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The Determinant of Islamic Bank Profitability and Stability in Malaysia

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Abstract

This study examines the determinants of profitability and stability of 14 Islamic banks in Malaysia using secondary data from 2018 until 2022. Hausman and Breush-Pagan's tests indicate that the fixed effect panel model is the best model to predict the relationships. The final fixed effect model for the profitability of Islamic banks shows that capital adequacy ratio (CAR), Z-score, and gross domestic product (GDP) have significant relationships with return on assets (ROA). CAR has a negative effect, while Z-score and GDP positively affect ROA. On the other hand, the final fixed effect model for the stability of Islamic banks shows that the liquidity ratio is negatively related to Z-score. At the same time, ROA has a positive relationship with Z-score. An optimal CAR would ensure banks meet their obligations and optimise the use of their funds to maximise profits. The study shows that Islamic banks with higher Z-score have a reduced likelihood of insolvency, suggesting that they operate in a stable environment and, as a result, generate profits and excellent performance. Additionally, the study found that Islamic banks flourish during periods of robust economic expansion. Finally, the results show a rise in return on assets (ROA) would enhance the viability of financial institutions by ensuring a steady stream of profits and a consistent performance.

1.0   Introduction

Islamic banking is a system that operates based on Islamic law, adhering to Shariah principles and Fiqh Muamalat (Islamic commercial transactions) derived from the Quran and Sunnah. It has emerged as a viable alternative to conventional banking, offering various financial products to cater to Muslim and non-Muslim customers across the global market. While Islamic banks operate under different mechanisms and underlying principles than conventional banks, they share similar roles within the dual financial ecosystem (Iqbal & Mirakhor, 2011). Banks generally act as financial intermediaries between depositors and borrowers by facilitating loans and investments. They develop and offer financial products to meet client needs, such as various types of deposit accounts and loans to finance personal or business requirements. In addition to that, banks also provide financial advisory services to guide businesses and individuals on investment opportunities, mergers, and acquisitions. Despite performing similar functions as conventional banks, Islamic banks operate according to Sharia law, which requires the prohibition of interest (*riba'*) and speculative practices to be adhered to. In Malaysia, the Islamic banking system plays a significant role in driving economic growth and development. By collecting deposits and providing funding, Islamic banks help support economic expansion, which is crucial for achieving long-term economic growth (Gani & Bahari, 2021).

In the banking sector, profitability is a critical indicator of growth, generating employment and determining the overall financial performance. Profitability changes can significantly impact the economy, as banks can affect earnings through investing and saving decisions. Profit growth increases bank performance and provides greater flexibility in the source of credit for corporate expansion, benefiting many people and businesses. Thus, Islamic banks constantly seek alternative strategies to boost their profitability over time, as it directly impacts their operational sustainability and economic contribution.

The stability of the banking sector is equally critical. Banks are pivotal in facilitating monetary circulation, ensuring effective payment systems, and financing investment projects supporting national economic growth. Consequently, regulators,

such as central banks and financial supervisory bodies, closely monitor bank stability to maintain monetary and financial system stability (Ullah et al., 2022). One widely used measure of bank stability is the Z-score, introduced by Altman (1968), which combines various indicators of a bank's financial health. A higher Z-score suggests greater financial resilience and stability (Supiyadi, 2021).

Despite the rapid growth of Islamic banking in Malaysia, there remains a significant research gap regarding the determinants of profitability and stability within these institutions. While several studies have explored internal and external factors influencing Islamic bank performance, the findings are often inconsistent, particularly when comparing factors such as bank size, liquidity, capital adequacy, and macroeconomic variables (Ali et al., 2018; Alfiyan et al., 2023; Anjom & Faruq, 2023; Ashraf et al., 2016; Daoud & Kammoun, 2020; Hamid et al., 2017; Muhammad, 2022; Rashid & Jabeen, 2016; Supiyadi, 2021; Tirmizi et al., 2021; Sobol et al., 2023; Wahid & Dar, 2016). This lack of consensus underscores the need for a more comprehensive analysis of how internal and external factors interact to affect the profitability and stability of Islamic banks in Malaysia.

This study aims to fill this research gap by examining the internal and external determinants of Islamic bank profitability and stability in Malaysia. The study also explores the inter-relationship between profitability and stability, contributing valuable insights to policymakers and industry practitioners. By addressing these issues, this research will provide a clearer understanding of the factors that sustain Islamic banks' financial health, with implications for enhancing their role in the broader financial system.

2.0   Literature Review and Hypotheses Development
2.1   Studies of Islamic Bank Profitability

Evaluating bank performance is a complex process involving analysis of the environment interaction, internal operations, and external activities (Arshad, 2017). Financial ratios are commonly used to evaluate the performance of financial intermediaries, such as

Islamic banks, which are typically generated using accounting data available in the bank's balance sheet and financial statement. Some studies on Islamic bank profitability apply the terms return on asset (ROA) and return on equity (ROE) to measure the bank's profitability (Alharthi, 2017; Chowdhury et al., 2017; Masood & Ashraf, 2012; Joudar et al., 2023; Wahid & Dar, 2016).

Internal factors that affect Islamic bank profitability include Capital Adequacy Ratio (CAR), Liquidity Ratio (LIQ), Credit Risk (CR), and Z-score. Tirmizi et al. (2021) indicate that capital adequacy is an essential factor of profitability, which has a significant and negative correlation with profitability. This relationship suggests that as capital adequacy increases, the profitability of Islamic banks decreases. Supiyadi (2021) suggests that Islamic banks have not maximised capital use due to their prioritisation of maintaining minimum capital determined by regulations, as the highest credit risk adjustment (CAR) tends to result in lower profitability and increased capital costs. In contrast, Hamid et al. (2017) found a positive relationship between capital adequacy and the performance of Indonesian Islamic banks, with a 10% significance level. Sufficient capital may enhance public trust, attract more clients, and increase profitability, indicating that a higher ratio benefits Islamic banking. The arguments lead to the following hypothesis;

H1: *Capital adequacy ratio significantly impacts the profitability of Islamic banks in Malaysia.*

Samail et al. (2018) found that liquidity is a critical factor in Islamic bank profitability in Malaysia. The study found that the ratio of total loans to deposits as the proxy for liquidity management positively affects the bank's financial performance. This finding aligns with Mohamad et al. (2019), which shows that the liquidity ratio positively impacts the profitability of Islamic banks. Higher liquidity ratios result in higher profits as banks invest the excess liquidity in other financial products to maximise return. Thus, this study proposes the following hypothesis;

H2: *Liquidity ratio significantly impacts the profitability of Islamic banks in Malaysia.*

Sobol et al. (2023) employed the asset quality ratio as a proxy for credit risk, showing that increasing credit risk exposure generally would decrease the company's profitability. This study is consistent with studies by Fazam et al. (2021), which stated that higher profitability ratios mean the credit quality is worse, leading to lower profitability. Consequently, the study proposes the following hypothesis;

H3: *Credit risk ratio significantly impacts the profitability of Islamic banks in Malaysia.*

Stability has a substantial effect on profitability. Alharti (2016) found that the Z-score positively impacts ROA, ROE, and NPM. A high Z-score suggests greater stability and reduced risk, ultimately leading to increased profitability. This study is in line with Nugrohowati et al. (2022), which reveals that the stability of a bank had a positive effect on the profitability of Islamic banks in 10 countries with the most prominent Islamic financial sector, including Malaysia, Saudi Arabia, and United Arab Emirates (UAE). Thus, this study proposes the following hypothesis;

H4: *Z-score significantly impacts the profitability of Islamic banks in Malaysia.*

External factors that affect Islamic bank profitability include GDP and inflation. Ali et al. (2018) found that the GDP growth rate is positively significant with the profitability of Islamic banks in Brunei, as the profit earned by the bank is directly proportional to the GDP. When the Bruneian economy booms, GDP will rise, and credit quality will improve, decreasing defaults and increasing earnings and profits. However, when a recession occurs, GDP will slow down, and credit quality will deteriorate, causing an increase in defaults and lower earnings. Nevertheless, Rashid and Jabeen (2016) found that GDP negatively impacts bank performance due to reduced investment and production. During bullish macroeconomic conditions, businesses have sufficient internal funds, reducing their reliance on bank borrowing, which results in banks' inability to lend at preferable terms, potentially affecting their performance. Based on the discussions, this study proposes the following hypothesis;

H5: *GDP growth rate significantly impacts the profitability of Islamic banks in Malaysia.*

The rate of inflation (INF) is another macroeconomic variable affecting Islamic banks' profitability. Sobol et al. (2023) used the annual consumer price index (CPI) as one of the macroeconomic variables affecting Islamic banks' profitability. The empirical results showed that CPI has a negative relationship with Islamic bank profitability but a positive effect on conventional bank profitability. Hence, this study proposes the following hypothesis;

H6: *Inflation significantly impacts the profitability of Islamic banks in Malaysia.*

Ozil (2023) studied the impact of sustainable development goals (SDGs) on bank profitability in 28 countries. Achieving certain sustainable goals contributes to bank profitability, especially in promoting good health and well-being, clean water and sanitation, quality education, and affordable energy sources. In conclusion, various internal, external, and macroeconomic factors influence Islamic bank profitability. Understanding these factors can help Islamic banks develop better operational strategies and boost their profits.

2.2   Studies of Islamic Bank Stability

Financial stability is crucial for Islamic banks, as it refers to the absence of excessive volatility in markets and financial institutions. A stable market has steady output growth, while an unstable economy has significant recessions, notable economic cycles, fluctuating inflation, or recurring financial crises (Muhammad, 2022). The stability of Islamic banks can be measured using the Z-score, which predicts the bankruptcy risk.

Internal factors that affect Islamic bank stability include Capital Adequacy Ratio (CAR), Liquidity Ratio (LIQ), and Profitability. Anjom and Faruq (2023) analysed the relationship between the financial stability and capital adequacy ratio of Islamic banks in Bangladesh. The positive relationship suggests that ensuring adequate capital and investment revenue can improve the financial stability of Islamic institutions. Based on this argument, this study proposes the following hypothesis;

H7: *Capital adequacy ratio significantly impacts the stability of Islamic banks in Malaysia.*

Liquidity is a bank's ability to convert assets into cash at face value to meet short-term obligations. A lack of liquidity can lead to financial difficulties and collapse. A study by Anjom and Faruq (2023) found that greater liquidity increases the ability to channel funds to third-party funds, leading to increased profitability and a positive impact on financial stability. Hassan et al. (2019) found a negative correlation between liquidity risk and stability of Islamic banks, demonstrating their superior risk management capabilities compared to conventional banks. This study hence proposes the following hypothesis;

H8: *Liquidity ratio significantly impacts the stability of Islamic banks in Malaysia.*

Wahid and Dar (2016) analysed the stability of Islamic and conventional banks in Malaysia. The study found that conventional banks outperform Islamic banks while having positive correlations between earnings and profitability with their level of stability. However, Ashraf et al. (2016) found that profitability has a negative and significant relationship with Islamic banks' stability, as they operate in a high-risk manner to increase profit margins. Thus, this study proposes the following hypothesis;

H9: *ROA significantly impacts the stability of Islamic banks in Malaysia.*

External factors that affect Islamic bank stability include GDP and inflation. Gross domestic product (GDP) is the value of goods and services generated yearly, and higher GDP values are associated with higher financial stability. Alfiyan et al. (2023) studied Indonesian Islamic banking's financial stability using Z-score before and during COVID-19. They found no significant difference in GDP ratios, although the mean value was larger before and during the pandemic. This suggests that the stability of Islamic banks during the pandemic is similar to before the pandemic; hence GDP has no significant relationship with the Z-score. On the contrary, Daoud and Kammoun (2020) found that GDP positively affects the stability of Islamic banks, suggesting that a solid macroeconomic environment might contribute to a good condition for bank stability. With that, this study proposes the following hypothesis;

H10: *GDP growth rate significantly impacts the stability of Islamic banks in Malaysia.*

Widarjono (2020) employed inflation as one of the macroeconomic variables to determine the stability of Islamic banks in Indonesia, finding that inflation hurts the stability of Islamic banks in the short run. In the long run, the relationship between inflation and stability is significantly positive, indicating that the higher the price, the more stable the Islamic bank is. Hence, the study proposes the following hypothesis;

H11: *Inflation significantly impacts the stability of Islamic banks in Malaysia.*

The financial system plays a vital role in achieving SDGs. Ozil and Iorember (2023) shows mixed results in the relationship of financial stability with SDGs in 26 countries. SDG3 (Good health and well-being) and SDG7 (Affordable and clean energy) positively affect financial stability in countries with high capital buffers. In conclusion, various internal factors, external factors, and macroeconomic conditions influence Islamic banks' stability. By focusing on these factors, Islamic banks can maintain their financial stability and reputation in the market.

2.3   Inter-relation between Islamic Bank Profitability and Stability

Alharthi (2017) and Supiyadi (2021) studied the relationship between profitability and stability in Islamic banks. Alharthi (2017) found that Islamic bank profitability in GCC countries positively impacts stability, as greater investment stock leads to greater stability. Factors influencing profitability include bank size, capital ratio, loan intensity, Z-score, inflation, market capitalisation, control of corruption, and Arab Spring. On the other hand, stability in Islamic banks in GCC countries is influenced by factors such as bank size, capital ratio, loan intensity, age, Z-score, ROE, foreign and domestic ownership, listing, GDP, and Arab Spring. Stable banks are more profitable, and larger banks contribute to higher profitability ratios.

In Indonesia, Supiyadi (2021) found that the Z-score had a significant positive effect on the profitability of Islamic banks. Companies with high Z-scores are more stable and have bright futures, benefiting bank profitability. Notably, the most critical factor

influencing stability is the return on assets (ROA), as profitability can improve the financial condition of Islamic banks. In conclusion, the factors of Islamic bank profitability are primarily determined by internal and external factors, with capital adequacy ratio, credit risk, asset size, operating efficiency, liquidity, Z-score, GDP, and inflation being influential and significant.

3.0   Research Methodology

3.1   Research Design

The study used a descriptive quantitative research framework utilising quantitative data as proxies for independent and independent variables. The literature review provides the basis for choosing significant independent variables to be considered in the model development. The study is an explanatory research method as it aims to determine the causal relationship between social phenomena.

3.2   Data

The sampling technique used in this study is purposive sampling. The sample selection criteria are: 1) Islamic banks in Malaysia, 2) Published financial statements from 2018-2022, and 3) Islamic banks with complete financial ratios for profitability and stability measures. Based on the criteria, 14 Islamic banks are used in this study, as listed in Table 1. The study period of 2018 to 2022 is selected based on the most recent data available and extends the previous studies on Islamic bank's profitability in Malaysia (Abduh & Idrees, 2013; Idris et al., 2011; Shukhur et al., 2015) and on Islamic banks stability in Malaysia (Rahim et al., 2012; Wasiuzzaman & Tarmizi, 2010).

Table 1: Islamic Bank in Malaysia
(Source: Islamic Financial Service Board (IFSB)

No.	Organisations
1.	Affin Islamic Bank Berhad
2.	Bank Islam Malaysia Berhad (BIMB)
3.	Maybank Islamic Berhad
4.	RHB Islamic Bank Berhad
5.	Bank Muamalat Malaysia Berhad
6.	CIMB Islamic Bank
7.	Public Islamic Bank
8.	Alliance Islamic Bank
9.	Hong Leong Islamic Bank
10.	Al Rajhi Bank
11.	HSBC Amanah
12.	OCBC Al-Amin
13.	AmBank Islamic
14.	Standard Chartered Saadiq

Two dependent variables for this study are Return on Asset (ROA) and Z-score. ROA is the proxy for the banks' profitability, while Z-score is the proxy for the banks' stability. The independent variables are Capital Adequacy Ratio (CAR), Credit Risk ratio (CR), Liquidity ratio (LIQ), Z-score, GDP, and Inflation. Data are gathered from the annual reports of each Islamic bank and the Department of Statistics Malaysia (DOSM). Internal variables are derived from balance sheets and income statements, while external variables are obtained from the DOSM Database 2023, resulting in 30 observations. Table 2 shows the details of the variables used in this study, including the notation and formulae.

Table 2: Summary of variables

Variables	Notation	Formulae	Source of data
Profitability	ROA	Return on assets = net income / total assets	Financial reports
Stability	Z-score	Log (Z-score), Where Z-score = (ROA + capital ratio) / S.D of ROA	
Capital Adequacy Ratio	CAR	Total equity / Total assets	
Liquidity	LIQ	Liquid assets / Total assets	
Credit Risk	CR	NPL / Total assets	
Gross Domestic Product	GDP	GDP growth (annual %)	DOSM
Inflation	INF	Inflation rate (annual %)	

3.3   Research Framework

Two separate models are developed based on previous studies on Islamic banks' profitability and stability (Alharti, 2017; Supiyadi, 2021). The first model, i.e., Islamic banks' profitability, uses Return on Asset (ROA) as the dependent variable with the independent variables of Capital Adequacy Ratio (CAR), Liquidity Ratio (LIQ), Credit Risk (CR), Z-score, GDP and Inflation rate (adapted from Alharti (2016); Ali et al. (2018); Samail et al. (2018); Sobol et al. (2023); Supiyadi (2021); Tirmizi et al. (2021)). The second model, i.e., Islamic banks' stability used Z-score as the dependent variable with the independent variables of Capital Adequacy Ratio (CAR), Liquidity Ratio (LIQ), Return on Asset (ROA), GDP and Inflation rate (adapted from Anjom & Faruq (2023); Alharti (2017); Daoud & Kammoun (2020); Muhammad (2022); Supiyadi (2021); Widarjono (2020)). Figure 1 shows the conceptual framework for the two models of profitability and stability of Islamic banks.
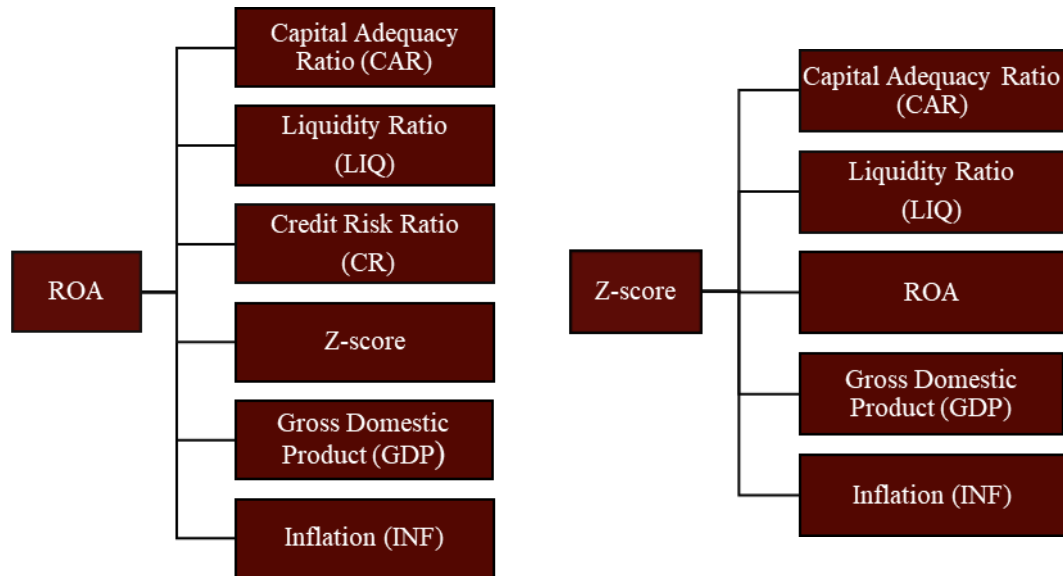
Figure 1: Conceptual Framework

3.4   Panel Data Regression Model

The study employs two separate models: the profitability (ROA) model and the stability (Z-score) model. Both models used fixed effect regression analysis.

Model 1: Profitability Model

$$ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 LIQ_{it} + \beta_3 CR_{it} + \beta_4 Z - Score_{it} + \beta_5 GDP_{it} + \beta_6 INF_{it} + \varepsilon_{it}$$

(1)

where,

$\beta_0 = the\ constant\ number\ of\ equation$

$\beta_1,,\ldots,\beta_n = coefficient\ beta\ value$

$i = bank$

$t = time\ period$

$\varepsilon_{it} = error\ term\ of\ bank\ i\ at\ time\ t$

<u>Model 2: Stability Model</u>

$$Z - Score_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 LIQ_{it} + \beta_4 ROA_{it} + \beta_5 GDP_{it} + \beta_6 INF_{it} + \varepsilon_{it}$$

(2)

where,

$\beta_0 = the\ constant\ number\ of\ equation$

$\beta_1,,\ldots, \beta_n = coefficient\ beta\ value$

$i = bank$

$t = time\ period$

$\varepsilon_{it} = error\ term\ of\ bank\ i\ at\ time\ t$

Breusch-Pagan Lagrangian Multiplier Test and Hausman Test are performed to identify the best-fitted model between Pooled OLS, Random Effect, and Fixed Effect Models.

4.0   Results and Discussion

4.1   Descriptive Statistics

Descriptive statistics are used to describe and summarise the sample data using mean, standard deviations, minimum, and maximum. Table 3 presents the summary statistics for all dependent and independent variables. In this study, there are two dependent variables: ROA and Z-score. ROA is used to measure the profitability and the performance of Islamic banks, while Z-score is used as a proxy to determine the financial stability of Islamic banks in Malaysia.

Table 3: Summary Statistics

Variables	Mean	Standard Deviation	Minimum	Maximum	Observation
Dependent Variables					
ROA	0.6483	0.3532	-0.9500	1.1800	70
Z-score	3.7613	0.3405	3.0415	4.5700	70
Independent Variables					
CAR	7.9349	1.7068	4.4200	11.0200	70
LIQ	10.2390	6.6477	0.8600	35.7000	70
CR	1.3079	1.1252	0.1714	6.0425	70
GDP	3.1017	4.7374	-5.5344	8.6943	70
INF	1.2520	1.5763	-1.1400	3.3800	70

Based on Table 3, the mean ROA of overall Islamic banks in Malaysia is 0.6483, with a standard deviation of 0.3532, a maximum value of 1.18, and a minimum of -0.95. The highest ROA of 1.18 referred to HSBC Amanah in 2022, while Al Rajhi Bank Malaysia recorded the lowest value of ROA of -0.9500 in 2020. For stability measures, Islamic banks in Malaysia typically have a low risk of insolvency, shown by an average Z-score of 3.7613. Bank Muamalat recorded the highest Z-score of 4.5700 in 2019, while Al Rajhi Bank Malaysia showed the lowest Z-score of 3.0415 in 2021. The standard deviation of the Z-score is 0.3405. The positive value of the Z-score shows that Islamic banks in Malaysia appear to have a healthy financial situation and long-term stability.

Moreover, the mean for CAR is 7.9349 and a standard deviation of 1.7068. A maximum value of 11.02 and a minimum value of 4.42 explain the value of the gap. Regarding liquidity, the LIQ has an average of 10.239 and a standard deviation of 6.6477. This shows that Islamic banks in Malaysia have low liquidity. The observation has been confirmed by the maximum value of this ratio, which reaches 35.7, and the minimum value, which is 0.86. The mean of CR is 1.3079, with a standard deviation of 1.1252. Credit risk's maximum and minimum values are 6.0425 and 0.1714, respectively.

Regarding GDP, the average growth rate in Malaysia is 3.1017%, which shows that the economy is on the right track, according to the Central Bank of Malaysia. The average score for the inflation rate in Malaysia is 1.252%, with a standard deviation of 1.5763. Thus, the inflation rate is stable.

4.2   Pearson Correlation Analysis

Pearson correlation analysis determines the correlation between each variable's understudy. The correlation values vary between -1 and 1. If the value is near -1, it means a negative correlation, while if the value is close to 1, it means a positive correlation. Conversely, if the value is 0, the variables are not correlated.

Table 4: Correlation Matrix

Variables	ROA	Z-score	CAR	LIQ	CR	GDP	INF
ROA	1						
Z-Score	0.3881**	1					
CAR	-0.2759*	-0.0126	1				
LIQ	-0.2032	-0.3399**	0.1956	1			
CR	-0.1658	-0.2839*	0.5171*	0.4968**	1		
GDP	0.3365**	0.0093	-0.0651	-0.0275	-0.0061	1	
INF	0.1731	-0.0186	-0.0808	0.0315	0.0715	0.8456**	1

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Table 4 shows the correlation between all variables used in this study (ROA, Z-Score, CAR, LIQ, CR, GDP, and INF). The highest correlation value is between the inflation rate and GDP growth rate, 0.8456, which is significant at a 5% significance level. This means that the changes in the inflation rate positively and strongly correlate with the changes in GDP. The second highest correlation value is between credit risk ratio and capital adequacy ratio, 0.5171. The higher CAR means that a bank is more

likely to be resilient to unexpected losses or a financial downturn and, at the same time, more exposed to credit risk. ROA and Z-score show positive and significant correlations (at a 5% significance level) between each other, at 0.3881. This means that the more profit that banks earn, the more stable Islamic banks are in Malaysia.

On the contrary, it is observed that the lowest correlation value is between Z-score and CAR, -0.0126, which are negatively correlated. A higher CAR indicates that the bank can meet its obligations well but does not guarantee stability.

4.3   Panel Data Regression Analysis

Panel data analysis was applied to fulfill the objective of this research. Three-panel data tests were performed in this study: the Pooled Ordinary Least Square (OLS), Random Effect Model, and Fixed Effect Model. The best model was determined using the LM Test and Hausman Test. Using STATA software, the results for panel data analysis were obtained.

Model 1: Profitability Model

The outcome of panel data regression analysis with Return on Asset (ROA) as the dependent variable is displayed in Table 5. The independent variables were capital adequacy ratio, liquidity ratio, credit risk, Z-score, gross domestic product (GDP), and inflation rate.

Breusch and Pagan Lagrangian Multiplier Test (LM Test) was conducted to determine the most appropriate model between the pooled OLS and random effect models. Since the p-value of the LM Test is 0.0104, the null hypothesis was rejected because the p-value is less than 0.05. Therefore, the random effect is chosen as the most appropriate model for the profitability model.

Next, the study conducted a Fixed-effect model and tested the suitable model against the Random-effect model using the Hausman test. Since the p-value (0.0000) of

the Hausman test is less than a 5% significance level, we reject the null hypothesis. Therefore, Fixed effect is preferred as the best model for this analysis.

Table 5: Panel Data Regression Estimation of ROA Model

	Pooled OLS	**Random Effect**	**Fixed Effect**
Constant	-0.433	-2.0973*	-21.4207**
(p-value)	(0.345)	(0.034)	(0.000)
CAR	-0.0726*	-0.0623	-0.8618**
(p-value)	(0.004)	(0.202)	(0.000)
LIQ	-0.0033	0.0031	-0.0004
(p-value)	(0.594)	(0.705)	(0.914)
CR	0.0615	-0.0854	0.0198
(p-value)	(0.153)	(0.065)	(0.389)
Z-score	0.4189**	0.8701**	7.6820**
(p-value)	(0.000)	(0.002)	(0.000)
GDP	0.0499**	0.0406**	0.0058
(p-value)	(0.001)	(0.000)	(0.266)
INF	-0.0955*	-0.0624	-0.0214
(p-value)	(0.028)	(0.056)	(0.154)
R-Squared	0.3853	0.28	0.2233
F-statistics	6.58	46.02	81.16
(p-value)	(0.000)	(0.000)	(0.000)
Observations	70	70	70
LM Test	p-value = 0.0104 OLS vs RE		
Hausman Test	-	p-value = 0.000 RE vs FE	
Multicollinearity	-	-	2.20
Autocorrelation (p-value)	-	-	0.028 (0.8693)
Heteroscedasticity (p-value)	-	-	7.30E+06 (0.0000)**

*.Significant at the 0.05 level (2-tailed).
**. Significant at the 0.01 level (2-tailed).

Based on the result of the fixed effect model, the capital adequacy ratio has a negative relationship with ROA and is statistically significant at a 1% level, while Z-score has a positive relationship with ROA and is significant at a 1% level. The value of R-squared is 0.2233, which indicates that 22.33% of the dependent variable was explained by the independent variables. The F-statistics is used to determine whether any of the model's coefficients varies from zero. Since the p-value is less than 0.05, which is 0.000, the fixed effect model is acceptable.

A diagnostic check was performed on the best-chosen model, which is the fixed-effect model. Three tests were carried out: multicollinearity, autocorrelation, and heteroscedasticity. The multicollinearity test is conducted to measure the correlation between two or more independent variables using the VIF Test. The mean value of VIF for the ROA model is 2.20, which is less than 10, indicating no multicollinearity issue in this model. For the autocorrelation test, the p-value is more than 5% significance level, which is 0.8693; we fail to reject the null hypothesis. Therefore, there is no first-order autocorrelation problem in this data. For the heteroscedasticity test, the p-value is less than a 5% significant level, which is 0.000; we reject the null hypothesis. Therefore, the fixed-effect model suffered from heteroscedasticity. Since the fixed-effect model suffered from heteroscedasticity, generalised least square (GLS) was employed to solve the problem, including heteroscedasticity. As a result, this model has no autocorrelation and is free from heteroscedasticity.

Model 2: Stability Model

The outcome of panel data regression analysis with Z-score as the dependent variable is displayed in Table 6. The independent variables were capital adequacy ratio, liquidity ratio, ROA, gross domestic product (GDP), and inflation rate.

Table 6: Panel Data Regression Estimation of Z-score Model

	Pooled OLS	**Random Effect**	**Fixed Effect**
Constant (p-value)	3.4095** (0.000)	2.8128** (0.000)	2.8103** (0.000)
CAR (p-value)	0.0319 (0.165)	0.1101** (0.000)	0.1104** (0.000)
LIQ (p-value)	-0.0151** (0.010)	-0.0001 (0.761)	-0.0001 (0.795)
ROA (p-value)	0.4183** (0.001)	0.1151** (0.000)	0.1149** (0.000)
GDP (p-value)	-0.0187 (0.237)	0.0001 (0.892)	0.0001 (0.867)
INF (p-value)	0.0320 (0.480)	0.0009 (0.622)	0.0009 (0.611)
R-Squared	0.2614	0.0058	0.0057
F-statistics (p-value)	4.53 (0.0013)	1911.18 (0.0000)	421.60 (0.0000)
Observations	70	70	70
LM Test	p-value = 0.000 OLS vs RE		-
Hausman Test	-	p-value = 0.0352 RE vs FE	
Multicollinearity	-	-	2.28
Autocorrelation (p-value)	-	-	0.134 (0.7206)
Heteroscedasticity (p-value)	-	-	1.30E+05 (0.0000)**

*. Significant at the 0.05 level (2-tailed).
**. Significant at the 0.01 level (2-tailed).

Breusch and Pagan Lagrangian Multiplier Test (LM Test) was conducted to determine the most appropriate model between the pooled OLS and random effect models. Since the p-value of the LM Test is 0.000, the null hypothesis was rejected because the p-value is less than 0.05. Therefore, the random effect is chosen as the most appropriate model for the stability model.

Next, the study conducted a Fixed-effect model and tested the suitable model against the Random-effect model using the Hausman test. The p-value (0.0352) of the Hausman test is less than a 5% significance level; hence, we reject the null hypothesis. Therefore, Fixed effect is preferred as the best model for this analysis.

Based on the result of the fixed effect model, ROA, and capital adequacy ratio are positive and significant at a 1% significance level. The remaining independent variables were not significant at a 1% or 5% significance level. The R-square value of the fixed effect model is 0.0057, which means that the independent variables were able to explain 0.57% of the Z-score model. The F-statistics value of 421.60 is statistically significant at a 1% level, indicating the good fit of the model. A diagnostic check was performed on the best-chosen model, which is the fixed-effect model. Three tests were carried out: the multicollinearity, autocorrelation, and heteroscedasticity tests. The multicollinearity test shows a mean VIF value of 2.28, which is less than 10, a good indication that there is no multicollinearity problem. For the autocorrelation test, the p-value is more than 5% significance level, which is 0.7206; we fail to reject the null hypothesis. Therefore, there is no first-order autocorrelation problem in this data. For the heteroscedasticity test, the p-value is less than a 5% significance level, which is 0.000; we reject the null hypothesis. Therefore, the fixed-effect model suffered from heteroscedasticity.

The generalised least square (GLS) approach was used to correct the fixed-effect model that suffered from heteroscedasticity. After conducting the GLS estimation, we found that this model has no autocorrelation and is free from heteroscedasticity.

4.4   Discussion of the results

Table 7 summarises the findings from the panel data regression of Malaysia's Islamic banks' profitability and financial stability for the period 2018 to 2022 respectively. The summary result of the Fixed-effect model for ROA and Z-score is displayed in Table 7. The most appropriate model for both is the fixed-effect model, which is corrected for heteroscedasticity problems using GLS. Based on Table 7, the CAR is negatively significant at a 1% level towards the profitability of Islamic banks, with a coefficient of -0.0726. This indicates that increasing the CAR would decrease the profitability of Islamic banks, as it means that a bank has more money set aside to deal with potential risks, especially those related to financing activities. However, this money may not be used for other profitable businesses like investments, potentially reducing profitability. Islamic banks prioritise having the minimum capital needed to comply with regulations over employing all available capital to increase profits. This may result in a more cautious approach to risk, reducing the potential profits of Islamic banks, particularly in Malaysia. This study aligns with previous studies by Supiyadi (2021) and Tirmizi et al. (2021) but contrasts with a study by Hamid et al. (2017), which found a positive relationship between capital adequacy and the performance of Indonesian Islamic banks.

Table 7: Estimation Results of Fixed Effect (GLS) Model

Independent Variables	ROA	Z-Score
Constant (p-value)	-0.433 (0.316)	3.4095** (0.000)
ROA (p-value)	-	0.4183** (0.000)
CAR (p-value)	-0.0726** (0.002)	0.0319 (0.142)
LIQ (p-value)	-0.0033 (0.573)	-0.0151** (0.006)
CR (p-value)	0.0615 (0.127)	-
Z-score (p-value)	0.4189** (0.000)	-
GDP (p-value)	0.0499** (0.000)	-0.0187 (0.212)
INF (p-value)	-0.0955 (0.018)	0.032 (0.458)
F-test (p-value)	43.88 (0.000)	24.78 (0.0002)

*. Significant at the 0.05 level (2-tailed).
**. Significant at the 0.01 level (2-tailed).

The Z-score, which is positively and strongly significant with the ROA at a 1% significance level, indicates that a 1 unit increase in Z-score would increase the profitability of Islamic banks by 0.4189%. A positive Z-score indicates that banks with stable financial positions tend to generate profits as they can survive during economic downturns and are attractive to investors and depositors. This study aligns with previous studies by Alharthi (2016), Nugrohowati et al. (2022), Santoso et al. (2016), and Supiyadi (2021), which found that stability has a positive effect on the profitability of Islamic banks.

The GDP growth rate also shows a positive and significant (at 1% level) impact on the profitability of Islamic banks in Malaysia. This is because the changes in GDP growth rate are related to notable fluctuations in Islamic banks' profitability Economic expansion often encourages investment to Islamic banks by participating in profit-sharing-based financing programs such as Musharakah and Mudarabah. An increase in the GDP growth rate may boost an investor's trust in the country's economic sustainability, particularly in Malaysia, which could result in more money being invested in the financial products provided by Islamic banks, improving their profitability. This study aligns with Ali et al. (2018), Hassan and Bashir (2005), and Wasiuzzaman and Tarmizi (2010), but it is inconsistent with Rashid and Jabeen (2016), who discovered that GDP had a negative relationship with bank performance.

Next, this paper discusses the summary result of the fixed-effect model for the Z-score, which is displayed in Table 7. The results show that the liquidity ratio has a negative and significant effect on the stability of Islamic banks in Malaysia. A 1% increase in liquidity ratio decreases the stability of Islamic banks by 1.51 units of Z-score. Although a high liquidity ratio indicates that banks can handle unpredictable cash demands and short-term obligations, it can negatively affect the stability of Islamic banks. When banks keep more liquid assets such as cash, earnings are reduced, and their financial stability is affected in the long term. The result of this study is in line with the study of Hassan et al. (2019). Nevertheless, this result is in contrast with Anjom and Faruq (2023).

The return on asset (ROA) is another determinant that influences the stability of Islamic banks in Malaysia. ROA has a significant positive impact on the stability of Islamic banks, with a coefficient of 0.4183. A high ROA indicates that banks generate more profit from their assets, sustaining stability. This stability is crucial for banks to endure operational difficulties, financial market changes, and economic shocks. Strong risk management strategies are often linked to increased profitability, and Islamic banks with a positive ROA are likely to control credit and operational risks effectively. This study aligns with previous studies by Alharthi (2017), Supiyadi (2021), and Wahid and Dar (2016), but it is inconsistent with Ashraf et al. (2016) finding that profitability has a negative and significant relationship with the stability of Islamic banks.

5.0   Conclusion and Future Research

The study examines the factors influencing Islamic bank profitability and stability in Malaysia from 2018 to 2022. The results show that Capital Adequacy Ratio (CAR), Z-score, and GDP growth rate significantly impact profitability. At the same time, liquidity ratio and ROA substantially impact Islamic banks' stability. The study suggests that: (1) A high CAR can decrease the profitability of Islamic banks since the capital reserve safeguards against potential risks instead of being used for profitable ventures. This could result in a cautious approach to risk, potentially reducing profits. (2) The positive Z-Score indicates that a stable bank is likely to produce higher profits, withstand economic downturns, and appeal to investors and depositors. The balance between stability and profitability is crucial for financial system sustainability, as seen in Islamic banks in Malaysia. (3) The GDP growth rate positively impacts Islamic banks' profitability, as economic expansion encourages investment. (4) A high liquidity ratio might harm Islamic banks' stability by decreasing profitability and impacting their long-term financial stability due to excess liquid assets. (5) A higher ROA will enhance the stability of Islamic banks by guaranteeing steady earnings, hence minimising the long-term risk of bankruptcy. In conclusion, the study highlights the importance of maintaining a balance between profitability and stability for Islamic banks in Malaysia.

The study is limited to 14 Islamic banks in Malaysia and a short study period of 5 years. Future research could explore the differences between determinants of profitability and stability in Islamic and conventional banks, as well as the interconnection between promoting sustainable development goals (SDGs), bank profitability, and financial stability. The study provides valuable insights into understanding the factors that influence the profitability and stability of Islamic banks, which can inform better operational strategies for these institutions.

References

Abduh, M., & Idrees, Y. (2013). Determinants of Islamic banking profitability in Malaysia. *Australian Journal of Basic and Applied Sciences*, 204-210.

Alfiyan, M., Wahyudi, R., Maimunah, M. B. A., & Riduwan, R. (2023). Financial stability in Indonesian Islamic banking using Z-Score: Before and during Covid-19. *Al-Uqud: Journal of Islamic Economics, 7*(1), 17–32. https://doi.org/10.26740/aluqud.v7n1.p17-32

Alharthi, B. (2016). The determinants of efficiency, profitability and stability in the Banking Sector: A Comparative Study of Islamic, Conventional and Socially Responsible. University of Plymouth. https://doi.org/10.24382/3470

Alharthi, M. (2017). Financial performance and stability in Islamic banks: Evidence from GCC countries. *Corporate Ownership and Control, 14*(4), 103–113. https://doi.org/10.22495/cocv14i4art9

Ali, Q., Maamor, S., Yaacob, H., & Tariq Gill, M. U. (2018). Impact of macroeconomic variables on Islamic banks profitability. *International Journal of Business Ethics and Governance, 1*(2), 20–35. https://doi.org/10.51325/ijbeg.v1i2.14

Altman, E. (1968). Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *Journal of Finance. 23*, 589-609. https://doi:10.1111/j.1540-6261.1968.tb00843.x

Anjom, W., & Faruq, A. T. M. O. (2023). Financial stability analysis of Islamic banks in Bangladesh. *European Journal of Business and Management Research, 8*(3), 320–326. https://doi.org/10.24018/ejbmr.2023.8.3.1953

Arshad, N. C. (2017). Displaced commercial risk in islamic banking institutions in Malaysia. Doctoral dissertation, University of Malaya (Malaysia).

Ashraf, D., Rizwan, M. S., & L'Huillier, B. (2016). A net stable funding ratio for Islamic banks and its impact on financial stability: An international investigation. *Journal of Financial Stability, 25*, 47–57. https://doi.org/10.1016/j.jfs.2016.06.010

Chowdhury, A. M. H., Chowdhury, A. S. M. M. H., Mainuddin, M., Rahman, M. L., & Siddiqua, A. (2017). Impact of Internal Factors on the Profitability of Banks: A Case of Commercial Banks in Bangladesh. *Asian Business Review*, *7*(1), 7-14.

Daoud, Y., & Kammoun, A. (2020). Financial stability and bank capital: the case of Islamic banks. *International Journal of Economics and Financial Issues, 10*(5), 361–369. https://doi.org/10.32479/ijefi.10147

Department of Statistics Malaysia. (2023). GDP and GNI at Constant Prices,1970-2020, Malaysia. https://www.dosm.gov.my/portal-main/time-series

Department of Statistics Malaysia. (2023). Consumer Price Index (2000=100) by Main Groups (CHGS), 1980-2005, Malaysia. https://www.dosm.gov.my/portal-main/searching-time-series?kategori=4

Fazam, N. T., Abd Samad, N., Mohd, W. N. I. W., Zawawi, W. A. W. M. T., Syafiyyah, W. N., & Asma'Hairul Anuar, A. I. Z. (2021). The performance of Islamic banking in Malaysia. *International Journal of Academic Research in Business and Social Sciences, 11*(11). https://doi.org/10.6007/ijarbss/v11-i11/10900

Gani, I. M. & Bahari, Z. (2021). Islamic banking's contribution to the Malaysian real economy. *ISRA International Journal of Islamic Finance, 13*(1), 6-25. https://doi.org/10.1108/IJIF-01-2019-0004

Hamid, A., Majid, M. S. A, & Khairunnisah, L. (2017). An empirical re-examination of the Islamic banking performance in Indonesia. *International Journal of Academic Research in Economics and Management Sciences, 6*(2). https://doi.org/10.6007/ijarems/v6-i2/3022

Hassan, M. K., & Bashir, A.-H. M. (2005). *Determinants of Islamic Banking Profitability. In Iqbal, M., & Wilson, R. (editors) Islamic Perspectives on Wealth Creation.* Edinburgh University Press, 118–140. https://doi.org/10.3366/edinburgh/9780748621002.003.0008

Hassan, M. K., Khan, A., & Paltrinieri, A. (2019). Liquidity risk, credit risk, and stability in Islamic and conventional banks. *Research in International Business and Finance, 48*, 17–31. https://doi.org/10.1016/j.ribaf.2018.10.006

Idris, A. R., Asari, F. F. A. H., Taufik, N. A. A., Salim, N. J., Mustaffa, R., & Jusoff, K. (2011). Determinant of Islamic banking institutions' profitability in Malaysia. *World Applied Sciences Journal, 12*, 01-07.

Iqbal, Z., & Mirakhor, A. (2011). An introduction to Islamic finance: Theory and practice (Vol. 687). John Wiley & Sons.

Joudar, F., Msatfa, Z., Metwalli, O., Mouabid, M., & Dinar, B. (2023). Islamic financial stability factors: An econometric evidence. *Economies*, *11*(3), 79.

Masood, O., & Ashraf, M. (2012). Bank-specific and macroeconomic profitability determinants of Islamic banks: The case of different countries. *Qualitative Research in Financial Markets*, *4*(2/3), 255-268. https://doi.org/10.1108/17554171211252565

Mohamad, M. T., Sulaiman, A. A., Hamimah, K., & Muslim, N. (2019). The determinants of bank profitability: how Malaysian Islamic banks response to the financing risk. *Advances in Social Sciences Research Journal, 6*(12), 1–15. https://doi.org/10.14738/assrj.612.7471

Muhammad, N. F. (2022). Malaysia Islamic Bank financial stability: A comparative analysis before and during Covid-19. Masters thesis, University Utara Malaysia.

Nugrohowati, R. N. I., Ahmad, M. H. S., & Fakhrunnas, F. (2022). Investigating the determinants of Islamic bank's profitability: a cross-countries analysis. *Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi Dan Pembangunan, 23*(2), 254–268. https://doi.org/10.23917/jep.v23i2.20409

Ozil, P. K. (2023). Sustainable development goals and bank profitability: International evidence. *Modern Finance, 1*(1), 70-92. https://doi.org/10.61351/mf.v1i1.44

Ozil, P. K., & Iorember, P. T. (2023). Financial stability and sustainable development. *International Journal of Finance & Economics*, 1-27. https://doi.org/10.1002/ijfe.2803

Rahim, S. R. M., Hassan, N. M., & Zakaria, R. H. (2012). Islamic Vs. conventional bank stability: a case study of Malaysia. *Prosiding Persidangan Kebangsaan Ekonomi Malaysia Ke VII*, 840.

Rashid, A., & Jabeen, S. (2016). Analysing performance determinants: Conventional versus Islamic Banks in Pakistan. *Borsa Istanbul Review, 16*(2), 92–107. https://doi.org/10.1016/j.bir.2016.03.002

Samail, N. A. B., Zaidi, N. S. B., Mohamed, A. S. B., & Kamaruzaman, M. B. (2018). Determinants of financial performance of Islamic banking in Malaysia. *International Journal of Academic Research in Accounting, 8*(4), 21–29. https://doi.org/10.6007/IJARAFMS

Santoso, T., Rum, I., & Patria, K. Z. (2016). Islamic and conventional banks stability: a comparative analysis. *In International Conference, Integrated Microfinance Management for Sustainable Community Development* (IMM 2016). Atlantis Press. https://doi.org/10.2991/imm-16.2016.2

Shukhur, N. A., Hussain, A., & Affandi, S. (2015). The internal determinants of Islamic banks' profitability in Malaysia. *Journal of Basic and Applied Scientific Research, 5*(7), 17-21.

Sobol, I., Dopierała, Ł., & Wysiński, P. (2023). Is the profitability of Islamic and conventional banks driven by the same factors? A study of banking in the Middle East. *PLoS one, 18*(8), e0289264. https://doi.org/10.1371/journal.pone.0289264

Supiyadi, D. (2021). The determinant of Islamic bank profitability and stability in Indonesia periods 2010-2017. *Advances in Economics, Business and Management Research, 187*, 16-21. https://doi.org/10.2991/aebmr.k.210831.004

Tirmizi, S. M. A., Ghazi, M. R. S. K., Hussain, S., & Shah, S. M. H. (2021). The return on assets and profitability growth of Islamic banks. *International Journal of Innovation, Creativity and Change, 15*(08), 681-702.

Ullah, S., Hussain, S. I., Nabi, A. A., & Mubashir, K. A. (2022). Role of regulatory governance in Financial stability: A comparison of high and low income countries. *Journal of Central Banking Theory and Practice*, *11*(1), 207-226. https://doi.org/10.2478/jcbtp-2022-0009

Wahid, M. A., & Dar, H. (2016). Stability of Islamic versus conventional banks: a Malaysian case. *Jurnal Ekonomi Malaysia, 50*(1). https://doi.org/10.17576/jem-2016-5001-09

Wasiuzzaman, S., & Tarmizi, H. A. B. A. (2010). Profitability of Islamic banks in Malaysia: an empirical analysis. *Journal of Islamic Economics, Banking and Finance, 6*(4), 53-68.

Widarjono, A. (2020). Stability of Islamic banks in Indonesia: autoregressive distributed lag approach. *Jurnal Keuangan Dan Perbankan, 24*(1), 40-52. https://doi.org/10.26905/jkdp.v24i1.3932