

The influence of financial performance on profitability of sharia commercial banks in Indonesia using the CAMEL method

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ABSTRACT

Introduction

Research on Islamic commercial banks in Indonesia have been extensively conducted, with a focus on banks in general and large banks. However, research specifically targeting medium-sized banks, namely PT Bank Muamalat Indonesia, PT Bank Mega Syariah, PT Bank Panin Dubai Syariah, PT Bank BCA Syariah, and PT Bank KB Bukopin Syariah, is still limited.

Objectives

This study aims to examine the influence of the financial performance of Islamic banks on their profitability using the CAMEL indicator.

Method

This research is quantitative with a correlational approach. The population in this study consists of 12 Islamic commercial banks in Indonesia, with 5 of them selected as samples. The sampling technique used is purposive sampling. The study utilizes secondary data from quarterly financial ratio reports of Islamic banks published by the Financial Services Authority (OJK). The analysis involves evaluating the impact of CAR, NPF, NOM, BOPO, and FDR on ROA using multiple linear regression analysis.

Results

The findings indicate that, partially, CAR and NPF do not significantly affect the ROA of Islamic banks. However, NOM, BOPO, and FDR have a significant impact on the ROA of Islamic banks.

Implications

the research motivates Islamic bank management to improve their financial ratios to meet the health criteria set by Bank Indonesia (BI) and OJK. Maintaining healthy financial ratios has implications for the level of trust that customers and potential customers have in Islamic banks and ultimately determines the long-term existence of these banks.

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ABSTRACT

Originality/Novelty

This study contributes to the development of risk management theory by examining the factors influencing the fluctuations in the values of CAR, NPF, NOM, BOPO, and FDR on the ROA of Islamic banks.

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INTRODUCTION

Bank Syariah is a bank that operates its business activities based on Islamic principles, consisting of Islamic or sharia commercial bank (*bank umum syariah* abbreviated BUS in Bahasa Indonesia) and Islamic or sharia rural bank (*bank pembiayaan rakyat syariah* abbreviated BPRS in Bahasa Indonesia), as stipulated in the Indonesian Islamic Banking Law No. 21 of 2008. The growth of the Islamic banking industry in Indonesia has been remarkable since it was tested by the monetary crisis in 1998. Islamic banking has proven to remain stable while some conventional banks experienced bankruptcy. One of the factors contributing to this stability is believed to be the financing operations of Islamic banks based on profit sharing and trade, rather than interest (Iswanto et al., 2022). The global economic crisis in 2008 tested the existence of the banking industry worldwide. Islamic banking is believed to have remained resilient to the financial crisis due to its adherence to non-interest principles and exclusion of financial derivatives. The performance of Islamic banks has been observed to be better than conventional banks, even though they were affected by the crisis. Therefore, financial performance becomes an important indicator for the health of banking institutions (Muhammad & Triharyono, 2019). The stability of a bank's financial performance largely determines the sustainability of the company in the long term.

To assess the health of a bank in terms of its financial performance, one approach is to use the CAMEL framework. Banks use CAMEL (Capital Adequacy, Asset Quality, Management, Equity and Liquidity) as a risk assessment tool for effective risk management (Bahri et al., 2022; Munir & Bustamam, 2017). Capital Adequacy (CA) is an important item on a bank's balance sheet, indicating the level of prudence and the bank's ability to meet its obligations. Asset Quality (AQ) helps maintain the quality of the Islamic bank's financial portfolio. Management Efficiency (ME) measures the operational competence of Islamic banks based on operating expenses to asset ratios. Earnings Quality (EQ) in Islamic banks can be measured by Return on Assets (ROA). ROA serves as a tool to assess the ability of Islamic banks to utilize their financial resources to generate profits. Liquidity Measurement (LQ) is done by dividing total loans by total assets (Danlami et al., 2022). Liquidity is an important aspect in the banking business that greatly affects profitability and the bank's reputation (Ab-Rahim, et al., 2018). The analysis of CAMEL plays a crucial role in assessing the health of

a bank. It serves as a control tool for monitoring the financial performance of banks and can predict the occurrence of bankruptcy in the banking business (C. Kurniasari & Ghozali, 2013; Muhmad & Hashim, 2015; Sayed & Sayed, 2013; Zedan & Daas, 2017).

The assessment of capital can be seen through the Capital Adequacy Ratio (CAR), which is the ratio of capital to total risk-weighted assets (Iswanto et al., 2022). According to Bank Indonesia regulations, the minimum CAR is 8%. Yuliana & Listari (2021) found that CAR has a significant positive effect on ROA. However, Wibisono & Wahyuni (2017) showed different results, indicating that CAR does not have a significant effect on ROA.

Asset quality can be measured through Non-Performing Financing (NPF). This is done to evaluate credit risks. The NPF ratio can assess the lack of bank liquidity and problem financing (Iswanto et al., 2022). In a previous study, it was found that NPF has a significant negative impact on ROA. This means that a lower NPF value will have a positive impact on higher ROA, and vice versa (Damayanti et al., 2021). However, another study found different results, indicating that NPF does not have an impact on ROA (Kusumastuti & Alam, 2019).

Meanwhile, Management Efficiency can be measured using NIM or in Shariah banks referred to as Net Operating Margin (NOM) (Iswanto et al., 2022). NOM represents the level of profitability in Shariah banks, indicating the ability of Shariah banks to manage their productive assets to generate margins or profits. The greater the value of NOM, the higher the net income of a bank obtained from its productive assets, and the profit increases (Aulia & Anwar, 2021). Previous research has shown that NOM has a negative and significant impact on ROA (Karno et al., 2020). On the other hand, Aulia & Anwar (2021) found that FDR and NOM have a positive and significant impact on profitability.

From the perspective of earning quality, which is the bank's assessment of profit generation, it can be measured using BOPO. The smaller the BOPO value, the impact on increasing the bank's ROA (Iswanto et al., 2022). Previous studies have found that BOPO has a negative impact on ROA (Maulana et al., 2021a; Syakhrun et al., 2019). In contrary, another study stated that BOPO does not have an impact on ROA (Kholis & Kurniawati, 2018).

As for liquidity risk factors, they can be measured using the Financing to Deposit Ratio (FDR). FDR measures the bank's ability to repay funds withdrawn by depositors, which have been directed towards financing activities (Iswanto et al., 2022). Previous research has found that FDR has a positive and significant impact on ROA (Rosada & Aulia, 2023). However, another study stated that FDR does not have an impact on ROA (Mutmainnah & Wirman, 2022).

Return On Asset (ROA) can be a parameter to assess the profitability of a Shariah bank. ROA is a ratio used to measure the bank's ability to generate profits through the use of managed assets (Rizal, 2016). The financial ratios of Shariah banks in the Financial Services Authority report (2023) show that the average ROA of Bank Panin Dubai Syariah is -1.71%, Bank Mega Syariah is 1.84%, Bank Muamalat is 0.10%, BCA Syariah is 1.14%, and Bank KB Bukopin Syariah is -0.64%. Referring to the ROA rating

criteria based on Bank Indonesia Circular Letter No. 13/24/DPNP/20, only Bank Mega Syariah is considered a very healthy bank with an ROA value $> 1.5\%$. Other banks, namely BCA Syariah and Bank Muamalat, are categorized as moderately healthy banks as their ROA values fall within the range of $0.5\% < ROA \leq 1.25\%$. Meanwhile, Bank Panin Dubai Syariah and Bank KB Bukopin Syariah are considered unhealthy banks as their ROA values are $\leq 0\%$. Looking at these ROA values, some Shariah banks still have poor financial performance, especially when viewed in terms of ROA not meeting the BI requirements.

Based on the background above, the current study aims to examine the impact of the financial performance of Shariah banks using the CAMEL approach, represented by independent variables such as CAR, NPF, NOM, BOPO, and FDR, and the dependent variable being ROA. This study formulates the research question: Do CAR, NPF, NOM, BOPO, and FDR have an impact on the ROA of General Shariah Banks in Indonesia? This question also indicates the health condition of Bank Mega Syariah, Bank Muamalat, Bank BCA Syariah, Bank Panin Dubai Syariah, and Bank KB Bukopin Syariah, as assessed through the CAMEL analysis. The position of this research in comparison to previous studies lies in the combination of the CAMEL analysis directly correlated with the impact of CAR, NPF, NOM, BOPO, and FDR ratios on ROA.

This study is expected to contribute to the relevant authorities in formulating policies for the Shariah financial industry to anticipate various financial risks faced by Shariah Financial Institutions. It also encourages the management of Shariah banks to improve their financial ratios. Furthermore, this study is expected to assist prospective customers and other stakeholders in selecting the appropriate Shariah bank for their investment and funding sources. In terms of the impact of CAR, NPF, NOM, BOPO, and FDR on ROA, this study may contribute to the development of risk management theories in Shariah banks.

LITERATURE REVIEW

In the international arena, Shariah banking is known as Islamic banking or interest-free banking. Islamic banking is a financial institution whose main business is to provide financing and other services in payment transactions and money circulation, operated in accordance with Islamic principles (Muhammad, 2005). The primary objective of establishing Shariah financial institutions is the Muslim community's effort to carry out economic aspects based on the Qur'an and Sunnah (Kasim & Bukido, 2018; Zanariyatim et al., 2016). Shariah banking in Indonesia shows a positive trend and requires a solid foundation to maintain competitiveness with other banks in achieving the desired profitability (Junjunan et al., 2021). The success of a bank is influenced by various factors, one of which is its financial performance reflected in several financial ratios.

The CAMEL analysis was introduced in 1979 as a banking supervision ranking method in the United States. After the financial crisis in 2008, the CAMEL analysis added one indicator, sensitivity to market risk, represented by the letter "S," becoming CAMELS (Varga et al., 2020). However, in this study, the indicators used to evaluate the

health of Shariah banks in Indonesia do not involve sensitivity to market risk. This study only utilizes the five dimensions of CAMEL, namely capital adequacy, asset quality, management efficiency, earnings quality, and liquidity.

Financial ratios such as CAR, NPF, NOM, BOPO, and FDR, which represent the elements of CAMEL, are used to examine the influence of the financial performance of Shariah banks on their profitability, represented by ROA. Ab-Rahim et al. (2018) revealed that ratio analysis can connect and test risks and outcomes in a company. Financial analysis results can be compared to identify problems or deficiencies experienced by a company and take steps to improve them. Trend analysis of financial ratios can also provide information on a company's performance compared to its competitors operating in the same business field. In this study, the financial performance of Shariah banks can be compared to each other to observe improvements or declines.

Profitability is a ratio that can be used as a parameter to assess a bank's ability to generate profits (Ariani & Satria, 2016). Return on Assets (ROA) can be used as a tool to measure the profitability of a bank. ROA is a ratio that indicates the return on the amount of assets used by the bank (Limesta & Wibowo, 2021). Ideally, a bank's ROA should be 1.5%. If a bank earns a profit below the Bank Indonesia's regulation, it means the bank has not been able to efficiently manage its assets (Maulana et al., 2021b). From this statement, it can be understood that ROA is a ratio that serves as a tool to show a bank's net profit, reflecting the bank management's performance in utilizing its productive assets. ROA is calculated by dividing profit before tax by total assets (Amalia & Diana, 2022).

Capital Adequacy Ratio (CAR) is a performance ratio for banks that serves as a parameter for assessing the adequacy of a bank's capital in supporting its risky assets (Hanafia & Karim, 2020). The higher the CAR value, the stronger the bank's ability to bear the risk of each credit or risky productive asset it allocates (Hakiim & Rafsanjani, 2016). According to PBI No.10/15/PBI/2008, CAR is calculated by dividing the capital by the risk-weighted assets (aktiva tertimbang menurut resiko abbreviated ATMR in Bahasa Indonesia).

Non-Performing Financing (NPF) is a ratio that measures the extent of financing risk faced by Islamic banks. NPF represents financing that encounters payment difficulties upon maturity due to intentional factors or circumstances beyond the borrower's ability (Suprayitno & Hardiani, 2021). According to PBI No. 6/9/PBI/2004, NPF refers to financing with less smooth, doubtful, and problematic quality. NPF ratio is calculated by dividing non-performing financing by total financing (Fadhilah & Suprayogi, 2019).

Net Operating Margin (NOM) is a ratio that measures net operational income to determine the average productive asset's ability to generate profit. Based on Bank Indonesia Circular Letter No. 9/24/DPBs in 2007, a good NOM for Islamic banks is above 3%. NOM is obtained by dividing net operations by average productive assets (Karno et al., 2020).

BOPO is the ratio between operating expenses and operating income. Operating expenses indicate the bank's efficiency level and its ability to carry out operations. On the other hand, operating income reflects the bank's ability to generate earnings from its operational activities (Kusumastuti & Alam, 2019). BOPO can be calculated by dividing operational costs by operating income (Pratikto et al., 2021).

Financing to Deposit Ratio (FDR) is a ratio used to measure a bank's liquidity. FDR compares the amount of financing conducted by an Islamic bank with the amount of third-party funds collected by the bank. Financing provided by Islamic banks to customers includes mudarabah financing, musyarakah financing, murabaha receivables, salam receivables, istisna receivables, qardh receivables, ijarah receivables, and other financing. Third-party funds consist of current accounts, time deposits, and savings accounts with wadiah and mudarabah contracts. FDR is calculated by dividing Total Financing by Third Party Funds (Fadhilah & Suprayogi, 2019).

Relationship between CAR and ROA

The Capital Adequacy Ratio (CAR) is a ratio used to measure a bank's ability to withstand potential losses in lending activities and other securities trading. According to BI regulations, the minimum normal CAR value should reach 8%. This indicates that the bank is able to optimize operational financing, enabling smooth commercial activities and resulting in increased profitability (Damayanti et al., 2021). Therefore, the following hypothesis can be formulated:

H1: CAR has a positive and significant impact on ROA.

Relationship between NPF and ROA

A lower NPF ratio indicates higher quality of financing in Islamic banks (lower non-performing financing risk), leading to increased profitability in terms of ROA. Conversely, a higher NPF ratio indicates lower quality of financing in Islamic banks (higher non-performing financing risk), resulting in a decrease in ROA (Fadhilah & Suprayogi, 2019). Hence, NPF has a negative relationship with ROA. Therefore, the following hypothesis can be stated:

H2: NPF has a partial and significant impact on ROA in Islamic banks.

Relationship between NOM and ROA

A higher NOM ratio indicates improved or better bank performance, while a lower NOM ratio indicates deteriorating or declining bank performance. A large NOM ratio can function to cover bank losses and pay high taxes, thereby driving profit increase or ROA (Aprida, 2021; R. Kurniasari & Zunaidi, 2022). Therefore, the following hypothesis can be determined:

H3: NOM has a partial and significant impact on ROA in Islamic banks.

Relationship between BOPO and ROA

A smaller BOPO ratio indicates that the bank is able to achieve cost efficiency, leading to increased opportunities for profitability or ROA in Islamic banks (Kusumastuti & Alam, 2019). Thus, the following hypothesis can be determined:

H4: BOPO has a partial and significant impact on ROA in Islamic banks.

Relationship between FDR and ROA

A higher FDR ratio indicates a larger amount of third-party funds allocated for financing, resulting in increased bank income in the form of ROA, assuming smooth fund allocation. Conversely, a lower FDR ratio indicates a lower amount of third-party funds allocated, leading to lower bank income in the form of ROA (Fadhilah & Suprayogi, 2019). Therefore, the following hypothesis can be determined:

H5: FDR has a partial impact on ROA in Islamic banks.

METHOD

The research conducted in this study is quantitative and descriptive in nature. The study utilized multiple linear regression analysis through the SPSS version 22 software. The data analysis was done using the CAMEL approach as an indicator of the financial performance of Islamic banks. The data used in this research consists of secondary data from quarterly reports obtained from the official website of the Financial Services Authority (OJK). Specifically, the data utilized in this study pertains to the financial ratios of Islamic commercial banks in Indonesia. The sample used in the study consists of 5 (five) Islamic commercial banks, namely PT Bank Muamalat Indonesia, PT Bank Mega Syariah, PT Bank Panin Dubai Syariah, PT Bank BCA Syariah, and PT Bank KB Bukopin Syariah. The data collected consists of time series financial ratios from the year 2015 until 2022.

The chosen Islamic banks for this research are Bank Panin Dubai Syariah, Bank Mega Syariah, Bank Muamalat Indonesia, Bank BCA Syariah, and Bank KB Bukopin Syariah. These banks were selected because they are registered with the OJK, regularly publish financial reports on the OJK website, and have not undergone any merger with other Islamic banks.

The purpose of this research is to examine the influence of the financial performance of Islamic banks on bank profitability, based on the CAMEL approach using proxies such as CAR, NPF, NOM, BOPO, FDR, and ROA. Capital adequacy is measured by the Capital Adequacy Ratio (CAR), asset quality is measured by the Non-Performing Financing (NPF) ratio, management quality is measured by the Net Operating Margin (NOM), earnings are measured by the BOPO ratio, and liquidity is measured by the Financing to Deposit Ratio (FDR). The equation used in this research is

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + e$$

$$ROA = \alpha + \beta_1 CAR + \beta_2 NPF + \beta_3 NOM + \beta_4 BOPO + \beta_5 FDR + e$$

Here is a breakdown of the variables used in the equation:

Y = ROA (Return on Assets)

X_4 = BOPO (Ratio of Operational Costs to Operational Income)

e = Residual Error

X_1 = CAR (Capital Adequacy Ratio)

X_5 = FDR (Financing to Deposit Ratio)

X_2 = NPF (Non-Performing Financing)

X_3 = NOM (Net Operating Margin)

α = Constant

β = Regression Coefficient

The research method includes descriptive statistics, classical assumption tests, and multiple regression analysis.

RESULTS

Table 1 presents the financial ratios including ROA, CAR, NPF, NOM, BOPO, and FDR of all Islamic Commercial Banks (ICBs) operating in Indonesia as a global overview of the financial performance profile of Islamic banks. The values of the financial ratios of Islamic Commercial Banks listed in Table 1 indicate the overall healthy performance of the banks according to the guidelines set by Bank Indonesia in its Circular Letter of 2007. The ROA values in the table fall within the criteria of being fairly healthy, with $0.51\% \leq \text{ROA} < 1.25\%$, and some fall within the healthy range of $1.26\% \leq \text{ROA} < 5\%$. Furthermore, the CAR values are $\geq 12\%$ (very healthy), NPF falls within the interval of $2\% \leq \text{NPF} < 5\%$ (healthy), the NOM ratio from 2015–2017 is still categorized as very unhealthy ($\text{NOM} \leq 1\%$), but it gradually improves to a healthy level of $1.5\% < \text{NOM} \leq 2\%$, the BOPO ratio improves from year to year and meets the criteria of being very healthy, with a value of $< 88\%$, and the majority of the FDR ratios indicate that the banks are classified as healthy, with ratios falling within the interval of $> 75\% \leq 85\%$.

Table 1

Financial ratios of Sharia Commercial Banks in research

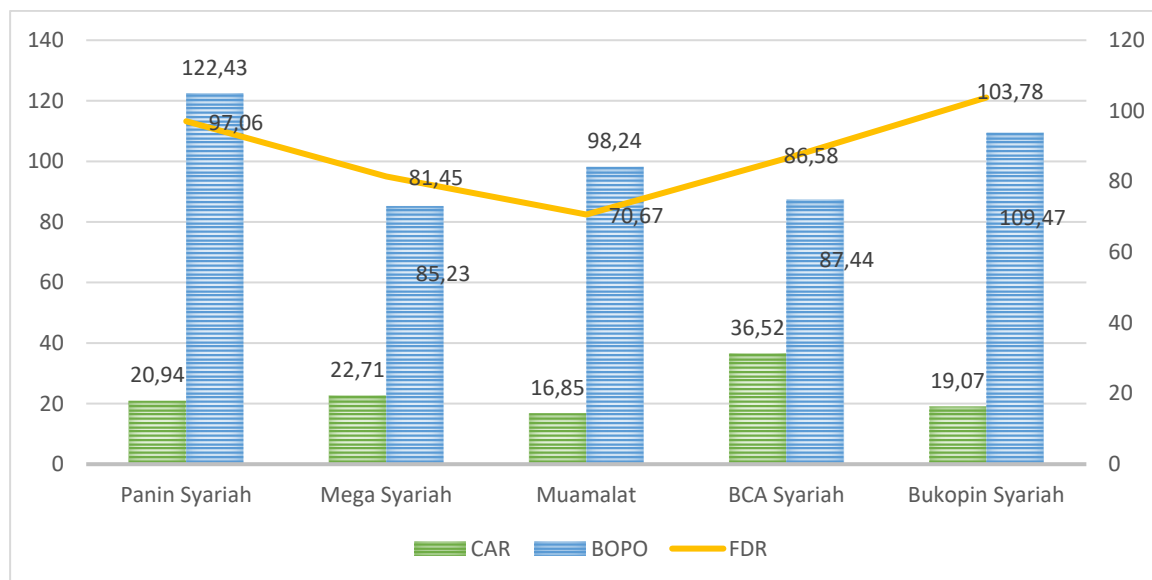
Year	ROA	CAR	NPF	NOM	BOPO	FDR
2015	0,49%	15,02%	4,84%	0,52%	97,01%	88,03%
2016	0,63%	16,63%	4,42%	0,68%	96,22%	85,99%
2017	0,63%	17,51%	4,76%	0,67%	94,91%	79,61%
2018	1,28%	20,39%	3,26%	1,42%	89,18%	78,53%
2019	1,73%	20,59%	3,23%	1,92%	84,45%	77,91%
2020	1,40%	21,64%	3,13%	1,46%	85,55%	76,36%
2021	1,55%	25,71%	2,59%	1,66%	84,33%	70,12%
2022	2,00%	26,28%	2,35%	2,59%	77,28%	75,19%

Source: OJK, 2023. Authors' estimation.

Furthermore, [Figure 1](#) presents the values of ROA, CAR, NPF, NOM, BOPO, and FDR from the five Islamic banks analyzed in this study. The financial performance ratios of the 5 Islamic commercial banks, namely Bank Panin Dubai Syariah, Bank Mega Syariah, Bank Muamalat, BCA Syariah, and Bank KB Bukopin Syariah, towards ROA for the period 2015–2022 indicate average CAR values that meet the criteria of being healthy as they exceed the minimum threshold of 8% set by the Central Bank. In the graph, it is evident that Bank BCA Syariah has the highest average CAR value of 36.52%. On the other hand, Bank Muamalat has the lowest average CAR value of 16.85%. As for the BOPO ratio, Bank Mega Syariah (85.23%) and BCA Syariah (87.44%) demonstrate very healthy criteria ($< 88\%$). Bank Muamalat shows less healthy criteria (97% – 100%) while Bank Panin Dubai Syariah (122.43%) and Bank KB Bukopin Syariah (109.47%) exhibit unhealthy criteria ($> 100\%$). Moving on to the FDR ratio, Bank Muamalat (70.67%) meets the criteria of being very healthy ($> 50\%$ and $\leq 75\%$), Bank Mega Syariah falls within the healthy range ($> 75\%$ and $\leq 85\%$), Bank BCA Syariah (86.58%) and Bank Panin Dubai Syariah (97.06%) qualify as moderately healthy ($> 85\%$ up to $\leq 100\%$). However, Bank KB Bukopin Syariah (103.78%) falls under the less healthy criteria ($> 100\%$).

Figure 1

Average Value of CAR Ratio, BOPO FDR 2015–2022



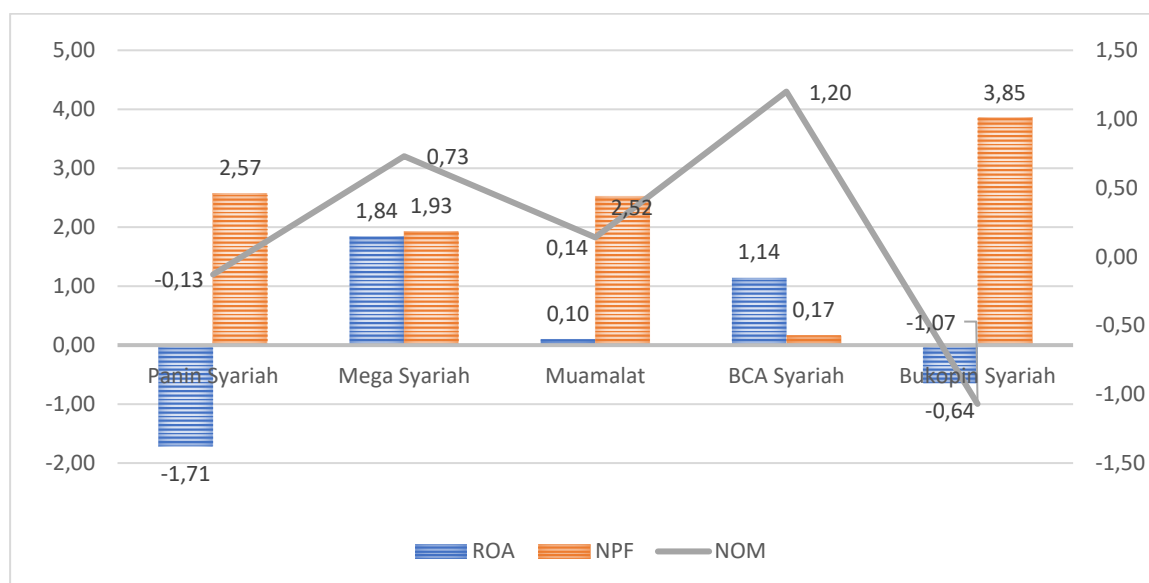
Source: OJK, 2023. Authors' estimation.

[Figure 2](#) showed NPF ratio, classified as very healthy ($\text{NPF} \leq 2\%$), is achieved by BCA Syariah (0.17%) and Bank Mega Syariah (1.93%). NPF with a healthy classification ($2\% \leq 5\%$) is evident in Bank Muamalat (2.52%), Bank Panin Dubai Syariah (2.57%), and Bank KB Bukopin Syariah (3.85%). Moving on to the NOM ratio, Bank BCA Syariah (1.20%) falls under the slightly unhealthy category ($1\% < \text{NOM} \leq 1.5\%$). However, Bank Mega Syariah (0.73%), Bank Muamalat (0.14%), Bank Panin Dubai Syariah (-0.13%), and Bank

KB Bukopin Syariah (-0.64%) are categorized as very unhealthy ($NOM \leq 1\%$). Furthermore, when evaluating the ROA ratio, Bank Mega Syariah (1.84%) is classified as healthy ($1.26\% \leq ROA < 5\%$). Bank BCA Syariah's ROA value (1.14%) is considered moderately healthy ($0.51\% \leq ROA \leq 1.25\%$). Bank Muamalat's ROA value (0.10%) falls under the slightly unhealthy category ($0\% \leq ROA < 0.5\%$). On the other hand, Bank Panin Dubai Syariah's ROA value (-1.71%) and Bank KB Bukopin Syariah's ROA value (-1.07) are classified as unhealthy ($ROA < 0\%$).

Figure 2

Average Value of ROA, NPF and NOM Ratios 2015–2022



Source: OJK, 2023. Authors' estimation.

Descriptive Statistics

The descriptive statistics in Table 2 shows the number (n) of observed financial ratio data for Islamic commercial banks totaling 37 during the period 2015–2022, with explanations as follows. CAR has a minimum value of 12.00 at Bank Muamalat in 2015. Its maximum value is 45.26 at Bank BCA Syariah in 2020. The average is 23.45. The sample difference from the average CAR ratio (X_1) is 8.94551. NPF has a minimum value of 0.01 at Bank BCA Syariah in 2020, 2021, and 2022. The maximum value is 4.95 at Bank KB Bukopin Syariah in 2020. The average value is 2.10. The sample difference from the average NPF ratio (X_2) is 1.50352. NOM has a minimum value of -2.44 at Bank Mega Syariah in 2016. Its maximum value is 2.45 at Bank Mega Syariah in 2022. The average is 0.4670. The sample difference from the average NOM ratio (X_3) is 0.96338.

Table 2

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std Deviation
CAR (X_1)	37	12.00	45.26	23.4489	8.94551
NPF (X_2)	37	.01	4.95	2.1019	1.50352

	N	Minimum	Maximum	Mean	Std Deviation
NOM (X3)	37	-2.44	2.45	.4670	.96338
BOPO (X4)	37	64.64	115.76	92.4870	9.44199
FDR (X5)	37	38.33	196.75	87.2643	24.14242
ROA (Y)	37	-1.27	4.08	.7808	.95828
Valid N	37				

Source: Authors' estimation.

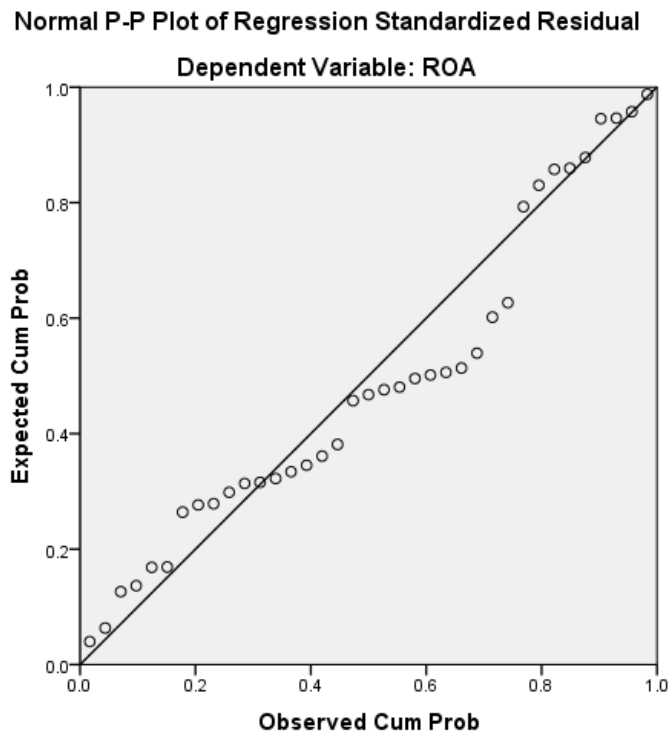
The minimum value of BOPO is 64.64 at Bank Mega Syariah in 2021, and its maximum value is 115.76 at Bank KB Bukopin Syariah in 2022. The average is 92.4870. The sample difference from the average BOPO ratio (X4) is 9.44199. The minimum FDR value is 38.33 at Bank Muamalat in 2021, and the maximum is 196.75 at Bank KB Bukopin Syariah in 2020. The average is 87.2643. The sample difference from the average FDR ratio (X5) is 24.14242. The minimum ROA value is -1.27 at Bank KB Bukopin Syariah in 2022, and its maximum value is 4.08 at Bank Mega Syariah in 2021. The average is 0.7808. The sample difference from the average ROA ratio (Y) is 0.95828.

Classical Assumptions

Figure 3 shows Normal P-P Plot for normality test. The normality test image of regression residuals shows a normal pattern, indicating that the points are scattered around the diagonal line and follow the diagonal line. This suggests that the regression model is suitable for use.

Figure 3

Normality Test



Source: Authors' estimation.

Table 3 shows normality test results based on Kolmogorof-Smirnova and Shapiro-Wilk criteria. Data in the table indicates that the Shapiro-Wilk Sig. value is $0.127 > 0.05$, or $p > 0.05$, meaning that the data is indeed drawn from a normal population. This suggests that the random variable is normally distributed, making the linear regression test appropriate.

Tabel 3

Normality Test

	Kolmogorof-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.161	37	.016	.954	37	.127

Source: Authors' estimation.

Multicollinearity is the condition of high inter correlation between one variable and another independent variable or between independent variables being tested. From the multicollinearity test results in Table 4, it is known that the VIF values for the variables CAR, NPF, NOM, BOPO, and FDR are less than 10, and their tolerance values are greater than 0.1. This result indicates that there is no multicollinearity among the independent variables.

Table 4

Multicollinearity test results

Model	Colinearity Statistics	
	Tolerance	VIF
(Constant)		
CAR	.434	2.302
NPF	.286	3.499
NOM	.360	2.781
BOPO	.400	2.501
FDR	.734	1.363

Source: Authors' estimation.

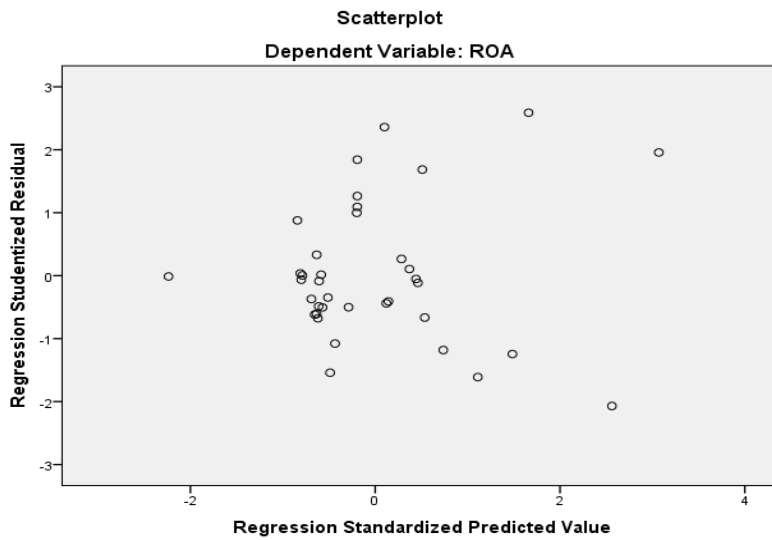
Figure 4 shows the Heteroskedasticity test scatterplot. The heteroskedasticity test image shows that the distribution of points is above and below the 0 axis on the vertical axis (y) and is not patterned. This means that the regression model is free from heteroskedasticity.

The heteroskedasticity test image shows that the distribution of points is above and below the 0 axis on the vertical axis (y) and is not patterned. This means that the regression model is free from heteroskedasticity.

Table 5 shows autocorrelation test results using Run test. The Run Test indicates that the Asymp. Sig. (2-tailed) value is $0.183 > 0.05$, meaning there are no symptoms of autocorrelation. Therefore, the linear regression test is deemed appropriate.

Figure 4

Heteroskedasticity Test



Source: Authors' estimation.

Table 5

Run Test results

	Unstandardized Residual
Test Value ^a	-.02495
Cases < Test Value	18
Cases >= Test Value	19
Total Cases	37
Number of Runs	15
Z	-1.330
Asymp. Sig. (2-tailed)	.183

Source: Authors' estimation.

Significance Test

Table 6 shows determination coefficient (R^2) for this research. It can be seen that the R square value of the influence of CAR, NPF, NOM, BOPO and FDR on ROA is 0.912 or 91.2%. This shows that the influence of the independent variable on the dependent variable is very strong, namely 91.2%. On the other hand, there are still other factors that influence ROA of 8.8% which are not included in this research model.

Table 6

Determination Coefficient

Model	R	R Square	Adjusted R Square	Std.Error of the Estimate
1	.955 ^a	.912	.898	.30577

Source: Authors' estimation.

F-test is used to analyse the simultaneous effects of independent variables. [Table 7](#) shows the results of F-test for this research. The calculated F result is $64.517 > F$ table 2.52 with a significance of $0.00 < 0.05$, meaning that CAR, NPF, NOM, BOPO and FDR simultaneously or together have a significant and positive effect on ROA.

Table 7*Simultaneous Test*

Model		Sum of Squares	Df	Mean Square	F	Sig
1	Regression	30.160	5	6.032	64.517	.000 ^b
	Residual	2.898	31	.093		
	Total	33.059	36			

Source: Authors' estimation.

To analyze the partial impact of each independent variable, this research uses *t*-test. [Table 8](#) shows the results of partial test for this research. The *t*-test result for CAR is less than the *t*-table value, namely $-0.430 < 2.03951$; therefore, CAR does not have a partial impact on ROA. The significance value of $0.670 > 0.05$ indicates that CAR does not significantly affect ROA. Next, the *t*-test for NPF is smaller than the *t*-table value, namely $-0.632 < 2.03951$, indicating no partial influence of NPF on ROA. The significance value of $0.532 > 0.05$ means that NPF does not significantly affect ROA.

Table 8*Partial Test*

Model		Unstandardized Coefficient		Standardized Coefficient	t	Sig
		B	Std. Error	Beta		
1	(Constant)	12.191	.870		14.006	.000
	CAR	-.004	.009	-.035	-.430	.670
	NPF	-.040	.063	-.063	-.632	.532
	NOM	-.353	.088	-.355	-4.004	.000
	BOPO	-.120	.009	-1.182	-14.057	.000
	FDR	.000	.002	.006	.102	.919

Source: Authors' estimation.

The *t*-test result for NOM is greater than the *t*-table value, namely $-4.004 > 2.0395$ (ignoring the negative sign on the *t*-test, the result is significant). This means that NOM has a significant partial effect on ROA, but the direction of the relationship is negative. The smaller the NOM, the larger the ROA, and vice versa. This indicates that NOM partially has a significant impact on ROA, but the relationship is negative. The significance value of $0.000 < 0.05$ also means that NOM significantly affects ROA.

As for the *t*-test result for BOPO, it is greater than the *t*-table value, namely $-14.057 > 2.0395$ (ignoring the negative sign on the *t*-test, the result is significant). This means that BOPO has a significant partial effect on ROA, but the direction of the relationship is negative. The smaller the BOPO, the larger the ROA, and vice versa. The significance value of $0.000 < 0.05$ indicates that BOPO significantly affects ROA.

The t-test result for FDR is less than the t-table value, namely $0.102 < 2.0395$. This indicates that FDR does not have a partial significant impact on ROA, and the direction of the relationship is positive. Similarly, the significance value exceeds the alpha value of 5%, namely $0.919 > 0.05$, indicating that the FDR value does not significantly affect ROA.

DISCUSSION

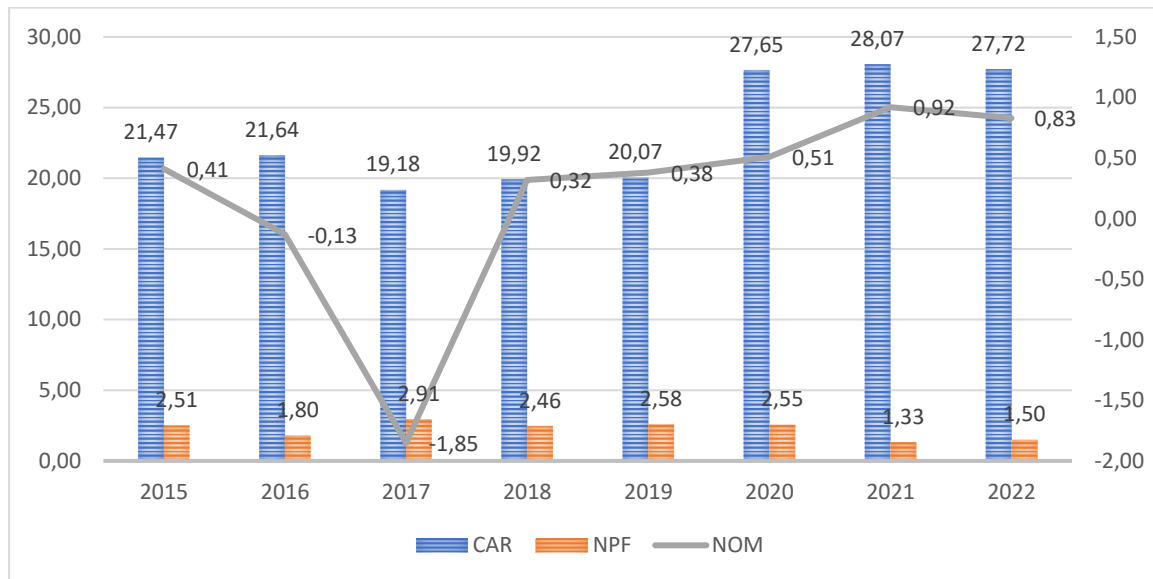
Influence of CAR on ROA

The first hypothesis states that CAR has a partial effect on the ROA of Islamic Commercial Banks. The t-test results in Table 8 indicate that CAR does not have a significant impact on ROA with a negative direction. Therefore, the first hypothesis is rejected. This is supported by the real-world data used, such as Panin Dubai Sharia Bank, which experienced an increase in CAR from 2.67% to 3.45% from 2019 to 2020, yet it did not affect the increase in ROA. In the same period, the ROA of Panin Dubai Sharia Bank actually decreased from 0.25% to 0.06%. Similar trends were observed in Muamalat Bank, BCA Sharia, and KB Bukopin Sharia Bank. This study aligns with the findings of previous research indicating that CAR does not affect the ROA of Islamic commercial banks (Hanafia & Karim, 2020). This result may be influenced by the imbalance between the available capital in Islamic banks and the disbursement of funds in risky financing, such as loans. This imbalance is exacerbated by the impact of Covid-19, causing banks to become more cautious in providing financing. As a result, capital may accumulate in banks, leading to a decline in the bank's income and profitability (ROA) even when CAR increases and vice versa.

Based on OJK data presented in Figure 5, the CAR ratio during the research period of 2015–2022 was consistently healthy, exceeding the minimum ratio of 8% of Weighted Assets. This complies with the regulations in POJK Number 15/POJK.03/2017 regarding the Minimum Capital Adequacy Ratio (CAR), which sets a ratio equal to or greater than 8%. A higher CAR is predicted to strengthen the ability of Islamic banks to withstand the risks of financing risky productive assets (Moorcy et al., 2020). However, an excessively high CAR does not always indicate a healthy bank; on the contrary, it may suggest that the bank is less expansive in investing its funds in risky assets. This contradicts a very low CAR, which indicates that the bank's capital is unable to cover the risks of investing in high-risk assets. Bank Indonesia recommends that banks with problematic CAR consider mergers or acquisitions with other banks to meet capital adequacy requirements (C. Kurniasari & Ghozali, 2013).

Figure 5

Average CAR, NPF, NOM Ratios for the 2015–2022



Source: OJK, 2023. Authors' estimation.

Influence of NPF on ROA

The second hypothesis states that NPF has a partial effect on the Return on Asset (ROA) of Islamic commercial banks. Based on the regression test results shown in Table 8, it is found that NPF partially does not have a significant impact on ROA with a negative relationship. Therefore, the second hypothesis is rejected. This study supports the findings of previous study indicating that NPF does not affect ROA significantly (Widyaningrum & Septiarini, 2015). This is because the financing conducted by Islamic Commercial Banks may not be optimal due to various constraints, minimizing the likelihood of problematic financing and not affecting ROA.

The Financial Services Authority (OJK) regulations stipulated in POJK Number 15/POJK.03/2017 state that the net Non-Performing Financing (NPF) ratio should not exceed 5% of the total financing. The data used in this study depicts that the NPF values from the five surveyed Sharia banks, as shown in Figure 3, have maintained a healthy ratio. The test results in this study show that NPF does not have a partial impact on ROA but does have a simultaneous impact. Therefore, Islamic banks should diversify their financing using various contracts to minimize the risk of problematic financing. Different financing schemes could attract a more diverse customer base with varying backgrounds, both in terms of professions and funding needs. The dominant financing scheme currently used by Islamic banks is *Murabahah*. It is advisable for Islamic banks to explore other financing schemes such as *Qard*, *Istisna'*, or *Salam*. This diversification can have different impacts on the types of risks faced by various Islamic banks. In doing so, Islamic banks demonstrate their responsibility to society as financial institutions that adhere strictly to Sharia principles in their

business activities, focusing on both profit-seeking and fostering cooperation and mutual assistance among individuals.

Influence of NOM on ROA

The third hypothesis states that NOM has a partial effect on the ROA of Islamic Commercial Banks. Referring to the t-test results, NOM significantly and negatively affects ROA. Thus, the third hypothesis is accepted. This result supports the findings of previous study indicating that NOM significantly and negatively influences ROA (Karno et al., 2020). According to theory, a smaller NOM ratio indicates a lower ability of the bank to generate profit through its productive assets, and vice versa (Zikri et al., 2021). However, in reality, this is not always the case.

The t-test results contradict existing theories, showing that NOM does have an impact on ROA with a negative direction. This implies that a smaller NOM ratio leads to an increase in ROA. This aligns with the field data, such as at Panin Dubai Sharia Bank in 2021–2022, where a decrease in NOM was accompanied by an increase in ROA. In 2021, Panin Dubai Sharia Bank had a NOM ratio of 7.37%, which decreased to 1.92% in 2022. While ROA increased from -6.72% in 2021 to 1.79% in 2022. Similarly, at Mega Sharia Bank, an increase in NOM was accompanied by a decrease in ROA. In 2021, NOM was 2.06%, increasing to 2.45% in 2022, while ROA decreased from 4.08% in 2021 to 2.59% in 2022.

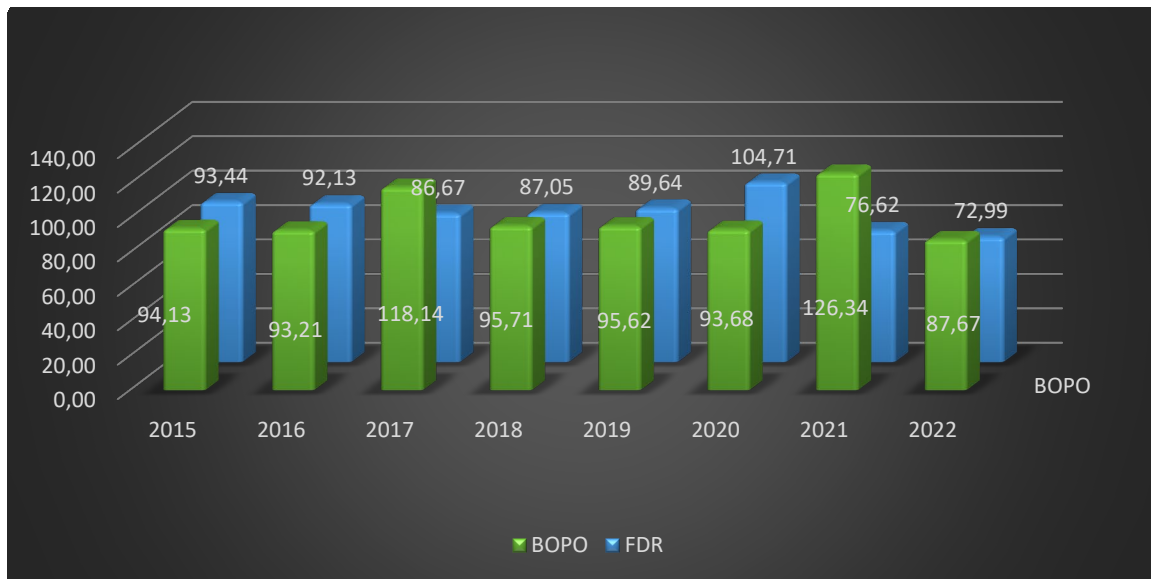
This phenomenon could be influenced by various factors, both internal and external. Internally, it may be related to the bank's management, financial performance, business segmentation, revenue control, and cost management. Externally, factors such as macroeconomic conditions (inflation and exchange rates) and competition in the banking industry can also play a role (Aprida, 2021). Figure 5 shows that the NOM ratio for Islamic Commercial Banks has consistently been very low from 2015 to 2022, below 1%, which is considered very unhealthy. Almost all Sharia banks, except BCA Sharia Bank with a NOM of 1.20%, contribute to NOM ratios < 1%. Most of the banks need to improve their financial performance to achieve a healthy NOM ratio of more than 3%. A healthy NOM ratio can enhance public trust in Islamic banks.

Influence of BOPO on ROA

The fourth hypothesis states that BOPO has a partial effect on the ROA of Islamic Commercial Banks. The t-test results show that BOPO has a negative and significant impact on ROA. Therefore, the fourth hypothesis is accepted. This relationship indicates that the smaller the BOPO ratio, the greater the profitability of Islamic banks, and vice versa. This study supports the findings of previous studies concluding that BOPO partially has a negative impact on profitability (Maulana et al., 2021b; Munandar & Aravik, 2022; Syakhrun et al., 2019). A higher BOPO ratio indicates declining financial performance for Islamic banks, while a lower BOPO ratio suggests greater efficiency. Banks can take cost-saving measures to minimize BOPO levels, such as reducing operational costs and cutting budgets for non-essential activities (Suprayitno & Hardiani, 2021). In Figure 6, it is evident that in 2022, the BOPO ratio for Islamic banks falls under the category of very healthy (BOPO < 88%) with a figure of 87.67%.

Figure 6

Average BOPO and FDR ratio



Source: OJK, 2023. Authors' estimation.

Influence of FDR on ROA

The fifth hypothesis states that FDR has a partial effect on the ROA of Islamic Commercial Banks. According to the t-test, this is proven, as the calculated t-value for FDR is greater than the tabulated t-value, but the direction of the relationship is negative. Therefore, the fifth hypothesis is accepted. So, partially, FDR has a significant negative impact on the ROA of Islamic Commercial Banks. This finding supports previous study stating that FDR partially has a significant negative impact on ROA (Wibisono & Wahyuni, 2017). This implies that an increase in financing in Islamic banks is followed by a decrease in pre-tax profits due to the conversion of a significant amount of financing into bank assets.

Financing for customer loans can balance the bank's obligation to immediately fulfill the withdrawal requests of depositors who want to liquidate their funds, where the funds are used by the bank to channel loans (Sitompul & Nasution, 2019). The higher the FDR ratio, the lower the liquidity of the Islamic bank. In Figure 4, it is evident that in 2020, the FDR ratio for Islamic commercial banks was classified as less healthy ($100\% > \text{FDR} \leq 120\%$) with a value of 104.71%. However, in 2021 and 2022, the FDR ratio reached the very healthy category ($50\% > \text{FDR} \leq 75\%$) with values of 76.62% and 72.99%, respectively. For the sustainability of their business, Islamic banks must maintain the health of their FDR ratios to avoid various financial difficulties.

Indonesian Islamic banks can learn from the Islamic Investment Bank Arcapita, which faced liquidity risk vulnerabilities despite implementing good governance and risk management. This occurred when the bank experienced financial distress due to internal and external factors. Internally, the bank's inability to finance the murabahah obligation of \$1.1 billion led to the financial distress. Externally, the financial crisis of

2007–2008 also played a role (Alhammadi et al., 2020). Financial liquidity stability is crucial for the image of Islamic banks. Failure to meet the withdrawal demands of depositors can lead to a crisis of confidence in the bank. Financial liquidity issues can pose serious problems for the existence of a bank and may trigger bankruptcy, as experienced by Bank Arcapita in Manama, Bahrain.

CONCLUSION

Based on the t-test results, it is known that CAR does not have a significant partial effect on ROA. This is caused by internal and external factors. Internally, the available capital is not distributed evenly for financing and other risk-bearing fund allocations. External factors include the COVID-19 pandemic. Furthermore, NPF does not have a significant partial effect on ROA. This is because the financing carried out by Islamic banks is still relatively small and does not impact ROA significantly. Islamic banks can take steps to use various variations of Sharia financing schemes to attract a diverse customer base, thus increasing the amount of Islamic financing disbursed and improving risk management.

NOM has a significant negative partial effect on ROA. This may be due to factors such as bank management, financial performance, business segments, the influence of revenue and cost controls, as well as macroeconomic factors. Next, BOPO has a significant negative partial effect on ROA. This relationship indicates that the better an Islamic bank controls operational costs, the higher its level of profitability. FDR also has a significant negative partial effect on ROA. An increase in financing not covered by third-party funds leads to an increase in the FDR, which, in turn, decreases the profitability of Islamic banks. Therefore, Islamic banks should pay attention to balancing the amount of financing disbursed with the amount of third-party funds that can be mobilized to ensure liquidity security.

Each variable's influence can signal the health level of Islamic Commercial Banks. Therefore, the financial performance of Islamic banks should be a primary concern for bank management and stakeholders in mitigating financial risks that could lead to bankruptcy or even bank liquidation threats. Improving the financial performance of Islamic banks is also a driving factor in boosting bank profitability. This study reveals that during the period 2015–2022, some Islamic banks have shown fairly good performance in terms of achieving ratios that meet healthy and very healthy criteria. However, some Islamic banks have not yet reached the healthy criteria, highlighting the need for continuous improvement in Islamic bank performance to maintain stability.

This study is expected to have implications for the development of risk management theories for Islamic banks and practical implications for Islamic banking management to consistently maintain financial ratios that impact the sustainability of Islamic banking business. It also suggests policy implications for relevant authorities, especially the Financial Services Authority (OJK) and Bank Indonesia (BI), to issue regulations that stimulate the improvement of Islamic bank performance, accompanied by guidance, support, and monitoring of financial

performance achievements in Islamic banking in Indonesia. This research has limitations, such as using data only from the five Islamic commercial banks registered with OJK and not covering all Islamic banks in Indonesia along with other Islamic business units. The study also uses limited variables, focusing only on a few financial ratio indicators with a limited research period of only 8 years. Future research could expand the scope, include macro variables such as inflation and exchange rates, and extend the research period.

Author Contributions

Conceptualization	M., M.A., & V.M.E.	Resources	M., M.A., & V.M.E.
Data curation	M., M.A., & V.M.E.	Software	M., M.A., & V.M.E.
Formal analysis	M., M.A., & V.M.E.	Supervision	M., M.A., & V.M.E.
Funding acquisition	M., M.A., & V.M.E.	Validation	M., M.A., & V.M.E.
Investigation	M., M.A., & V.M.E.	Visualization	M., M.A., & V.M.E.
Methodology	M., M.A., & V.M.E.	Writing – original draft	M., M.A., & V.M.E.
Project administration	M., M.A., & V.M.E.	Writing – review & editing	M., M.A., & V.M.E.

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

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Informed Consent Statement

Informed consent was not required for this study.

Data Availability Statement

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

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Conflicts of Interest

The authors declare no conflicts of interest.

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