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PROFITABILITY DRIVERS IN INDONESIAN ISLAMIC AND CONVENTIONAL BANKS: MACROECONOMIC AND MICROECONOMIC PERSPECTIVES

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Abstract

This study investigates the impact of macroeconomic variables, namely inflation, gross domestic product (GDP), and the Bank Indonesia interest rate (BI-rate), alongside microeconomic indicators such as non-performing loans (NPL), loan-to-deposit ratio (LDR), non-performing financing (NPF), financing-to-deposit ratio (FDR), and operating expenses to operating income (OEOI) on the profitability of both conventional and Islamic banks in Indonesia over the period 2017–2023. Employing a purposive sampling technique, 7 Islamic banks and 7 conventional banks were selected from a population of 13 Islamic and 92 conventional banks, based on the criteria of complete financial disclosures and consistent financial performance. Panel data regression analysis reveals that, for conventional banks, inflation exerts a statistically significant negative influence on return on assets (ROA), whereas GDP, the BI-rate, and LDR exhibit significant positive effects. Conversely, NPL and OEOI negatively affect profitability. In the case of Islamic banks, inflation, NPF, and FDR demonstrate significant adverse impacts on ROA, while GDP, the BI-rate, and OEOI contribute positively. These findings emphasize the divergent financial structures and sensitivities of conventional and Islamic banks in response to macroeconomic and microeconomic dynamics. The study offers strategic insights for bank management and regulatory authorities to enhance policy frameworks, with particular emphasis on risk mitigation and digital adaptation, thereby fostering sustained profitability and competitiveness in Indonesia's banking sector.

Keywords*: Bank Profitability; Macroeconomics Determinants; Microeconomics Indicators; Islamic and Conventional Banking; Panel Data Analysis*

Abstrak

Penelitian ini mengkaji pengaruh variabel makroekonomi, yaitu inflasi, produk domestik bruto (PDB), dan suku bunga Bank Indonesia (BI-rate), serta indikator mikroekonomi seperti kredit bermasalah (*non-performing loan/NPL*), rasio pinjaman terhadap dana pihak ketiga (*loan-to-deposit*

ratio/LDR), pembiayaan bermasalah (*non-performing financing/NPF*), rasio pembiayaan terhadap dana pihak ketiga (*financing-to-deposit ratio/FDR*), dan rasio beban operasional terhadap pendapatan operasional (BOPO) terhadap profitabilitas bank konvensional dan bank syariah di Indonesia selama periode 2017–2023. Melalui teknik *purposive* sampling, sebanyak 7 bank syariah dan 7 bank konvensional dipilih dari total populasi 13 bank syariah dan 92 bank konvensional, berdasarkan kriteria ketersediaan laporan keuangan yang lengkap serta kestabilan rasio keuangan. Hasil analisis regresi data panel menunjukkan bahwa pada bank konvensional, inflasi berpengaruh negatif secara signifikan terhadap *return on assets (ROA)*, sedangkan PDB, *BI-rate*, dan LDR memiliki pengaruh positif yang signifikan. Sebaliknya, NPL dan BOPO berdampak negatif terhadap profitabilitas. Adapun pada bank syariah, inflasi, NPF, dan FDR berpengaruh negatif signifikan terhadap ROA, sedangkan PDB, *BI-rate*, dan BOPO memberikan kontribusi positif. Temuan ini menegaskan perbedaan struktur keuangan dan sensitivitas antara bank konvensional dan bank syariah dalam merespons dinamika makroekonomi dan mikroekonomi. Studi ini memberikan wawasan strategis bagi manajemen perbankan dan otoritas pengatur dalam memperkuat kerangka kebijakan, dengan penekanan khusus pada mitigasi risiko dan adaptasi terhadap transformasi digital, guna mendorong profitabilitas dan daya saing yang berkelanjutan di sektor perbankan nasional.

Kata kunci: Profitabilitas Bank; Determinan Makroekonomi; Indikator Mikroekonomi; Perbankan Syariah dan Konvensional; Analisis Data Panel

INTRODUCTION

Profitability is a fundamental metric in the banking sector used to assess a bank's financial performance, with return on assets (ROA) commonly employed to evaluate the efficiency with which a bank utilizes its assets to generate earnings (Chabachib et al., 2019). ROA is often favored over return on equity (ROE) as a measure of profitability (Rana-Al-Mosharrafa & Islam, 2021). This preference arises from the fact that ROA more accurately reflects the overall profitability of a bank, particularly in the Indonesian context where Bank Indonesia emphasizes asset performance derived from public deposits as a key indicator of profitability (Chabachib et al., 2019).

Conventional and Islamic banks exhibit fundamental differences in their operational systems, which significantly affect profitability metrics, especially ROA (Šeho et al., 2020). Conventional banks function based on an interest-based intermediation model, where income is primarily derived from the spread between interest on loans and interest on deposits (de Haan et al., 2023). Conversely, Islamic banks adhere to Sharia principles that prohibit interest *(riba),* utilizing alternative mechanisms such as profit-sharing, trading, and leasing schemes to generate income (Uluyol, 2024).

In recent years, the banking industry has encountered substantial challenges due to significant fluctuations in interest rate policy. During the COVID-19 pandemic, Bank Indonesia reduced the BI Rate to a historical low of 3.5% to stimulate economic recovery (Bank Indonesia, 2021). However, in response to rising global inflationary pressures, the central bank began gradually increasing the BI Rate from mid-2022 to stabilize inflation and maintain the rupiah's exchange rate (Bank Indonesia, 2022). By 2025, the BI Rate was lowered again to 5.50% to address economic deceleration and manageable inflation levels. These policy changes have had a direct impact on both conventional and Islamic banks, especially in terms of ROA (Mushtaq & Siddiqui, 2017). Lower interest rates may stimulate lending but could also compress net interest margins and reduce ROA in conventional banks (López-Penabad et al., 2022). Although Islamic banks are also incentivized to increase financing, declining yields could negatively affect their profitability (Šeho et al., 2020). On the other hand, rising interest rates may improve interest income for conventional banks while simultaneously dampening loan demand and heightening credit risk (Mushtaq & Siddiqui, 2017). For Islamic banks, higher BI rates pose a challenge in adjusting profit-sharing ratios without corresponding improvements in financing quality (Šeho et al., 2020). These dynamics are reflected in the profitability trends of both banking models over recent years.

Figure 1 illustrates the comparative profitability of conventional and Islamic banks from 2011 to 2023. The data show fluctuating trends in profitability for both banking types. Between 2011 and 2016, profitability remained low in both sectors. In 2017, conventional bank profitability surged to 17.02%, while Islamic bank profitability experienced a sharp increase in 2018, reaching 5.47% from just 0.96% in the previous year. A simultaneous decline occurred in 2020 during the COVID-19 pandemic. By 2023, both types of banks exhibited notable improvements in profitability. Since profitability remains the ultimate goal of all banking operations, financial institutions consistently formulate strategic plans aimed at achieving optimal profit levels (Kirana, 2021).

Numerous factors, both macroeconomic and microeconomic, play critical roles in determining bank profitability (Barra & Ruggiero, 2021). Macroeconomic factors are essential to consider as they encompass national-level economic conditions, including inflation, gross domestic product (GDP), and central bank interest rates (BI-rate), which influence banking performance over both short and long-term horizons (Al-Homaidi et al., 2018). At the same time, microeconomic variables are equally crucial, as they reflect the operational decision-making and financial behavior within individual

banks. For Islamic banks, key microeconomic indicators include Non-Performing Financing (NPF), Financing to Deposit Ratio (FDR), and Operating Expenses to Operating Income (OEOI), which must be maintained within optimal thresholds to ensure stability (Sjarief et al., 2023). For conventional banks, similar indicators apply, Non-Performing Loans (NPL), Loan to Deposit Ratio (LDR), and OEOI, all of which must be effectively managed to sustain profitability (Sembiring & Janrosl, 2023).

Terminological differences such as NPF versus NPL and FDR versus LDR stem from the divergent operational frameworks of Islamic and conventional banking (Sulaeman et al., 2019). Islamic banks operate based on principles that prohibit interest *(riba),* speculative activities *(gharar),* and investments in non-halal sectors, thereby requiring all transactions to be governed by Sharia-compliant contracts (Uluyol, 2024). In contrast, conventional banks function within an interest-based system for both fund mobilization and credit distribution (de Haan et al., 2023). These operational disparities give rise to different financial performance metrics. In Islamic banking, the term NPF is used to denote problematic financing agreements based on contracts such as *Murabahah, Mudharabah*, and *Musyarakah*. Conversely, conventional banking uses NPL to describe delinquent credit based on fixed interest arrangements (Suprayitno & Hardiani, 2021). Similarly, FDR in Islamic banks reflects the ratio of financing to third-party funds, whereas LDR in conventional banks measures the ratio of loans to deposits (Sulaeman et al., 2019).

Assessing the influence of macroeconomic and microeconomic factors on bank profitability is therefore essential. Prior studies, such as those by Barra & Ruggiero (2021) and Syarifa Nasution et al. (2023), suggest a significant relationship between these factors and bank profitability. However, contrasting findings by Kirana (2021), Sembiring & Janrosl (2023), and Widiyanti (2023) argue that macroeconomic and microeconomic factors do not exert a statistically significant effect on profitability.

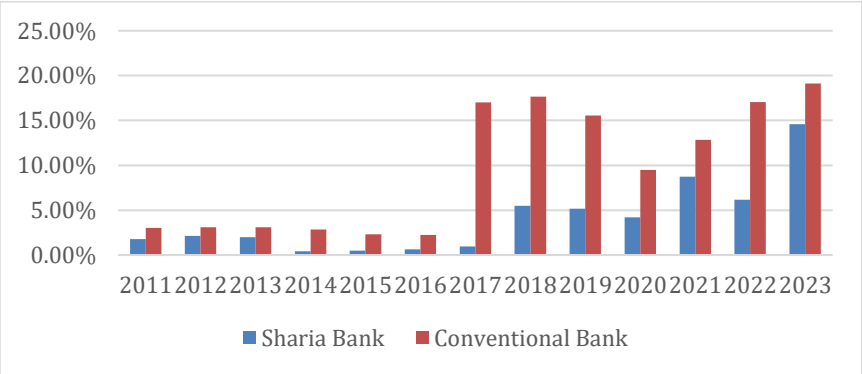

Figure 1. Banking Profitability Chart 2011-2023
Source: OJK (2024)

This study offers notable novelty compared to previous research, which tends to examine the determinants of bank profitability, particularly ROA, separately for conventional and Islamic banks. Most earlier studies focus on one banking system and apply a linear approach to economic variables, thereby lacking a comprehensive perspective on how different structural and operational principles affect financial outcomes. By adopting a comparative framework that integrates both banking models, this study captures differences in sensitivity, risk adaptation, and performance in response to shared economic conditions, including inflation, interest rates, operational efficiency, asset quality, and fund allocation. Accordingly, the research contributes to a more holistic understanding of how interest-based mechanisms in conventional banks and contract-based models in Islamic banks influence ROA and overall financial performance.

Indonesia holds significant potential for the advancement of Islamic banking, as it is home to the world's largest Muslim population (Safar Nasir et al., 2022). Nonetheless, Islamic banking's market share remains relatively small compared to its conventional counterpart. Hence, examining how macroeconomic and microeconomic variables affect the profitability of both systems is vital to ensuring long-term sustainability and competitiveness in the national banking landscape. The findings of this study are also expected to offer valuable insights for regulators, bank executives, and other stakeholders in formulating policies aimed at strengthening profitability and institutional resilience.

LITERATURE REVIEW

Banks, both Islamic and conventional, play a strategic role in channeling funds to the public through financing activities aimed at promoting economic growth (Khasawneh, 2016). According to Financial Intermediation Theory, banks serve as intermediaries between surplus units (those with excess funds) and deficit units (those in need of funds), with the primary goal of efficiently distributing funds to stimulate economic development (Spearman, 2020). Conventional banks fulfill this role through interest-based lending mechanisms, while Islamic banks employ sharia-compliant financing contracts such as *Murabahah, Mudharabah*, and *Musyarakah* (Uluyol, 2024). A fundamental distinction lies in their operational principles: Islamic banks reject the use of interest due to its classification as riba, and instead implement a profit-sharing system (Sobol et al., 2023; Hanafia & Karim, 2020). Although both systems aim to provide returns to fund providers, the mechanisms and ethical frameworks that underpin them differ significantly.

A bank's ability to generate efficient and effective performance is reflected in its profitability (Hanafia & Karim, 2020). One of the key indicators of profitability in banking is Return on Assets (ROA), as reported in financial statements. Effective resource management is critical to achieving optimal performance, and ROA serves as a clear measure of how well a bank utilizes its assets to generate profits (Rana-Al-Mosharrafa & Islam, 2021). A higher ROA indicates stronger profitability and operational efficiency (Rana-Al-Mosharrafa & Islam, 2021). In the context of Islamic banking, profitability must also comply with sharia principles, which prohibit interest (*riba*) and speculative practices (*maysir*), thereby necessitating a profit-generation process that adheres to religious guidelines (Uluyol, 2024).

In achieving profitability, banks must consider both macroeconomic and microeconomic determinants. Macroeconomic variables such as inflation, BI-rate, and GDP are key indicators informed by macroeconomic theory (Al-Homaidi et al., 2018). Inflation affects consumer purchasing power and operational costs; high inflation can erode the real value of banking assets and diminish profit margins, thereby adversely affecting ROA in both conventional and Islamic banks (Karkowska et al., 2025; Sobol et al., 2023). Interest rates, or the BI-rate, serve as a primary instrument of monetary policy. In conventional banks, interest rates directly influence the primary source of revenue, interest income (López-Penabad et al., 2022). Islamic banks, while not directly affected by interest, are still influenced by BI-rate fluctuations due to their effect on funding costs and competitive positioning in the market (Šeho et al., 2020). GDP, another key macroeconomic factor, serves as an indicator of economic health; an increase in GDP typically boosts demand for financing and credit, which can enhance banking profitability (Cepni & Emirmahmutoglu, 2025).

Equally important are the microeconomic factors that influence banking performance. Microeconomics serves as an analytical tool for banks to make operational decisions regarding the supply and demand of financial services (Sjarief et al., 2023). Indicators such as NPL in conventional banks and NPF in Islamic banks assess the quality of credit or financing disbursed (Wasiaturrahma et al., 2020). Elevated NPL or NPF ratios signal increased credit risk, which can diminish income and ultimately reduce ROA (Wasiaturrahma et al., 2020). The LDR and FDR reflect the extent to which collected public funds are utilized for lending or financing (Chabachib et al., 2019; Sulaeman et al., 2019). High LDR or FDR indicates strong intermediation performance, though excessive values may indicate potential liquidity risks (Sulaeman et al., 2019). Another crucial indicator is OEOI, which measures a

bank's efficiency in managing operational costs. A lower OEOI suggests greater operational efficiency, positively contributing to profitability (Pasaribu, 2022).

In Indonesia's dual banking system, operational differences between Islamic and conventional banks give rise to distinct terminology and performance indicators such as NPF vs. NPL and FDR vs. LDR (Sulaeman et al., 2019). In Islamic banks, the term NPF is used because funds are disbursed via sharia-compliant contracts like *Murabahah, Mudharabah*, and *Musyarakah*. In contrast, conventional banks refer to NPL as they provide interest-based loans (Suprayitno & Hardiani, 2021). Similarly, FDR measures the ratio of financing to third-party funds in Islamic banks, while LDR serves the same function for conventional banks but is based on credit disbursement (Sulaeman et al., 2019). Understanding these distinctions is essential for analyzing market behavior and developing economic strategies that influence banking performance (Kirana, 2021).

Bank profitability is shaped by an interplay between macroeconomic (external) and microeconomic (internal) factors (Barra & Ruggiero, 2021). Macroeconomic variables, such as inflation, BI-rate, and GDP, reflect broader economic dynamics that are beyond the direct influence of banks but critically affect loan demand, funding costs, and systemic risk (Barra & Ruggiero, 2021; Cepni & Emirmahmutoglu, 2025). Microeconomic indicators, on the other hand, such as NPL/NPF, LDR/FDR, and OEOI, demonstrate a bank's managerial competence and operational capacity in managing risk, distributing credit or financing, and maintaining cost efficiency (Khasawneh, 2016). Integrating both sets of variables is essential to capture the full picture of profitability. While external economic trends set the context, internal strategies and management quality determine the degree to which those trends impact performance (Barra & Ruggiero, 2021).

HYPOTHESES

The Relationship between Inflation and Profitability of Conventional Banks

Inflation refers to the general rise in prices of goods and services, which directly impacts purchasing power and the real value of a bank's assets (Karkowska et al., 2025). High inflation can reduce the real value of these assets and adversely affect the profit margins of banks (Sulaeman et al., 2019). For conventional banks, inflation can diminish interest income from loans, particularly if lending rates are not adjusted swiftly in response to rising prices (Karkowska et al., 2025). This results in a narrower net interest margin, ultimately depressing profitability. Moreover, inflation increases operational

costs and the likelihood of customer default, both of which can negatively influence the bank's ROA (Chabachib et al., 2019; Karkowska et al., 2025).
H1: Inflation has a significant effect on the profitability of conventional banks

The Relationship between GDP and Profitability of Conventional Banks

An increase in GDP signifies a rise in overall economic activity, which can stimulate greater demand for credit and financing (Cepni & Emirmahmutoglu, 2025). As credit demand grows, conventional banks experience higher interest income, contributing positively to their profitability (Sobol et al., 2023). Furthermore, a robust economy enhances borrowers' capacity to meet debt obligations, thereby lowering the risk of bad loans and supporting higher ROA (Cepni & Emirmahmutoglu, 2025).
H2: GDP has a significant effect on profitability of conventional banks

The Relationship between BI-rate and Profitability of Conventional Banks

The BI rate, Indonesia's benchmark interest rate, has a direct influence on lending and deposit rates. Consequently, the profitability of conventional banks is closely tied to fluctuations in the BI rate (López-Penabad et al., 2022). When the BI rate rises, banks typically raise their loan and deposit interest rates, which may increase interest income but can also reduce credit demand and raise default risks (Barra & Ruggiero, 2021). Conversely, when the BI rate falls, lending rates decrease, potentially boosting loan volumes. However, narrower interest margins may exert downward pressure on profitability (Mushtaq & Siddiqui, 2017).
H3: BI rate has a significant effect on the profitability of conventional banks

The Relationship between NPL and Profitability of Conventional Banks

A high NPL ratio indicates elevated credit risk and greater chances of default, which can significantly reduce a bank's interest income and increase impairment losses (Takahashi & Vasconcelos, 2024). As a result, the profitability of conventional banks is adversely affected due to shrinking income and rising costs associated with non-performing loans (Bolognesi et al., 2020). Effective credit risk management and maintaining low NPL levels are therefore crucial to preserving bank stability and profitability (Bolognesi et al., 2020).
H4: NPL has a significant effect on profitability of conventional banks

The Relationship between LDR and Profitability of Conventional Banks

LDR reflects the bank's ability to allocate funds efficiently, which enhances interest income and supports profitability growth (Muhammed et al.,

2024). However, if the LDR is excessively high, it may signal a liquidity risk, as the bank may be disbursing loans beyond its safe reserve threshold, threatening financial stability and long-term profitability (Fiana & Endri, 2025).

H5: LDR has a significant effect on profitability of conventional banks

The Relationship between OEOI and Profitability of Conventional Banks

OEOI ratio indicates that operational costs are consuming a larger share of income, signifying declining efficiency (Pasaribu, 2022). This negatively impacts the profitability of conventional banks, as increased expenses reduce net income and ROA (Sobol et al., 2023). Conversely, a lower OEOI implies better cost management, which positively contributes to profitability (Sobol et al., 2023).

H6: OEOI has a significant effect on the profitability of conventional banks

The Relationship between Inflation and Profitability of Islamic Banks

Inflation affects Islamic banks primarily by reducing the real value of financing returns and customer purchasing power (Sobol et al., 2023). Elevated inflation increases operating expenses and diminishes real profit margins, ultimately lowering net profits and ROA (Sobol et al., 2023). Moreover, inflation can impair customers' ability to fulfill profit-sharing obligations or financing installments, thereby raising the risk of non-performing financing (Maimun & Tzahira, 2022).

H7: Inflation has a significant effect on profitability of Islamic banks.

The Relationship between GDP and Profitability of Islamic Banks

In Islamic banking, GDP growth typically translates into increased demand for sharia-compliant financing, such as mudharabah and musyarakah, which are linked to the real economy (Abusharbeh, 2020). Strong economic performance enhances clients' repayment capabilities, reducing the risk of default and supporting profitability (Sobol et al., 2023). In contrast, a GDP slowdown may hinder financing distribution and weaken financial performance (Abusharbeh, 2020).

H8: GDP has a significant effect on profitability of Islamic banks

The Relationship between BI-rate and Profitability of Islamic Banks

Although Islamic banks do not rely on interest-based systems, the BI rate still indirectly affects them. Changes in the BI rate influence the cost of funds and returns on financing through adjustments in profit-sharing ratios (Šeho et al., 2020). A lower BI rate may reduce financing yields and, if not managed

efficiently, can decrease overall profitability (Mushtaq & Siddiqui, 2017). Conversely, a higher BI rate may compel banks to increase profit-sharing ratios to remain competitive, possibly lowering financing volume and raising default risk, thus impacting profitability (Šeho et al., 2020).
H9: BI-rate has a significant effect on profitability of Islamic banks

The Relationship between NPF and Bank Profitability of Islamic Banks

NPF ratio reflects substantial credit risk and a greater probability of defaults in contracts such as *Murabahah, Mudharabah*, and *Musyarakah* (Chabachib et al., 2019). Elevated NPF reduces the income from financing margins and increases the cost of provisioning for losses, both of which directly suppress profitability (Sjarief et al., 2023).
H10: NPF has a significant effect on profitability of Islamic banks

The Relationship between FDR and Bank Profitability of Islamic Banks

An optimal FDR demonstrates the bank's effectiveness in channeling funds into productive financing, thereby boosting margin income and profitability (Chabachib et al., 2019). However, an excessively high FDR, similar to LDR in conventional banks, increases liquidity risk and could undermine the long-term profitability and stability of Islamic banks (Sjarief et al., 2023).
H11: FDR has a significant effect on profitability of Islamic banks

The Relationship between OEOI and Bank Profitability of Islamic Banks

A high OEOI ratio indicates inefficiency, where operating expenses significantly outweigh income (Chabachib et al., 2019). This condition adversely affects profitability, as increased costs diminish net income and ROA (Priyadi et al., 2021). On the other hand, a low OEOI signifies effective cost management, thereby contributing to improved profitability for Islamic banks (Sobol et al., 2023).
H12: OEOI has a significant effect on profitability of Islamic banks

METHOD

This research employs a quantitative approach to examine the relationship between the variables included in the study. The data consist of quarterly financial statements from Islamic Commercial Banks (BUS) and Conventional Commercial Banks (BUK) for the period 2017–2023, obtained from the Financial Services Authority (OJK) website (www.ojk.go.id), Bank Indonesia (www.bi.go.id), and the Indonesian Central Bureau of Statistics (www.bps.go.id). From a total population of 13 Islamic Commercial Banks and

92 Conventional Commercial Banks, a sample of 7 Islamic Commercial Banks and 7 Conventional Commercial Banks was selected using a purposive sampling technique. The Islamic bank samples include PT Bank Muamalat Indonesia, PT Bank KB Bukopin Syariah, PT Bank Jabar Banten Syariah, PT Bank Aceh, PT Bank BCA Syariah, PT Bank Mega Syariah, and PT Bank Victoria Syariah. Meanwhile, the conventional bank samples comprise PT Bank Mandiri, PT Bank Rakyat Indonesia, PT Bank Central Asia, PT Bank Negara Indonesia, PT Bank Tabungan Negara, PT Bank CIMB Niaga, and PT Bank Permata.

The purposive sampling criteria used in this study are as follows: (1) Islamic Commercial Banks, Conventional Commercial Banks, and National Private Banks must be registered with the Financial Services Authority (OJK) and Bank Indonesia continuously from 2017 to 2023; (2) they must have published quarterly financial statements consistently throughout the 2017–2023 period; and (3) they must provide complete financial data relevant to the study variables and exhibit relatively stable financial ratios during the study period.

The data analysis employs the Panel Data Regression method. The analysis is conducted in two stages. In the first stage, the Panel Data Regression technique is applied to assess the influence of macroeconomic and microeconomic variables on the Return on Assets (ROA) of both Conventional and Islamic Banks. The panel data regression equations used in the analysis are presented in Equations (1) and (2). To validate the robustness of the estimation results, a two-step robustness test is conducted. First, the profitability measure is altered from ROA to Return on Equity (ROE). Second, control variables are added to each model to ensure consistent and reliable findings.

$$ROABUK_{it} = a + \beta_1 Inflation_{it} + \beta_2 GDP_{it} + \beta_3 BR_{it} + \beta_4 NPL_{it} + \beta_5 LDR_{it} + \beta_6 OEOI_{it}\ E_{it} \quad (1)$$

$$ROABUS_{it} = a + \beta_1 Inflation_{it} + \beta_2 GDP_{it} + \beta_3 BR_{it} + \beta_4 NPF_{it} + \beta_5 FDR_{it} + \beta_6 OEOI_{it}\ E_{it} \quad (2)$$

RESULTS AND DISCUSSION

The Effect of Macroeconomic and Microeconomic Factors on ROA of Conventional Commercial Banks

Based on the Chow test, Hausman test, and Lagrange Multiplier (LM) test, the most appropriate model for this analysis is the Random Effect Model (REM) (Table 1). The relationship between the independent variables, Inflation, GDP, BI Rate (BR), NPL, LDR, and OEOI, and the dependent variable, ROA of conventional banks, is assessed using the partial t-test. The results show that all six independent variables significantly affect ROA, as indicated by p-values

less than 0.05. Specifically, Inflation, NPL, and OEOI exhibit a negative and significant effect, while GDP, BR, and LDR show a positive and significant effect on the ROA of Conventional Commercial Banks.

The Effect of Macroeconomic and Microeconomic Factors on the ROA of Islamic Commercial Banks

Based on the Chow test, Hausman test, and Lagrange Multiplier (LM) test, the Fixed Effect Model (FEM) is determined to be the best model for analyzing the data (Table 2). The t-test results indicate that Inflation, NPF, and FDR negatively and significantly influence the ROA of Islamic Commercial Banks. In contrast, GDP, BR, and OEOI have a positive and significant effect on profitability. This is supported by the probability values of these variables being less than 0.05, indicating their substantial role in determining the financial performance of Islamic banks.

Table 1. Hypothesis Test for Conventional Bank

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Hypothesis Test
C	3.469999	0.378341	9.171606	0.0000	
INFLATION	-0.457065	0.126255	-3.620183	0.0004	Accepted H1
GDP	0.122987	0.016796	7.322269	0.0000	Accepted H2
BR	0.160295	0.038380	4.176496	0.0000	Accepted H3
NPL	-0.009401	0.003781	-2.486166	0.0138	Accepted H4
LDR	0.185968	0.064653	2.876377	0.0045	Accepted H5
OEOI	-0.022498	0.003226	-6.974381	0.0000	Accepted H6
R-squared				0.519043	
F-statistic				33.99439	
Prob (F-statistic)				0.000000	

Source: Data Processed (2024)

Table 2. Hypothesis Test for Sharia Bank

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Hypothesis Test
C	-0.552851	0.512512	-1.078709	0.2822	
INFLATION	-0.543202	0.267782	-2.028524	0.0440	Accepted H7
GDP	0.067454	0.031200	2.161977	0.0319	Accepted H8
BR	0.151060	0.073437	2.057018	0.0411	Accepted H9
NPF	-0.203285	0.054068	-3.759825	0.0002	Accepted H10
FDR	-0.011058	0.003617	-3.057190	0.0026	Accepted H11
OEOI	0.039332	0.004365	9.010582	0.0000	Accepted H12
R-squared				0.606093	
F-statistic				23.08003	
Prob (F-statistic)				0.000000	

Source: Data Processed (2024)

Robustness Test

Table 3 presents the first stage of the robustness test, where ROA is replaced with ROE as the profitability indicator (Alkhazali et al., 2024). This substitution aims to determine whether the significant relationships between independent and dependent variables hold under a different profitability metric. In the second stage, an additional control variable, Bank Size, is introduced into the model (Table 4), following the approach of Alkhazali et al. (2024). This adjustment accounts for potential heterogeneity in bank size, which may influence operational efficiency, access to resources, and risk exposure. Controlling for this factor helps ensure that the results are not biased by external variations (Sobol et al., 2023). The robustness tests confirm the consistency of the original findings and reinforce the validity of the conclusions regarding the impact of macroeconomic and microeconomic variables on bank profitability in both conventional and Islamic banking contexts.

Table 3. Robustness Test Results ROA replaced ROE

	Conventional Bank		Sharia Bank*	
Variable	t-Statistic	Prob.	t-Statistic	Prob.
C	8.375689	0.0000	-2.633242	0.0092
INFLATION	-2.916309	0.0040	-2.258553	0.0251
GDP	3.292550	0.0012	3.360056	0.0009
BR	5.579548	0.0000	3.257846	0.0020
NPL/ NPF*	-2.644927	0.0089	-3.131866	0.0013
LDR/ FDR*	3.572150	0.0004	-6.588022	0.0000
OEOI	-8.181382	0.0000	3.528023	0.0005
R-square		0.540413		0.778391
F-statistic		37.03975		53.56479
Prob (F-statistic)		0.000000		0.000000

Source: Data Processed (2024)

Table 4. Robustness Test Results Adding Bank Size Variables

	Conventional Bank		Sharia Bank*	
Variable	**t-Statistic**	**Prob.**	**t-Statistic**	**Prob.**
C	6.238954	0.0000	-4.513384	0.0000
INFLATION	-2.219952	0.0277	-2.149066	0.0330
GDP	4.519164	0.0000	2.589376	0.0104
BR	2.984421	0.0032	2.739810	0.0068
NPL/NPF*	-2.616110	0.0096	-2.313771	0.0218
LDR/ FDR*	2.096082	0.0375	-2.283396	0.0236
OEOI	-4.889419	0.0000	10.34182	0.0000
BS	2.374397	0.0186	4.403161	0.0000
R-square		0.881190		0.644588
F-statistic		103.2644		24.97238
Prob (F-statistic)		0.000000		0.000000

Source: Data Processed (2024)

Table 4 further validates the research by showing that replacing ROA with ROE produces results consistent with the initial analysis. This confirms that the findings are not dependent on a specific profitability proxy and strengthens the evidence for the influence of the examined variables on bank performance in both BUK and BUS. Additionally, Table 6 reports the results of the robustness test incorporating Bank Size as a control variable. These results also align with the original findings and further affirm that the effects of macroeconomic and microeconomic variables on profitability remain robust after accounting for institutional size differences.

DISCUSSION

The Effect of Macroeconomic and Microeconomic on ROA of Conventional Commercial Banks

In conventional commercial banks, ROA is significantly influenced by macroeconomic variables such as inflation, GDP, and the BI-rate (Liang et al., 2023). Inflation exerts a negative and significant impact on ROA. Due to their core role in financial intermediation and widespread operations within the financial sector, BUK are highly susceptible to macroeconomic volatility (Barra & Ruggiero, 2021). This finding aligns with the fundamental concept of inflation, which tends to increase the cost of goods and services, including key operational expenditures such as employee compensation, administrative fees, and maintenance costs (Karkowska et al., 2025). Rising operating expenses ultimately compress the bank's profit margins. Moreover, inflation erodes consumer purchasing power, which may prompt depositors to withdraw funds amid economic uncertainty and decrease their reliance on banking services (Rana-Al-Mosharrafa & Islam, 2021). This reduced service usage diminishes transaction volume and income streams, thereby lowering bank profitability (Karkowska et al., 2025).

Conversely, GDP growth has a positive and significant effect on ROA in conventional commercial banks. This supports the economic principle that increasing GDP signals robust economic activity, which stimulates demand for banking services, including loans, deposits, and financial instruments (Chae et al., 2020). Enhanced economic activity drives higher bank revenues, leading to improved profitability (Selayan et al., 2023). Given their expansive operational networks and varied market segments, BUKs are highly responsive to changes in macroeconomic conditions (Barra & Ruggiero, 2021). Economic growth typically fosters consumer and business confidence, increasing transaction volumes and expanding the use of banking services, which directly boosts the bank's financial performance (Cepni & Emirmahmutoglu, 2025). Furthermore, in periods of economic expansion, the risk of loan defaults decreases,

improving asset quality and reducing the need for loan loss provisioning (Selayan et al., 2023). These conditions not only strengthen ROA but also enhance the bank's long-term financial stability, consistent with Sobol et al. (2023), who observed that GDP growth positively influences ROA through increased credit activity and financial transactions, which elevate operational profits.

In addition, the BI-rate also has a positive and significant influence on the ROA of conventional banks. As the BI-rate increases, BUKs are able to adjust by raising the interest rates charged on loans (Barra & Ruggiero, 2021). According to financial theory, higher interest rates enable banks to increase interest income from lending, thereby boosting ROA (López-Penabad et al., 2022). Although banks must also pay higher interest to depositors in response to BI-rate hikes, they can still preserve or expand their net interest margin (Fabian & Kočišová, 2023). As this margin increases, overall operating income also rises, allowing banks to more effectively leverage their assets to generate profit (López-Penabad et al., 2022). This is consistent with findings by Mushtaq & Siddiqui (2017), who argue that a rising BI-rate leads to higher interest income from loans, a primary source of revenue for conventional banks.

Beyond external macroeconomic factors, internal microeconomic conditions also play a critical role in determining bank profitability (Barra & Ruggiero, 2021). Indicators such as NPL, LDR, and OEOI are pivotal in shaping ROA. NPL negatively and significantly affects profitability, consistent with the theory that a higher NPL ratio undermines a bank's financial performance (Wu et al., 2022). High NPL levels indicate increased credit risk and uncollectible loans, prompting banks to allocate greater resources to loan loss provisions (Wu et al., 2022). These provisions diminish net income and, consequently, ROA (Takahashi & Vasconcelos, 2024). Moreover, rising NPLs signal deteriorating asset quality, which can weaken stakeholder confidence in the bank's performance (Bolognesi et al., 2020). Given their broader credit exposure and varied clientele, from MSMEs to large corporations, BUKs are particularly vulnerable to such risks (Wu et al., 2022). According to Takahashi & Vasconcelos (2024), a decline in interest income due to bad loans hampers a bank's asset optimization, thereby depressing ROA. Therefore, robust credit risk management and vigilant monitoring of the loan portfolio are essential for sustaining financial health and profitability (Wu et al., 2022).

In contrast, LDR exerts a positive and significant impact on ROA. LDR reflects a bank's capacity to convert collected funds into loans and generate income (Boďa & Zimková, 2021). An optimal LDR range, typically between 78% and 92%, is often associated with higher interest income and enhanced

profitability (Fiana & Endri, 2025; Muhammed et al., 2024). From a theoretical perspective, a higher LDR implies more active and efficient use of collected funds in productive lending, which directly boosts bank income (Fiana & Endri, 2025). Muhammed et al. (2024) emphasize that increased lending activity leads to higher net interest income and net profits, positively influencing ROA. This supports the principle of fund utilization effectiveness, whereby strategic allocation of funds to productive assets enhances operational efficiency and overall earnings (Boďa & Zimková, 2021). Effective LDR management also contributes to maintaining liquidity while promoting profitability, reinforcing the bank's long-term financial resilience (Barra & Ruggiero, 2021). However, while a high LDR supports profit generation, prudent liquidity risk management is crucial to ensure that short-term obligations can be met without financial strain (Boďa & Zimková, 2021).

On the other hand, OEOI has a negative and significant effect on the profitability of BUKs. According to financial theory, a high OEOI ratio signals elevated operational costs relative to income (Chabachib et al., 2019). Ratios exceeding 60% typically reflect inefficiencies in cost management, which reduce profit margins and erode ROA (Pasaribu, 2022). Pasaribu (2022) also notes that high OEOI values indicate limited operational efficiency. This aligns with operational efficiency theory, which suggests that excessive operating expenses suppress net income, thereby negatively impacting ROA (Sobol et al., 2023). Poor cost efficiency also hinders investment in service innovation and development, adversely affecting competitiveness and long-term profitability (Sobol et al., 2023). Furthermore, the structural characteristics of BUKs, including extensive branch networks and significant staffing needs, contribute to high operational expenses. Therefore, improved efficiency strategies are needed to manage costs without compromising service quality (Pasaribu, 2022).

The Effect of Macroeconomic and Microeconomic Factors ROA of Islamic Commercial Banks

Macroeconomic stability plays a vital role in influencing the profitability of Islamic commercial banks (Liang et al., 2023). Variables such as inflation, GDP, and the BI-rate can significantly impact ROA through multiple mechanisms. Inflation exerts a notably negative effect on Islamic banks' profitability. Theoretically, a rise in inflation leads to increased prices for goods and services, which escalates the operational costs borne by Islamic banks (Sobol et al., 2023). Furthermore, Islamic banks rely heavily on profit-sharing investments like *mudharabah* and *musyarakah* (Maimun & Tzahira, 2022). As inflation rises, the real returns from these investments may

diminish, especially when profit margins fail to outpace inflation (Sobol et al., 2023). Given that Islamic finance principles prohibit fixed interest income, returns are more susceptible to economic volatility (Sobol et al., 2023). Abusharbeh (2020) found that inflation negatively affects ROA by compressing profit margins due to increased costs and decreased investment returns. Additionally, high inflation can erode consumer purchasing power, reducing demand for Islamic financial services and slowing asset growth, which ultimately hinders profitability (Abusharbeh, 2020).

Conversely, GDP has a positive and significant influence on the ROA of BUS. Rising GDP typically corresponds to increased economic activity, leading to higher third-party fund placements as investors seek Sharia-compliant returns (Sobol et al., 2023). These funds can then be directed into profitable Islamic financing projects, thereby boosting income (Mushtaq & Siddiqui, 2017). Abusharbeh (2020) emphasized that economic expansion enhances business activity and consumer confidence, increasing the demand for Islamic financing. This increase allows Islamic banks to utilize more of their productive assets, thereby strengthening ROA (Sobol et al., 2023). Theoretically, strong GDP growth supports financial stability, enhances institutional trust, and creates an environment conducive to improved bank performance and profitability (Sobol et al., 2023).

Moreover, the BI-rate also has a significant and positive impact on Islamic bank profitability. While Islamic banks do not operate on an interest-based model, their financial instruments are often benchmarked against conventional interest rates (Šeho et al., 2020). Consequently, fluctuations in the BI-rate influence the pricing of profit-sharing ratios and financing margins. When the BI-rate rises, Islamic banks often adjust their margin structures and profit-sharing formulas for contracts such as *murabahah*, ijarah, and *musyarakah* in response to prevailing market rates (Fonseka & Farooque, 2024). As a result, Islamic banks can maintain competitive yet profitable financing structures, indirectly benefiting from higher BI-rates (Šeho et al., 2020). This aligns with findings by Priyadi et al. (2021), who observed that increases in the BI-rate led to higher income from Sharia-compliant financing, thereby enhancing returns from productive assets. BI-rate adjustments also help Islamic banks stabilize income amid interest rate fluctuations, contributing to sustained profitability (Fonseka & Farooque, 2024).

Islamic bank profitability is also shaped by microeconomic factors reflecting internal performance and risk exposure. Among these, NPF, FDR, and OEOI are critical indicators influencing ROA. A high NPF has a negative and significant effect on ROA. It signifies deteriorating financing quality and rising default risk (Hanafia & Karim, 2020). According to theory, increased NPF

means more financing becomes uncollectible or delayed, thereby reducing profit-sharing or margin income (Widana et al., 2023). Additionally, when financed assets become non-productive, they no longer generate returns, reducing the overall efficiency of asset utilization (Chabachib et al., 2019). Widana et al. (2023) confirm that growing NPF levels undermine ROA by disrupting income streams from productive financing. Similarly, Sjarief et al. (2023) found that elevated NPF significantly depressed ROA in Islamic banks by weakening financing performance. High NPF also reflects weaknesses in operational and managerial oversight, contributing to increased provisioning costs and lower profitability (Hanafia & Karim, 2020).

The FDR (Financing to Deposit Ratio) also shows a negative and significant relationship with BUS profitability. An excessively high FDR indicates aggressive financing strategies, which heighten default risks and deteriorate asset quality (Safar Nasir et al., 2022). Theoretically, this can result in lower profit-sharing returns and greater loss provisioning, ultimately diminishing net profits (Chabachib et al., 2019). Additionally, high FDR may trigger liquidity issues, making it harder for banks to fulfil short-term obligations (Nastiti & Kasri, 2019). The dual risks of illiquidity and non-performing financing adversely impact the bank's ability to convert assets into profits, thus reducing ROA (Safar Nasir et al., 2022). Although in theory a high FDR reflects effective fund utilization, in practice, without proper risk controls, it can harm financial performance (Safar Nasir et al., 2022).

In contrast, the OEOI shows a positive and significant relationship with BUS profitability. While typically a high OEOI ratio suggests inefficiency, in the case of Islamic banks, this may also indicate productive spending aimed at long-term growth (Priyadi et al., 2021). The OEOI ratio assesses how much cost is incurred to generate revenue, and in many cases, higher operational spending supports strategic initiatives such as digitalization, staff development, or network expansion (Chabachib et al., 2019). Thus, an increased OEOI may not necessarily signal inefficiency but rather reflect investment in future revenue generation (Priyadi et al., 2021). Chabachib et al. (2019) suggest that these operational costs, although high, may be directed towards initiatives that strengthen the bank's competitive edge and customer value proposition. Therefore, the positive effect of OEOI on ROA implies that Islamic banks benefit when operational expenses are effectively channelled to stimulate growth and innovation, even if this raises the cost-to-income ratio (Chabachib et al., 2019).

In conclusion, the profitability of both Islamic and conventional banks is influenced not only by internal performance indicators, such as operational efficiency, asset quality, and risk management, but also by the ability to

respond strategically to macroeconomic dynamics. A synergistic relationship between macroeconomic stability (e.g., inflation, GDP growth, BI-rate fluctuations) and sound microeconomic management practices is essential in enhancing ROA. Maintaining this balance enables banks to achieve sustainable profitability and financial resilience in an ever-evolving economic landscape.

CONCLUSION

This study demonstrates that macroeconomic and microeconomic stability and growth significantly influence the profitability of both conventional and Islamic banks. In BUK, inflation exerts a negative and significant impact on ROA by increasing operational costs and reducing consumer purchasing power. Conversely, GDP growth and a higher BI-rate contribute positively by stimulating demand for banking services and enhancing net interest income. From a microeconomic perspective, NPL negatively affects ROA by increasing non-performing loans, while LDR positively influences ROA as it reflects effective fund utilization in lending. Meanwhile, OEOI has a negative impact, indicating inefficiencies in operational cost management. In the context of BUS, inflation similarly reduces ROA due to rising operational expenses and declining investment returns. However, GDP growth and BI-rate positively influence ROA by increasing third-party fund accumulation and enabling profit-sharing margin adjustments. On the micro level, NPF and FDR have a negative effect on ROA, reflecting the risk of problematic financing and liquidity constraints. In contrast, OEOI positively contributes to ROA, suggesting that increased spending supports business growth and development.

Accordingly, it is recommended that future research adopt a longitudinal design with broader time coverage to capture the evolving influence of macroeconomic and microeconomic variables on the profitability of both Islamic and conventional banks more comprehensively. Furthermore, the development of a more refined comparative model between BUS and BUK, incorporating additional control variables and external influences, is highly encouraged to enhance the generalizability of findings. This approach will offer deeper insights into the interplay between internal and external factors in shaping financial performance. Moreover, fostering a synergistic relationship between macroeconomic stability and internal operational efficiency is essential to promote sustained improvements in ROA and to strengthen the competitive position of banks in the financial sector. The findings of this study offer valuable strategic insights for bank management and regulatory authorities in formulating robust internal and external policies,

especially in the areas of risk management and digital transformation, to enhance profitability and national banking competitiveness.

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