Determinants of global Islamic bank profitability: a multi-country analysis

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Abstract
Purpose – This study examines the effect of net operating margin, capital adequacy ratio, and operating expense ratio on return on assets with non-performing financing as a moderating variable. **Method** – The object of this research is all the strongest world banks listed on the TabInsight page, according to the Asia Banker, for 2020-2023. The result of purposive sampling is 71 companies with a total observation data of 284. The data collected were analyzed using panel data regression and moderation regression to test each hypothesis. **Findings** – The test results show that the net operating margin positively affects return on assets. The operating expense ratio negatively affects return on assets. At the same time, the capital adequacy ratio variable does not affect returns on assets. Furthermore, the non-performing financing weakens the effect of the capital adequacy ratio on return on assets. Conversely, the non-performing financing cannot moderate the effect of net operating margin and operating expense ratio on return on assets. **Implications** – Theoretically, this research can complement existing theories in finance and banking, especially in analysing the profitability of banks or Islamic financial institutions. Practically, these research results and the measurement of the proper financial performance of banks will be a reference for investors in determining plans.
Keywords: net operating margin, capital adequacy ratio, operating expense ratio, non-performing financing, return on assets.

Introduction

Inclusive and sustainable economic growth is a global focus, with Islamic banking a promising alternative to creating economic stability. The sharia system that abolishes the practice of interest has led to a surge in demand for Islamic banking products (Rehman et al. 2021). Reflected in global asset growth that increased from $2.13 trillion in 2019 to $3.24 trillion in 2022 (The Asian Banker 2021). In addition to asset growth, the profitability of Islamic banking has also increased. However, the dominance of large banks has led to the displacement of funds from smaller banks, which could threaten liquidity and increase financial risks. This phenomenon can weaken small banks and create economic instability, as happened to bank Al-Madinah in Saudi Arabia in 2021 due to poor management and a liquidity crisis. Similar events have also occurred in American banking, where economic instability has made small banks such as Silicon Valley bank (SVB) and Washington Mutual (WaMu) bankrupt and even acquired by JPMorgan Chase.

In Indonesia, there is also a similar phenomenon where the Indonesian Islamic bank acquired several Islamic banks as a government strategy to overcome or increase the stability of Islamic banking in Indonesia. Therefore, research on Islamic banking's resilience to liquidity and customer confidence challenges is crucial to ensure the sector's stability and

maintain investor confidence through optimal profitability. Understanding these factors also entails evaluating the financial performance of Islamic banks, which serves as a key indicator of the overall health and sustainability of Islamic banks. One of the most effective ways to assess financial performance is by measuring profitability. Islamic banking profitability can be measured through ratios representing financial performance. The financial performance of Islamic banking is primarily derived from the financing carried out. Financial ratios related to this financing are categorised based on the source of financing, capital used, classification of income, and costs incurred. The appropriate ratios to measure this performance include CAR (capital adequacy ratio), OER (operational efficiency ratio), and ROA (return on assets) (Khairi, Halim, and Rokhmawati 2024).

Several studies have shown inconsistent results regarding the effect of CAR and OER on Islamic banking profitability. Alnajjar and Othman (2021) found that CAR has a negative effect on ROA. These results do not align with Mandagie (2021), who stated that the CAR positively influences ROA. Meanwhile, Sitompul and Nasution (2019) stated that no significant effect existed. Likewise, Virgana, Athoillah, and Wulan (2019) show that OER has a negative effect on ROA. However, in contrast to the research of Nasution, Erlina, and Situmeang (2024) which states that there is a unidirectional influence between the OER and the ROA. Putra, Rahmadita, and Azmy (2023) found that OER has no partial impact on profitability. These inconsistent results also influence the profitability of the net operating margin (NOM) and NPF, which states that the NOM ratio positively affects ROA (Nasution, Erlina, and Situmeang 2024). These positive results contradict the statement that the NOM ratio does not affect the increase in ROA (Merry et al. 2022). Navita, Fauzi, and Muliasari (2023) state that the NPF variable can have a negative effect on profitability. These negative results are different from the research conducted by states that the NPF does not affect profitability (Setiadi, Meldona, and Wahyuni 2024).

This inconsistency indicates a research gap that needs to be investigated further. This inconsistency can occur due to several factors. The heterogeneity of Islamic banking policies in various countries creates a different regulatory framework for the supervision of Islamic banking. Malaysia has more established regulations with the support of BNM and IFSA. Meanwhile, Indonesia is still strengthening its industry through the intervention of the FSA and BI. In addition, Middle Eastern countries have a more flexible approach because they operate on a global scale. Another factor comes from the dominance of banking competitors in each country. Countries with the dominance of conventional banks tend to be more competitive in managing operating costs and more optimal in generating their operating margins. At the same time, countries with the most Islamic banks have regulatory support and special incentives from the government. As a result, the effect of CAR, OER, NOM and NPF on profitability can be different in each country because the rules governing operations and capital are different.

Therefore, this study revisits the relationship of these variables to Islamic banking profitability and adds two new variables to enrich the analysis and provide a more in-depth scientific contribution. The addition of NOM as an additional independent variable and NPF as a moderating variable introduces novelty in this research. Adding NOM as a novelty can fill the gap in efficient financing. The NOM variable can be used to analyse how effectively Islamic banks manage productive assets to generate operating income. Therefore, adding NOM to this study provides a new dimension for analysing Islamic banking profitability. Besides that, adding NPF acts as a factor changing the strength and direction of the relationship between variables. The relevance of multi-country conditions can show that the impact of NPF on Islamic banking profitability may differ in each country due to differences in regulations and Sharia compliance standards. Therefore, this study contributes by looking at the role of NPF in various economic and regulatory contexts.

Based on the existing phenomena, research gaps and novelties, it is necessary to research the influence of NOM, CAR, and OER on ROA with NPF as a moderating variable. This study aims to demonstrate the strategic role of financial ratios in determining the profitability and resilience of banks to financial risk, especially in the context of Islamic banking, which has different operational principles from conventional banks. Additionally, this research is motivated by the increasing prominence of Islamic banking in the global financial system and the pressing need to explore the determinants of its profitability across different national contexts. Considering the unique principles governing Islamic finance and the growing complexity of financing activities, this study addresses the limited empirical evidence concerning the relationship between financing risk and bank performance. By examining profitability dynamics and emphasizing the critical role of effective risk management, the research contributes to the broader discourse on financial stability in Islamic banking. The findings are expected to provide a valuable empirical basis for assessing business conditions and informing strategic decisions among banking practitioners, regulators, and policymakers.

Literature review

Signaling theory

Important information will be sent to the message's recipient through a sign or signal. Then, the recipient will decide based on the message received as a response to the signal obtained (Spence 1973). In financial markets and banking, signal theory states that firms or banks send signals to investors, regulators, and other stakeholders through observable indicators, such as financial ratios and performance metrics. These signals help reduce uncertainty by providing insight into an institution's financial health and prospects. The growth of Islamic banking can be measured through ratios that expressly represent its financial performance (Jarbou, Irimia-Diéguez, and Prieto-Rodríguez 2024). The financial performance of Islamic banking is primarily derived from the financing carried out (Fakhrunnas and Anto 2024). Financial ratios related to this financing are categorised based on the source of financing, capital used, classification of income, and costs incurred (Gaytan et al. 2022). The appropriate ratios to measure this performance include NOM, CAR, OER, NPF and ROA (Syaidi, Achmad, and Putra 2024). The results of the ratio research test will be a signal for an entity to determine its future steps. Signal theory provides a framework to understand how Islamic banks communicate their financial health through performance indicators (Saputra and Dwiputri 2024). Correctly interpreting these signals allows stakeholders to make more informed decisions, supporting sustainable growth and stability in the Islamic banking sector (Kazak et al. 2024).

Profitability

Profitability is the ability of a company to generate profits (profit) from its operational activities in a specific period (Suresh et al. 2023). Profitability shows the extent to which the company can maintain its business continuity, attract investors, and finance its operational activities by selling goods or services (Inna and Alina 2021). Profitability measures are often the basis for decision-making by management, investors, and other stakeholders (Adi and Panji 2022). Ahmed (2019) also states that profitability is the ability of Islamic banking to earn profits from sales, total assets, and capital. In this context, profitability can be measured through various financial indicators or ratios that reflect a business entity's operational efficiency and financial strength (Sah and Saud 2022). Profit measurement in Islamic banking is based on Sharia principles that emphasise fairness, transparency, and social responsibility (Muhamad et al. 2022). From the Islamic perspective, profits must be obtained through halal economic activities (by Islamic law), free from usury (interest), *gharar* (uncertainty), and

maysir (Asra 2023). The basics of profit measurement in Islamic banking based on an Islamic perspective include profit and loss sharing, profit measurement based on real activities, avoidance of usury in profit measurement, profit measurement based on justice and social responsibility and transparency in profit Measurement (Alandejani 2022).

Return on assets (ROA)

ROA is one of the profitability ratios used to measure companies', including banks', ability to generate profits from the assets they manage (Choiriyah et al. 2021). ROA indicates how efficiently a company or bank utilises its assets to generate profits (Suryawan 2024). In Islamic banking, ROA assesses overall financial performance, considering assets managed according to Sharia principles (Supriyanto and Murwaningsari 2022). In Islamic banking, ROA directly affects bank profitability. The higher the ROA, the more efficient the Islamic bank is in utilising its assets to generate profits (Mursyid et al. 2022).

Net operating margin (NOM)

NOM is one of the profitability ratios used to measure a company's or bank's operational efficiency in generating net profit from operating income (Sah and Saud 2022). In banking, NOM assesses how much net profit is earned from the main operational activities, namely raising funds and channelling financing, after deducting operating costs (Putri, Badina, and Fatoni 2024). The NOM ratio illustrates how much net profit is earned from each unit of operating income after reducing all operating expenses. The higher the NOM ratio, the more efficiently the bank manages its operational activities to earn profits (Abu-Alrop 2020).

Capital adequacy ratio (CAR)

CAR is a financial ratio used to measure a bank's capital adequacy in facing the risk of loss from its various operational activities (Mandagie 2021). CAR serves as a tool to assess the financial health of banks and ensure that banks have sufficient capital to cover the risks that may arise (Yudistira and Ristati 2022). In Islamic banking, CAR measures how much the bank can protect shareholders and depositors from non-performing financing or losses due to market and operating volatility. The CAR ratio aims to measure the ability of a banking entity's capital to absorb financing losses that occur (Bitar and Tarazi 2019). Systematically, the formula for CAR divides core capital and complements it with RWA. RWA calculation is divided into two types: on the balance sheet and calculating all assets in the financial statements. The second is off the balance sheet, or only the bank's administrative bills are considered. So, the higher the CAR ratio, the more likely it is to impact the banking entity's solvency level (Alnajjar and Othman 2021).

Operating expense ratio (OER)

OER is one of the financial ratios used to measure the operational efficiency of a bank (Sitompul and Nasution 2019). This ratio shows the ratio between the operating costs incurred by the bank and the operating income generated in a specific period (Ginting, Nasution, and Erwin 2024). In Islamic banking, OER assesses the bank's efficiency in managing operating costs to support its business activities. If the OER value is low, then it shows that the Islamic bank efficiently manages its operating costs (Alandejani 2022).

Non-performing financing (NPF)

NPF in Islamic banking is a term used to describe problematic financing, namely financing that fails or does not fulfil payment obligations by the agreement or contract between the Islamic bank and the customer (Halim and Buana 2021). NPF is one of the important indicators used to measure the quality of Islamic banking assets because it reflects

how much credit risk or financing risk the bank faces (Othman and Gabbori 2024). In Islamic banking, NPF usually includes financing based on contracts such as murabahah (sale and purchase), mudharabah (profit sharing), musyarakah (partnership), and ijarah (rental) (Saprudin, Sudrajat, and Saepudin 2024). Financing is declared problematic or categorised as NPF if the customer fails to fulfil their obligations within the specified period, in principal instalments, profit sharing, or rental payments (Hardana et al. 2023).

Hypothesis development

NOM is a financial ratio used to measure a company's profitability level from its core operational activities (Salman 2021). Signaling theory states that financial ratios can serve as indicators or signals of a company's financial health and performance, influencing investor perceptions and decision making (Lubis 2023). Signal theory supports that the NOM ratio can be a reflection for investors on how efficiently banks utilize their productive assets. The more effectively the bank optimises its productive assets, the higher the resulting NOM performance. An increase in NOM performance will affect fluctuations in profits earned by the bank. This theory is in line with the findings of Sah and Saud (2022), which shows that NOM can have a significant effect directly on ROA. Based on the results of the theory and previous research obtained, the following hypothesis can be drawn.

H1: NOM has a positive effect on ROA.

CAR reflects the calculation of ratios in showing the effect of an entity's capital in covering the risk of its assets. According to signaling theory, A good CAR ratio can be a benchmark for investors when making investment decisions. The more effectively the bank manages capital inflows and outflows, the lower the risk related to capital adequacy it will face. The higher the capital in an entity, the better the opportunity for the entity to generate profits (Syafrizal et al. 2023). This is in line with Mandagie's (2021) research, which suggests that the CAR variable positively influences ROA. Based on the results of the theory and previous research obtained, the following hypothesis can be drawn.

H2: CAR has a positive effect on ROA.

OER illustrates the extent to which banks can manage their operational activities efficiently. The smaller the OER ratio, the more efficient the bank is in its business activities. On the other hand, if the OER ratio is high, the bank's performance is inefficient, affecting the increase in net income received, so it becomes the primary indicator of fluctuations in profits received by banks (Sofyan 2019). Signal theory provides investors with an overview of banking performance. The effectiveness of the bank in running its operations can be a reference for investors when making decisions to invest. This is also in line with Susila et al. (2021), which states that the OER variable has a unidirectional relationship with the ROA variable, which means that when the OER value increases, the ROA value will be reduced. This study is not in line with research conducted by Chabachib et al. (2019), which states that OER negatively influences ROA. Based on the results of the theory and previous research obtained, the following hypothesis can be drawn.

H3: OER has a negative effect on ROA.

Signal theory states that banks can provide information or signs related to their financial condition to investors, which can then be used as a reference in making investment decisions. NPF (Non-Performing Financing) is a ratio that shows the failure rate of instalment payments on financing (Novalista, Anggraeni, and Nurmalia 2024). Financing problems will become an obstacle to banking performance and indirectly affect the entity's ability to obtain external sources of funds or financing. Substandard financing will result in low income from financing and will indirectly affect profits. This theory aligns with Mas'ud et al. (2022) findings, which show that NOM partially affects NPF. These results are also supported by

research by Najib et al. (2024), which states that NPF positively affects ROA. Based on the results of the theory and previous research obtained, the following hypothesis can be drawn.
H4: NPF can moderate the effect of NOM on ROA.

NPF is a factor that shows managers' readiness to manage an entity's financing. Non-performing financing can affect the burden of capital utilisation and indirectly affect the effectiveness of banks in generating profits. The problem of lousy financing can affect the CAR ratio indirectly because it simultaneously affects the course of business capital. The higher the risk of NPF, the lower the CAR ratio will be, so it will indirectly affect the income generated by banks. According to signaling theory, the rise and fall of the NPF variable can be a signal for stakeholders in deciding plans. This is in line with the research of Masmuna, Yuliani, and Thamrin (2024), which found that CAR has a significant negative effect on ROA but has a significant positive effect after being moderated by NPF. Based on the results of the theory and previous research obtained, the following hypothesis can be drawn.
H5: NPF can moderate the effect of CAR on ROA.

The high level of NPF not only influences the CAR, but based on Signaling Theory, it also serves as an important signal for stakeholders in making informed decisions regarding the bank's financial condition. This perspective is supported by Sutikno and Aisyah (2022), who found that NPF significantly and negatively moderates the relationship between the OER and ROA. These findings suggest that NPF can weaken the positive impact of operational efficiency on profitability. Given the theoretical framework and empirical evidence, this area warrants further investigation to better understand the extent of NPF's moderating role in the relationship between key financial ratios and bank performance.
H6: NPF can moderate the effect of OER on ROA.

Based on the development of the hypothesis, a conceptual framework can be prepared in Figure 1.

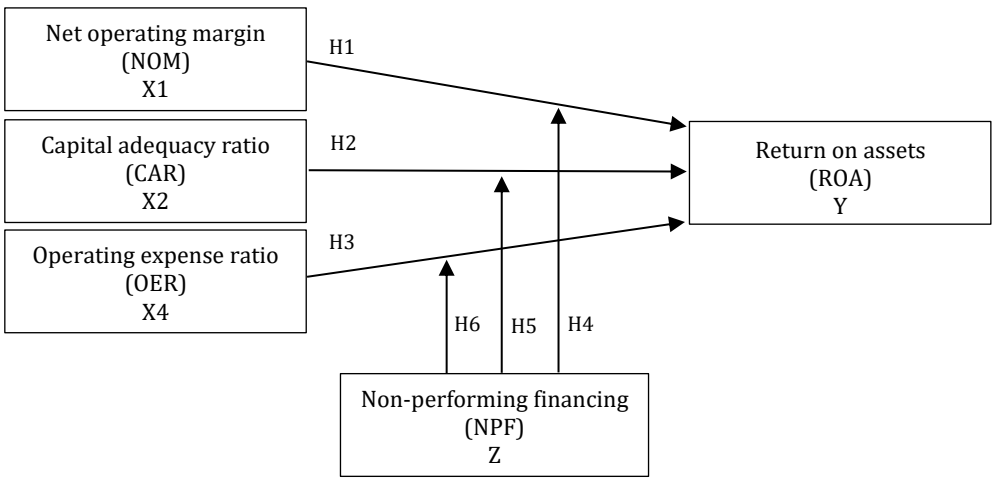

Figure 1 conceptual framework

Method

This exploratory quantitative study aims to test how independent and moderating variables affect the dependent variable. The analysis used in this study is panel data regression, a combination of time-series and cross-sectional data. This study observes several Islamic banks operating in various regions of the world, such as Algeria, Bahrain, Bangladesh, Brunei, Egypt, Germany, Indonesia, Iran, Iraq, Jordan, Kuwait, Malaysia, Maldives, Nigeria, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Sri Lanka, Sudan, Syria, Thailand, Turkey, UAE, United Kingdom (see appendix). The characteristics used for this study focus on Islamic

banks, which are among the 100 strongest Islamic banks based on capitalisation, liquidity, and profitability recorded in the Tab Insights service, and Islamic banks that provide complete financial reports available for the period 2020-2023. These Islamic banks can be accessed in English or Indonesian, and Islamic banks that present RWA (risk weighted assets) information in their financial statements. The purposive sampling techniques with the criteria applied from each sample in this study can be seen in Table 1.

Table 1 criteria of sample

No	Criteria	Total
1.	Islamic banking that is included in the 100 strongest Islamic banks based on capitalization, liquidity, and profitability recorded in the Tab Insights service.	100
2.	Islamic banks that do not provide comprehensive financial statements are available for the years 2010-2023.	(13)
3.	Islamic banking that is not accessible in English or Indonesian.	(2)
4.	Islamic banking that does not present RWA (risk weighted assets) information in the bank's financial statements.	(14)
Total sample		71
Total observation data (n x research year)		284

Source: secondary data (processed, 2024)

The number of Islamic banks listed in the 100 strongest Islamic banks based on Tab Insights. Of the 100 Islamic banks listed, 87 have complete financial reports from 2020 to 2023. Among the 87 Islamic banks with complete financial statements, 85 report financial statements in English and Indonesian. Among the 85 Islamic banks that report financial statements in full and in English and Indonesian, 71 Islamic banks present RWA (risk-weighted assets) information in their financial statements. Therefore, the number of samples in this study was 71 Islamic banks, totalling 284 observation data points. The operational definition of each variable in this study can be seen in Table 2.

Table 2 operational variables

Variables	Formulas	Sources	Scale
Net operating margin (NOM)	$\text{NOM} = \frac{\text{Disbursement income after funding expenses} - \text{operating expenses}}{\text{Average productive assets}}$	(Sah and Saud 2022)	Ratio
Capital adequacy ratio (CAR)	$\text{CAR} = \frac{\text{Tier 1 capital} + \text{supplementary capital}}{\text{RWA}}$	(Gwatiringa 2020)	Ratio
Operating expense ratio (OER)	$\text{OER} = \frac{\text{Operating expenses}}{\text{Operating income}}$	(Susila et al. 2021)	Ratio
Non-performing financing (NPF)	$\text{NPF} = \frac{\text{Operating income}}{\text{Total financing}}$	(Windriya 2019)	Ratio
Return on assets (ROA)	$\text{ROA} = \frac{\text{Net profit}}{\text{Total assets}}$	(Sanjida and Fokhray 2019)	Ratio

Source: secondary data (processed, 2024)

This study adopts a panel data regression approach combining time-series and cross-sectional data. This study uses several tests, including a descriptive statistical analysis test, a panel data test consisting of model selection tests such as Chow, Hausman, and the Lagrange multiplier, followed by a normality test, a partial T-test, and a moderated regression analysis test. The analysis in this study was carried out with the help of EViews 12.

Results and discussion

A descriptive analysis test refers to a series of statistical techniques used to describe, summarise, or visualise the essential characteristics of a set of data (Dong 2023). Each variable's smallest, highest, and average values can illustrate detailed information that describes the variable. Table 3 presents the results of the research data's minimum, maximum, average, and standard deviation values.

Table 3 descriptive statistics

Variables	Mean	Maximum	Minimum	Std. dev
ROA	0,011211	0,114300	-0,071300	0,015165
NOM	0,021633	0,141900	-0,049900	0,024571
CAR	0,201345	0,582700	0,106500	0,068482
OER	0,583043	2,061900	0,134100	0,248757
NPF	0,027994	0,295700	0,000000	0,034485

Source: secondary data (processed, 2024)

Table 3 describes the gap between each variable's maximum and minimum values. The maximum ROA value is 0.114, which comes from BTPN Syariah Bank. Although the average ROA value is 0.01, some banks have negative ROA values, such as the minimum value of -0.07 from Bank Bukopin. These results are like the value in the NOM variable, with the maximum value coming from BTPN Syariah Bank and the minimum value coming from Bukopin Bank. This proves that several companies are not efficient in managing their financing. Furthermore, the maximum value of CAR is 0.58, and the average is 0.20. Even so, there is a minimum value of 0.10, which is smaller than the average value of other banks, meaning there are less than optimal banks managing the funds or capital they have. The average OER of Islamic banks shows that 58.30% of revenue is used for operating expenses. The minimum value of 0.1341 at Qatar Islamic Bank reflects the high-cost efficiency. The sample average NPF is 0.028, indicating a small proportion of non-performing financing. The minimum value of 0.0000 at BCA Syariah reflects the absence of non-performing financing, while the maximum value of 0.2957 at Itmaar Bank indicates almost 30% non-performing financing. After learning the description of the sample studied, a model selection test was conducted, which was carried out in this study with the Chow, Hausman and Lagrange multiplier tests. The results of the Chow test can be seen in Table 4.

Table 4 Chow test results

Effects test	Statistic	d.f.	Prob.
Cross-section F	9,817835	(70,210)	0,0000
Cross-section Chi-square	412,431970	70	0,0000

Source: secondary data (processed, 2024)

Table 4 describes the Chow test results, showing the probability of Chi-square 0.0000. A probability value of less than 0.05 means that the fixed effect model (FEM) is more suitable than the common effect model (CEM) (Gujarati and Porter 2009). Furthermore, the Hausman test determines which model is more effective. The results of the Hausman test can be seen in Table 5.

Table 5 Hausman test results

Test summary	Chi-sq. statistic	Chi-sq. d.f.	Prob.
Cross-section random	42,737551	3	0,0000

Source: secondary data (processed, 2024)

Table 5 describes the results of the Hausman test. The results obtained show a probability of 0.0000. A probability value of less than 0.05 means that the fixed effect model (FEM) is more suitable than the random effect model (REM). Both model selection tests produce the same conclusion, namely the fixed effect model (FEM), which indicates that the FEM model is the best choice for this study (Gujarati and Porter 2009). The ordinary least squares (OLS) category includes the fixed effect model. The classic assumption tests the OLS model uses are multicollinearity and heteroscedasticity (Alabi et al. 2020).

The multicollinearity test shows no correlation coefficient value between variables that exceed 0.85. The coefficient values between variables are 0.303947, -0.170440, and 0.026638, respectively. The results of the correlation coefficient value between variables indicate that there is no multicollinearity in the sample tested. The following classic assumption test is for heteroscedasticity. The results of the heteroscedasticity test show that there is no residual graph between variables that exceed +500 and -500. The residual graph value is from -0.3 to 0.4, meaning no heteroscedasticity symptoms exist. Based on the results of classical assumption testing, it explains that the observation data in this study is standard so that researchers can proceed to further testing.

Table 6 regression results

Variables	Model 1			Model 2		
	Coef.	T-Stat.	Prob.	Coef.	T-stat.	Prob.
C	0.0296			0.0298		
NOM	0.1964	3.8349	0.0002*	0.2013	4.0175	0.0001*
CAR	0.0064	0.3471	0.7288	0.0081	0.4470	0.6553
OER	-0.0390	-10.086	0.0000*	-0.0399	-10.534	0.0000*
NOM*NPF				-0.0052	-0.9278	0.3546
CAR*NPF				-0.0152	-37628	0.0002*
OER*NPF				-0.0010	-0.2287	0.8193
Adj.R-Square	0.8003			0.8104		

Source: secondary data (processed, 2024)

Table 6 shows that the constant value of 0.0296 means that if all independent variables have a constant or zero value, the value of the dependent variable (Y) is 0.0296. The NOM variable (X1) has a coefficient value of 0.1964, which means that if the other independent variables are zero or constant, then an increase in the NOM variable by 1 percent will result in an increase in the ROA variable by 0.1964 and a probability value of 0.0002. This happens because the positive value of the NOM coefficient indicates the direction of the positive influence of the NOM variable on ROA (H1 Accepted). The coefficient on the CAR variable (X2) is 0.0064 and a probability of 0.7288, which means that the CAR variable does not affect ROA (H2 Rejected). The coefficient on the OER variable (X3) is -0.0390 and a probability of 0.0000, which means that the OER variable has a negative or opposite direction of influence on ROA (H3 Accepted).

Table 6 shows that NOM * NPF has a coefficient value of -0.0052 and a probability value of 0.3546, meaning that NPF cannot moderate the relationship between NOM and ROA (H4 Rejected). CAR * NPF has a coefficient value of -0.0152 and a probability value of 0.0002, which means that NPF can moderate, namely weaken the relationship between CAR and ROA

(H5 Accepted). OER * NPF has a coefficient value of -0.010 and a probability value of 0.8193, meaning that NPF can moderate the relationship between OER and ROA (H6 Rejected).

Table 6 shows that the coefficient of determination test presents the amount of influence of the independent variable on the dependent variable. The coefficient test results can be seen from the Adj. R-square value presented. The result of Adj. R-square result of 0.800379 indicates that the net operating margin, capital adequacy ratio, and operating expense ratio variables have a role of 80.03% to explain the return on asset variable.

The effect of net operating margin on return on assets

The study results showed that NOM has a positive effect on ROA. This indicates that operational efficiency in managing productive assets increases banking profitability. This reflects the efficiency in managing third-party funds and channelling them into productive loans or investments. Islamic banks with high NOM tend to have a more efficient cost structure and better pricing capabilities for financial products. Operating income is a key component in calculating net income. If a Islamic bank has a high operating margin, it means that each product and transaction generate more operating profit. High operating profit usually means that net income is also high. A high NOM indicates that the Isalmic bank is operationally efficient and can generate profits from its products. This efficiency increases net income, which, compared to fixed assets, will result in a higher ROA (Mehzabin et al. 2023). Based on the signaling theory, a high NOM provides a positive signal to investors about healthy financial performance, increasing market confidence. These results form the basis for assessing Islamic bank stability by ensuring that operating margins remain healthy without overburdening customers. Therefore, although NOM plays a significant role in profitability, banks must also consider revenue diversification strategies to be more sustainable in the long run. This result is in line with the research of Banamtuan, Zuhroh, and Sihwahjoeni (2020); Galajak, Suttitam, and Saesuk (2024), which confirms that good productive asset management drives an increase in ROA. Thus, these findings can be the basis for Islamic banking in determining the direction of asset management policies, because the results show that operational efficiency reflected in the high NOM contributes significantly to increasing ROA, thus supporting the stability and profitability of banks on an ongoing basis.

The effect of capital adequacy ratio on return on assets

The study results showed that CAR does not affect ROA. This indicates that high capital adequacy does not always impact increasing Islamic bank profitability. This illustrates that Islamic banks have different risk profiles that CAR does not cover entirely. Although CAR reflects Islamic banks' financial resilience, the efficient use of assets plays a more significant role in generating profits. This can be a signal and one of the decision-making factors for investors. If this capital is not allocated productively into profitable loans or investments, its impact on ROA is insignificant. Efficiency in asset utilization, not just capital adequacy, is crucial in determining Islamic bank profitability (Guizani and Ajmi 2022). This result confirms that maintaining capital adequacy alone is insufficient to increase profitability. Islamic banks must ensure their capital is optimally utilized in income-generating activities, such as high-quality lending and investment in profitable financial instruments. In addition, operational efficiency strategies, such as digitizing services and optimizing operational costs, must also be the focus so that the assets owned can provide maximum returns. This is supported by Mandagie (2021); Syafrizal et al. (2023) research, which states that the increase in CAR does not affect ROA. Based on signaling theory, a high CAR should signal stability to investors, but if capital is not optimized in productive financing, it will not increase profitability. Thus, these findings provide important implications for Islamic banking in formulating asset management policies, because they show that a high CAR does not directly increase profitability. Therefore,

a more targeted asset management strategy is needed through optimizing capital utilization in productive activities that can generate income on an ongoing basis.

The effect of operating expense ratio on return on assets

The study results showed that OER has a negative effect on ROA. This indicates that the higher the operating costs, the lower the bank's profitability. Efficiency in managing operating costs is a key factor in increasing profits. High operating costs can reduce profit margins, especially if these costs are not offset by increased revenue. Therefore, this study's results align with signaling theory, which states that these results can be a benchmark in the decision-making of the management team and investors, and that Islamic banks need to implement more efficient cost management strategies to increase ROA. This result confirms that efficiency in managing operating costs should be a top priority. Islamic banks must identify and reduce expenses that do not add value, such as excessive administrative costs or inefficiencies in branch operations. This finding aligns with the research of Chen, Harford, and Kamara (2019); Shaw, Irwin, and Blanton (2019), which show that OER has a negative relationship with profitability. However, this contradicts Novalista, Anggraeni, and Nurmalia (2024), who found that operating expenses do not always affect banking profits. Based on the signaling theory, a high OER ratio can give a negative signal to investors about the Islamic bank's efficiency in managing its operations. Thus, this finding can be a foundation for Islamic banking in determining the direction of asset management policies, because the results show that efficiency in controlling the OER contributes significantly to increasing ROA, so that a more selective and value-added-oriented spending strategy needs to be the primary focus to improve the bank's financial performance.

The effect of net operating margin on return on asset moderated by non-performing financing

The results showed that NPF could not moderate the relationship between NOM and ROA. This indicates that although non-performing financing can affect overall Islamic banking profits, its effect on income from earning assets (NOM) is insignificant. In other words, this result is in line with signaling theory that the effect of NOM on ROA with NPF as moderation can serve as a basis or benchmark for stakeholders that efficiency in managing operating margin remains the main factor in determining ROA. At the same time, NPF directly affects the Islamic bank's net profit more than interest income or operating margin. These results confirm that the management of NPF should be a top priority in maintaining financial stability. Islamic banks need to strengthen the credit risk management system, including implementing an early warning system to detect potential problem loans early on. This finding contradicts Yusuf and Surjaatmadja (2018) research, which states that NPF can affect NOM, but is in line with Salman (2021), who found that non-performing financing has a more direct effect on profit than financing income. In the context of signaling theory, high NPF can provide a negative signal to investors regarding the Islamic bank's financial stability. However, its inability to moderate the relationship between NOM and ROA indicates that profitability remains more dependent on the efficiency of productive asset management. Therefore, banks must manage non-performing financing well to maintain financial stability and improve long-term profitability. Thus, research can be used by Islamic banks to determine the direction of asset management policies because it shows that efficiency in managing operating margins remains a significant factor in increasing profitability, while NPF does not strengthen the relationship, so financing risk management needs to be focused directly on maintaining financial stability.

The effect of capital adequacy ratio on return on asset moderated by non-performing financing

The results showed that NPF can moderate, namely weaken the relationship between CAR and ROA, where an increase in NPF weakens the effect of CAR on ROA. This is in line with signaling theory, which states that financial information, such as the level of CAR, can provide signals to investors and stakeholders regarding the financial health of banks. When NPF is high, the positive signal from CAR becomes less effective because the increase in capital reserves is more focused on covering credit risk rather than increasing profitability. In other words, when the NPF increases, most of the additional capital owned by the bank is used to cover potential losses due to non-performing loans, rather than for business expansion or increased profitability. This result confirms that simply having a high CAR is not enough to guarantee profitability if the Islamic bank also has a high NPF ratio. Therefore, Islamic banks need to strengthen credit risk management strategies to keep NPF under control, so that the capital owned can be used more productively for business expansion and increased profitability. This finding is supported by Harahap (2018), which shows that Islamic banks with high NPF must allocate more capital to cover potential losses, thus reducing the effectiveness of CAR in increasing ROA. In contrast, research by Kusumastuti and Alam (2019) states that NPF has no effect on the relationship between CAR and ROA. Thus, this study contributes to Islamic banking in formulating asset management policies, because the results show that the high level of NPF can weaken the relationship between CAR and ROA. This indicates that the availability of large capital will not have an optimal impact on profitability if financing risk is not managed properly. Therefore, Islamic banking needs to strengthen financing risk mitigation strategies so that available capital can be directed productively to support business growth and sustainability of financial performance.

The effect of operating expense ratio on return on asset moderated by non-performing financing

The results showed that NPF could not moderate the relationship between OER and ROA, which means that non-performing financing does not directly affect operational cost efficiency in increasing Islamic bank profitability. This can be explained through signaling theory, where operational efficiency, as measured by OER, is more reflective of cost management strategies than credit risk, as indicated by NPF. When NPF increases, the resulting operating expenses are more related to credit risk mitigation than overall cost management efficiency. This means that while NPF may affect an Islamic bank's overall profitability, its effect on operating cost efficiency is insignificant. In other words, an increase or decrease in NPF does not directly impact how Islamic banks manage their operating costs to increase profitability. This result confirms that operational cost management strategies should be a top priority in increasing profitability, regardless of the level of NPF. This result is in line with the research of Novalista, Anggraeni, and Nurmalia (2024), which states that NPF has no significant effect in moderating the relationship between OER and ROA and shows that many other factors beyond non-performing financing influence operating expenses. In contrast, Ningsih (2024) study found that NPF can have a negative effect on this relationship. Thus, this study contributes to Islamic banking in formulating asset management policies, because the results show that operating cost efficiency, as measured by the OER, is not significantly affected by the level of NPF. This confirms that effective operating expense management is determined more by internal policies related to cost efficiency, not by financing risk. Therefore, Islamic banking needs to prioritize cost control strategies independently to increase profitability, regardless of fluctuations in financing risks.

Conclusions

Based on the test results, the NOM and OER variables influence ROA. NOM has a positive impact on ROA, while OER has a negative impact on ROA. Moreover, the CAR variable

cannot affect the ROA variable. Furthermore, NPF can moderate the influence between CAR and ROA. Conversely, NPF cannot moderate the effect of NOM and OER on ROA in 71 global Islamic banking samples listed on the asian banker in 2020-2023. This shows that operational efficiency and profit margin on earning assets are the main factors affecting the profitability of Islamic banks globally. The moderation of the NPF variable also explains that when the level of non-performing financing is high, the effect of capital adequacy on profitability becomes weaker because capital is allocated more to cover credit risk than for business development.

This research can complement existing theories in finance and banking, especially in analysing the profitability of banks or Islamic financial institutions. Practically, these research results and the measurement of the proper financial performance of banks will be a reference for investors in determining plans. This research also can be a reference for Islamic banking in determining the direction of asset management policies, because the results show that operational efficiency and financing risk management have a crucial role in maintaining profitability, while the amount of capital or the level of non-performing financing does not always have a significant effect if it is not accompanied by optimal management.

This research has several limitations, namely the existence of external variables such as inflation rates, exchange rates between countries, as well as the politics and policies of each country that have not been observed and the period that has not fully covered the existing situation, besides that the sample in this study is mostly only Islamic banking on the Asian continent. Recommendations for future research are to add several external variables closely related to this study, such as the influence of inflation in each country, exchange rates that are vulnerable in each period, and even socio-politics in each country. These variables are needed with the urgency of regulation in each country, which is the limit of research coverage to reflect the company's actual state better. Research samples can also be added by adding research years or populations to rural banks or Islamic business units so as not to focus on the Asian continent alone.

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Appendix

No	Islamic banking identity	Country
1.	AlRajhi Bank	Saudi Arabia
2.	Kuwait Finance House	Kuwait
3.	Turkiye Emlak Katilim Bankasi	Turkey
4.	Qatar Islamic Bank	Qatar
5.	Alinma Bank	Saudi Arabia
6.	Meezan Bank	Pakistan
7.	Kuvyt Turky Katilimi Bankasi	Turkey
8.	Albilad Bank	Saudi Arabia
9.	Islami Maybank	Malaysia
10.	Vakif Katilim Bankasi	Turkey
11.	Turkiye Finans Katilim Bankasi	Turkey
12.	Al Salam Bank	Bahrain
13.	Bank AlJazira	Saudi Arabia
14.	Ziraat Katilim Bankasi	Turkey
15.	Dubai Islamic Bank	UAE
16.	CIMB Islamic Bank	Malaysia
17.	Bank BTPN Syariah	Indonesia
18.	Boubyan Bank	Kuwait
19.	Bank Islam	Malaysia
20.	QIIB	Qatar
21.	Warba Bank	Kuwait
22.	Hong Leong Islamic Bank	Malaysia
23.	Albaraka Turk Katilim Bankasi	Turkey
24.	Public Islamic Bank	Malaysia
25.	Bank BCA Syariah	Indonesia
26.	Kuwait International Bank	Kuwait
27.	Jordan Islamic Bank	Jordan
28.	Emirates Islamic Bank	UAE
29.	Arabi Islami	Jordan
30.	RHB Islamic Banking	Malaysia
31.	Abu Dhabi Islamic Banking	UAE
32.	Amana Banking	Sri Lanka
33.	AmBank Islamic	Malaysia
34.	BankIslami	Pakistan
35.	Dukhan Bank	Qatar
36.	Affin Islamic Bank	Malaysia
37.	Alliance Islamic Bank	Malaysia
38.	Bank Muamalat	Malaysia
39.	Sharjah Islamic Bank	UAE
40.	Bank NTB Syariah	Indonesia
41.	Bank Mega Syariah	Indonesia
42.	Bank Panin Dubai Syariah	Indonesia
43.	Bank Rakyat	Malaysia
44.	Masraf AlRayan	Qatar
45.	Abu Dhabi Islami Banking	Egypt
46.	Bank Aceh Syariah	Indonesia
47.	MCB Islamic Bank	Pakistan
48.	Khaleeji Bank	Bahrain
49.	Safwa Islamic Bank	Jordan
50.	Al Arafah Islamic Bank	Bangladesh
51.	Kuwait Finance House	Malaysia
52.	Ithmaar Bank	Bahrain
53.	Bank Muamalat	Indonesia

No	Islamic banking identity	Country
54.	Al Rayan Bank	United Kingdom
55.	Bahrain Islamic Bank	Bahrain
56.	Al Hilal Bank	UAE
57.	AlBaraka Bank	Pakistan
58.	Jaiz Bank	Nigeria
59.	OCBC Al-Amin Bank	Malaysia
60.	Palestine Islamic Bank	Palestine
61.	Union Bank	Bangladesh
62.	Albaraka Bank	South Africa
63.	MBSB Bank	Malaysia
64.	Ajman Bank	UAE
65.	Maldives Islamic Bank	Maldives
66.	Standard Chartered Saadiq	Malaysia
67.	BIBD	Brunei
68.	Global Islami Bank	Bangladesh
69.	Bank KB Bukopin Syaria	Indonesia
70.	Bank BJB Syaria	Indonesia
71.	Standard Banking	Bangladesh