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The Effect of Capital Regulation Measures and Non-Performing Financing on Islamic Banks' Performance: Evidence from the Post-Crisis Era

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Abstract:

Purpose: *This paper aims to investigate the relationship between Islamic banks' financial performance and critical external and internal factors, focusing on the complex interaction between capital adequacy regulation and bank profitability.*
Design/methodology/approach: *This study was based on a sample of 81 Islamic banks (IB) over the period 2010-2020. A multiple regression analysis was employed to assess the direct and moderating effects.*
Findings: *The authors have demonstrated that both the regulatory capital ratio and the non-risk-weighted capital ratio have a positive and significant impact on bank performance. The findings of this research demonstrate that when a banking institution is confronted with elevated credit risk, as evidenced by the proportion of non-performing financing, there is a concomitant decline in its profitability. Furthermore, it can be deduced that an enhancement in asset quality is associated with an increase in profitability.*
Practical implications: *These findings may be of significance to the existing literature on IB regulation, particularly with regard to capital adequacy and its effects on performance. The results obtained have significant ramifications for regulators and policymakers, supporting sustained economic growth and financial stability in the Islamic banking sector.*
Originality/value: *This study adds to the current literature on Islamic banking by exploring the impact of Basel III capital adequacy requirements on the financial performance of Islamic banks. It provides novel evidence on both regulatory and non-risk-weighted capital ratios in the post-crisis era.*

Keywords: *Performance, regulation, Islamic banks, capital adequacy, non-performing financing.*

JEL Codes*: G21, G28, G32, E44.*

Paper Type: *Research study.*

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1. Introduction

The Global Financial Crisis (GFC) of 2007-08 highlighted the pivotal role of a robust banking system in facilitating credit and promoting economic stability and societal well-being. In the post-crisis period, Islamic finance has exhibited an augmentation in the heterogeneity of its product offerings and participant demographics, thereby signifying its enhanced significance in the economic and social spheres.

Despite the decline in oil prices, the industry's resilience and performance have convinced investors of its viability and potential for sustained growth, positioning Islamic finance as a crucial player in fostering economic inclusion and promoting social equity (Asutay *et al.,* 2022).

This development has prompted academics to diversify their research and assess the evolution of the Islamic finance landscape over the last three decades. The present study focuses on the period of recovery following the global financial crisis, up to 2020.

Islamic banks were less impacted by the crisis in comparison to their conventional counterparts, primarily due to the exclusion of financial instruments that were instrumental in the subprime crisis from their balance sheets (Chapra, 2009; Daoud and Kammoun, 2014; Péran and Sdiri, 2024). These instruments are prohibited in Islamic finance due to the prohibition of interest.

Moreover, Islamic banks benefit from stability as they are supplied with liquidity from affluent regions such as the Gulf countries. Islamic finance is predicated on five fundamental pillars, offering universal principles.

Three prohibitions relate to interest, speculative behaviors, and certain economically impure sectors. Two injunctions include profit and loss sharing and the linking of financial transactions to tangible assets, in adherence to Sharia. Unlike conventional finance, Islamic finance provides non-speculative and interest-free financial instruments, avoiding the root causes of financial crises. The primary Islamic financing modes are Mudaraba and Musharaka, which foster a financial economy closely tied to the real economy.

Other financing modes, such as Murabaha and Ijara, operate on the cost-plus-margin principle. Murabaha involves buying and reselling with a fixed margin, while Ijara is a lease contract with the option to acquire ownership over time. Governed by strict conditions, these contracts contribute to maintaining financial discipline. Regulators specify that banks must maintain adequate capital reserves to mitigate losses and prevent moral hazard, thereby fostering financial stability. However, there are concerns about the implementation of this prudential regulation.

According to Berger and Bouwman (2009), higher capital ratios may lead to compromises in terms of liquidity creation. They have been shown to contribute to financial stability through their effects on bank insolvency, future loan impairment, and risk taking (Alqahtani and Mayes, 2018; Beck *et al.,* 2013; Berger and DeYoung, 1997; Daoud and Kammoun, 2020; Fiordelisi *et al.,* 2011).

Economic and financial studies have analysed the determinants of banking performance in developed and developing countries. However, there is a lack of empirical studies on this subject at a global level for Islamic Banks (IBs). The analysis of banking performance, specifically in terms of profitability, is crucial for IBs to comprehend the factors that affect their financial performance. This understanding enables them to identify better levers for action, control, and forecasting, thereby influencing not only their economic viability but also their contribution to social development.

The present study explores the relationship between financial performance, capital regulation, and bank characteristics while controlling for indicators of macroeconomic and financial structure. The study aims to determine which determinants of performance are important (see figure1). Finally, this study aims to contribute to the discussion on the repercussions of regulatory measures on the performance of the banking sector.

This paper presents the main previous studies on IB financial performance, in particular, how capital regulation is related to IB performance in Section 2, and derives the related hypotheses. Section 3 details the proposed methodology. In the following section, the results are presented and discussed. Section 5 concludes the research.

2. Literature Review

The relationship between non-performing financing, capitalisation, and financial performance is theorised in two economic-based models: agency theory and signalling theory.

Agency Cost Theory: This theoretical perspective posits that conflicts of interest among shareholders, managers, and creditors can result in agency costs. These costs may consequently prompt managers to prioritise personal gains over the maximisation of firm profit. This bias may lead managers to choose lower-risk, lower-return investment projects and lower leverage in order to minimise the spectre of insolvency.

In reaction to these disputes and with the aim of reducing agency expenses, Harris and Raviv (1991) suggested the implementation of leverage as a mechanism to supervise and encourage board performance. This recommendation is grounded in the positive correlation evidenced between the leverage ratio and a firm's financial

distress. As financial distress escalates, the probability of bankruptcy rises concomitantly, prompting managers to enhance their performance in order to circumvent potential job loss or reputational damage.

Signaling Theory: This theory assumes that there is unequal access to information, leading to information asymmetry. This can lead to suboptimal decisions about how to invest and how to grow. In response, corporate financial decisions are viewed as intentional signals from managers to investors, serving to mitigate information asymmetry and guide investment policies. Within the domain of the banking industry, the structure of capital serves as an important signal to convey information about the financial soundness of financial institutions.

Banks strategically use their capitalization levels to communicate with stakeholders, including investors, regulators, and depositors. Higher levels of capital are often interpreted as a signal of the bank's stability and its capacity to absorb potential losses. The bank's signaling mechanism demonstrates its financial strength and instills confidence among stakeholders in its ability to navigate economic challenges.

Additionally, strict adherence to regulatory requirements and standards is another critical aspect of signaling theory in banking. As banks operate within a highly regulated environment, their compliance with these regulations serves as a powerful signal to stakeholders. It conveys a commitment to stability, governance, and compliance.

Adherence to regulatory standards is crucial for building trust among investors and depositors who rely on regulatory frameworks to guarantee the integrity and solidity of the banking institution. Banks signal their strong commitment to regulatory compliance to mitigate information asymmetry and enhance their reputation in the financial marketplace.

A substantial corpus of empirical research has focused on the pivotal elements that influence bank performance, especially return on equity (ROE) and return on assets (ROA). ROA is a measure of the efficiency with which assets are managed in order to generate income.

ROA differs from ROE in that it includes all assets, whether these are financed by borrowing or contributed by investors. It reflects a company's efficiency in utilizing assets for profit generation. A higher ROA indicates superior profitability and productivity efficiency of the bank.

This is because the ROA ratio measures the bank's capacity to generate profitable outcomes by leveraging its total assets. Evidence has demonstrated the widespread utilisation of this indicator as a proxy to evaluate banks' performance in numerous academic studies (Akhtar *et al.,* 2011; Phillips and Sipahioglu, 2004; Rivard and

Thomas, 1997; Wong *et al.,* 2021). ROE measures the effectiveness of using equity for income, which is crucial for assessing bank performance.

Essentially, ROE is a measure of the efficacy of corporate governance in terms of the generation of profits for shareholders. As a basis for assessing management competence, a strong ROE is indicative of improved profitability and robust shareholder benefits (Bashir, 2003; Guru *et al.,* 2002; Trofimov *et al.,* 2018).

A comprehensive literature review indicates that a multitude of variables influence the pivotal factors impacting a bank's financial performance. The following variables are to be considered: total assets (TA), the ratio of equity capital to total assets, the ratio of non-performing loans to total assets, the ratio of deposits to total assets, the ratio of operating costs to total assets, GDP, and inflation (Aldy Syafrizal *et al.,* 2023; Choong *et al.,* 2012; Eltweri *et al.,* 2024; Muda *et al.,* 2013; Ridho and Siswanto, 2023; Sanwari *et al.,* 2013; Tarek Al-Kayed *et al.,* 2014).

The literature on the factors influencing bank profitability, measured by ROA and ROE, allows for the formulation of hypotheses regarding the possible linkages between the profitability of IBs and their main explanatory factors.

3. Relationship between Capitalisation (CAP and CAR) and Financial Performance

The effect of the capital ratio (non-risk-weighted capital ratio) on the performance of IBs was investigated by several authors (Bashir, 2003; Hassan and Bashir, 2003; Masood and Ashraf, 2012; Sufian and Chong, 2008). Recent empirical studies suggest a positive correlation between a high level of capital and good capital adequacy of IBs, indicating a low possibility of bank failure.

Moreover, it has been demonstrated to enhance community confidence and the profitability of IBs. Furthermore, Choong *et al.* (2012) suggest that the capital ratio exerts a positive and significant effect on the Malaysian IBs' performance, a finding supported by Sanwari *et al.* (2013) and Tarek Al-Kayed *et al.* (2014). Thus, the capital ratio is used as the initial construct in the proposed model, which formulates the first hypothesis of this research as follows:

H1: The Capital Ratio (CAP) has a positive impact on the financial performance metrics (ROE and ROA) of IBs.

The CAP ratio is a crucial financial metric used to assess the financial health of a banking institution. Additionally, banks are required to maintain another capital adequacy ratio (CAR), known as the regulatory capital adequacy ratio. The numerator of this ratio comprises Tier 1 and Tier 2 capital. Capital regulations require banks to maintain a minimum risk-weighted capital ratio of 8%. This ratio measures the risk-weighted capital associated with regulatory requirements, and it is

derived by dividing regulatory capital (comprising Tier 1 and Tier 2 capital within the authorised limits) by risk-weighted assets. A bank's management should be able to manage an appropriate amount of capital.

While a high CAR is an indication of soundness and regulatory compliance, excessive levels may imply under-utilisation of funds, limiting profit potential. As a result, a high CAR ratio can reduce profit potential. Although the existing literature compares Islamic banks and conventional banking institutions extensively, the impact of capital requirements on the profitability of Islamic institutions remains a subject of debate.

In theory, IBs could reap advantages by implementing PLS principles for investment account holders (IAHs). However, this could result in bank increasing their leverage to generate higher profits in order to fulfil shareholders' expectations, which could be detrimental to IAHs who bear any losses.

Therefore, it is important for bank shareholders and managers to balance attracting additional IAHs and increasing leverage, while considering agency costs between the two parties. This statement suggests that IBs can increase profits for their shareholders while improving the reputation, salaries, and remuneration of their managers. The use of investment accounts for revenue maximisation could be at the expense of the IAH.

Berger and Bonaccorsi Di Patti (2006) suggests that higher leverage and low capital ratios can improve bank performance. Tamimi and Obeidat (2013) conducted an analysis of Jordanian commercial banks in the period from 2000 to 2008, as listed on the Amman Stock Exchange. They used multiple linear regression and Pearson correlation to find a positively correlated relationship between ROA and CAR. However, they also observed an inverse correlation between CAR and ROE.

Furthermore, Ahmed Aref Almazari (2013) found a negative correlation between the CAR and return on assets and equity. Capital adequacy constrains a bank's investment risk profile, which in turn affects its ability to achieve a desired level of profitability.

In practice, however, IBs may find it difficult to transfer losses to IAHs, given the potential repercussions on investor confidence and the emergence of liquidity and solvency issues. To mitigate this risk, IBs may maintain profit smoothing reserves. These reserves can be used to remunerate investment accounts and prevent withdrawals, particularly in competitive scenarios with conventional banking institutions. IBs may choose to maintain capital ratios that surpass those of conventional banks.

This approach is adopted in order to circumvent the possibility of solvency issues that might arise from substantial losses or when their reserves no longer possess the

capability of generating sufficient profits for the IAH. This may also give bank shareholders greater leverage in terms of exerting control over bank managers' investment decisions. An increase in capital requirements obliges bank managers to assume the burden of losses on an internal basis rather than to pursue public funding (Basher *et al.,* 2017). The empirical literature review highlights the significance of capital regulation as a determinant of bank profitability.

Mateev and Bachvarov (2021) investigated the impact of regulation and ownership on the performance of banks in 19 countries in the Middle East and North Africa (MENA) region over an 11-year period (2005-2015). The study tested the hypothesis that the impact of regulatory oversight on bank profitability is influenced by private monitoring and capital requirements when interacting with ownership concentration.

To expand upon this, Yudistira and Ristati's (2022) examination of the effect of the CAR on the financial performance of IBs in Indonesia utilised data from 2013 to 2020. Their findings indicate that CAR exerts a positive and significant effect on the financial performance of these financial institutions. Drawing upon the findings of previous studies and research in this area, the present investigation proposed the subsequent hypothesis:

H3-a: CAR negatively affects the financial performance metrics (ROE and ROA) of IBs.
H3-b: CAR positively affects the financial performance metrics (ROE and ROA) of IBs.

4. Relationship between Non-Performing Financing and Financial Performance

The analysis explores the effect of the non-performing financing (NPF) ratio on the IB profitability. The NPF ratio is a pivotal metric for evaluating the quality of loans and a retrospective measure of credit risk. Previous studies have shown that this ratio is a reliable indicator of future performance problems (Berger and DeYoung, 1997).

Fluctuations in credit risk are the primary cause of variation in bank profitability. Financial institutions tend to be less profitable as their exposure to credit risk increases (Putra *et al.,* 2023; Sufian and Chong, 2008; Yudistira and Ristati, 2022; Hasanah *et al.,* 2024).

For IBs, financing through Profit and Loss Sharing (PLS) financing contracts has the potential to improve loan quality. This means that the growth of fixed-rate financing contracts may increase the NPF more than PLS contracts. IBs that anticipate future borrower defaults must increase their provision for credit losses, which reduces net income. Provisions for NPF may reflect the state of the economy, where good times indicate the solvency of debtors who would otherwise default.

A high ratio of NPF indicates that the bank faces a higher credit risk, which can impact its performance (Choong *et al.,* 2012). Deteriorating asset quality can negatively impact IBs' profitability, reducing profits from margin financing contracts and increasing provisioning costs. Previous studies have shown a significant effect of the NPL ratio on bank performance.

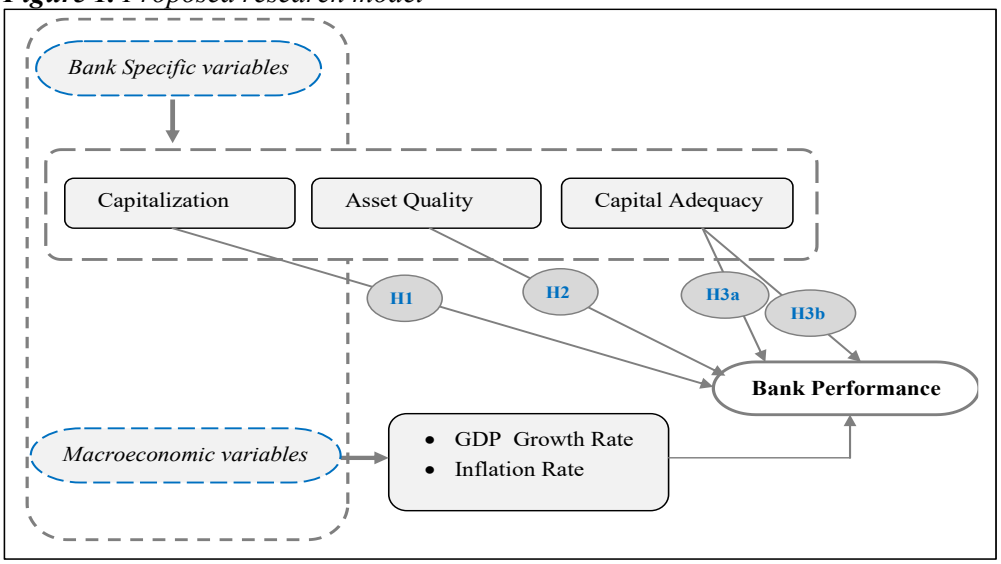
Akhtar *et al.* (2011) demonstrated this relationship in the context of Islamic finance in Pakistan, while Ruslim (2012) reached similar conclusions in Indonesia. Therefore, it is expected that NPFs will have a detrimental influence on performance, as evaluated by ROE and ROA.

H2: The non-performing financing (NPF) ratio negatively affects the financial performance metrics (ROE and ROA) of IBs.

5. Methodology

This section presents the empirical research methodology adopted in this study. It outlines the sample selection and its justification, followed by the specification of the empirical model, the measurement of variables, and the estimation techniques employed.

Figure 1. *Proposed research model*



Source: *Author's work.*

5.1 Sample Data

The study employs descriptive and correlation analyses to investigate the correlation between financial performance, capital regulation, bank characteristics, and economic factors. Data was collected from 81 IBs in 22 countries. It covered the

period from 2010 to 2020. The sample included Bahrain, Bangladesh, Brunei, Djibouti, Egypt, Indonesia, Iran, Jordan, Kuwait, Malaysia, Pakistan, Philippines, Qatar, Saudi Arabia, South Africa, Sri Lanka, Sudan, Thailand, Turkey, UAE, the United Kingdom, and Yemen.

It was verified that the sample consisted of the main IBs. Incorporating institutions from both developed and developing economies, with a particular focus on those in South Asia, such as Pakistan and Bangladesh, where Islamic banking is assuming a progressively strategic role in the promotion of inclusive finance and regulatory innovation, the study encompasses a broad spectrum of operational contexts and regulatory structures.

This diversity enhances the generalisability and policy relevance of the findings, especially for countries where Islamic banking is undergoing significant institutional development. The banking data used in this study were retrieved via the Thomson Reuters Eikon database, which provides information on financial statements, and from the websites of the individual financial institutions. Macroeconomic data were obtained from the World Bank database. The selection of IBs was conducted on the basis of the availability of information during the study period, with particular attention given to financial condition, capital adequacy, and non-performing loans.

A financial ratio analysis was conducted to assess the efficiency of IBs. It is acknowledged that the relationship between capital regulation and Islamic bank performance has been previously examined by researchers, e.g., Ibrahim (2019). This paper makes a novel contribution by investigating a different group of countries and capturing specific regulatory dynamics in the post-crisis period. This provides novel empirical perspectives.

The period 2010-2020 is of particular relevance to this study, as it encompasses the aftermath of the global financial crisis and the significant regulatory, industry, and economic changes that ensued. This decade provides a critical context for exploring the evolving dynamics of regulatory compliance, especially in Islamic banks, which face unique challenges due to their dual mandate of achieving profitability while fulfilling social and ethical obligations.

The analysis of this period enables the study to investigate how Islamic banks have adapted to heightened regulatory demands and whether these adjustments have influenced their financial performance metrics. By focusing on this timeframe, the study also sheds light on the long-term impacts of regulatory changes on financial stability and profitability within the Islamic banking sector.

The study analysed the correlation between performance capital regulation, bank characteristics, and economic factors. Internal characteristics reflect bank characteristics, including liquidity and risk, and are based on the framework developed by Hassan and Bashir (2003). The growth rate of gross domestic product

and the annual inflation rate were used to test the impact of macroeconomic Indicators on IB's performance.

Table 1. *Variables definitions*

Symbol	Definition	Notation in The Model
Dependent variables		
ROE	Ratio of net profit to total equity	I_{ijt}
ROA	Ratio of net profit to total assets	
Independent variables		
CAP	Capital to total assets ratio	B_{it}
CAR	Capital adequacy ratio: Ratio of regulatory capital (comprising Tier1 and Tier2 within authorised limits) to risk-weighted assets	(Bank characteristics)
NPF	Ratio of non-performing financing to total assets	
SIZE	Total bank assets	
PRA	Ratio of loans to total assets	
DPOA	Ratio of deposits to total assets	
DEPA	Ratio of operating costs to total assets	
GDP	Growth rate of gross domestic product	X_{jt}
INF	Annual inflation rate	(Macroeconomic Indicators)

Source: *Authors' work.*

5.2 Research Approaches

We tested the relationship between financial performance, capital regulation, and bank characteristics while controlling for indicators of macroeconomic and financial structure by running multivariate regression analysis and rigorous diagnostic testing in STATA analysis software. This procedure is well suited to the detection of endogeneity and heterogeneity concerns.

Panel data analysis with time and individual effects was used to increase observational power. The chosen model is the linear formulation proposed by Bourke (1989).

The following basic equation presents the model used to estimate the degree of influence of the selected determinants on the profitability of IBs:

$$\pi_{it} = \alpha_0 + \alpha_i B_{it} + \beta_j X_{jt} + \varepsilon_{ijt}$$

Where:

π_{ijt} is the performance measure (ROE and ROA) for bank *i* at time *t;* in country *j*

B_{it} is the vector of characteristic variables for bank *i* at time *t*

X_{jt} is the vector of macroeconomic variables for country *j* at time *t*. α_0 a constant, α_i et β_j are coefficients, while ε_{ijt} is an error term (see Table 1).

The present study aims to investigate how capital adequacy regulation and other crucial factors influence the financial performance of Islamic banks. The analysis is conducted in two regression models, starting with the estimation of the following model:

Model 1:

$$ROA_{it} = \alpha_0 + \alpha_1 CAP_{it} + \alpha_2 NPF_{it} + \alpha_3 SIZE_{it} + \alpha_4 PRA_{it} + \alpha_5 DPOA_{it} + \alpha_6 DEPA_{it} + \alpha_7 GDP_{jt} + \alpha_8 INF_{jt} + \varepsilon_{it} \quad (1)$$

$$ROE_{it} = \alpha_0 + \alpha_1 CAP_{it} + \alpha_2 NPF_{it} + \alpha_3 SIZE_{it} + \alpha_4 PRA_{it} + \alpha_5 DPOA_{it} + \alpha_6 DEPA_{it} + \alpha_7 GDP_{jt} + \alpha_8 INF_{jt} + \varepsilon_{it} \quad (2)$$

Then, in order to examine the effect of capital regulation, the following model is introduced and estimated:

Model 2:

$$ROA_{it} = \alpha_0 + \alpha_1 CAP_{it} + \alpha_2 CAR_{it} + \alpha_3 NPL_{it} + \alpha_4 TA_{it} + \alpha_5 PRA_{it} + \alpha_6 DPOA_{it} + \alpha_7 DEPA_{it} + \alpha_8 GDP_{jt} + \alpha_9 INF_{jt} + \varepsilon_{it} \quad (3)$$

$$ROE_{it} = \beta_0 + \beta_1 CAP_{it} + \beta_2 CAR_{it} + \beta_3 NPL_{it} + \beta_4 TA_{it} + \beta_5 PRA_{it} + \beta_6 DPOA_{it} + \beta_7 DEPA_{it} + \beta_8 GDP_{jt} + \beta_9 INF_{jt} + \varepsilon_{it} \quad (4)$$

Where:

CAP : Ratio of equity to total assets (non-risk-weighted capital ratio);
NPF: Ratio of Non-Performing Financing
CAR: Ratio of regulatory capital (comprising Tier 1 and Tier 2 within authorised limits) to risk-weighted assets.

In analysing the performance of IBs, various factors are taken into account (see Table 1).

6. Empirical Results

6.1 Descriptive Statistics

The results of the descriptive statistics are presented in Table 2. The mean return on assets is shown to be 0.0075, with the lowest and highest values recorded at –0.45 and 0.304, respectively. The mean return on equity is 0.0785 or 7.85%, where the minimum is −1.14 and the maximum is 1.4. The quality of assets is assessed using the Non-Performing Financing Ratio (NPF), which has an average value of 0.064

and a range from 0% to 80%. This indicates that, on average, 6.4% of the IB's financing portfolio is classified as non-performing. This indicates a moderate level of non-performing assets.

However, it is important to address instances of higher ratios to ensure the overall financial strength of the portfolio. The debt structure of the IBs was analysed using the loans ratio (PRA), which had an average value of 0.554. This finding suggests that IBs adhere to a relatively safe debt structure, characterised by a debt-to-asset ratio of 55.41%. The Deposits to Total Assets ratio, with an average of 0.5461, indicates that approximately 54.61% of the total assets of the IBs are funded by deposits. This points towards a substantial reliance on deposits to support the IBs' asset base.

Table 3 presents the correlations among the study variables. As a rule of thumb, all coefficients are below the 0.70 threshold (Hair et al., 2023), indicating no multicollinearity concerns. The highest observed correlation (0.43) is between PRA and DPOA, while CAR and CAP show a moderate association (0.37). Overall, the observed correlations remain within the acceptable limits for regression analysis.

Table 2. *Descriptive statistical analysis of IBs*

Variables	ROA	ROE	CAP	CAR	SIZE	NPF	PAR	DPOA	DEPA	GDP	INF
Moy	0.0075	0.0785	0.1934	0.2128	6.3827	0.0644	0.5541	0.5461	0.0165	0.0765	0.0555
Std. Dev	0.0587	0.2234	0.2345	0.2005	0.7723	0.1270	0.2861	0.3113	0.0226	0.1151	0.0559
Min	-0.45	-1.14	-0.0217	-0.7333	4.0971	0	0.001	0.001	0.0003	0.001	-0.0036
Max	0.304	1.4	1.00	0.9983	7.9636	0.8254	0.9931	0.9492	0.2721	0.5980	0.3926

Variables Definition: ROE = Net Profits/Total Equity; ROA = Net Profits/TA; CAP= (Equity/TA); CAR = (Regulatory Capital/Risk Weighted Assets); NPF= (Non-Performing financing/Total Net Loans); *Size* =Logarithm of TA; PRA= (Total Net Loans/TA); DPOA= (Deposits/TA); DEPA= (Personnel Expenses/TA); GDP= Gross Domestic Product Growth Rate; INF= Inflation Rate.

Source: *Authors' work.*

Table 3. *Correlation matrix*

	ROA	ROE	CAP	SIZE	PRA	DPOA	PIB	NPF	INF	CAR	DEPA
ROA	1.0000										
ROE	0.4128	1.0000									
CAP	0.0182	-0.0981	1.0000								
TA	-0.0750	0.0565	-0.2981	1.0000							
PRA	0.0028	-0.0069	-0.1092	0.0091	1.0000						
DPOA	-0.0323	0.0241	-0.3691	0.1236	0.4325	1.0000					
PIB	0.0660	0.0107	0.0027	0.1322	-0.1532	-0.0492	1.0000				
NPF	-0.2251	-0.1273	0.0240	-0.0360	-0.2043	-0.0672	0.0381	1.0000			
INF	0.1040	0.0616	-0.0064	-0.1627	0.0561	0.0281	0.0772	-0.0811	1.0000		
CAR	0.2239	-0.0339	0.3658	-0.3069	-0.1963	-0.1752	0.0559	-0.0265	0.2080	1.0000	
DEPA	-0.0759	-0.0783	0.0562	-0.3851	0.1663	0.1644	-0.0599	0.0624	0.0427	0.0149	1.0000

Source: *Authors' work.*

6.2 Regression Analysis

6.2.1 Relationship between capital ratio, credit risk ratios and IBs performance (Model 1)

Table 4 presents the results of Model 1, which examines the relationship between internal bank factors and financial performance. The model explains 47.2% of the variation in ROA and 34.3% in ROE, indicating a good explanatory power. Table 4 show, as predicted, that capital ratio (CAP) is positive and significant at the 10% level for ROA, suggesting that well-capitalized Islamic banks (IBs) tend to be more profitable.

This finding aligns with the signaling theory, which argues that higher capitalization signals financial strength, prudent management, and long-term stability. Such results indicate that IBs with higher capital ratios have better access to funding and are perceived as safer by investors and depositors.

Table 3. *Regression Analysis*

	Model 1		**Model 2**	
	ROA	ROE	ROA	ROE
Variable	Coefficient	Coefficient	Coefficient	Coefficient
CAR	-	-	0.044***	0.016
CAP	0.031*	0.06	0.004	-0.014
NPF	-0.140 ***	-0.267***	-0.117 ***	-0.236 ***
SIZE	0.007	0.009	-0.003	0.010
PRA	-0.021	-0.188***	-0.005	-0.114**
DPOA	0.016	0.038	0.002	0.038
DEPA	-0.151 *	-0.349	-0.182 *	-0.443
PIB	0.022	-0.039	0.024*	-0.033
INF	0.048	-0.077	0.018	0.037
R-squared	0.472	0.343	0.377	0.339

Note(s): Significance levels: : The symbols * , **, *** denote significance at the 10% , 5% and 1% levels, respectively

Source: *Authors' work.*

The results further show that the non-performing financing (NPF) ratio exerts a negative and highly significant impact (at 1% level) on both ROA and ROE. This confirms that higher credit risk reduces profitability, supporting the bad management hypothesis (Berger and DeYoung, 1997), which posits that weak management practices lead to poor loan quality and lower returns. This finding is consistent with prior studies such as Akhtar *et al.* (2011), Choong *et al.* (2012) and Ruslim (2012).

The coefficient associated with DEPA, representing operating costs, is negative and significant at the 10% level, indicating that greater operational efficiency enhances profitability. This implies that cost management remains a crucial determinant of IBs' performance.

The PRA variable exhibits a negative and significant effect on ROE at the 1% level, suggesting that excessive exposure to financing activities increases risk and reduces shareholder returns. This result supports Bashir (2003) and Mustafa (2014), who found that Islamic banks prefer low-risk, short-term financing instruments such as Murabaha, while limiting Mudaraba and Musharaka modes due to higher risk and monitoring costs (Samad, 2004; Samad and Hassan, 2006).

Macroeconomic indicators (GDP and INF) maintain the expected signs but are statistically insignificant, implying that bank-specific characteristics are more influential in explaining profitability than external factors.

Overall, these findings demonstrate that internal management factors, particularly capitalization, credit quality, and operational efficiency, are the primary determinants of Islamic bank performance. Maintaining a high capital ratio and controlling non-performing financings strengthen IBs' resilience and sustainability within the financial system

6.2.2 Relationship between capital adequacy ratios and IBs performance (Model 2)

Table 4 presents the findings of Model 2, which incorporates the capital adequacy ratio (CAR), defined as the ratio of regulatory capital (Tier 1 and Tier 2 within authorised limits) to risk-weighted assets. The model explains 37.7% of the variation in ROA and 33.9% in ROE, confirming its explanatory power. The coefficient of CAR is positive and significant at the 1% level for ROA, showing that higher regulatory capital ratios enhance bank profitability. This finding supports the capital buffer theory, which holds that well-capitalised banks are more resilient to economic shocks and less exposed to insolvency risks.

A strong CAR reflects prudent financial management and compliance with Basel III and Islamic Financial Services Board (IFSB) standards. Well-capitalised Islamic banks are better positioned to absorb losses, ensure solvency, and maintain market confidence. This result aligns with Daoud and Kammoun (2022; 2024), who found a positive association between capital adequacy and Islamic bank performance.

The NPF ratio continues to exhibit a negative and significant relationship with both profitability indicators, confirming that credit risk remains a crucial determinant of financial performance. Likewise, PRA retains its negative sign and significance for ROE, suggesting that excessive risk exposure weakens returns on equity. The DEPA variable remains negative, reinforcing the importance of cost efficiency in improving profitability.

The macroeconomic indicators, GDP and INF, maintain their expected positive signs but are not statistically significant, suggesting that internal bank characteristics outweigh external economic conditions in shaping profitability. Overall, the results of Model 2 highlight that higher regulatory capital ratios enhance the performance of

Islamic banks. Strengthening capital adequacy not only reduces the probability of financial distress but also promotes prudent management, resilience, and long-term sustainability in the Islamic banking sector.

6.3 Robustness Tests Results

To ensure the reliability and validity of the empirical findings, robustness tests were performed by decomposing the full sample according to crucial structural characteristics of Islamic banks (IBs).

Specifically, the sample was divided by bank size, using a USD 1 billion total asset threshold (Models 3 and 4), and by capital adequacy levels (Models 5 and 6), distinguishing less-capitalized (CAR ≤ 12%), and well-capitalized (CAR > 12%) institutions (Parmankulova et al., 2022). The results, presented in Table 5, confirm the consistency of earlier relationships across all subsamples, reinforcing the robustness of the model.

For bank size, Table 5 shows that Models 3 and 4 indicate that smaller IBs outperform larger ones, suggesting potential diseconomies of scale. The CAP coefficient is positive and significant for small IBs, highlighting that stronger capitalization enhances profitability at lower asset levels, whereas this effect weakens as size increases. Similarly, CAR maintains a positive and significant effect on ROA and ROE, emphasizing the critical role of sound capitalization in sustaining financial stability.

The NPF ratio remains negatively and significantly associated with profitability in both groups, confirming that higher credit risk undermines performance. The GDP variable is significant only for small IBs, indicating that macroeconomic conditions exert greater influence on smaller institutions.

The negative coefficient of SIZE for small IBs supports the findings of Dawar, 2014 and Nenu et al., 2018, which suggest that larger firms may experience reduced efficiency and flexibility as they expand.

In Models 5 and 6, focusing on capitalization structure, the results reveal that CAP positively affects ROA for less-capitalized IBs, while CAR remains a significant driver of profitability for well-capitalized banks. The persistent negative impact of NPF and PRA across all groups underscores the importance of effective credit risk management.

Overall, these robustness tests demonstrate that the crucial determinants, capital adequacy and credit quality, maintain their explanatory power across different bank profiles. The decomposition thus provides a more nuanced understanding of how structural factors shape the financial performance of IB, confirming the stability and reliability of the study’s main results.

Table 4. *Robustness check*

	Model 3 (Small IBs)		***Model 4 (Large IBs)***	
	ROA	ROE	ROA	ROE
Variable	Coefficient	Coefficient	Coefficient	Coefficient
CAR	0.082**	0.276*	0.025 ***	0.021
CAP	0.075 *	1.087***	0.008	-0.038
NPF	-0.255 ***	-0.423**	-0.023*	-0.151*
SIZE	-0.064***	0.282*	0.003	0.017
PRA	-0.021	-0.379**	-0.011	-0.142**
DPOA	0.111**	0.720***	-0.014**	-0.056
DEPA	-0.167	-0.623	-0.079	-0.686
PIB	0.168*	0.401*	-0.002	-0.089
INF	0.108	0.256	0.025***	-0.362
R-squared	0.292	0.412	0.355	0.304
	Model 5 (Less-capitalised IBs)		***Model 6 (Well- capitalised IBs)***	
	ROA	ROE	ROA	ROE
Variable	Coefficient	Coefficient	Coefficient	Coefficient
CAR	0.008	-0.168	0.035 ***	0.027
CAP	0.332***	0.395	0.008	-0.028
NPF	-0.196***	-0.668***	-0.110***	-0.149***
SIZE	-0.040	-0.029	0.002	0.035*
PRA	-0.104***	-0.454***	-0.019*	-0.069*
DPOA	0.017	0.263*	-0.005	-0.059
DEPA	0.133	0.232	0.004	-0.031
PIB	-0.020	-0.405*	0.017	0.022
INF	0.037	0.447	-0.009	-0.104
R-squared	0.351	0.318	0.331	0.209

Note(s): Significance levels: The symbols * , **, *** denote significance at the 10% , 5% and 1% levels, respectively.

Source: *Authors' work.*

7. Conclusion

This study aimed to empirically examine the relationship between IBs' financial performance, proxied by ROA and ROE, and a set of internal, external, and macroeconomic determinants. Using panel data analysis, the results reveal that capitalization plays a crucial role in enhancing profitability.

This finding suggests that well-capitalized IBs are better positioned to absorb shocks, reduce financial distress costs, and comply with solvency requirements in line with Basel III and IFSB standards. As new entrants in many financial systems, IBs tend to maintain higher capital buffers to protect both their individual stability and the reputation of the Islamic banking industry as a whole.

The results further demonstrate that credit risk, measured through the non-performing financing (NPF) ratio, exerts a negative and significant effect on profitability, confirming that sound asset quality remains a crucial driver of

performance. This result aligns with theoretical expectations and prior empirical evidence, emphasizing the centrality of credit risk management in maintaining profitability. Moreover, compliance with international regulatory standards regarding solvency and liquidity fosters confidence among stakeholders and supports financial stability, particularly in developing economies.

From a macroeconomic perspective, the study finds a positive association between GDP growth and the profitability of IBs, highlighting their dual role as financial intermediaries and catalysts for sustainable economic development. This reinforces the contribution of IBs to broader economic and social welfare objectives, consistent with the principles of Islamic finance.

Overall, the results confirm that capital adequacy and credit quality are the most influential determinants of Islamic banks' profitability. Strong capitalization not only enhances resilience to crises, such as political instability or health shocks like COVID-19 (Ghenimi *et al.,* 2024), but also enables access to lower-cost funding and prudent investment opportunities.

These findings underscore the strategic importance of maintaining robust capital structures and effective risk management systems within IBs. In line with Daradkah and Al-Sayyah (2020), diversifying revenue streams beyond traditional financing activities can contribute to greater resilience and reduced risk exposure within Islamic banks.

This study contributes to the literature in several ways. First, it extends existing research by jointly examining the effects of internal factors (capitalization, risk exposure), external regulatory frameworks, and macroeconomic conditions on the performance of Islamic banks in developing contexts.

Second, it provides empirical evidence supporting the stabilizing role of adequate capital ratios in Islamic banking, in line with the broader objectives of financial soundness and sustainable growth.

The findings have important managerial and policy implications. For policymakers and regulators, ensuring adequate capitalization through well-designed prudential frameworks can promote a more stable and resilient Islamic banking sector. For managers, maintaining a balance between profitability and solvency remains vital to achieving long-term performance and stakeholder trust.

Despite its contributions, this study has some limitations that open avenues for future research. Further analyses could consider additional dimensions such as corporate governance, risk diversification, or the influence of Sharia compliance ratings on financial performance. Extending the sample to include different regional or institutional contexts could also enhance the generalizability of the results.

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