

The Effect of Capital Adequacy and Operational Risk on Profitability with Net Operating Margin as an Intervening Variable in Islamic Commercial Banks in Indonesia During the 2020–2024 Period



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Abstract

Islamic commercial banks serve as alternative financial institutions that operate in accordance with Islamic principles by prohibiting interest (*riba*) and implementing a profit-and-loss sharing system. Funds collected from customers are channeled into the real sector, while returns are distributed based on predetermined profit-sharing agreements (*nisbah*). Although higher returns increase profit-sharing benefits for both banks and customers, they also expose banks to greater financial risk. Therefore, maintaining adequate capital and effectively managing operational risk are essential for ensuring business sustainability and achieving stable profitability. This study aims to examine the effects of capital adequacy and operational risk on profitability, measured by Return on Assets (ROA), with Net Operating Margin (NOM) acting as a mediating variable. The study employed a quantitative approach using panel data from 55 observations of Islamic commercial banks registered with the Indonesian Financial Services Authority (OJK) during the 2020–2024 period. Data were analyzed using Structural Equation Modeling (SEM). The results indicate that capital adequacy has no significant effect on Net Operating Margin, whereas operational risk has a significant negative effect on Net Operating Margin. In addition, neither capital adequacy nor operational risk directly affects profitability, while Net Operating Margin has a significant positive effect on profitability. The mediation analysis further reveals that Net Operating Margin does not mediate the relationship between capital adequacy and profitability but successfully mediates the relationship between operational risk and profitability. These findings highlight the importance of operational efficiency in improving the profitability of Islamic commercial banks.

Keywords: Islamic Commercial Banks; Capital Adequacy; Operational Risk; Net Operating Margin; Profitability; Return On Assets

INTRODUCTION

Indonesia's financial sector has experienced substantial growth, with banking playing a vital role in mobilizing public funds and channeling them into financing activities, as stipulated in Law No. 10 of 1998 amending Law No. 7 of 1992 on Banking. The Indonesian banking system consists of conventional and Islamic banks. In recent years, Islamic banking has expanded significantly, driven by increasing public awareness of Sharia-compliant financial principles and the prohibition of *riba* (interest). This growth has intensified competition among Islamic banks to strengthen their market share through effective marketing strategies while serving both Muslim and non-Muslim customers. The rapid development of the industry is reflected in the continuous increase in Islamic banks' total assets, highlighting the sector's growing contribution to Indonesia's financial system (Law No. 10 of 1998; Indonesian Financial Services Authority/OJK).

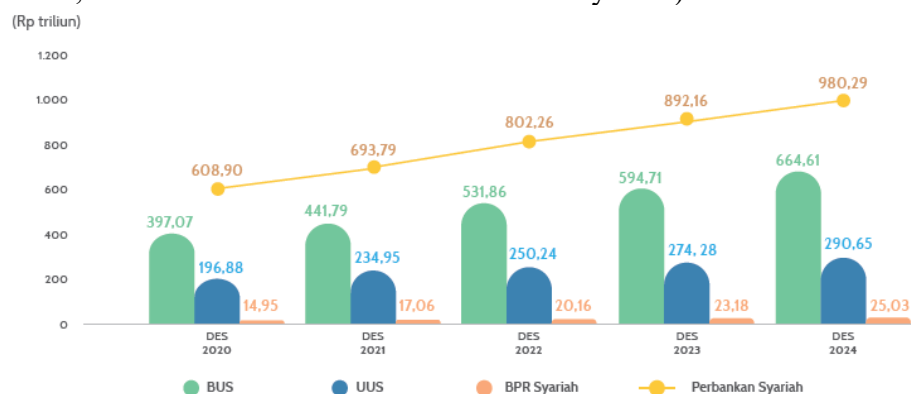


Figure 1.1
Total Assets of Islamic Banks in Indonesia
(in Billion Indonesian Rupiah)
Source: Indonesian Financial Services Authority (OJK)

Figure 1.1 shows that the total assets of Islamic banks in Indonesia increased consistently from 2020 to 2024. This upward trend reflects the sector's continuous growth and expansion. However, increasing assets must be accompanied by effective asset management and sound financial performance to ensure optimal utilization. A financially healthy Islamic bank is expected to generate sustainable profitability, enabling it to provide competitive profit-sharing returns under Sharia-compliant financing schemes, such as *mudharabah*. Therefore, profitability, particularly as measured by Return on Assets (ROA), serves as an important indicator of the financial health and operational performance of Islamic banks.

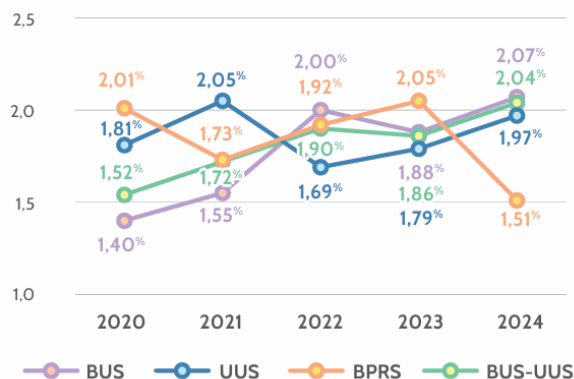


Figure 1.2
Return on Assets (ROA) Ratio of Islamic Banks
Source: Indonesian Financial Services Authority (OJK)

Figure 1.2 shows that the Return on Assets (ROA) of Islamic commercial banks increased from 2020 to 2022, declined in 2023, and recovered in 2024. ROA is a key profitability indicator that measures a bank's ability to generate earnings from its total assets (Hakim, 2021). Maintaining strong profitability requires effective capital management, as adequate capital supports business operations and serves as a buffer against potential risks (Sawir, 2022). Capital adequacy, commonly measured by the Capital Adequacy Ratio (CAR), reflects a bank's financial resilience and its capacity to absorb current and future risks (Hakim, 2021). Figure 1.3 presents the trend of the Capital Adequacy Ratio (CAR) of Islamic banks.

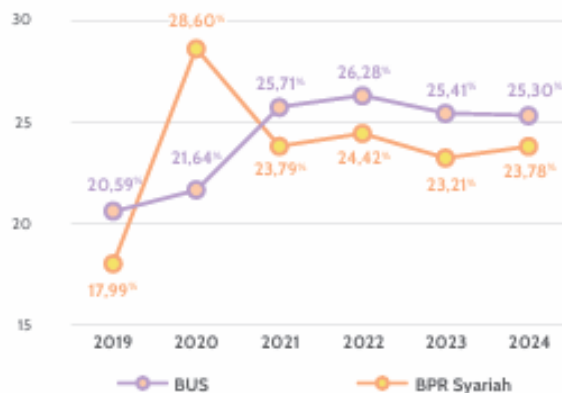


Figure 1.3
Capital Adequacy Ratio (CAR) of Islamic Banks
Source: Indonesian Financial Services Authority (OJK)

Figure 1.3 shows that the Capital Adequacy Ratio (CAR) of Islamic commercial banks increased from 2020 to 2022 before declining between 2023 and 2024. A higher CAR indicates a stronger capacity to absorb financial risks and support financing activities, which may enhance profitability (Puspitasari et al., 2021). However, adequate capital alone does not guarantee strong financial performance without effective operational risk management. Operational efficiency is essential for maximizing returns by controlling operating costs and increasing income. Banks that manage their operations efficiently tend to achieve higher

profitability (Santhuso, Herawati, & Karimah, 2023). Operational risk is commonly measured using the Operating Expenses to Operating Income (BOPO) ratio, as illustrated in Figure 1.4.

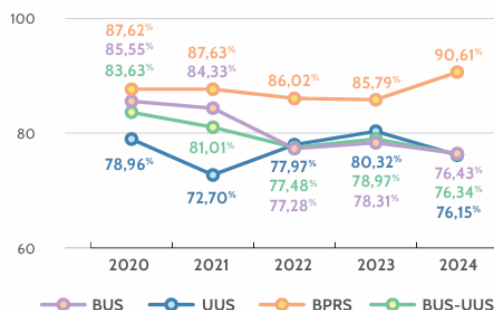


Figure 1.4
Operating Expenses to Operating Income (BOPO) Ratio of Islamic Banks

Source: Indonesian Financial Services Authority (OJK)

Figure 1.4 shows that the Operating Expenses to Operating Income (BOPO) ratio of Islamic commercial banks declined from 2020 to 2022, increased in 2023, and decreased again in 2024. BOPO is a key indicator of operational efficiency, reflecting a bank's ability to control operating costs relative to its operating income (Harmono, 2022). Efficient management of productive assets enhances income generation, which can be assessed using the Net Operating Margin (NOM). A higher NOM indicates better asset utilization and contributes positively to profitability by improving earnings (Khasanah & Stiawan, 2023; Sufyati, 2021). As Islamic banks operate under profit-sharing principles instead of interest-based financing, maintaining adequate capital and effectively managing operational risk are essential to ensuring sustainable profitability and long-term operational stability.

REVIEW OF LITERATURE

Islamic Banking

Islamic banks operate based on Sharia principles by avoiding transactions involving *riba* (interest) and implementing profit-sharing and trade-based financing systems (Wulandari et al., 2024). According to Law No. 21 of 2008 on Islamic Banking, Islamic banks conduct activities such as collecting funds through Sharia-based savings and investments, distributing financing through contracts including *mudharabah*, *musyarakah*, *murabahah*, *ijarah*, and *qardh*, and providing other services in accordance with Islamic principles.

The operational activities of Islamic banks are guided by regulations and fatwas issued by the National Sharia Council of the Indonesian Ulama Council (DSN-MUI), ensuring compliance with Islamic law. Fatwas such as DSN-MUI No. 63/DSN-MUI/XII/2007 provide guidelines for Sharia-compliant financial instruments and contracts. In general, Islamic banking mechanisms include collecting public funds through savings, current accounts, and deposits; distributing funds through profit-sharing, sale, and leasing schemes; and providing fee-based services (Hakim, 2021). Based on Law No. 21 of 2008, Islamic banks consist of Islamic Commercial Banks and Islamic Rural Banks.

Islamic Commercial Banks

Islamic Commercial Banks (Bank Umum Syariah/BUS) are banking institutions that conduct business activities based on Sharia principles and provide payment transaction services. According to Financial Services Authority Regulation (POJK) No. 16/POJK.03/2022, Islamic Commercial Banks operate under Islamic principles and may function as foreign exchange or non-foreign exchange banks depending on their business scope (Pratiwi et al., 2022). Unlike conventional banks, Islamic Commercial Banks avoid *riba* (interest) and apply Sharia-based contracts in accordance with Islamic law to ensure fair and ethical transactions (Azwar et al., 2022).

Profitability

Profitability is an important indicator for evaluating bank performance, as it reflects the ability of a bank to generate profits, manage risks, and increase value (Syaipudin & Luthfi, 2025). In Islamic banking, profitability is primarily generated from financing activities based on profit-sharing contracts, such as *mudharabah* and *musyarakah*, as well as margin-based financing through *murabahah*, *salam*, and *istishna* contracts (Zahra & Mutmainah, 2024). The effectiveness of Islamic banks in managing assets and funds can be measured using financial ratios, particularly Return on Assets (ROA). ROA measures a bank's ability to generate profits by utilizing its total assets (Hakim, 2021).

$$ROA : \frac{(Net\ Profit)}{(Total\ Assets)}$$

Table 2.1.
Return on Assets (ROA) Rating Criteria

No.	ROA Ratio	Rating
1	1.22% – 1.50%	Healthy
2	0.99% – <1.22%	Fairly Healthy
3	0.77% – <0.99%	Less Healthy
4	0% – <0.77%	Unhealthy

Source: Bank Indonesia Circular Letter No. 13/1/PBI/2011.

The Return on Assets (ROA) rating criteria are used to assess the profitability and financial performance of banks. A higher ROA indicates a greater ability to generate profits from total assets, reflecting better operational efficiency and financial health. According to Bank Indonesia regulations, banks with an ROA between 1.22% and 1.50% are classified as Healthy, while lower ROA values indicate weaker profitability and a lower level of financial soundness.

Capital Adequacy

Capital is a fundamental resource that supports banking operations and plays an important role in maintaining financial stability. Effective capital management enables banks to operate efficiently and absorb potential losses (Mahdatika & Shofawati, 2022). According to Bank Indonesia Regulation No. 15/12/PBI/2013, the minimum Capital Adequacy Ratio (CAR) requirement is set at 8% to ensure adequate capitalization and strengthen banks'

ability to manage risks. A CAR below this threshold indicates potential capital risks that may affect financial stability.

CAR serves to protect depositors and strengthen the financial system by measuring the adequacy of bank capital. It consists of Tier 1 capital, which absorbs losses while the bank continues operating, and Tier 2 capital, which provides protection during liquidation (Puspitasari et al., 2021). A higher CAR indicates stronger capital capacity and greater flexibility for banks to invest in profitable activities, potentially improving profitability (Hakim et al., 2023).

$$CAR : \frac{(Capital)}{A(Risk-Weighted Assets (RWA))}$$

Table 2.2.
Capital Adequacy Ratio (CAR) Rating Criteria

No.	CAR Ratio	Rating
1	CAR > 12%	Very Good
2	9% < CAR < 12%	Good
3	8% < CAR < 9%	Fairly Good
4	6% < CAR < 8%	Less Good
5	CAR < 6%	Poor

Source: Bank Indonesia Circular Letter No. 13/24/DPNP/2011.

Operational Risk

Operational risk refers to potential losses arising from inadequate internal processes, human errors, system failures, or external events that affect bank operations, as defined by Bank Indonesia Regulation No. 13/23/PBI/2011. Effective operational risk management is essential because banking products, services, and activities inherently contain operational risks that may impact financial performance (Anam, 2023).

One key indicator for measuring operational risk is the Operating Expenses to Operating Income (BOPO) ratio. BOPO measures a bank's operational efficiency by comparing operating expenses with operating income (Sofyan, 2021). A lower BOPO ratio indicates better efficiency, while a higher ratio reflects greater operational costs and less optimal management. In Islamic banking, operational expenses include labor, marketing, and financing-related costs, while income is primarily generated from financing activities (Santhuso, Herawati, & Karimah, 2023). Therefore, efficient BOPO management reflects effective resource utilization and improved bank performance (Safira, 2024).

$$BOPO : \frac{(Operating Expenses)}{(Operating Income)}$$

Net Operating Margin

Net Operating Margin (NOM) is an important profitability indicator for Islamic banks, which operate based on profit-sharing principles rather than interest-based systems. NOM measures the effectiveness of productive assets in generating net operating income by

comparing operating income and expenses with average productive assets (Khasanah & Stiawan, 2023). A higher NOM indicates better asset management and greater income generation, which can contribute to increased profitability, including Return on Assets (ROA) (Sufyati, 2021). Conversely, a low NOM ratio reflects lower operational income and less effective utilization of productive assets. Therefore, NOM is used to assess the efficiency of Islamic banks in managing their assets to achieve sustainable profitability (Santhuso, Herawati, & Karimah, 2023).

$$NOM : \frac{(PO - DBH) - BO}{\text{Average Productive Assets}}$$

Description:

NOM : Net Operating Margin

PO : Operating Income

DBH : Profit-Sharing Distribution

BO : Operating Expenses

Research Model

The research model is developed to provide a framework for understanding, analyzing, and addressing the research problem. Based on the theoretical framework and previous empirical studies, this study proposes a research model consisting of Capital Adequacy (CAR) and Operational Risk (BOPO) as independent variables, Profitability (ROA) as the dependent variable, and Net Operating Margin (NOM) as the mediating variable. The proposed research model illustrates the relationship among these variables and serves as the basis for analyzing the direct and indirect effects within the study.

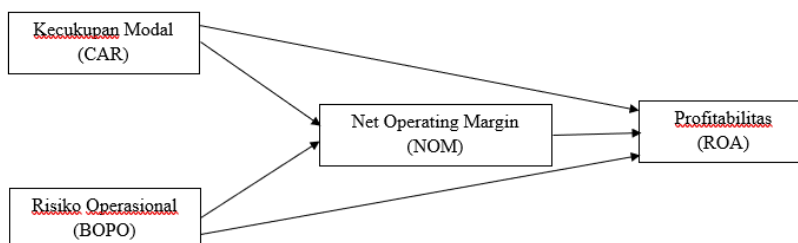


Figure 2.1.
Research Model

Research Hypotheses

A hypothesis is a preliminary assumption or prediction regarding a research problem that guides the direction of empirical investigation (Ramdhan, 2021). Based on the research model and theoretical framework, the following hypotheses are proposed:

H1: The Effect of Capital Adequacy on Net Operating Margin

Adequate capital enables banks to expand productive assets and generate operating income. A higher Capital Adequacy Ratio (CAR) strengthens a bank's ability to manage risks and increase income from productive assets, which may improve Net Operating Margin (NOM). Previous studies have shown mixed results, with some finding that CAR affects NOM (Mahdatika & Shofawati, 2022; Purbadasuha & Prasetiono, 2024), while others found

no significant effect (Purnamasari & Renanda, 2022; Khasanah & Stiawan, 2023).

H1: Capital Adequacy affects Net Operating Margin.

H2: The Effect of Operational Risk on Net Operating Margin

Operational efficiency reflects a bank's ability to control operating expenses relative to operating income. A lower BOPO ratio indicates higher efficiency and better income generation, while a higher BOPO ratio may reduce operational income and NOM. Previous studies indicate that BOPO affects NOM (Santhuso et al., 2023; Zikri et al., 2021), although other studies report insignificant effects (Mahdatika & Shofawati, 2022; Purbadasuha & Prasetyono, 2024).

H2: Operational Risk affects Net Operating Margin.

H3: The Effect of Capital Adequacy on Profitability

Capital adequacy supports bank expansion, strengthens asset management, and contributes to profitability. A higher CAR indicates greater ability to generate profits from assets, which may improve Return on Assets (ROA). Previous studies found that CAR has a positive and significant effect on ROA (Purnamasari & Renanda, 2022; Fathihani et al., 2024), while other studies found no significant effect (Nufus & Munandar, 2021; Puspitasari et al., 2021).

H3: Capital Adequacy affects Profitability.

H4: The Effect of Operational Risk on Profitability

Operational risk, measured by BOPO, reflects banking efficiency in managing operating costs. Higher efficiency improves profitability, while increasing operating expenses may reduce ROA. Previous studies found that BOPO affects ROA (Purbadasuha & Prasetyono, 2024; Khuluqi, 2024), whereas other studies found no significant relationship (Natanael & Mayangsari, 2022; Laily et al., 2022).

H4: Operational Risk affects Profitability.

H5: The Effect of Net Operating Margin on Profitability

NOM reflects the ability of banks to generate net operating income from productive assets. Higher NOM indicates better asset utilization and contributes to increased profitability measured by ROA. Previous studies found that NOM has a positive significant effect on ROA (Santhuso et al., 2023; Purnamasari & Renanda, 2022), while other research found no significant effect (Nufus & Munandar, 2021).

H5: Net Operating Margin affects Profitability.

H6: The Effect of Capital Adequacy on Profitability through Net Operating Margin

Capital adequacy may improve profitability indirectly through NOM by increasing banks' ability to manage productive assets and generate operating income. A higher CAR provides greater capacity to support financing activities, which can increase NOM and subsequently improve ROA. Previous studies found that NOM mediates the relationship between CAR and ROA (Purbadasuha & Prasetyono, 2024; Khasanah & Stiawan, 2023), while other studies found no mediation effect (Puspitasari et al., 2021; Purnamasari & Renanda, 2022).

H6: Capital Adequacy affects Profitability through Net Operating Margin.

H7: The Effect of Operational Risk on Profitability through Net Operating Margin

Operational efficiency influences profitability through its impact on operating income. A lower BOPO ratio indicates better efficiency, which may increase NOM and subsequently improve ROA. NOM can act as a mediating variable between operational risk

and profitability by explaining how operational efficiency affects bank earnings. Previous studies found that NOM mediates the relationship between BOPO and ROA (Purnamasari & Renanda, 2022), while other studies found no mediation effect (Santhuso et al., 2023; Purbadasuha & Prasetyono, 2024).

H7: Operational Risk affects Profitability through Net Operating Margin.

RESEARCH METHOD

Research Object

The object of this study focuses on examining the effect of Capital Adequacy and Operational Risk on Profitability through the mediating role of Net Operating Margin. The unit of analysis in this research consists of the financial statements of Islamic Commercial Banks for the 2020–2024 period. The subjects of this study are Islamic Commercial Banks registered with the Financial Services Authority (Otoritas Jasa Keuangan/OJK) in Indonesia.

Population and Sampling Procedure

The population of this study includes all Islamic Commercial Banks in Indonesia that were registered with the Financial Services Authority (OJK) during the 2020–2024 period. Based on the official records, there were 13 Islamic Commercial Banks included in the population. The sample selection was conducted using a purposive sampling technique, which is a method of selecting samples based on predetermined criteria relevant to the objectives of the research (Ramadhan, 2021).

The criteria used in selecting the research sample are as follows:

1. Islamic Commercial Banks that were registered with the Financial Services Authority (OJK) during the 2020–2024 period.
2. Islamic Commercial Banks that published complete annual financial reports for the 2020–2024 period.
3. Islamic Commercial Banks that presented their financial statements in Indonesian Rupiah (IDR) during the 2020–2024 period.

Based on these criteria, the research sample was determined by considering the availability, completeness, and suitability of the financial data required for the analysis. Therefore, only Islamic Commercial Banks that met all predetermined criteria were selected as research samples.

RESULTS AND DISCUSSION

Data Collection Results

This chapter presents the data analysis and discussion of the research variables. The study focuses on Islamic Commercial Banks registered with the Financial Services Authority (OJK) that consistently published complete annual reports during the 2020–2024 observation period. The sample selection was conducted using purposive sampling based on the suitability of the research objects with the study objectives. The data collection and selection process resulted in 11 Islamic Commercial Banks that met the predetermined criteria and were selected as the research sample.

Table 4.1
List of Islamic Commercial Bank Samples

No.	Company Name
1	PT Bank Aceh Syariah
2	PT BPD Nusa Tenggara Barat Syariah
3	PT Bank Muamalat Indonesia
4	PT Bank Victoria Syariah
5	PT Bank Jabar Banten Syariah
6	PT Bank Mega Syariah
7	PT Bank Panin Dubai Syariah, Tbk
8	PT Bank Syariah Bukopin
9	PT BCA Syariah
10	PT Bank Tabungan Pensiunan Nasional Syariah, Tbk
11	PT Bank Aladin Syariah, Tbk

Source: Processed Data (2025)

General Overview of the Research Object

Islamic banking in Indonesia is part of the financial system that operates based on Islamic principles. Its main activities include collecting funds from customers, distributing funds through various financing schemes, and providing other banking services that comply with sharia regulations. The Islamic banking industry consists of Islamic Commercial Banks, Islamic business units within conventional banks, and Islamic Rural Banks, with operational supervision conducted by the Sharia Supervisory Board to ensure compliance with Islamic principles.

Research Data

Based on the previous sample selection process, 11 Islamic Commercial Banks were selected as the research samples. The data used in this study are presented in Table 4.2.

Table 4.2
Research Data

No.	Bank Name	Year	CAR	BOPO	NOM	ROA
1	PT Bank Aceh Syariah	2020	18.60	81.50	1.29	1.73
		2021	20.02	78.37	1.38	1.87
		2022	23.52	76.66	1.27	2.00
		2023	22.70	77.00	1.39	2.05
		2024	21.89	77.44	1.39	2.01
2	PT BPD Nusa Tenggara Barat Syariah	2020	31.46	81.39	1.22	1.74
		2021	29.53	82.56	1.16	1.64
		2022	26.36	80.54	1.27	1.93
		2023	24.47	80.09	1.39	2.07

No.	Bank Name	Year	CAR	BOPO	NOM	ROA
		2024	25.14	80.57	1.35	1.85
3	PT Bank Muamalat Indonesia	2020	15.21	99.45	0.04	0.03
		2021	23.76	99.29	0.04	0.02
		2022	32.70	96.62	0.20	0.09
		2023	29.42	99.41	0.03	0.02
		2024	28.48	99.04	0.06	0.03
4	PT Bank Victoria Syariah	2020	24.60	96.93	0.50	0.16
		2021	33.21	91.35	1.17	0.71
		2022	149.68	94.41	0.07	0.45
		2023	65.83	89.52	2.76	0.64
		2024	60.13	90.87	1.56	0.82
5	PT Bank Jabar Banten Syariah	2020	24.14	95.41	0.60	0.41
		2021	23.47	88.73	0.44	0.96
		2022	22.11	84.90	0.79	1.14
		2023	20.14	92.31	0.66	0.62
		2024	18.70	93.14	0.32	0.57
6	PT Bank Mega Syariah	2020	24.15	85.52	1.57	1.74
		2021	25.59	64.64	2.06	4.08
		2022	26.99	67.33	2.45	2.59
		2023	30.87	76.69	1.95	1.96
		2024	28.80	77.64	0.95	2.04
7	PT Bank Panin Dubai Syariah Tbk	2020	31.43	99.42	0.05	0.06
		2021	25.81	202.74	-7.37	-6.72
		2022	22.71	76.99	1.92	1.79
		2023	20.39	82.47	1.52	1.51
		2024	21.94	92.01	0.70	0.65
8	PT Bank Syariah Bukopin	2020	22.22	97.73	-0.28	0.04
		2021	23.74	180.25	-6.07	-5.48
		2022	19.49	115.76	-1.79	-1.27
		2023	19.38	206.19	-8.71	-7.13
		2024	18.79	96.69	0.28	0.20
9	PT BCA Syariah	2020	45.26	86.28	1.19	1.09
		2021	41.43	84.76	1.22	1.12
		2022	36.72	81.63	1.37	1.33

No.	Bank Name	Year	CAR	BOPO	NOM	ROA
		2023	34.83	78.59	1.65	1.49
		2024	29.58	79.56	1.59	1.61
10	PT Bank Tabungan Pensiunan Nasional Syariah Tbk	2020	49.44	72.42	7.68	7.16
		2021	58.10	59.97	11.54	10.72
		2022	52.05	58.13	12.03	11.36
		2023	50.04	76.35	6.49	6.30
		2024	51.71	74.93	6.46	6.42
11	PT Bank Aladin Syariah Tbk	2020	329.09	56.16	6.30	6.19
		2021	390.50	428.40	-9.93	-8.81
		2022	189.28	354.75	-12.24	-10.85
		2023	96.17	128.65	-4.77	-4.22
		2024	64.96	109.29	-0.99	-0.90

Source: Processed Data (2025)

Notes:

- CAR = Capital Adequacy Ratio
- BOPO = Operating Expenses to Operating Income Ratio
- NOM = Net Operating Margin
- ROA = Return on Assets

Financial Ratio Overview

Table 4.2 presents the financial ratios of Islamic commercial banks during 2020–2024, highlighting variations in Capital Adequacy Ratio (CAR), Operational Risk (BOPO), Net Operating Margin (NOM), and Return on Assets (ROA). Most banks maintained CAR levels above the regulatory minimum, reflecting adequate capitalization. Banks with lower BOPO ratios generally achieved higher NOM and ROA, indicating greater operational efficiency and profitability. In contrast, banks with higher BOPO ratios tended to record lower or even negative NOM and ROA, suggesting inefficient operations and weaker profit generation. Overall, the data indicate that operational efficiency and operating margins play a crucial role in determining the profitability of Islamic commercial banks, with more efficient banks consistently demonstrating stronger financial performance.

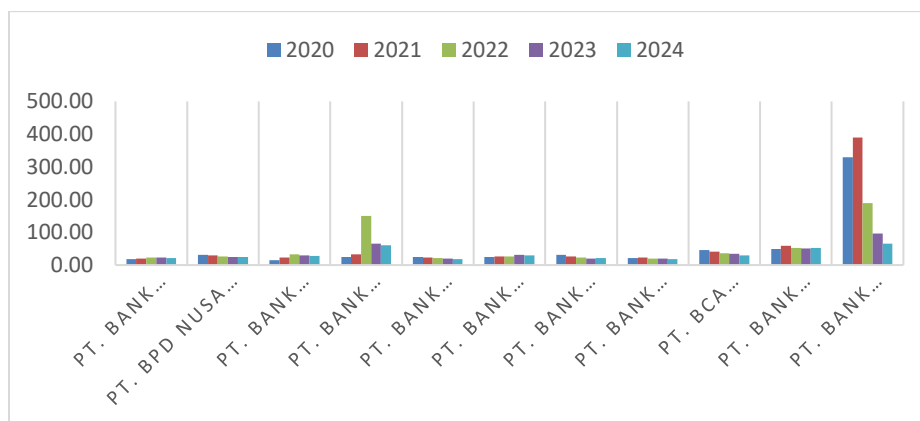


Figure 4.1
Capital Adequacy Ratio (CAR)

(Source: Processed data using Microsoft Excel)

Figure 4.1 illustrates the development of the **Capital Adequacy Ratio (CAR)** of Islamic commercial banks in Indonesia during the 2020–2024 period. Overall, the CAR values of individual banks fluctuated from year to year but remained at relatively high levels. Several banks, including **PT Bank Victoria Syariah** and **PT Bank Aladin Syariah**, recorded significantly higher CAR values than other banks, indicating strong capital adequacy and a greater capacity to absorb financial risks. Meanwhile, most other banks maintained relatively stable CAR levels throughout the observation period. Overall, the figure suggests that the capital position of Islamic commercial banks remained sound, providing sufficient financial strength to support operational activities and business expansion.

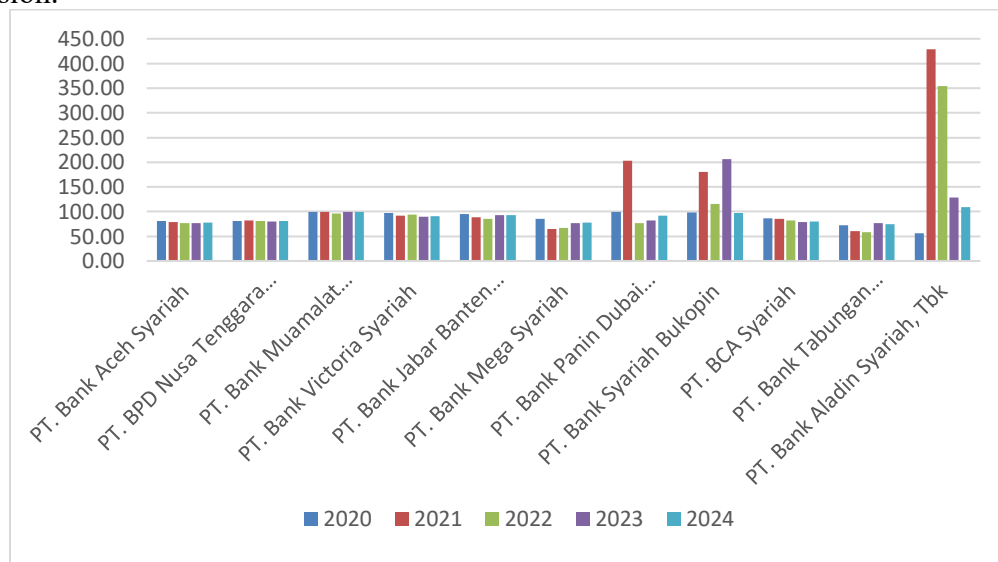


Figure 4.2
Operating Expenses to Operating Income Ratio (BOPO)
(Source: Processed data using Microsoft Excel)

Figure 4.2 illustrates the trend of the Operating Expenses to Operating Income (BOPO) Ratio of Islamic commercial banks in Indonesia during the 2020–2024 period. Overall, the BOPO ratio of most banks remained relatively stable, although several banks experienced considerable fluctuations in certain years. Some banks recorded substantial increases in their BOPO ratio, indicating that operating expenses grew faster than operating income, which reflects lower operational efficiency during those periods. In contrast, banks with lower BOPO ratios demonstrated better operational efficiency, as they were more effective in controlling operating expenses relative to the operating income generated.

Descriptive Analysis of Variables

The descriptive analysis in this study is based on the variables of Capital Adequacy (CAR) (X_1), Operational Risk (BOPO) (X_2), Profitability (ROA) (Y), and Net Operating Margin (NOM) (Z). The data were collected from the official websites of the Islamic commercial banks included as the research sample, as well as from the official website of the Indonesian Financial Services Authority (OJK). The results of the descriptive statistical analysis are presented in Table 4.3.

Table 4.3.
Descriptive Statistics of Research Variables

Variable	Mean	Median	Minimum	Maximum	Standard Deviation
X1 – Capital Adequacy Ratio (CAR)	49.03	26.99	15.21	390.50	67.66
X2 – Operational Expense to Operating Income Ratio (BOPO)	102.90	85.52	56.16	428.40	63.25
Y – Return on Assets (ROA)	0.94	1.12	-10.85	11.36	3.81
Z – Net Operating Margin (NOM)	0.75	1.19	-12.24	12.03	4.13

Source: Processed research data.

Descriptive Statistics Analysis

Table 4.3 summarizes the descriptive statistics of the study variables: Capital Adequacy Ratio (CAR), Operational Expense to Operating Income Ratio (BOPO), Return on Assets (ROA), and Net Operating Margin (NOM). CAR recorded a mean of 49.03 (range: 15.21–390.50), indicating generally strong capital adequacy but substantial variation across Islamic commercial banks. BOPO had the highest mean (102.90) with considerable dispersion ($SD = 63.25$), suggesting differences in operational efficiency among banks. ROA averaged 0.94 (range: -10.85 to 11.36), reflecting relatively low profitability, with some banks experiencing losses while others achieved high returns. NOM showed a mean of 0.75 (range: -12.24 to 12.03), indicating fluctuations in banks' ability to generate net operating income from productive assets. According to Evi and Rachbini (2022), Partial Least Squares Structural Equation Modeling (PLS-SEM) is appropriate for studies with small sample sizes or non-normally distributed data. Therefore, despite the presence of non-normal data, the empirical analysis remains valid using the PLS-SEM approach.

Model Evaluation

Data analysis in this study employed the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. Since the research model did not include latent constructs and each variable was represented by a single indicator, the analysis focused solely on the structural model (inner model) evaluation. The inner model assessment was conducted to examine the relationships between the independent variables and the dependent variable. The results of the PLS algorithm generated using SmartPLS are presented in Figure 4.1.

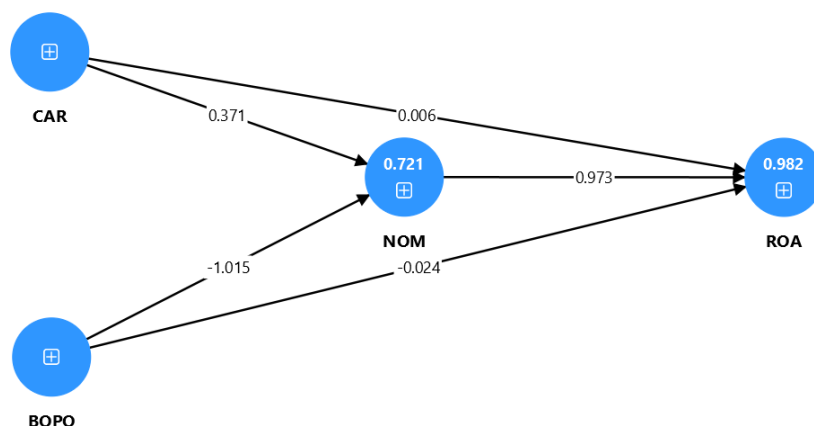


Figure 4.5
Structural Model (Algorithm Calculation Output)

Structural Model Results

Figure 4.5 presents the structural model estimated using the PLS algorithm. The results indicate that Capital Adequacy Ratio (CAR) has a positive effect on Net Operating Margin (NOM) ($\beta = 0.371$), while Operational Expense to Operating Income Ratio (BOPO) has a strong negative effect on NOM ($\beta = -1.015$), suggesting that higher operational costs reduce operating margins. CAR has a negligible direct effect on Return on Assets (ROA) ($\beta = 0.006$), whereas BOPO shows a weak negative effect ($\beta = -0.024$). In contrast, NOM has a strong positive influence on ROA ($\beta = 0.973$), indicating that operating margin is the primary driver of profitability. The coefficient of determination (R^2) is 0.721 for NOM, meaning that CAR and BOPO explain 72.1% of its variance. For ROA, the R^2 value is 0.982, indicating that 98.2% of the variation in profitability is explained by CAR, BOPO, and NOM. These findings highlight the important mediating role of NOM in linking operational performance to bank profitability.

CONCLUSION

Based on the SEM-PLS analysis, this study examines the effect of Capital Adequacy (CAR) and Operational Risk (BOPO) on Profitability (ROA) through Net Operating Margin (NOM) in Indonesian Islamic Commercial Banks during 2020–2024. The results show that Capital Adequacy does not affect NOM, while Operational Risk has a negative effect on NOM. Furthermore, Capital Adequacy and Operational Risk do not directly affect Profitability, whereas NOM has a positive effect on Profitability. NOM does not mediate the

relationship between Capital Adequacy and Profitability but mediates the effect of Operational Risk on Profitability.

Research Implications

The findings indicate that capital adequacy alone is insufficient to improve profitability. Effective operational risk management, cost efficiency, and optimal margin management are key factors in enhancing the financial performance of Islamic Commercial Banks. These results provide implications for bank management and regulators in developing strategies to strengthen the sustainability and competitiveness of the Islamic banking industry.

Suggestions

Future researchers are encouraged to expand the research model by considering additional variables, longer observation periods, or comparisons among Islamic banks. For academics, this study can serve as a reference for further research on Islamic banking profitability using the SEM-PLS approach. Investors should consider operational efficiency and Net Operating Margin in addition to capital and risk indicators when making investment decisions. Meanwhile, Islamic Commercial Banks are advised to optimize asset management, improve financing quality, control operational costs, and strengthen business strategies to achieve sustainable profitability.

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