These findings imply that Islamic banks should continue expanding financing prudently while maintaining sound risk management practices.

Although Non-Performing Financing (NPF) is theoretically expected to reduce profitability because banks must absorb financing losses and establish impairment provisions, its effect is statistically insignificant in this study. This finding suggests that Islamic banks have implemented effective risk management practices, including prudent provisioning and forward-looking impairment policies, thereby mitigating the adverse effects of financing deterioration on current profitability. Furthermore, problematic financing may largely consist of loans secured by liquid collateral, reducing the likelihood of substantial realized losses. These findings are consistent with Muhammad et al. (2020), who argued that increases in NPF do not necessarily reduce profitability when supported by adequate provisions and effective collateral management. Nevertheless, continuous monitoring of financing quality remains essential to prevent the accumulation of future credit risk.

The significant negative effect of Operating Expenses to Operating Income (BOPO) strongly supports the efficiency hypothesis in banking. BOPO is the primary indicator of management efficiency in controlling operating expenses relative to operating income. A higher BOPO ratio reflects lower operational efficiency because rising operating expenses directly erode profit margins when not accompanied by proportional increases in revenue. Conversely, lower BOPO values indicate greater efficiency, enabling banks to retain a larger share of operating income as net profit. This finding is consistent with previous studies, including Illahi et al. (2023), which identified BOPO as one of the most influential internal determinants of bank profitability. Accordingly, improving operational efficiency through cost optimization and digital transformation remains essential for enhancing the profitability of Islamic banks.

The insignificant effect of inflation indicates that fluctuations in domestic price levels did not materially affect the financial performance of Islamic Commercial Banks during the observation period. This finding reflects the resilience and adaptability of Islamic banking management in responding to macroeconomic changes. When inflation is anticipated, Islamic banks can adjust pricing strategies, including profit-sharing ratios and financing margins, thereby maintaining customer demand and financial performance. This result is consistent with Ahzahra et al. (2025), who found that inflation tends to have a neutral effect on banks operating primarily within the real sector. From a managerial perspective, the findings suggest that maintaining operational efficiency and asset quality is more critical than responding directly to moderate inflationary pressures.

Similarly, the BI Rate does not have a significant effect on profitability. This result reinforces the distinctive characteristics of Islamic banking, which operates under an interest-free financial system. Changes in the policy interest rate do not immediately alter the funding costs or financing revenues of Islamic banks, unlike conventional banks. A substantial proportion of Islamic financing is based on *murābahah* contracts with fixed profit margins that remain unchanged throughout the financing period. Consequently, Islamic banks are relatively insulated from the direct transmission of interest rate-based monetary policy. These findings provide empirical evidence that conventional interest rate instruments should not be regarded as the sole indicator for assessing or predicting the profitability of the Islamic banking industry.

This finding provides theoretical support for the validity of the proposed regression model, suggesting that bank profitability cannot be adequately explained by internal or external factors in isolation. Instead, profitability reflects the combined influence of capital management, financial intermediation, financing risk, operational efficiency, and macroeconomic conditions. Furthermore, the relatively high Adjusted R^2 of 0.789410 indicates that 78.94% of the variation in ROA is explained by the variables included in the model, while the remaining 21.06% is attributable to other factors outside the model, such as corporate governance, bank size, or market share. This high explanatory power suggests that the model provides a robust framework for predicting the profitability of Islamic Commercial Banks in Indonesia.

CONCLUSION

This study examined the effects of the Capital Adequacy Ratio (CAR), Financing-to-Deposit Ratio (FDR), Non-Performing Financing (NPF), Operating Expenses to Operating Income (BOPO), inflation, and the BI Rate on the profitability of Islamic Commercial Banks in Indonesia, as measured by Return on Assets (ROA). The empirical findings indicate that, simultaneously, these variables significantly influence bank profitability. The regression model explains 78.94% of the variation in ROA, suggesting that the selected variables provide substantial explanatory power. Partially, CAR and FDR have positive and statistically significant effects on profitability, indicating that stronger capital adequacy and more effective financing intermediation contribute to higher ROA. Conversely, BOPO has a negative and statistically significant effect on profitability, implying that operational inefficiency reduces bank performance. Meanwhile, NPF, inflation, and the BI Rate do not exhibit statistically significant effects on the profitability of Islamic Commercial Banks during the observation period. Overall, the findings highlight the importance of maintaining adequate capital, optimizing financing activities, and improving operational efficiency to enhance the financial performance of Islamic Commercial Banks in Indonesia. Although the proposed model explains a substantial proportion of profitability variation, approximately 21.06% remains unexplained. Future research is therefore encouraged to incorporate additional variables that may better explain Islamic bank profitability. Governance-related variables, such as Good Corporate Governance (GCG), the size and effectiveness of the Sharia Supervisory Board (Dewan Pengawas Syariah/DPS), institutional ownership, and board characteristics, may provide further insights. In addition, bank-specific variables such as bank size, liquidity, financing diversification, and digital banking adoption could be considered.

Regulators should strengthen capital, financing, and operational efficiency frameworks to support sustainable Islamic banking profitability. Future research should also assess the impact of BSI's merger and the potential benefits of further consolidation for industry competitiveness and profitability. Future studies are also recommended to extend the observation period and expand the sample by including Islamic Rural Banks (Bank Pembiayaan Rakyat Syariah/BPRS) or conducting comparative studies across different countries. Such approaches would provide more comprehensive evidence regarding the determinants of profitability in the Islamic banking sector.

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AUTHOR CONTRIBUTION STATEMENT

Rofiul Wahyudi contributed to the research conceptualization, theoretical framework, study design, and manuscript revision. Noor Aimi Mohamad Puad contributed to methodological development, empirical interpretation, and critical manuscript review. Siti Wardah contributed to data collection, data processing, statistical analysis, literature review, and original manuscript preparation. All authors participated in reviewing and refining the manuscript, approved the final version, and accepted responsibility for the integrity and accuracy of the research.

AI DISCLOSURE STATEMENT

The authors affirm that the research design, data analysis, interpretation of findings, and conclusions presented in this manuscript reflect their independent scholarly contributions and academic judgment. The authors retain full responsibility for the originality, accuracy, and integrity of the research. Any use of artificial intelligence-assisted technologies in manuscript preparation is subject to appropriate disclosure and does not replace the authors' intellectual contributions or accountability for the published work.

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This research was conducted using secondary data obtained from publicly available financial statements and official publications issued by relevant financial and statistical institutions. The study did not involve primary data collection or experimental procedures requiring direct participant involvement. The authors retain full responsibility for the research process, data analysis, interpretation of findings, and conclusions, independently of the institutions providing the publicly accessible data.

CONFLICTS OF INTEREST

The authors affirm their commitment to objectivity, transparency, and academic integrity throughout the research and publication process. The study was conducted using publicly accessible financial and macroeconomic data, and its findings were derived from established quantitative analytical procedures. The authors acknowledge their responsibility to disclose any financial, professional, institutional, or personal relationships that could reasonably be perceived as influencing the research or its publication.

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