Stressed but Stable? Examining Risk, Investment, and Geopolitical Tensions in Islamic Bank Stability: Evidence from QISMUT+3

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***Abstract*—This study aims to examine the influence of credit risk (Non-Performing Financing), financial risk (Debt to Equity Ratio), investment (Capital Expenditure), and Geopolitical Risk on the stability of Islamic banks. This study utilizes static panel data from 22 Islamic banks spread across nine QISMUT+3 countries during the period 2016–2024. The analysis was conducted using panel regression with Random Effect as the main model. Robustness tests were conducted through Fixed Effect and Pooled OLS models. The results indicate that Capex and Geopolitical Risk are significant in the main model, but only Capex remains consistently significant across all robustness models, confirming the strategic role of productive investment in the long-term stability of Islamic banks. DER is found to be insignificant, while NPF and GPR do not show consistent effects, reflecting the unique risk structure and financing management of Islamic banking. This study offers the first comprehensive approach combining internal and external determinants in the context of cross-country Islamic bank stability within the strongest global representation of Islamic finance. These findings hold high significance for developing regulatory strategies and providing evidence-based insights relevant to Islamic banking regulators in Indonesia for formulating risk mitigation policies and strengthening the resilience of Islamic banks.**

***Keywords*—Islamic bank stability, capital expenditure, credit risk, financial risk, geopolitical risk**

I. Introduction

The stability of the Islamic banking sector is a critical component of an inclusive and robust financial system, particularly in countries with significant Muslim populations (Abedifar *et al*., 2016; Daoud & Kammoun, 2024). Empirical studies demonstrate that Islamic banks contribute to financial and economic stability through higher asset quality, stronger capitalization, and greater resilience during crises (Aun *et al*., 2019; Beck *et al*., 2013; Parsa, 2020). The prohibition of riba, gharar, and maysir, in conjunction with the emphasis on risk-sharing and asset-backed financing, has been demonstrated to offer a safeguard against interest rate shocks and speculative risks (Al-wesabi & Yusof, 2020; Masvood, 2019). On a global scale, Islamic financial assets amounted to USD 4.93 trillion in 2023 and are projected to reach USD 7.53 trillion by 2028, exhibiting an 8.9% Compound Annual Growth Rate (CAGR) (DinarStandard, 2024). This rapid expansion positions Islamic finance as a systemic component of the global financial architecture, underscoring the need to safeguard banking stability as the industry scales.

The QISMUT+3 countries, namely Qatar, Indonesia, Saudi Arabia, Malaysia, Turkey, the United Arab Emirates (UAE), Kuwait, Bahrain, and Pakistan, account for 93% of global Islamic banking assets and have been identified as top performers in the Global Islamic Economy Indicator (Probohudono *et al*., 2025; Serkbayeva *et al*., 2024). As global hubs of Islamic finance, they exhibit diverse regulatory capacities, economic structures, and geopolitical exposures, rendering them an appropriate setting to study cross-country stability dynamics. However, the escalating geopolitical tensions, the ongoing deglobalization process, and the prevailing economic volatility are collectively exerting mounting pressures on the financial sector's stability and the economic integration within the OIC (DinarStandard, 2024).

The Z-Score is a well-established metric for insolvency risk (Al-wesabi & Yusof, 2020; Ghassan & Fachin, 2016) that captures profitability, capital strength, and income volatility. This study adopts the Z-Score to assess Islamic bank stability. The following four key determinants are analyzed: The following financial indicators are of particular relevance in the context of financial analysis: Non-Performing Financing (NPF), Capital Expenditure (CAPEX), Debt-to-Equity Ratio (DER), and the Geopolitical Risk Index (GPR). NPF measures credit risk and asset quality, CAPEX reflects long-term investment decisions, DER captures financing structure, and GPR represents external systemic pressures affecting liquidity, capital flows, and macroeconomic stability (see Al-manaseer, 2024; Behn *et al*., 2025; Ćurak *et al*., 2013; Oino, 2021).

Accordingly, this study as a follow-up to the urgency of maintaining the stability of Islamic banking amid rapid growth and increasingly complex global risk pressures, this study aims to empirically analyze the influence of Non-Performing Financing (NPF), Capital Expenditure (CAPEX), Debt-to-Equity Ratio (DER), and Geopolitical Risk Index (GPR) on the stability of Islamic banks measured using Z-Score in QISMUT+3 countries. Theoretically, this study contributes by integrating micro dimensions (credit risk and financing structure) and macro dimensions (geopolitical pressures) into a comprehensive model to measure Islamic bank stability. Practically, the findings are expected to serve as a basis for data-driven policy recommendations for relevant authorities, such as the Ministry of Finance, in designing strategies to mitigate systemic risks and enhance the competitiveness of national Islamic banks amid the ongoing global dynamics.

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II. Materials and Methods

This study uses a quantitative approach with panel data regression using STATA 17 to analyze the influence of internal and external factors on the stability of Islamic banks in QISMUT+3 countries, which include Qatar, Indonesia, Saudi Arabia, Malaysia, the United Arab Emirates, Turkey, Bahrain, Kuwait, and Pakistan. This study is similar to Mirza *et al*. (2025), which also examined bank stability and customer exposure; however, our measurement of banking performance will differ slightly. Bank stability is measured using Z-Score, with independent variables including credit risk (Non-Performing Financing), financial risk (Debt to Equity Ratio), capital expenditure (Capital Expenditure), and the global geopolitical risk index (Geopolitical Risk Index/GPR). The population in this study is all Islamic banks operating in QISMUT+3 countries, with a sample of 22 Islamic banks selected based on data availability during the observation period. The observation period spans from 2016 to 2024, resulting in 198 panel observations (22 banks × 9 years).

Table 1. Variable, sources, and measurement

Variable	Measurement	Identifier	Sources
Bank Stability	ROA+EQTA/STDEV.ROA	Z-Score	Bloomberg Database
Credit Risk	Non-Performing Financing	NPF	Bloomberg Database
Financial Risk	Debt-to-Equity Ratio	DER	Bloomberg Database
Investment	Capital Expenditure	Capex	Bloomberg Database
Geopolitical Risk	Geopolitical Risk Index	GPR	https://www.matteoiacoviello.com/gpr.htm

Source: Author's compilation, 2025.

This study uses Z-Score as the primary proxy for measuring bank financial stability because this indicator has been widely used in international literature as a measure of bank bankruptcy probability, where higher values indicate stronger stability (Aliyu *et al*., 2023; Çelik, 2024; Ozili & Iorember, 2024). The use of the Z-Score is considered superior to single indicators such as Return on Assets or Net Interest Margin because it can capture systemic extreme risks and provide a comprehensive representation of a bank's financial resilience. To analyze the determinants of the Z-Score, this study selectively chose three main variables, namely Non-Performing Financing (NPF), Debt to Equity Ratio (DER), Capital Expenditure (CAPEX), and Geopolitical Risk Index (GPR), which were adopted from the studies by Mirza *et al*. (2025) and Reivan-Ortiz *et al*. (2023).

NPF reflects asset quality and credit risk, which directly affect ROA volatility and, ultimately, reduce bank stability (Kalkan, 2024). High NPF levels indicate poor asset quality, which can lead to increased credit risk and potential financial instability (Hernawati *et al*., 2021). Banks with better asset quality management tend to show higher ROA and overall financial performance (Barakat *et al*., 2024). Meanwhile, DER plays an important role as a leverage indicator that reflects the capital structure and the bank's dependence on external funds, which is important in the framework of long-term risk management.

The debt-to-equity ratio measures the proportion of debt used by a bank compared to its own capital in conducting operations. This ratio is highly relevant in assessing financial risk because the higher the debt-to-equity ratio, the greater the potential for a bank to experience liquidity and solvency pressures, which can ultimately negatively impact its financial stability (Tran *et al*., 2016). Capital expenditure is used as a proxy for a bank's long-term strategic investment behavior. Appropriate investments can improve efficiency and financial resilience, but disproportionate capital expenditure risks reducing capital buffers and increasing instability (Bae *et al*., 2022; Choi *et al*., 2020). Capital expenditure is adopted as a proxy for investment because it reflects banks' long-term strategic spending decisions aimed at enhancing operational capacity, technology, and infrastructure. Compared to other proxies, capital expenditure provides a more specific and observable measure of real investment for banks, which has the potential to influence financial stability.

Finally, geopolitical risk is used to capture external impacts in the form of political uncertainty and global conflicts that cause an increase in non-performing loans and a decrease in banking Z-Scores and have been proven to significantly disrupt financial sector stability (Trinh & Tran, 2024). These four variables were selected because they reflect complementary internal and external dimensions and have been proven theoretically and empirically to influence banking system stability. Therefore, the basic research model is formulated in the following equation.

$$Zit = \alpha + \beta 1 \cdot NPFit + \beta 2 \cdot DERit + \beta 3 \cdot Capexit + \beta 4 \cdot GPRit + \varepsilon i \quad (1)$$

In the equation above, Zit is the Z-score that measures the stability of bank i in year t. NPFit, DERit, Capexit, and GPRit are independent variables for bank i in year t. In addition, εit is the error term value. The analysis technique used is static panel data regression, which includes three main approaches, namely Pooled Ordinary Least Squares (POLS), Fixed Effect Model (FE), and Random Effect Model (RE). This analysis technique was adopted based on research by Mirza *et al*., (2025), who also studied bank stability in BRICS countries. The best model is selected through a series of tests, including the Chow Test (to choose between POLS and FEM), the Hausman Test (to choose between FE and RE), and the Breusch-Pagan Lagrange Multiplier Test (to choose between POLS and RE). To ensure the reliability of the model, a robustness test was also conducted by comparing the estimation results of the three models to examine the consistency of the direction and significance of the coefficients. Robust standard errors were also applied to address potential heteroscedasticity and autocorrelation.

III. Result and Discussion

Multicollinearity testing is a method of ensuring that independent variables are not excessively correlated, which could inflate coefficient variance and reduce the reliability of regression estimates (Schreiber-Gregory, 2018). The results demonstrate that the VIF values for NPF (1.74), DER (1.43), Capex (1.22), and GPR (1.06) are all well below the threshold

of 10 (Gujarati & Porter, 2009), with an average VIF of 1.36. The findings, bolstered by relatively elevated 1/VIF values, suggest the absence of multicollinearity concerns. Consequently, the regression model is deemed to be free from multicollinearity, and the coefficients can be regarded as stable and interpretable. The findings corroborate the model specification and affirm that no variable removal or additional data transformation is required.

Table 2. Result of baseline regression

Variable	(1) POLS			(2) FE			(3) RE		
	std. err.	t	P>|t|	std. err.	t	P>|t|	std. err.	z	P>|z|
NPF	14.818	–2.79	0.006	17.992	–1.10	0.274	16.628	–1.46	0.144
DER	6.020	–1.84	0.068	4.44	0.19	0.847	4.360	–0.06	0.954
Capex	6.758	–10.64	0,000	9.02	–6.37	0.000	8.678	–7.49	0.000
GPR	1.850	2.10	0.037	1.10	3.72	0.000	1.090	3.69	0.000
cons	3.280	1.61	0.109	1.98	2.05	0.042	3.610	1.13	0.260
R-Squared		0.4141			0.3974			0.4021	
Prob > F		0,0000			0,0000			0,0000	
Hausman Fe Re								0.4135	
Lagrangian Multiplier (Pols Re)								0,0000	

Source: Data processed by STATA 17, 2025.

The Random Effects (RE) model was selected as the most appropriate model after extensive regression diagnostics, including the Hausman and Lagrange Multiplier (LM) tests. The Hausman test, a statistical procedure employed to ascertain the relative suitability of Fixed-Effects (FE) and Random-Effects (RE) models, yielded a probability value of 0.4135 (>0.05). This outcome suggests that there is an absence of a substantial correlation between individual effects and the independent variables. In such conditions, the RE model exhibits enhanced efficiency (Guggenberger, 2010; Lalon *et al*., 2025).

The LM test was subsequently employed to compare the RE model with the POLS model. The LM probability value of 0.0000 (< 0.05) confirms that individual effects are significant and that the RE model outperforms POLS (Baltagi *et al*., 2003; Breitung *et al*., 2016). Accordingly, the RE model was selected as the primary estimation approach, as it more effectively captures cross-bank and time-varying effects when assessing the impact of NPF, DER, Capex, and GPR on bank financial stability (Z-Score).

Table 3. Regression analysis best model (RE)

Z-Score	Coefficient	Std. err.	z	P>|z|	[95% conf. interval]		Description
NPF	–24.29381	16.6275	–1.46	0.144	–56.88311	8.295491	Not Significant
DER	–2.54E+09	4.36E+10	–0.06	0.954	–8.80E+10	8.30E+10	Not Significant
Capex	–61.2048	8.167702	–7.49	0.000	–77.2132	–45.1964	Significant
GPR	4.03E+11	1.09E+11	3.69	0.000	1.89E+11	6.16E+11	Significant
_cons	4.07E+13	3.61E+13	1.13	0.260	–3.01E+13	1.11E+14	
rho			0.68564589				
R-Squared			0.4021				
Prob > chi2			0.0000				
Wald chi2(4)			78.29				

Source: Data processed by STATA 17, 2025. Statistical significance P>|z <0.05.

As demonstrated in Table 3, the random effect model indicates that Capital Expenditure (CAPEX) and Geopolitical Risk (GPR) exert a statistically significant influence on the stability of Islamic banks. Conversely, Non-Performing Financing (NPF) and Debt-to-Equity Ratio (DER) demonstrate an absence of quantifiable impact. CAPEX demonstrates a negative and significant coefficient (−61.2048, $p = 0.000$), suggesting that augmented capital expenditure has a tendency to diminish bank stability. This outcome is indicative of the inherent nature of CAPEX as a long-term investment, which is not necessarily designed to generate immediate returns and can, at times, result in temporary financial strain. Excessive or inadequately managed capital expenditures (CAPEX) have the potential to compromise efficiency, escalate operational expenditures, and augment vulnerability to financial risks. This assertion is in alignment with the findings of Danarsari *et al*. (2018). Nonetheless, Capital Expenditures (CAPEX) allocated toward technological transformation have the potential to function as a strategic stabilizing force. Mirza *et al*. (2025) emphasize that digital investments enhance risk management, reduce Nonperforming Loans (NPLs), and increase risk-adjusted profitability, suggesting that the impact of Capital Expenditure (CAPEX) is contingent on the quality and orientation of investment decisions.

The findings indicate a positive and significant effect of geopolitical risk on Islamic banks' stability, with a magnitude of 4.03E+11 and a p-value less than 0.01. This suggests that Islamic banks enhance their stability in the face of rising geopolitical tensions. This counterintuitive result can be explained by the conservative and asset-based structure of Islamic finance, which reduces speculative exposure and promotes higher prudence during periods of uncertainty (Masvood, 2019; Parsa, 2020). Islamic banks have demonstrated a consistent pattern of enhanced resilience during periods of economic downturns, as evidenced by their superior capitalization, the quality of their assets, and their strict adherence to Sharia-compliant risk-sharing principles (Al-wesabi & Yusof, 2020; Beck *et al*., 2013). Despite the findings of prior studies indicating that geopolitical tensions tend to erode financial stability (Trinh & Tran, 2024; Wang *et al*., 2025), the context of QISMUT+3 countries, defined by their substantial Muslim populations, high demand for Islamic financial products, and well-developed Sharia-compliant financial ecosystems, may potentially moderate the adverse effects of geopolitical shocks. The positive stability response observed in this study is likely attributable to structural factors, including consumer loyalty,

regulatory conservatism, and stronger real-sector linkages.

In this model, NPF and DER are statistically insignificant, indicating that variations in credit quality and leverage do not directly influence stability within the examined period. These findings contradict the extant literature, which has identified high NPLs and elevated leverage as factors that contribute to the erosion of bank stability (Alshehadeh *et al*., 2024; Fernández, 2020; Hernawati *et al*., 2021). The insignificance observed here may be indicative of effective risk mitigation practices, government support mechanisms, or the predominance of asset-backed financing structures in Islamic banks, which have been shown to cushion short-term volatility. This finding suggests that the stability of Islamic banks in QISMUT+3 countries may be more strongly influenced by macro-structural factors, such as geopolitical dynamics and long-term investment decisions, than by internal risk indicators alone.

The R-squared value of 0.4021 indicates that the model accounts for 40% of the variation in bank stability, thereby substantiating the efficacy of the RE approach. The findings underscore the notion that long-term capital allocation and geopolitical conditions, rather than conventional risk indicators like NPF and DER, play a pivotal role in shaping stability across Islamic banks in this region. This underscores the significance of strategic investment governance, adaptive risk management, and a resilient regulatory environment in maintaining financial stability under global uncertainty.

Table 4. Robustness test

Variable	(1) POLS			(2) FE			(3) RE		
	Robust std. err.	t	P>|t|	Robust std. err.	t	P>|t|	Robust std. err.	z	P>|z|
NPF	9.831	–4.21	0.000	5.377	–3.67	0.001	5.409	–4.49	0,000
DER	6.130	–1.80	0.086	8.740	0.98	0.336	8.980	–0.28	0.777
Capex	12.422	–5.79	0.000	9.920	–5.80	0,000	6.343	–9.65	0,000
GPR	2.150	1.81	0.085	2.220	1.84	0.081	2.200	1,83	0.068
cons	5.280	1.99	0.060	3.430	1.18	0.250	2.150	1.89	0.058
R-Squared		0.4141			0.3974			0.4021	
Prob > F		0,0000			0,0000			0,0000	

Source: Data processed by STATA 17, 2025.

The findings reveal that Capital Expenditure (CAPEX) is the most consistent and significant determinant of Islamic bank stability in the QISMUT+ region. Although it exerts a negative short-term effect on the Z-score due to investment burdens, Capex strategically enhances long-term resilience through technological modernization, risk management strengthening, and service expansion. In contrast, Non-Performing Financing (NPF), initially insignificant, becomes significant in the robustness test, underscoring its role as a key source of financial pressure. The Debt-to-Equity Ratio (DER) shows no significant effect, indicating that debt-based capital structure is less relevant in the context of Islamic banking, while Geopolitical Risk (GPR), though significant in baseline models, loses consistency under robustness testing, reflecting its contextual and policy-dependent nature. Overall, the study emphasizes the critical role of long-term investment planning and effective credit risk management as the primary drivers of Islamic bank resilience against external shocks.

IV. Conclusion

The findings of the panel regression analysis indicate that Capital Expenditure (CAPEX) emerges as the most consistent and robust predictor of Islamic bank stability. The negative short-term effect on the Z-score is indicative of temporary investment pressures rather than weakened fundamentals. It has been demonstrated that, over time, strategic Capital Expenditure (CAPEX), particularly in the domains of technology and risk management infrastructure, has the potential to fortify operational resilience and augment stability. Geopolitical Risk (GPR) displays a positive effect in the primary model but loses significance in robustness checks, indicating that its influence is context-dependent and shaped by risk-management capacity and macroeconomic conditions. Initially negligible, credit risk (NPF) becomes substantial in the robustness model, suggesting a latent effect moderated by the risk-sharing nature of Islamic financing contracts. Concurrently, the Debt-to-Equity Ratio (DER) maintains a consistently negligible value, thereby suggesting that leverage structure does not function as a primary catalyst for stability. The study underscores the pivotal function of strategic investment planning through CAPEX and the imperative to fortify financing risk management to bolster the resilience of Islamic banks, particularly in the face of external pressures such as geopolitical tensions. The findings contribute to the existing Islamic finance literature by offering empirical insights that are pertinent to the design of adaptive macroprudential policies that align with both global dynamics and the structural characteristics of Sharia-compliant financial systems.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

F conceptualized the study, developed the research framework, econometric modeling, and wrote the initial draft. AW was responsible for data collection, and statistical analysis. TNS contributed to the literature review, interpretation of results, and refinement of the manuscript. All authors discussed the results, contributed to the final version of the paper, and approved the manuscript for submission.

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