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Analysis of the Influence of Macroeconomic Variables and Internal Bank Performance on the Profitability of Islamic Banking in Indonesia

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Abstract

This study aims to examine and analyze the profitability level of Islamic banking in Indonesia by considering macroeconomic conditions, such as inflation, the BI-Rate, and exchange rates, as well as the internal performance of Islamic banks, including CAR, FDR, and BOPO. The research adopts a quantitative methodology with a time-series data analysis covering five years (2019–2023), comprising 60 samples. Data analysis uses the VECM method and the Granger Causality Test to identify causal relationships between variables. Additionally, the study employs Impulse Response Functions and Variance Decomposition to determine the magnitude of variable impacts. The study results indicate that macroeconomic conditions and internal bank characteristics significantly impact efforts to enhance the profitability of Islamic banking. In the short term, the CAR, BOPO, FDR, and exchange rate variables have an insignificant negative effect. Conversely, inflation exhibits a significant positive relationship, while the BI Rate has an insignificant positive effect on improving Islamic banking profitability. In the long term, the CAR, FDR, and inflation variables negatively influence Islamic banking profitability, whereas BOPO has an insignificant positive impact. On the other hand, the BI Rate and exchange rate variables show a relatively significant positive effect. However, these variables collectively substantially impact the profitability of Islamic banking in Indonesia. Bank Indonesia and other financial authorities can utilize the research findings to design more responsive policies to maintain the profitability of Islamic banking. This study provides empirical evidence that can assist Islamic banks in risk management strategies and financial planning.

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Introduction

In recent periods, Islamic banking in Indonesia has experienced remarkable progress. Significant changes in the structure and regulations of Islamic banking have occurred in line with government initiatives to expand financial inclusion and promote sustainable economic development. Islamic banking plays a vital role in mobilizing funds and redistributing them to society through products such as savings and various types of financing (Firmansyah & Setiawan, 2024). The main principles underpinning Islamic banking include justice ('adl), balance (tawazun), public benefit (maslahah), and the prohibition of elements such as uncertainty (gharar), gambling (maysir), and interest (riba) (Dahruji & Muslich, 2022). Islamic banking holds significant potential for advancing the economy, mainly through developing the MSME sector (Nasrulloh et al., 2023). To support a bank's success, comparing income levels before and after tax can enhance profitability, using ROA indicators as a measurement. According to research by Hidayat et al. (2024), Bank Indonesia considers ROA the best indicator for evaluating a bank's health.

Table 1. Development of Return on Assets (ROA) of Islamic Banks 2019-2023

No	Period	Return On Assets (ROA)
1	2019	1.73%
2	2020	1.40%
3	2021	1.55%
4	2022	2.04%
5	2023	1.88%

Source: Islamic Banking Statistics (www.ojk.go.id)

Based on the data above, it can be seen that the ROA ratio has experienced both increases and decreases from 2019 to 2023. One phenomenon observed in Islamic banking is the fluctuating profitability of Islamic banks. This phenomenon indicates an issue with the ROA of Islamic banks, as ideally, ROA should continuously increase. However, the ROA of Islamic banks has experienced both increases and decreases. Annual increases in profitability should be achievable; one way to achieve this is by improving various factors that influence the profitability indicators of Islamic banks, such as operational efficiency.

A bank's ability to maintain profitability reflects solid financial performance, benefiting various stakeholders, including customers and investors. Financial ratios such as solvency, liquidity, and profitability ratios are key metrics for assessing the performance of Islamic banks (Kasmir, 2009). Jusuf (2021) revealed that internal factors significantly influence the financial performance of Islamic banks, alongside ongoing macroeconomic conditions measured through net operational profit. Moreover, Dwinanda and Tohirin (2021) added that a bank's profitability level is determined by a combination of internal and external factors influencing its operational activities.

Various factors influencing a bank's profitability remind Islamic banking management to consistently maintain its internal conditions, particularly concerning bank health indicators (Srisusilawati et al., 2022). Financial performance indicators are among the most efficient measures in conducting its operational activities. Financial indicators for Islamic banking include CAR, NPF, and FDR, while profitability is measured using net income, total assets, ROA, and ROE. Inflation, as a macroeconomic factor, can also affect a bank's profitability level. According to Yulianta and Nurjaya (2021), one of the indicators that can cause fluctuations in bank profitability is inflation, where increased inflation tends to amplify variations in bank profits. This finding is supported by Shafika (2024), who revealed a significant relationship between a bank's profitability and inflation during operational activities. Inflation can impact the financial performance of banks, particularly in managing loans disbursed to borrowers.

Research conducted by Sari, R. N., and Pangestuty (2024) concluded that both internal and external factors significantly influence Islamic banks' performance. A panel data analysis method was chosen to understand the relationships between the variables studied. Meanwhile, Selayan et al. (2023) aimed to explain the

relationships between macroeconomic variables and the financial performance of Islamic banks in Indonesia during the 2015–2022 period using Path Analysis. The macroeconomic variables examined included inflation, exchange rates, and GDP. The study results indicated that inflation, exchange rates, and financing had no significant relationship with profitability, while GDP positively affected profitability. The research by Sakti and Tandean (2024) analyzed the relationship between Islamic banking financial ratios and profitability in Indonesia using inflation as a moderating variable, employing a Moderate Regression Analysis (MRA) approach. The study found that CAR and BOPO variables did not influence ROA, while NPF also did not show any effect on ROA. Inflation was found to moderate the relationship between CAR and BOPO with ROA but not the relationship between NPF and ROA.

Meanwhile, Irham (2024) explained that an increase in ROA is not influenced by inflation rates, exchange rates, NPF, or CAR; however, the BOPO variable showed a significant negative impact on ROA. This study period encompasses the impact of COVID-19 and economic recovery, which has not been widely discussed in previous studies on Islamic banking. By analyzing the latest data, this research contributes to understanding how Islamic banks maintain profitability in volatile economic conditions. This study not only considers macroeconomic variables but also examines the internal performance of banks. This approach provides a more comprehensive perspective than studies focusing solely on a single aspect.

On the other hand, Rusliani and Mubyarto (2019) concluded that Islamic banking in Malaysia has greater advantages in supporting economic stability compared to Islamic banking in Indonesia, which still faces various limitations in this aspect. Based on these phenomena, it is evident that research findings regarding the influence of internal and external factors on the profitability of Islamic banks are inconsistent.

The inconsistency of previous research findings has created a gap in the literature, and this study aims to fill that gap. Not only is there inconsistency in previous research, but there is also a debate about the factors that most significantly affect the profitability of Islamic banks. Setiawan et al. (2021) examined the impact of inflation, exchange rates, and BI Rates on the profitability of Islamic banks but did not integrate internal factors such as CAR, BOPO, and FDR into its research. Motivated by the differences between the results of previous studies and the existing theoretical framework, this study seeks to provide a new contribution to understanding the influence of macroeconomic variables and internal bank performance on the profitability of Islamic banks from 2019-2023. This is because, during this period, there were economic shocks in Indonesia due to the COVID-19 pandemic, which caused many companies, including Islamic banks, to experience an economic crisis. Coupled with the decline in Return on Assets in 2020, this study comprehensively integrates macroeconomic variables and internal bank performance into a single research model.

This study integrates macroeconomic variables and internal bank performance into a single analytical model to comprehensively understand the factors affecting the profitability of Islamic banks. Previously, similar studies have more often discussed these variables separately. This issue is raised because there has been no previous research using the VECM model to explore the relationship between these variables, so this study aims to provide a new contribution to the economic and financial literature. Bank Indonesia and other financial authorities can utilize the research findings to design more responsive policies to maintain the profitability of Islamic banking. This study provides empirical evidence that can assist Islamic banks in risk management strategies and long-term financial planning. This research can identify how Islamic banks adapt to economic shocks and return to equilibrium by considering long-term error correction.

Literature Review

The Effect of CAR on the Profitability of Islamic Banking

In the short term, a high CAR reflects good capital adequacy, which can enhance investor and depositor confidence in the bank's stability Wahyuningsih et al., (2021). However, since large capital reserves are not

necessarily immediately channeled into productive financing, their impact on profitability may not be significant. This aligns with the findings of Astuti (2022) and Munir (2018), who concluded that the profitability of Islamic banks is not significantly influenced by CAR. In this situation, Islamic banks may focus more on maintaining liquidity and complying with capital regulations, meaning that an increase in CAR does not directly contribute to profitability.

On the other hand, in the long term, a high CAR can positively impact profitability if the bank can utilize its excess capital for financing expansion and asset diversification (Agus & Fadli, 2024). This is consistent with the research conducted by Natanael (2022), which states that a high CAR ratio positively influences the profitability of Islamic banks. With more substantial capital reserves, Islamic banks can extend financing on a larger scale, increasing revenue from profit margins and profit-sharing. However, if excess capital is not optimized, such as when banks adopt a more cautious approach to financing expansion or face market demand limitations, a high CAR may have a negative or insignificant impact on profitability. Based on the explanations above, the following hypothesis can be drawn:
H1: *CAR and profitability (ROA) have a positive and significant relationship*

The Effect of BOPO on the Profitability of Islamic Banking
According to Kusnadi and Sukartaatmadja (2022), BOPO is often referred to as an efficiency ratio, where a lower ratio reflects better management of operational costs by the bank. Achieving operational efficiency positively impacts the bank's ability to maintain profitability. In the short term, a high BOPO indicates that operational costs are high relative to the bank's operating income. This condition can directly pressure profitability, as revenue may not cover significant operational expenses (Natanael, 2022). Therefore, consistent with the study by Sakti and Tandean (2024), BOPO tends to have a significant adverse effect on ROA, as low operational efficiency can reduce the bank's profit margins within a relatively short period.

In the long term, the impact of BOPO on profitability may depend on the bank's strategy to improve operational efficiency. If the bank successfully optimizes operational costs through service digitalization, process automation, or better resource management, the negative effect of BOPO on ROA may gradually diminish. However, if operational efficiency remains low and operational costs continue to rise without being offset by increased revenue, the negative impact of BOPO on profitability may persist in the long run. From this explanation, the following hypothesis is derived:
H2: *BOPO and profitability (ROA) have a negative and significant relationship*

The Effect of FDR on the Profitability of Islamic Banking
An increase in FDR not accompanied by good financing quality can lead to a higher level of non-performing financing. This can pressure ROA, as banks must allocate funds for credit risk reserves and face potential defaults. Therefore, as Akhiruddin Siregar et al. (2023) found, an increase in FDR can negatively impact profitability if not followed by effective risk management.

On the other hand, in the long term, an optimally managed FDR can enhance the profitability of Islamic banks. When banks can efficiently channel funds into productive sectors with measured risks, financing income will increase and contribute positively to ROA. Studies by Wahyunitasari et al. (2024) and Veriana and Wirman (2023) indicate that an optimal FDR level can positively impact profitability by ensuring that the collected funds are utilized productively and profitably. Based on the theoretical framework and previous research findings, the following hypothesis is proposed:
H3: *The FDR variable has a significant positive impact on the ROA of Islamic banks*

The Effect of Inflation on the Profitability of Islamic Banking
Research by Setiawan et al. (2021) showed that inflation negatively affects the profitability of Islamic banks, primarily through increased operational costs and decreased consumer purchasing power. However, a study by Dodi and Arief (2018) revealed that inflation can positively impact Islamic banking profitability under

certain conditions by increasing profit margins from trade-based financing. In contrast, in conventional banking, inflation typically has a negative impact due to rising interest rates, which pressure profit margins. Saleh (2021) found that inflation significantly negatively impacts the Return on Assets (ROA). Higher inflation rates lead to lower bank profitability. Inflation reduces purchasing power and the actual value of money, discouraging people from saving and taking out loans, thus decreasing banking profits. This research supports the findings of Anindya et al. (2022), which also revealed a significant negative correlation between inflation and ROA. Inflation influences a bank's strategy in pricing its products and maintaining operational efficiency. In Islamic banking, the profit-sharing mechanism can have macroeconomic effects different from those of conventional banks. Based on the theoretical framework and previous research findings, the following hypothesis is proposed:
H4: *The inflation variable significantly negatively impacts the ROA of Islamic banks*

The Effect of BI Rate on the Profitability of Islamic Banking
The BI Rate, which reflects Bank Indonesia's benchmark interest rate policy, significantly affects the profitability of Islamic banking in Indonesia. Although Islamic banks do not directly implement the interest rate concept, the BI Rate is a reference in determining financing margins and profit-sharing and influencing the cost of funds. In contrast, in conventional banking, interest rates have a significant impact as they determine borrowing costs and deposit interest rates.

An increase in the BI Rate can pressure Islamic banks' profitability, especially if banks do not promptly adjust financing margins or profit-sharing arrangements with partners and depositors. A rising BI Rate can lead to higher funding costs, as Islamic banks must offer more attractive returns to depositors to remain competitive with conventional banks. If this increase is not offset by higher financing income, profitability may decline, as found by Anindya et al. (2022), who identified a negative relationship between the BI Rate and bank profitability.

On the other hand, in the long term, Islamic banks have the flexibility to adjust financing margins and profit-sharing schemes to counterbalance rising funding costs. If banks can efficiently implement these adjustments, an increase in the BI Rate may enhance profitability, as observed by Addury and Ramadhani (2024) and Aminulloh and Suselo (2021). This is due to higher financing income that can offset the increased cost of funds, especially if the demand for financing remains firm and does not decline significantly due to higher interest rates. Based on the theoretical framework and previous research findings, the following hypothesis is proposed:
H5: *The BI Rate variable has a significant positive impact on the ROA of Islamic banks*

The Effect of Exchange Rates on the Profitability of Islamic Banking
Compared to conventional banking, exchange rates can have a more significant impact, especially on banks with high exposure to foreign debt. Exchange rate fluctuations can create instability in the profitability of Islamic banks, particularly if they have significant exposure to foreign debt or financing in foreign currencies. The depreciation of the Rupiah increases the cost of foreign currency debt, which can pressure bank profitability due to higher repayment burdens. Additionally, the risk of default also rises, as debtors with foreign currency loans must bear higher conversion costs. These findings align with the study by Ramadhan et al. (2022), which shows that Rupiah depreciation negatively affects the profitability of Islamic banks.

On the other hand, in the long term, a stable or appreciating exchange rate can enhance the profitability of Islamic banks, mainly through increased international transactions and higher valuations of dollar-based assets. When the Rupiah strengthens, banks that invest or finance in foreign currencies can benefit from the appreciation of their asset values. The study by Putri et al. (2024) supports this argument, showing that Rupiah appreciation can positively impact the profitability of Islamic banks. Additionally, studies by Anindya et al. (2022) and Pratiwi et al. (2022) reveal that the BI Rate has a significant negative impact on Return on

Assets (ROA). Based on the theoretical framework and previous research findings, the following hypothesis is proposed:

H6: *The exchange rate variable significantly negatively impacts the ROA of Islamic banks*

Method

Type of Research

This study employs quantitative analysis using time series data with secondary data types. The data is analyzed every month over the period from January 2019 to December 2023. The data sources used are obtained from the Central Bureau of Statistics (BPS), Bank Indonesia (BI), and the Financial Services Authority (OJK). Time series analysis is used to observe data presented over time, where, in addition to being influenced by other variables, a variable is also affected by its values in previous periods (Ekananda, 2016).

The population in this study consists of Islamic banks registered with the Financial Services Authority (OJK). In this research, the entire population was used as a research sample through saturated sampling. This study employs the Vector Error Correction Model (VECM) for analysis. The VECM model is considered the most suitable for research using multivariate time series data Faizin (2021), as it estimates both short-term and long-term relationships between variables using time series data for each variable. The VECM (Vector Error Correction Model) allows for analyzing short-term and long-term relationships between macroeconomic variables, internal bank performance, and profitability. This method is superior to ordinary regression as it captures long-term equilibrium dynamics, which are often overlooked in previous studies. Through this analysis, the research will provide insights into how Islamic banking responds to macroeconomic and internal variables, thereby assisting regulators, academics, and banking practitioners in formulating more effective business strategies and policies. The research data was processed using EViews 10.

Measurements

Table 2. Operational Variables

Variable	Measurement	Relevance to Islamic Banking
Return On Assets (ROA)	ROA= (Net Income / Total Assets) x 100%	Measures how efficiently a bank generates profit from its assets. In Islamic banking, profits come from profit-sharing, fee-based income, and asset-backed transactions rather than interest income
Capital Adequacy Ratio (CAR)	CAR= (Bank Capital / Risk Weighted Assets) x 100%	Indicates a bank's ability to absorb risks and maintain financial stability
Operational Cost to Operating Income (BOPO)	BOPO= (Operating Cost / Operating Income) x 100%	Measures the efficiency of a bank's operational management. A lower BOPO indicates greater efficiency
Financing Deposit Ratio (FDR)	FDR= Total Financing / Total Deposits x 100%	Measures the proportion of collected funds allocated to financing activities
Inflation	Annual percentage change in the general price level of goods and services	Inflation affects consumer purchasing power, which influences both financing demand and deposit growth in Islamic banks
Kurs	The value of the Indonesian Rupiah relative to other currencies, such as USD	Affects Islamic banks with foreign currency-based financing
BI Rate	The benchmark interest rate set by Bank Indonesia	While Islamic banks do not engage in interest-based transactions, BI Rate affects the competitive landscape

Data Analysis

The data was analyzed using EViews 10. Vector Autoregression (VAR) analysis was employed in this study, provided that the data is stationary at level. Vector Error Correction Model (VECM) was utilized if the data is

stationary at first difference. However, VECM also has potential methodological limitations, one of which is that the direction of causality between variables is not always clear, even with the Granger Causality Test. For example, does the BI Rate affect the ROA of Islamic banks, or does the profitability of Islamic banks influence BI's decision in setting interest rates? If an external variable affects both but is not included in the model, the estimation results may become biased. The equation model of the influence of macroeconomic variables and internal bank performance on Islamic banking profitability is as follows:

$$ROAt = \alpha 0 + \alpha 1 InCARt + \alpha 2 InBOPOt + \alpha 3 InFDRt + \alpha 4 InINFLASIt + \alpha 5 InKURSt + \alpha 6 InBIRATEt + \varepsilon t$$

Testing using the VECM model involves several stages:

1. Stationarity Test/Unit Root Test
   The stationarity test is an initial assessment required before analyzing the data. The methodologies for unit root testing are the Augmented Dickey-Fuller test (ADF-test) and the Phillips Perron test (PP-Test). Both tests can indicate the presence of a unit root as the null hypothesis (Hamid, 2014).
2. Optimal Lag Length Test
   The VECM model's lag length significantly impacts the estimation results. The optimal lag length test proves each variable's influence on the other variables (Eka et al., 2019).
3. Cointegration Test
   The cointegration test determines a relationship between variables, especially in the long-term equilibrium (Basuki, Agus Tri., & Prawoto, 2017). The cointegration test in this study was conducted using Johansen's Cointegration Test. This theory explains that economic variables that move together can be cointegrated in the long run.
4. VAR/VECM Model Stability Test
   This stability test is necessary because if the estimated stability of the VAR/VECM is unstable, then the analysis of Impulse Response Function (IRF) and Variance Decomposition (VDC) is invalid. If the modulus of all roots is less than 1, then the stability test results can be considered stable (Basuki, Agus Tri., & Prawoto, 2017).
5. Granger Causality Test
   The Granger causality test examines the influence of each variable on the other variables and determines the significant bidirectional relationship between them.
6. VECM Estimation Test
   The VECM model is used in the framework of a non-structural VAR where time series data is not stationary at the level but is stationary after differencing and cointegration, thus describing the theoretical relationship between variables. VECM restricts the long-term relationship between existing variables to converge into a cointegration relationship while allowing for dynamic fluctuations in the short term.

Result and Discussion

Stationarity Test

According to Kuncoro (2013), if variables are not stationary at the level stage, first-order differencing (1st difference) is required.

Table 3. Unit Root Test Results

Variabel	Level		First Difference	
	ADF t-statistik	Prob	ADF t-statistik	Prob
ROA	-2.005763	0.2837	-7.359944	0.0000
CAR	-1.309381	0.6197	-7.962530	0.0000
BOPO	-1.630629	0.4608	-6.856888	0.0000
FDR	-1.631680	0.4603	-7.125010	0.0000
INFLASI	-2.163558	0.2216	-11.71969	0.0000
BI RATE	-1.510830	0.5212	-3.190896	0.0256
KURS	-5.324968	0.0000	-8.198892	0.0000

Source: Processed Eviews Output, (2024)

Since the data was not stationary at the level stage, the analysis performed a stationarity test at the first difference level to eliminate unit roots and ensure stationarity. The presence of unit roots indicates non-stationary data. In contrast, data without unit roots is stationary, with values that tend to remain stable around the mean and are not influenced by time factors. After conducting additional stationarity tests at the first difference level, the variables were found to be stationary, with significant probability values below 0.05 (<0.05). This indicates that the data is suitable for further analysis.

Optimal Lag Length Test

This study's lag length ranges from 0 to 4, as 60 data points are analyzed. This range of lag lengths is considered adequate to represent the relationships among variables in the study.

Table 4. Results of Optimal Lag Length Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-751.9374	NA	3803.521	28.10879	28.36662*	28.20823
1	-675.8970	129.5503	1418.752	27.10730	29.16995	27.90278*
2	-623.7052	75.38814	1378.659	26.98908	30.85655	28.48061
3	-551.4541	85.63086*	745.5112*	26.12793	31.80022	28.31551
4	-495.7167	51.60875	986.8238	25.87840*	33.35550	28.76202

Source: Processed EViews Output (2024)

The study's results indicate that the optimal lag length is 4, as shown by the lowest value of the Akaike Information Criterion (AIC). Consequently, the subsequent analysis will utilize a lag length of 4. Once the optimal lag length is determined, the cointegration test is conducted.

Cointegration Test

The cointegration test is used to identify the long-term equilibrium and stability patterns among variables. Suppose the profitability of Islamic banks and macroeconomic variables are interconnected in the long run. VECM can capture the long-term equilibrium relationship and short-term adjustments in that case. Johansen's Cointegration Test is applied in this study with a significance level (critical value) of 5% ($\alpha = 0,05$).

Table 5. Results of Cointegration Test

No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.925655	304.7718	125.6154	0.0000
At most 1 *	0.625222	167.0228	95.75366	0.0000
At most 2 *	0.536315	115.0074	69.81889	0.0000
At most 3 *	0.441954	74.27418	47.85613	0.0000
At most 4 *	0.381643	43.35854	29.79707	0.0008
At most 5 *	0.164552	17.88201	15.49471	0.0214
At most 6 *	0.145817	8.353322	3.841466	0.0039

Source: Processed Eviews Output, (2024)

The test results show that the probability values for all variables are less than 0.05 (<0.05). This indicates the presence of a long-term relationship or cointegration among the variables. Therefore, the subsequent data analysis can use the VECM model.

VAR/VECM Model Stability Test

The VECM model's stability test ensures the data's validity using the Impulse Response Function (IRF) and Variance Decomposition (VDC) analyses. The evaluation of VECM stability based on the modulus criterion being less than one (<1) confirms the validity of the analysis. These results indicate that the IRF and VDC analyses are valid.

Table 6. Results of the VECM Stability Estimation Test

Root	Modulus	Root	Modulus
-0.670279 - 0.680414i	0.955111	0.577422 - 0.595349i	0.829371
-0.670279 + 0.680414i	0.955111	0.577422 + 0.595349i	0.829371
-0.841363 - 0.417257i	0.939146	0.251390 - 0.783331i	0.822681
-0.841363 + 0.417257i	0.939146	0.251390 + 0.783331i	0.822681
0.555020 + 0.739262i	0.924422	-0.808256	0.808256
0.555020 - 0.739262i	0.924422	0.266742 - 0.619685i	0.674656
-0.860415 - 0.225234i	0.889407	0.266742 + 0.619685i	0.674656
-0.860415 + 0.225234i	0.889407	-0.020843 + 0.673831i	0.674153
0.092967 + 0.881257i	0.886147	-0.020843 - 0.673831i	0.674153
0.092967 - 0.881257i	0.886147	-0.542331 + 0.378793i	0.661518
-0.285225 + 0.809245i	0.858038	-0.542331 - 0.378793i	0.661518
-0.285225 - 0.809245i	0.858038	0.528546	0.528546
-0.401180 - 0.740256i	0.841976	0.225255	0.225255
-0.401180 + 0.740256i	0.841976	-0.097762	0.097762

Source: Processed EViews Output, (2024)

The stability test of the VECM model in Islamic banking reveals that the system used is stable. There are 28 roots in the characteristic polynomial, with modulus values ranging from 0.955111 to 0.097762, all below 1 (<1). Therefore, the VECM model used for the IRF and VDC analyses can be considered stable.

Granger Causality Test

The Granger causality test aims to identify the causal relationships between the ROA (Return on Assets) variable and its influencing factors: CAR, BOPO, FDR, inflation, BI Rate, and exchange rate. A variable is said to have a causal relationship if its probability value is less than 0.05 (<0.05).

Table 7. Results of the Granger Causality Test

Null Hypothesis	Obs	Lag 4	
		F-Statistic	Prob.
CAR does not Granger Cause ROA	56	1.54928	0.2035
ROA does not Granger Cause CAR		0.53620	0.7098
BOPO does not Granger Cause ROA	56	1.20688	0.3205
ROA does not Granger Cause BOPO		6.44029	0.0003
FDR does not Granger Cause ROA	56	0.96501	0.4356
ROA does not Granger Cause FDR		1.33590	0.2706
INFLASI does not Granger Cause ROA	56	0.30821	0.8710
ROA does not Granger Cause INFLASI		0.40642	0.8031
BIRATE does not Granger Cause ROA	56	0.79439	0.5348
ROA does not Granger Cause BIRATE		1.26647	0.2965
KURS does not Granger Cause ROA	56	1.45387	0.2313
ROA does not Granger Cause KURS		0.67924	0.6098

Source: Processed EViews Output, (2024)

Based on the test results, the following findings were obtained:

The CAR variable does not significantly affect ROA, and vice versa (0.2035 and 0.7098 > 0.05). Therefore, there is no causality between CAR and ROA due to the insignificant probability values. The BOPO variable does not significantly affect the ROA variable, with a probability value of 0.3205 > 0.05. However, ROA significantly affects BOPO with a probability value of 0.0003 < 0.05. Thus, the data indicates a one-way causal

relationship between ROA and BOPO. The FDR variable does not significantly affect the ROA variable, and vice versa. With probability values of 0.4356 and 0.2706 (> 0.05), there is no evidence of a causal relationship between FDR and ROA. The inflation variable does not have a significant effect on ROA (p = 0.8710), and ROA does not affect inflation (p = 0.8031). These results confirm the absence of causality between inflation and ROA. The BI-Rate variable does not have a significant effect on ROA (p = 0.5348), and ROA does not affect the BI-Rate (p = 0.2965). These results confirm the absence of causality between the BI-Rate and ROA. The exchange rate (KURS) variable does not significantly affect the ROA variable, and vice versa, with probability values of 0.2313 and 0.6098 (> 0.05). Therefore, there is no causal relationship between the exchange rate and ROA.

Interpretation of VECM (Vector Error Correction Model) Estimation Results

Table 8. Short-Term VECM Estimation Test Results

Variabel	Koefisien	t-statistik	R-Squared
CointEq1	-0.046224	[-0.18126]	
D(ROA(-1),3)	-0.701091	[-3.16163]	0.932443
D(CAR(-1),3)	-0.039652	[-0.90556]	0.864004
D(BOPO(-1),3)	-0.011433	[-0.87179]	0.903734
D(FDR(-1),3)	-0.039525	[-2.87760]	0.916413
D(INFLASI(-1),3)	0.001071	[2.01853]	0.902705
D(BIRATE(-1),3)	0.193753	[1.37281]	0.743457
D(KURS(-1),3)	-2.90E-05	[-0.22485]	0.956413
C	-0.000239	[-0.01454]	

Source: Processed EViews Output, (2024)

Table 9. Long-Term VECM Estimation Test Results

Variabel	Koefisien	t-statistik
D(CAR(-1),2)	-0.090594	[-3.15235]
D(BOPO(-1),2)	0.019899	[1.45138]
D(FDR(-1),2)	-0.004962	[-0.31000]
D(INFLASI(-1),2)	-0.117017	[-1.75515]
D(BIRATE(-1),2)	0.299178	[2.48666]
D(KURS(-1),2)	0.000579	[13.1074]

Source: Processed EViews Output, (2024)

The results of the VECM estimation analysis show that the R-squared value reaches 0.932443 or 93.24%, indicating the model's short- and long-term accuracy. Independent variables (CAR, BOPO, FDR, inflation, BI-Rate, and exchange rate) explain 93.24% of the dependent variable's (ROA) changes. Other variables outside the study influence the remaining 6.76%. To analyze the significance of the relationships between variables, the t-statistic is compared with the t-table value. If the t-statistic > t-table (2.005746), the variable has a significant effect, and vice versa; if the t-statistic < t-table, it does not.

IRF (Impulse Response Function) Analysis Results

The ROA response to shocks in CAR variable values

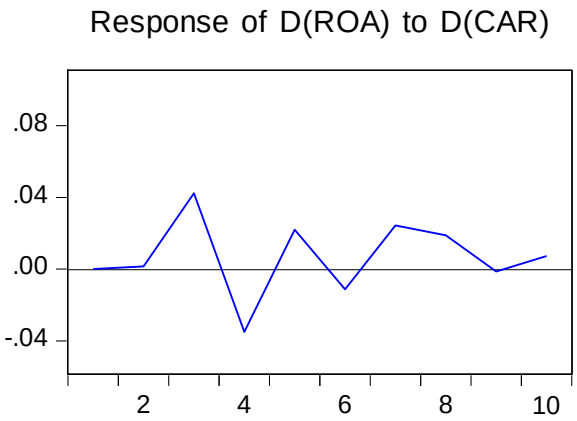

Figure 1. IRF Analysis Results of ROA Response to CAR Shock

The graph above illustrates that ROA responds fluctuatively to changes (shocks) in CAR. The IRF graph shows that the response increases from period 1 to period 3, showing a positive trend, then declines in period 4. Subsequently, the response rises again in period 5 and continues to increase from period 7 to period 10. Thus, the ROA variable responds to shocks in the CAR variable, which fluctuates each period. The development of CAR does not influence the movement of ROA in Islamic banks. The results of the analysis indicate that CAR does not have a significant effect on ROA levels. This may be because Islamic banks operating from 2019 to 2023 did not optimize the available funds. This situation might have occurred because the COVID-19 pandemic led Islamic bank management to pay less attention to CAR levels when determining capital additions. Although the increase in CAR was higher in the second period, this rise was not due to an increase in bank capital but rather a decline in financing disbursed by Islamic banks due to COVID-19. Previous studies have shown similar results. Research by Suryadi et al. (2020) and Khoirunnisa et al. (2016), as well as Sabtatianto and Yusuf (2019) and Munir (2018), found that CAR does not have a significant effect on ROA levels.

The ROA response to shocks in BOPO variable values

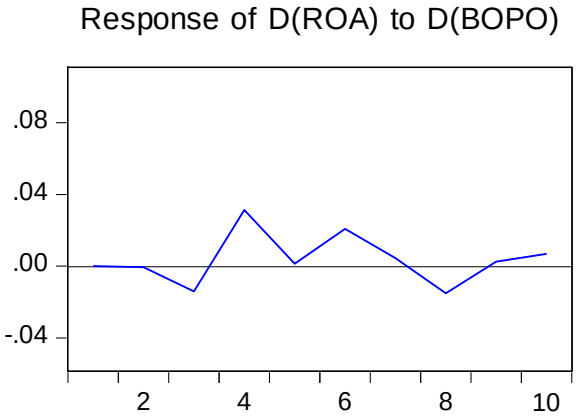

Figure 2. IRF Analysis Results of ROA Response to BOPO Shock

The graph above shows that ROA responds to changes (shocks) in BOPO with a negative trend from the beginning of the period to period 3. The trend shifts to positive starting from period 4 and continues to increase until period 7. However, in period 8, the response declines again with a negative trend. Hence, the ROA variable fluctuates in response to BOPO shocks throughout the period. The results above show that a 1% increase in BOPO will increase the value of ROA. This result differs from the hypothesis that BOPO hurts ROA. However, previous research conducted by Khoirunnisa et al. (2016) and Suryadi et al. (2020) found that BOPO positively affects ROA. The level of BOPO becomes a guideline for bank management to influence ROA through financing, and financing will reduce the ratio of operating expenses to operating income of Islamic banks. If the income of Islamic banks increases with the assumption that operating costs remain constant,

then BOPO will decrease, and ROA will increase. The positive relationship between BOPO and ROA can be interpreted as the ability of Islamic bank management to manage operating costs efficiently to maximize ROA.

The ROA response to shocks in FDR variable values

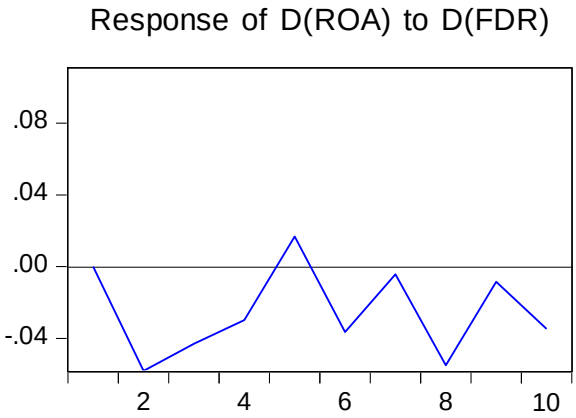

Figure 3. IRF Analysis Results of ROA Response to FDR Shock

The graph above illustrates ROA's response to changes (shocks) in FDR. ROA initially shows a negative trend from period 1 to 4, then shifts to a positive trend in period 5. However, the response declines again with a negative trend from period 6 to period 10. In conclusion, ROA responds negatively and inconsistently to FDR shocks, fluctuating throughout the period. The fact that a higher FDR leads to a declining ROA indicates that the bank's management is less capable of optimizing the funds it has to channel into profitable financing. This research finds that in the long term, FDR hurts the ROA level. This finding is in line with the research of Mirawati et al., (2019) and Saleh (2021) that FDR is negatively related to ROA. The fluctuating nature of the FDR movement influences this negative result during the second to tenth period, while the movement of ROA is relatively constant during the observation period.

The ROA response to shocks in Inflation variable values

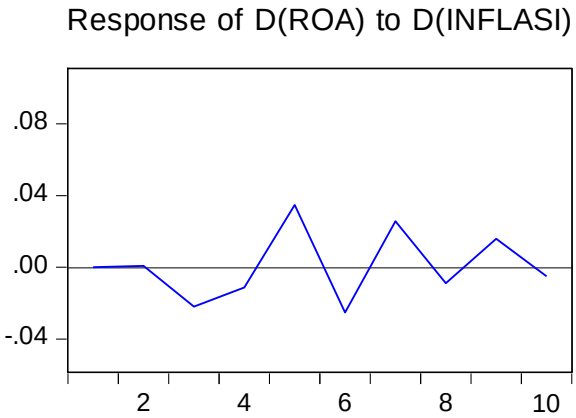

Figure 4. IRF Analysis Results of ROA Response to Inflation Shock

The graph above depicts ROA's response to changes (shocks) in inflation. ROA exhibits a negative trend from the early period to period 4. In period 5, the trend shifts to positive. Subsequently, the response declines again with a negative trend in period 6, increases in period 7, and declines once more in period 10, though maintaining a stable trend. Thus, ROA's response to inflation shocks shows fluctuations throughout the period, with a negative but stable tendency. If the inflation rate increases, the profitability rate decreases, and if the inflation rate decreases, profitability will increase. If the profit margin increases, then financing in Islamic banks increases. This is in line with the Dornbusch and Fischer Theory, as stated in Wahdaniyah (2013), which says that high inflation causes the value of money to decrease and harms or at least does not benefit the public. Thus, the funds collected by banks become smaller.

The ROA response to shocks in BI Rate variable values

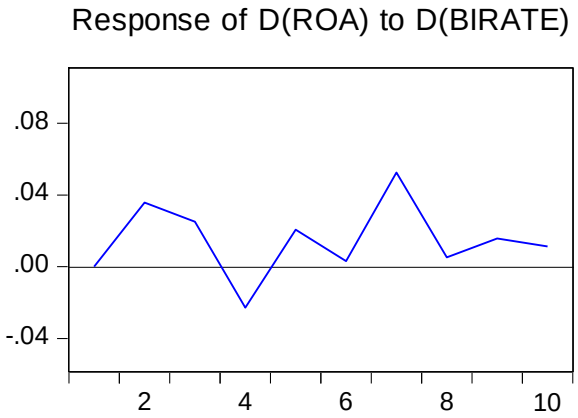

Figure 5. IRF Analysis Results of ROA Response to BI Rate Shock

The graph above shows that ROA responds positively to changes (shocks) in the BI Rate from period 1 to period 3. In period 4, an unstable decline occurs, but in period 5, despite some fluctuations, the overall trend remains stable. Therefore, it can be concluded that ROA's response to BI Rate shocks fluctuates throughout the periods, with a generally positive and stable tendency. An increase in the BI Rate is typically followed by a rise in interest rates in conventional banks. However, this increase does not directly affect Islamic banks. This is because Islamic banks do not operate based on interest rates, meaning that regardless of interest rate fluctuations, the profitability of Islamic banks remains unaffected. Even though the BI Rate increases, the profitability of Islamic banks continues to rise. This is because, when interest rates rise, Islamic banks implement several internal policies, including increasing the profit-sharing ratio they offer.

The ROA response to shocks in Exchange Rate (KURS) variable values

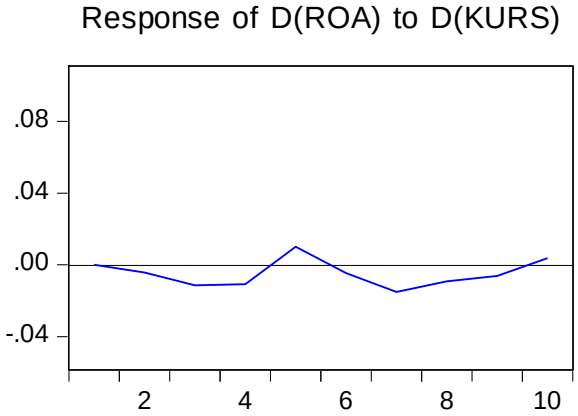

Figure 6. IRF Analysis Results of ROA Response to Exchange Rate (KURS) Shock

The graph above shows that ROA responds to changes (shocks) in the exchange rate (KURS) with an unstable negative trend from the initial period until period 4. The trend shifts to positive in period 5 but declines again with a negative trend from period 6 to period 9 before stabilizing with a positive trend in period 10. In conclusion, ROA's response to exchange rate shocks fluctuates throughout the periods, with a generally negative tendency but stabilizing towards the end. The exchange rate has a positive but not highly significant correlation with the profitability of Islamic banks. When the exchange rate appreciates, meaning the domestic currency strengthens, it can increase profitability for Islamic banks. However, if the domestic currency depreciates, it becomes detrimental or at least unfavorable to the public, resulting in a decline in the funds collected by the bank. Conversely, when the domestic currency appreciates, it benefits the public, increasing collected funds. The exchange rate has a significantly positive effect on profitability. This study supports the findings of Selayan et al. (2023), indicating that whether the currency appreciates or depreciates, it will impact bank profitability, although not significantly.

Variance Decomposition Analysis Results

Table 10. Variance Decomposition (VDC) Analysis Results

Variance Decomposition of ROA:								
Period	**S.E.**	**D(ROA)**	**D(CAR)**	**D(BOPO)**	**D(FDR)**	**D(INFLASI)**	**D(BI RATE)**	**D(KURS)**
1	0.110468	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.147468	78.45020	0.011170	0.001451	15.56388	0.002464	5.884891	0.085950
3	0.175556	68.33347	5.822470	0.637427	16.96611	1.558713	6.204584	0.477226
4	0.186667	60.89827	8.672768	3.382046	17.56121	1.743524	6.987867	0.754316
5	0.197482	58.63022	8.987133	3.026843	16.41983	4.657075	7.339092	0.939808
6	0.205359	55.70325	8.608316	3.820348	18.32680	5.813333	6.810914	0.917030
7	0.220495	52.76290	8.691927	3.356426	15.93352	6.404131	11.58933	1.261760
8	0.235380	51.68868	8.270960	3.355703	19.45057	5.759237	10.21865	1.256207
9	0.242644	53.49195	7.785708	3.168516	18.42167	5.850001	10.03608	1.246082
10	0.250945	54.18470	7.363196	3.035953	19.13470	5.508908	9.585786	1.186756

Source: Processed Eviews Output, (2024)

Based on Table 10, in the first period, Return on Assets (ROA) is entirely influenced by fluctuations within the ROA variable, contributing 100%. In this initial period, other variables such as CAR, BOPO, FDR, inflation, BI Rate, and exchange rate (KURS) have not yet impacted ROA. From the second to the tenth period, the influence of ROA shocks on itself remains significant, although it gradually declines, contributing 54.18% by the end of the period. In the second period, the CAR variable influences ROA by 0.01%, increasing steadily to 7.36% by the tenth period. Similarly, the BOPO variable starts contributing 0.001% in the second period and rises to 3.03% by the tenth period. The FDR variable contributes 15.56% in the second period, increasing to 19.13% in the tenth period. Meanwhile, the contributions of inflation, BI Rate, and KURS in the second period are recorded at 0.002%, 5.88%, and 0.08%, respectively. By the tenth period, their contributions increase to 5.5%, 9.58%, and 1.18%. According to the data in the table, the FDR variable in the tenth period emerges as the most significant contributor to the formation of ROA.

Discussion

The Effect of CAR on the Profitability of Islamic Banking

The analysis of the VECM estimation results indicates that the CAR variable has an insignificant negative effect on the profitability of Islamic banking in both the long and short term. This finding suggests that the CAR ratio, which reflects a bank's capital adequacy, does not always correspond to higher profitability. Banks with sufficient capital that fail to manage it effectively to generate profits tend to experience limited profitability growth. Therefore, banks strive to maintain capital adequacy prudently to mitigate risks, particularly in fund allocation. Although a high CAR indicates that a bank has sufficient capital to bear risks, poor risk management effectiveness can hinder profitability. If an Islamic bank allocates funds to profitable sectors inefficiently, a high CAR will not significantly contribute to profitability. This study is supported by previous research, such as Yulianda, Maslichah (2024), Yayan, K. A., & Ayuningtyas (2024), and Saputra et al., (2023), which also concluded no significant causal relationship between CAR and ROA. This study finds that CAR has a negative relationship with profitability; therefore, OJK may consider adjusting capital regulations for Islamic banks. For example, regulators could implement more flexible CAR requirements for Islamic banks, allowing them greater freedom in channeling financing to the real sector. Additionally, they could encourage Islamic banks to develop hybrid sukuk as a capital instrument, which enhances CAR and remains compliant with Sharia principles.

The Effect of BOPO on the Profitability of Islamic Banking

The VECM estimation analysis indicates that BOPO has a negative but insignificant effect on the profitability of Islamic banks in the short term. In contrast, it has a positive but still insignificant effect in the long term. This study aligns with the findings of Sakti and Tandean (2024), who concluded that BOPO significantly and

negatively affects ROA. In the short term, a high BOPO reflects high operational costs relative to the bank's operating income. This can put pressure on the profitability of Islamic banks. However, since the impact is insignificant, banks may still be able to manage their operational burdens over a short period. Conversely, in the long term, BOPO's impact on profitability shifts to positive, although it remains insignificant. This may occur because Islamic banks continuously improve their operational efficiency, which can eventually create more stable revenue sources. Economies of scale, investments in service digitalization, and strengthening efficiency-based business strategies can help banks achieve better profitability, even if their BOPO ratio remains relatively high. Additionally, in the long run, high operational costs can be offset by revenue growth from financing product diversification, reducing the negative impact of BOPO on profitability.

These findings suggest that Islamic banks need to implement operational efficiency strategies that are short-term and long-term oriented. In the short term, controlling operational costs should be a top priority to maintain profitability. Meanwhile, in the long run, banks can strengthen risk management systems to ensure operational efficiency contributes positively to sustained profitability. From a regulatory perspective, support for policies that promote efficiency in Islamic banking, such as incentives for digitalization and the reduction of unnecessary regulatory burdens, can help enhance Islamic banks' competitiveness and long-term profitability.

The Effect of FDR on the Profitability of Islamic Banking

The VECM analysis results indicate that FDR has a negative but insignificant effect in both the short and long term. These findings are consistent with the study by Syahrir et al. (2023), which stated that FDR has an insignificant negative impact on ROA. In the short term, a high FDR ratio suggests that Islamic banks are more aggressive in disbursing financing. However, since financing takes time to generate revenue, its impact on profitability is not immediately apparent. Additionally, in the short run, banks still face uncertainty regarding financing quality, which could lead to potential non-performing financing and, consequently, pressure profitability.

In the long term, although FDR remains negatively associated with profitability, its insignificance suggests that even though banks continue to allocate a high portion of third-party funds for financing, the results are not strong enough to enhance profitability consistently. This could be due to inefficient financing management, lower returns compared to funding costs, or high default risks that erode bank revenue. These findings suggest that Islamic banks need to enhance the effectiveness of their financing distribution to ensure that FDR contributes positively to profitability. In the short term, banks can strengthen credit analysis and adopt a more selective financing approach to minimize NPF risks. Meanwhile, in the long run, reinforcing risk management strategies is crucial for FDR to impact profitability positively. From a regulatory perspective, OJK and Bank Indonesia (BI) can support policies that improve financing efficiency, such as providing incentives for financing in productive sectors or developing risk mitigation instruments that align with Sharia principles.

The Effect of Inflation on the Profitability of Islamic Banking

The results of the analysis indicate that inflation has a significant positive impact on the profitability of Islamic banking in the short term. In contrast, inflation has a negative but insignificant effect in the long term. This finding is consistent with the study by Selayan et al. (2023), which states that inflation negatively affects profitability due to higher operational costs and declining bank revenues. However, another study by Faizin (2021) suggests that the profitability of Islamic banks does not always decline significantly despite high inflation, as these banks have a certain level of resilience to inflation. In the short term, rising inflation can positively impact the profitability of Islamic banks because higher prices of goods and services are often followed by higher demand for financing. Customers may require additional working capital or consumption financing, leading to increased bank revenue from margins and profit-sharing.

However, in the long term, high inflation tends to negatively impact Islamic banks' profitability, although, in this study, the effect is insignificant. Persistent inflation can reduce consumers' purchasing power, increase banks' operational costs, and create economic uncertainty that may lower financing demand. Additionally,

if inflation continues to rise, the risk of customer defaults also tends to increase, which could lead to higher levels of non-performing financing in Islamic banking. Under such conditions, Islamic banks may need to adjust their profit-sharing schemes or financing margins, which could ultimately pressure their profitability.
The Effect of BI Rate on the Profitability of Islamic Banking

The VECM analysis indicates that the BI Rate has a positive and significant impact on the profitability of Islamic banks in the long term but a positive yet insignificant effect in the short term. This finding is consistent with Nadzifah and Sriyana (2020), who stated that an increase in the BI Rate affects the operations of Islamic banks, particularly in fund allocation and financing. In the short term, changes in the BI Rate do not have a significant impact because Islamic banks have flexibility in adjusting their profit-sharing ratios with customers. Additionally, Islamic financing contracts, such as murabahah or mudharabah, are generally medium to long-term, meaning that changes in the benchmark interest rate do not immediately affect the bank's income.

Conversely, in the long term, an increase in the BI Rate significantly impacts the profitability of Islamic banks. This can occur because Islamic banks gradually adjust their profit-sharing ratios to maintain a balance between third-party funds and financing. A higher BI Rate can also increase profit margins on Sharia-compliant investment instruments based on sale and purchase (murabahah) or profit-sharing (mudharabah) contracts, strengthening bank profitability. Furthermore, a tight monetary policy can create economic stability in the long run, ultimately increasing public confidence in the Islamic banking system and expanding the financing market share. Therefore, regulators such as OJK and BI can support policies that promote the stability of the Islamic financial system, including strengthening Sharia monetary instruments that are more responsive to benchmark interest rate dynamics.

The Effect of Exchange Rate (KURS) on the Profitability of Islamic Banking
The VECM estimation results indicate that the exchange rate has a significant positive effect on Islamic banks' long-term profitability. In contrast, it has a negative but insignificant effect in the short term. This supports Nadzifah and Sriyana's study (2020), which states that exchange rate fluctuations affect bank profitability. In the short term, exchange rate changes tend to create uncertainty, increasing transaction costs and exchange rate risk, especially for Islamic banks engaged in foreign currency-based financing. However, the negative impact remains insignificant since Islamic banks generally do not use interest-based instruments for risk mitigation.

Conversely, in the long term, a stable or appreciating exchange rate can enhance the profitability of Islamic banks. This occurs because exchange rate appreciation strengthens the purchasing power of individuals and businesses, increases demand for Islamic financing products, and reduces import costs for raw materials in the real sector financed by banks. As a result, in the long run, the exchange rate has a significantly positive effect on the profitability of Islamic banks. This contrast highlights the need for monetary policy and regulation to consider the time dimension in decision-making. Short-term regulations should focus on exchange rate stabilization, while long-term policies should aim to strengthen Sharia-compliant hedging instruments to ensure Islamic banks remain competitive and protected from exchange rate risks. OJK and BI can play a role in developing alternative instruments aligned with Sharia principles, enabling Islamic banks to manage better the impact of exchange rate fluctuations on their profitability.

Conclusions and Recommendations

The results of this study explain that the CAR variable has a significant negative influence in the long term but does not affect the profitability of Islamic banking in the short term. The FDR and BOPO variables do not significantly influence profitability in the short or long term. If FDR and BOPO are well managed, Islamic banks can provide more affordable and stable financing, helping MSMEs and Sharia-based businesses grow more rapidly. The BI Rate and inflation positively impact Islamic banks' profitability, allowing regulators to design more inclusive monetary policies for Islamic banks, thereby ensuring sustained economic growth. The Kurs variable significantly and positively impacts profitability in the long term.

This study makes an important contribution to Islamic banking efforts to enhance profitability. By analyzing the relationship between the profitability of Islamic banks and macroeconomic variables, this study helps to understand whether Islamic banks effectively channel financing to the real sector. A limitation of this research is the scarcity of studies examining the impact of macroeconomic variables and monetary performance on Islamic banking profitability using the VECM method. Consequently, the available references are inadequate. Furthermore, numerous other variables significantly influence Islamic banking profitability. For future research, expanding the sample size by including additional years of observation is recommended to improve the robustness of the findings and provide a more comprehensive understanding of the phenomenon.

References

Addury, M. M., & Ramadhani, A. K. P. (2024). The Influence of Financing Model and Credit Risk on Financial Stability (Study of Islamic Rural Banks in Java Island). Journal of Islamic Monetary Economics and Finance, 10(3), 427–444. https://doi.org/10.21098/jimf.v10i3.1788

Agus, A., & Fadli, Y. (2024). Pengaruh Net Interest Margin dan Capital Adequacy Ratio Terhadap Return On Assets di PT Bank Jtrust Indonesia Tbk. EconBank: Journal of Economics and Banking, 6(1), 161–168.

Akhiruddin Siregar, P., Harahap, A., & Olivia, H. (2023). Menganalisis Pengaruh Cadangan Kerugian Penurunan Nilai (CKPN), Dana Pihak Ketiga (DPK), dan Non-Performing Financing (NPF) Terhadap Profitabilitas Perbankan Syariah di Indonesia. Jurnal EKUITAS: Ekonomi, Keuangan, Investasi Dan Syariah, 5(2), 307–316. https://doi.org/10.47065/ekuitas.v5i2.4494

Aminulloh, B. R., & Suselo, D. (2021). Pengaruh Inflasi, BI 7-Day Reserve Repo Rate, Dana Pihak Ketiga, Dan Fee Based Income Terhadap Profitabilitas BNI Syariah Tahun 2015-2020. Al Maal: Journal of Islamic Economics and Banking, 3(1), 35. https://doi.org/10.31000/almaal.v3i1.4641

Anindya, P. A., Aprilianto, F., & Agustin, A. F. (2022). Pengaruh Inflasi, Bi Rate, Dan Kurs Terhadap Profitabilitas (Roa) Bank Umum Syariah Di Indonesia Periode 2012-2021. Journal of Islamic Economics Development and Innovation (JIEDI), 1(3), 126–138. https://ejournal.umm.ac.id/index.php/ijiedi/issue/view/1079

Astuti, R. P. (2022). Pengaruh CAR, FDR, NPF, Dan BOPO Terhadap Profitabilitas Perbankan Syariah. Jurnal Ilmiah Ekonomi Islam, 8(3), 3213. https://doi.org/10.29040/jiei.v8i3.6100

Basuki, Agus Tri., & Prawoto, N. (2017). Analisis Regresi Dalam Penelitian Ekonomi dan Bisnis(2nd ed.). PT. Raja Grafindo Persada.

Dahruji, D., & Muslich, A. A. (2022). Pengaruh Profitabilitas terhadap Financial Distress pada Bank Umum Syariah Periode 2018 – 2020. Jurnal Ekonomi Syariah Teori Dan Terapan, 9(3), 388–400. https://doi.org/10.20473/vol9iss20223pp388-400

Dodi, S., & Arief, D. (2018). Islamic Bank Profitability : A Study of Islamic Bank in Indonesia. The International Journal of Business Review (The Jobs Review), 1(1), 51.

Dwinanda, S. K., & Tohirin, A. (2021). Analisis pengaruh faktor makroekonomi dan karakteristik bank terhadap profitabilitas bank syariah di Indonesia. Jurnal Kebijakan Ekonomi Dan Keuangan, 1(1), 15–26. https://doi.org/10.20885/jkek.vol1.iss1.art2

Eka, H., Maruto, P., & Basuki, U. (2019). Analisis Pengaruh Investasi Dan Budget Deficit Terhadap Pertumbuhan Di Indonesia. Diponegoro Journal of Economics, 1, 67. https://ejournal2.undip.ac.id/index.php/dje

Ekananda, M. (2016). Analisis Ekonometrika Dan Analisis Time Series (2nd ed.). Mitra Wacana Media.

Faizin, M. (2021). Penerapan Vector Error Correction Model pada Hubungan Kurs, Inflasi dan Suku Bunga. E-Journal Ekonomi Bisnis Dan Akuntansi, 8(1), 33. https://doi.org/10.19184/ejeba.v8i1.18810

Firmansyah, A., & Setiawan, F. (2024). Implementasi Gaya Leadership Islami Dalam Memotivasi Pegawai Bank Syariah Indonesia KCP Surabaya Diponegoro. Rizquna : Jurnal Hukum Dan Ekonomi Syariah, 2(3), 174–187.

Hamid, A. (2014). Analisis Variabel Pembangunan Ekonomi dan Sosial Daerah Provinsi Sumatera Selatan Periode 1980-2013, Sebuah Kajian dengan Pendekatan ECM dan VECM. ESENSI: Jurnal Bisnis Dan Manajemen, 4(1), 1–20.

Hidayat, I. F., Wijayanti, R., & Taufik, N. I. (2024). Analisis Kinerja Keuangan PT Bank Syariah Indonesia Tbk Menggunakan Metode Sharia Conformity and Profitability (SCnP) Periode 2021-2023. Economics and Digital Business Review, 5(2), 472–487.

Irham, M. (2024). Faktor-Faktor Internal dan Eksternal yang Mempengaruhi Profitabilitas Pada Bank Syariah. Jurnal Tabarru' : Islamic Banking and Finance, 7(November).

Jusuf, Z. A., Murni, S., & Saerang, I. S. (2021). Analisis Pengaruh Faktor Fundamental Terhadap Profitabilitas Perbankan Syariah Di Indonesia (Periode 2016-2020). Jurnal EMBA, 9(4), 923–934.

Kasmir. (2009). Pengantar Manajemen Keuangan (Kedua). Prenada Media Group.

Khoirunnisa, H. M., Rodhiyah, & Saryadi. (2016). Pengaruh Capital Adequacy Ratio (CAR), Loan To Deposit Ratio (LDR) Dan Bopo Terhadap Profitabilitas (ROA Dan ROE) Bank Persero Indonesia Yang Dipublikasikan Bank Indonesia Periode 2010 - 2015. Jurnal Ilmu Administrasi Bisnis, 5(4), 264–271.

Kuncoro, M. (2013). Mudah Memahami dan Menganalisis Indikator Ekonomi. UPP STIM YKPN.

Kusnadi, N. K., & Sukartaatmadja, S. (2022). Pengaruh Loan To Deposite Ratio (Ldr) Dan Beban Operasional Pendapatan Operasional (Bopo) Terhadap Profitabilitas Bank. Jurnal Ilmiah Manajemen Kesatuan, 10(1), 115–120. https://doi.org/10.37641/jimkes.v10i1.1188

Mirawati, Putra, R. A., & Fitri, M. D. (2019). Npf Sebagai Variabel Intervening Pada Btpn Syariah 2015-2019. 137, 63–71.

Munir, M. (2018). Analisis Pengaruh CAR, NPF, FDR dan Inflasi terhadap Profitabilitas Perbankan Syariah di Indonesia. Ihtifaz: Journal of Islamic Economics, Finance, and Banking, 1(1), 89. https://doi.org/10.12928/jiiefb.v1i1.285

Nadzifah, A., & Sriyana, J. (2020). Analisis Pengaruh Inflasi, Kurs, Birate, PDB Dan Kinerja Internal Bank Terhadap Profitabilitas Pada Perbankan Syariah Dan Konvensional. Jurnal Manajemen Dan Bisnis Indonesia, 6(1), 79–87. https://doi.org/10.32528/jmbi.v6i1.3537

Nasrulloh, N., Adiba, E. M., & Efendi, M. N. (2023). Pengembangan Potensi Pariwisata Halal Pesisir Bangkalan Madura: Identifikasi Peranan Bank Syariah. Muslim Heritage, 8(1), 79–102. https://doi.org/10.21154/muslimheritage.v8i1.4989

Natanael, N. (2022). Pengaruh NIM, BOPO, CAR dan Ukuran Perusahaan Terhadap Profitabilitas Perusahaan Sektor Perbankan. Jurnal Ekonomi Trisakti, 20(1), 105–123.

Pratiwi, L. N., Sari, S. N., & Fadhilah, H. N. N. (2022). Analisis Pengaruh CAR, NPF, FDR, Inflasi, BI Rate terhadap Profitabilitas Bank Umum Syariah di Indonesia: Studi Masa Pandemi Covid-19. Jurnal Maps (Manajemen Perbankan Syariah), 5(2), 116–125. https://doi.org/10.32627/maps.v5i2.430

Putri, L. T., Sudarmawan, B. N., Islam, U., Maulana, N., & Ibrahim, M. (2024). Shariah Banking Dynamics: Financial Performance and Stability Amid Middle East Conflict. Al-Infaq: Jurnal Ekonomi Islam, 15(1), 49–68.

Ramadhan, M. S., Iskandar, R., Suhaety, Y., & Hayat, N. (2022). The Effect of Internal Factors and Exchange Rate on Sharia Banking Liquidity in Indonesia. Journal of Business and Management Review, 3(5), 387–399. https://doi.org/10.47153/jbmr35.3572022

Rusliani, H., & Mubyarto, N. (2019). Dampak Penerapan Perbankan Syari'Ah Terhadap Pertumbuhan Ekonomi Negara: Kajian Perbandingan Malaysia Dan Indonesia. Iltizam Journal Of Shariah Economic Research, 1(1), 44–66.

Sabtatianto, R., & Yusuf, M. (2019). Pengaruh BOPO, CAR, FDR dan ROA terhadap Tingkat Bagi Hasil Deposito Mudharabah pada Bank Umum Syariah di Indonesia. ULTIMA Accounting, 10(2), 169–186. https://doi.org/10.31937/akuntansi.v10i2.978

Sakti, D. T., & Tandean, V. A. (2024). Pengaruh Beban Operasional Pendapatan Operasional (BOPO) Non Performing Financing (NPF), dan Financing To Deposit Ratio (FDR) terhadap Profitabilitas pada Bank Umum Syariah yang Terdaftar di OJK Periode 2019-2023. Mount Hope International Accounting Journal, 2(3), 289–300.

Saleh, I. (2021). Pengaruh Kinerja Keuangan Dan Inflasi Terhadap Return On Asset Pada Bank Umum Syariah Di Indonesia. JPS (Jurnal Perbankan Syariah), 2(2), 212–225. https://doi.org/10.46367/jps.v2i2.369

Saputra, R., Zaroni, A. N., & Komariah, K. (2023). Pengaruh NPF, FDR, dan CAR Terhadap Profitabilitas (ROA) Bank Umum Syariah Periode 2017-2021. Indonesian Scientific Journal Of Islamic Finance, 1(2), 183–192. https://journal.uinsi.ac.id/index.php/INASJIF/index

Sari, R. N., & Pangestuty, F. W. (2024). Analisis Faktor Yang Mempengaruhi Stabilitas Perbankan Syariah Dan Konvensional Di Indonesia Periode 2008-2022. Islamic Economics and Finance in Focus, 3(2), 419–432. https://doi.org/10.21776/ieff.2024.03.02.15

Selayan, A. N., Yafiz, M., & Daulay, A. N. (2023). Pengaruh Inflasi, Kurs, dan PDB terhadap Profitabilitas Bank Umum Syariah di Indonesia dengan Pembiayaan Sebagai Variabel Intervening. Jurnal Intelektualita: Keislaman, Sosial Dan Sains, 12(2), 145–156. https://doi.org/10.19109/intelektualita.v12i2.19364

Setiawan, Pratiwi, L. N., & Dewi, R. P. K. (2021). Efisiensi Operasional, Makroekonomi, dan Profitabilitas Pada Perbankan Syariah di Indonesia. Jurnal Fair Value: Jurnal Ilmiah Akuntansi Dan Keuangan, 04(01), 40–45.

Shafika, W. O. N. N. (2024). Pengaruh NPF, CAR, BOPO, FDR, dan INFLASI Terhadap ROA Pada Bank Muamalat Indonesia Periode 2015-2022. IAIN PONOROGO.

Srisusilawati, P., Hardianti, P. D., Erlianti, N., Pitsyahara, I. R., & Nuraeni, S. K. (2022). Implementasi Maqashid

Syariah Terhadap Produk Perbankan Syariah. Al-Mustashfa: Jurnal Penelitian Hukum Ekonomi Syariah, 7(1), 1. https://doi.org/10.24235/jm.v7i1.8409

Suryadi, N., Mayliza, R., & Ritonga, I. (2020). Pengaruh Inflasi, Biaya Operasional Terhadap Pendapatan Operasional (Bopo), Dan Pangsa Pasar Terhadap Profitabilitas Bank Umum Syariah Di Indonesia Priode 2012-2018. Jurnal Tabarru': Islamic Banking and Finance, 3(1), 1–10. https://doi.org/10.25299/jtb.2020.vol3(1).4724

Syahrir, L. O., Ali Nurdin, A., Heryanto, H. K., & Syarief, M. E. (2023). Pengaruh CASA, FDR, CAR, dan Inflasi terhadap ROA pada Bank Umum Syariah di Indonesia. Journal of Applied Islamic Economics and Finance, 3(2), 275–285. https://doi.org/10.35313/jaief.v3i2.3752

Veriana, L., & Wirman, W. (2023). Pengaruh Car, Bopo, Dan Fdr Terhadap Npf Bank Umum Syariah. Measurement Jurnal Akuntansi, 17(1), 58–68. https://doi.org/10.33373/mja.v17i1.5073

Wahdaniyah, H. M. T. (2013). Pengaruh DPK, Inflasi, dan NPF Terhadap Pembiayaan UKM; Studi Pada Bank Syariah di Indonesia 2012-2013. Jurnal Islaminomics: Journal of Islamic Economics, Business and Finance, 5(2), 15–28.

Wahyuningsih, A., Wiyono, G., & Maulida, A. (2021). Pengaruh Dana Pihak Ketiga, Kecukupan Modal, Inflasi dan Suku Bunga Kredit Terhadap Profitabilitas Bank Konvensional. Jurnal Ilmiah MEA (Manajemen, Ekonomi Dan Akuntansi), 5(1), 1136–1150.

Wahyunitasari, E. D., Sopingi, I., & Musfiroh, A. (2024). Pengaruh BOPO , BI Rate , NPF dan DPK Terhadap ROA Pada. Afkaruna: International Journal of Islamic Studies (AIJIS), 2(1), 76–90. https://doi.org/10.38073/aijis.v2i1.1981

Yayan, K. A., & Ayuningtyas, R. N. (2024). Pengaruh CAR, BOPO, NPF, dan FDR Terhadap Profitabilitas Bank Umum Syariah (Studi Kasus 2018-2022). SAUJANA : Jurnal Perbankan Syariah Dan Ekonomi Syariah, 6(01), 24–38. https://doi.org/10.59636/saujana.v6i1.149

Yulianda, Maslichah, I. H. (2024). Analisis Pengaruh CAR, FDR DAN BOPO Dengan NPF Sebagai Variabel Mediasi Terhadap Profitabilitas Perbankan Syariah di Indonesia. Jurnal Warta Ekonomi, 7(2), 37–48.

Yulianta, Y., & Nurjaya, N. (2021). Pengaruh Kurs dan Inflasi terhadap Pertumbuhan Laba pada Pt. Bank Central Asia Syariah Tbk, Periode Tahun 2012-2019. Jurnal Neraca Peradaban, 1(2), 136–147. https://doi.org/10.55182/jnp.v1i2.37