




# “The impact of management performance on risk-taking behavior in a dual banking system: A cross-country analysis”

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# THE IMPACT OF MANAGEMENT PERFORMANCE ON RISK-TAKING BEHAVIOR IN A DUAL BANKING SYSTEM: A CROSS-COUNTRY ANALYSIS

## Abstract

In an era defined by global economic uncertainty, the role of management performance in influencing bank risk-taking has become pivotal. This urgency stems from the evolving dynamics of the banking sector and the need for robust risk management strategies. This study investigates the relationship between management performance and banks' risk-taking behavior, drawing data from 248 banks across eight countries comprising Indonesia, Malaysia, Bangladesh, Pakistan, Saudi Arabia, Oman, Bahrain, and the United Arab Emirates spanning 2013–2021 using panel data analysis. The study reveals that management performance measured by a cost-to-income ratio ( $\beta = -0.44, p < 0.01$ ) has a negative and significant relationship with bank risk-taking behavior. In essence, a bank with superior management performance, indicated by a lower cost-to-income ratio, tends to have greater financial stability, as evidenced by a higher Z-score. Notably, external factors like the financial crisis and institutional development as moderating variables do not significantly alter the relationship between management performance and banks' risk-taking behavior. The study also discovers that Islamic banks ( $\beta = 0.31, p < 0.01$ ) outperform their conventional counterparts in risk management and management performance. However, it is worth noting that the results of regional analysis demonstrate variations across the Southeast, South, and Middle East regions. After conducting several robustness check tests, the findings of this study remain consistent, offering valuable implications for both policymakers and bank management. These insights emphasize the importance of formulating appropriate regulations and frameworks to enhance management performance at the banking level.

## Keywords

management performance, bank risks-taking, financial stability, Islamic bank, conventional bank, financial crisis, institutional development

**JEL Classification** G20, G21, G33

## INTRODUCTION

In today's globalized world, marked by economic uncertainties, the banking sector plays a pivotal role in stabilizing economies. During financial turmoil, the banking sector suffers from economic volatility that adversely affects performance. Over the past three decades, the sector has weathered at least three major financial crises with regional or global repercussions: the Asian Financial Crisis of 1998, the Subprime Mortgage Crisis of 2008, and the global economic downturn triggered by the pandemic during 2020 and 2021. Amid such unstable economic conditions, banks confront the daunting task of managing financial risks, with a particular emphasis on ensuring financial stability (Bourkhis & Nabi, 2013; Contreras et al., 2021). Consequently, the manner in which banks operate and manage their businesses becomes a critical determinant of their resilience during challenging times and their competitiveness during periods of stability, especially when viewed through the lens of management performance.

Furthermore, banks operating within dual banking systems encounter unique challenges in maintaining their competitive edge. Two primary reasons underscore the heightened efforts required by banks in such systems. First, the dual banking system presents a distinct financial landscape where Islamic and conventional banks operate side by side under a unified regulatory framework (Zulkhibri & Sukmana, 2017). From a regulatory standpoint, policies must cater to the needs of both banking models, despite their inherent differences. Second, the coexistence of Islamic and conventional banks intensifies intra-system competition (Albaity et al., 2019). This dynamic compels both types of banks to elevate their competitive strategies and operational efficiencies. In essence, these challenges underscore the paramount importance of superior management performance at the individual bank level, especially within a dual banking system.

## 1. LITERATURE REVIEW AND HYPOTHESES

The concept of management performance is rooted in Total Quality Management (TQM), which emphasizes achieving and sustaining management quality for optimal firm performance (Stoll, 1986; Saraph et al., 1989; Mohrman et al., 1995). TQM prioritizes continuous quality improvement and integrates planning, organizing, action, and control into firm activities (Carr et al., 1997). In the banking sector, management performance plays a pivotal role in ensuring business sustainability. For instance, effective resource allocation in banking operations directly enhances financial performance (Banna et al., 2018). Moreover, the Office of the Comptroller of the Currency (OCC) (1988) highlighted that while macroeconomic conditions account for only 7% of bank failures, management performance influences 89% of banking outcomes. Furthermore, Kathwala and Johnson (1990) explain that the reflection of management performance can be measured from the financial performance through banking sector's efficiency level (Banna et al., 2018).

Empirically, the relationship between management performance and a bank's risk-taking has been studied by many researchers. However, the findings are mixed and remain debatable. Studying the case of the US banking industry, Banna et al. (2018) found that higher management performance increases loan quality, decreasing the percentage of non-performing loans in the bank. Observing the banking sector in a dual banking system, Danlami et al. (2022) investigate the impact of management performance on financial stability. The results of the study document that management performance strengthens the

level of banking stability. This indicates that when the bank has good management performance, it reduces financial instability. However, when the analysis is deepened to the regional base, in the case of Southeast Asia Countries, the results are different in that management quality has negative and significant relationship to banking stability. In addition, Shamshur and Weill (2019) explain that an increase in management efficiency boosts banking performance in the case of European banking. A bank with higher management performance can efficiently allocate the resources of funds that significantly impact the bank's financial performance.

In contrast, observing the banking sector in Pakistan from 2005 to 2017, Khan et al. (2020) surprisingly conclude that management performance has significantly increased the level of the bank's risk. It is explained by Khan et al. (2020), who state that the bank is too efficient to spend the funds for risk-management purposes. Even though the income is higher, it is generated from the expense of higher risk-taking but lower risk management. Similar findings are also found by Alsharif (2021), who revealed that management performance negatively affects Z-SCORE in the case of Gulf Cooperation Council (GCC) countries. It explains that when the management performance is efficient, the risk of a bank's stability is lower. In this circumstance, the GCC's banks fail to allocate efficient funds resources to manage the bank's risks. A high and low management performance level also evidently decreases banking stability in the African banking sector (Borauzima & Muller, 2022), but an average management performance level increases banking stability. Borauzima and Muller (2022) add that an optimum level of management performance is necessary to find a bal-

ance between the optimum allocation of funds and risk management in the case of the banking industry.

With different business models, an Islamic bank is predicted to have different performance on management performance to the bank's risk-taking. A study by Safiullah (2021) using cross-country analysis concludes that an Islamic bank's management performance is better than conventional banks. It also indicates that the managerial performance of a conventional bank does not outperform its counterparty. The finding is in line with Hidayat et al. (2021), who find that the management performance of an Islamic bank affects to a bank's financial performance differently, which Islamic bank has better management in managing the bank's risks. The finding is also supported by the fact that in some financial contracts, an Islamic bank has different risk exposure with the presence of profit-loss sharing contract, which requires a tighter supervisory role from the management of an Islamic bank, based on the finding of Hidayat et al. (2021).

Furthermore, during the financial crisis, Belanes et al. (2015) delineate that an Islamic bank has efficient management performance that positively supports financial performance. Contrary, an Islamic bank, in the case of GGC, is less efficient than a conventional bank (Alsharif, 2021). The finding is because the management performance of Islamic banks fails to optimally allocate the source of funds to generate more income and manage the bank's risk consecutively.

During the COVID-19 pandemic, banking sectors experienced financial shocks that endangered their performance. A study by Elnahass et al. (2021) revealed that the banking sector severed its financial performance due to economic shock during the outbreak, particularly in its financial stability and risk-taking behavior. The same finding is also found in the study by Fakhrunnas et al. (2022a, 2022b) on how the pandemic adversely affects banking performance. However, during the financial distress, the crisis did not affect management performance (Elnahass et al., 2021). This indicates that banking management is robust and ready to face any external shock against its financial performance. Moreover, institutional de-

velopment empirically and directly affects bank risk-taking behavior performance. Danlami et al. (2022) found that better institutional quality improves bank risk management.

In addition, institutional development is also able to moderate banks' financial performance to risk-taking behavior (Danlami et al., 2022; Elnahass et al., 2021). The importance of institutional development, reflected by the performance of political stability, control of corruption, government effectiveness, regulatory quality, the rule of law, and accountability, is also emphasized by Nabi and Suliman (2009) and Albaity et al. (2022) who conclude that the institutional development significantly affects banking performance.

According to the discussion above, the role of management performance in bank risks has been previously studied. However, the result remains inconclusive. The relevance of this study lies in its potential to offer insights into how banks can maintain financial stability, especially when faced with external economic challenges. Therefore, the study aims to investigate the role of management performance on banks' risk-taking behavior and compare different banking systems such as Islamic and conventional banks in this regard. By addressing this problem, the study aims to provide a clearer understanding of the dynamics between management efficiency and risk management in banks.

The study contributes to three aspects. At first, the study attempts to precisely answer the ongoing debate in results, as it is found by Banna et al. (2018), Danlami et al. (2022), Ding and Wei (2023), and Khan et al. (2020). The answer to how management performance affects a bank's financial stability remains essential to understand the role of management performance in bank risk-taking behavior. Secondly, the study provides new insight into the impact of management performance in a dual banking system.

When a bank's management performs efficiently, the impact on the bank's risk-taking behavior may be different depending on the bank's business model, Islamic or conventional bank. Thirdly, the study contributes to more comprehensively identifying how the role of management performance

affects banks' risk-taking behavior through the moderating variables of economic crisis and institutional development. In the previous studies, it needs to be sufficiently explained.

Based on the review of prior findings, the following hypotheses were proposed:

H1: *Management performance significantly influences a bank's risks.*

H2: *The impact of management performance on a bank's risks varies between Islamic and conventional banks.*

H3: *Financial turmoil moderates the relationship between a bank's management performance and the bank's risks.*

H4: *Institutional development moderates the effect of management performance on a bank's risks.*

## 2. METHODS

The study focuses on countries with dual banking systems, where Islamic and conventional banks operate side by side. As highlighted by ICD-Refinitiv (2022), there are eight key countries experiencing substantial growth in Islamic banking development: Indonesia, Malaysia, Bangladesh, Pakistan, Saudi Arabia, Oman, Bahrain, and the United Arab Emirates. Together, these nations hold more than 80% of the total assets of global Islamic banks, a figure that underscores the international growth and significance of Islamic banking. During the observation period from 2013 to 2021, the study encompasses a total of 248 banks, including 54 Islamic banks and 194 conventional banks. These banks represent a diverse and significant sample that provides a comprehensive view of both banking systems.

In these countries, the prominence of Islamic banking is not merely a regional phenomenon; it stands as a testament to the global development and acceptance of Islamic financial principles. The study's model is designed to delve into this dynamic interplay, shedding light on the intricate relationships and trends within these dual banking systems. The model of the study is as follows:

Model 1

$$\text{Bank's Risk}_{it} = a_0 + a_1IB_{it} + a_2MGT_{it} + a_3Bank_{it} + a_4Macro_{jt} + \varepsilon_{ijt}, \quad (1)$$

Model 2

$$\text{Bank's Risk}_{it} = a_0 + a_1IB_{it} + a_2MGT_{it} + a_3MGT \cdot COVID_{it} + a_4COVID + a_5Bank_{it} + a_6Macro_{jt} + \varepsilon_{ijt}, \quad (2)$$

Model 3

$$\text{Bank's Risk}_{it} = a_0 + a_1IB_{it} + a_2MGT_{it} + a_3MGT \cdot GOV_{it} + a_4GOV + a_5Bank_{it} + a_6Macro_{jt} + \varepsilon_{ijt}. \quad (3)$$

In the context of this study, a bank's risk is represented by two key metrics: Non-Performing Loans (NPL) and Z-SCORE, both of which serve as indicators of financial stability at the banking level. Specifically, a higher value of NPL indicates less financial stability, while a higher Z-SCORE indicates greater stability.

Management performance (MGT) reflects the efficiency level of a bank's management. A higher MGT score denotes less efficiency, whereas a lower MGT score signifies increased efficiency.

Moreover,  $a_0$  means constant or intercept,  $a_1$ - $a_6$  are the coefficient of the variables, while  $i$ ,  $t$ , and  $j$  explain bank, time, and country for each. Bank and Macro mean bank-specific variables and macroeconomic variables for each. Additionally, the study includes two further models, identified as Model 2 and Model 3, which introduce moderating variables labeled as COVID and GOV. These are included to investigate whether these two factors can moderate the role of management performance, thus providing a more nuanced understanding of the complex interplay between these variables.

The study employs balanced panel data analysis, favoring the Random Effect Model (REM) due to the inclusion of time-invariant variables. This method resonates with the techniques proposed by Isa and Lee (2020) and Mohammad et al. (2020). A robustness test is executed to ensure the baseline result's reliability, excluding 25% of banks with the highest and lowest assets.



**Table 1.** Explanation of variables

Variables	Description	Data source
<b>Dependent Variable</b>		
Non-Performing Loan (NPL)	Percentage of non-performing loans to total loan	Fitch Connect
Z-SCORE	The log of the sum of return on asset plus equity to total asset and both are divided by the standard deviation of return on asset	Fitch Connect, Self-calculated
<b>Main Independent Variable</b>		
Management Performance (MGT)	The ratio of cost to income	Fitch Connect
COVID	Dummy variable, 1= period of 2020 to 2021, 0=period of 2013 to 2019	Self-calculated
Governance Index (GOV)	The average score of indices of voice and accountability, political stability and absence of violence, government effectiveness, regulation quality, the rule of law, and control of corruption	World Bank
<b>Bank Specific Variable</b>		
Islamic Bank (IB)	Dummy variable, 1= Islamic bank, 0= Conventional bank	Self-calculated
Capital to Liabilities (CAPLIB)	The percentage of capital to liabilities	Fitch Connect
Log of Total Asset (LNASSET)	The log of banks' total asset	Fitch Connect, Self-calculated
Loan Growth (LOANGR)	The percentage of yearly growth of the bank's loan or financing activities	Fitch Connect
<b>Macroeconomic Variable</b>		
Bank Concentration (CONS)	The percentage of the top three largest banks compared to the total asset of the banking sector	World Bank
Economic Growth (GDPGR)	The percentage of gross domestic product (GDP) at t minus GDP at t-1, then divided by GDP at t-1	World Bank
Inflation (INF)	The percentage of consumer price index at the country level	World Bank

In addition to these methods, the study also draws on the works of Alandejani and Asutay (2017), Ibrahim and Law (2019), Kim et al. (2020), and Bakhouché et al. (2022). By adopting a two-stage least square (2SLS) approach and the Hausman-Taylor regression, the study endeavors to further validate the robustness of its findings. These methods are particularly selected to address the instrumental variable, tackling potential endogeneity concerns within the model.

### 3. RESULTS

As delineated in Table 2, the empirical analysis commences with a descriptive examination of the dataset. The average Z-SCORE value across all samples stands at 3.15, with a higher Z-SCORE indicating reduced bankruptcy risk, suggesting the banks' resilience against financial adversities. Notably, Islamic banks consistently outperform conventional banks in terms of Z-SCORE, pointing to their enhanced financial stability. The NPL values further corroborate this, with Islamic banks registering lower values, indicative of a healthier loan portfolio. The NPL value is crucial in assessing the quality of a bank's loan portfolio. Lower NPL implies that the loans are performing

well, which indicates more prudent lending practices in Islamic banks.

The MGT highlights the efficiency of a bank's management. A lower level of MGT means a reduced cost-to-income ratio, reflecting higher management performance. This result aligns with the notion that streamlined operations and careful financial planning can save costs and improve financial performance. Further, Islamic banks show a lower ratio of capital to liabilities than conventional banks. This suggests that conventional banks may have more funds to meet their obligations. The data indicates that conventional banks are generally larger in size than Islamic banks. This might result from broader market penetration, higher capitalization, or differing business models between the two types of banks. The difference is attributable to the investment and risk management strategies between the two types of banks, with conventional banks possibly having a more aggressive approach in financing activities.

Table 3 offers a correlation analysis, ensuring that no two variables have a correlation value exceeding 0.8 or dropping below -0.8. This lack of strong correlation underpins the statistical validity of the study by confirming that the variables are inde-

**Table 2.** Data description

Variable	Obs.	Mean (All Banks)	Mean (Islamic Bank)	Mean (Conventional Bank)
Z-SCORE	2,232	3.15	3.29	3.11
NPL	2,232	4.76%	3.62%	5.08%
MGT	2,232	0.58	0.57	0.58
CAPLIB	2,232	22.25%	14.23%	24.48%
LOANGR	2,232	13.14%	12.71%	13.27%
ASSET	2,232	12,670	12,085	12,833
CONS	2,232	46.51%	–	–
GDPGR	2,232	3.99%	–	–
INF	2,232	3.85%	–	–
COVID	2,232	0.222	–	–
GOV	2,232	–0.226	–	–

Note: Asset is in USD million.

pendent of one another. Therefore, the concern of autocorrelation is not present.

Table 4 delves into the core of the study that provides the baseline result about the relationship between management performance and banks' risk-taking behavior, using NPL and Z-SCORE, respectively. According to the findings, management performance has a positive and significant relationship with NPL. The results underscore the pivotal role of efficient management in maintaining loan quality and ensuring financial stability. In practical terms, this means that a decrease in management efficiency (i.e., higher MGT value) leads to an increase in NPL. The data also highlights the distinct financial stability patterns between Islamic and conventional banks, with Islamic banks consistently showcasing superior resilience.

On the other hand, management performance demonstrates a negative and significant relationship with Z-SCORE. Given that a higher Z-SCORE

represents bankruptcy risk reduction, this relationship indicates that when management performance is more efficient (i.e., lower MGT value), it contributes to a higher Z-SCORE or less bankruptcy risk. This relationship further strengthens the argument that effective management is pivotal in enhancing a bank's stability.

The results for an Islamic Bank (IB) compared to conventional banks are striking. They show a significant negative relationship with NPL and a significant positive relationship with Z-SCORE across almost all models. This underlines the differences in financial stability between Islamic and conventional banks, with the former demonstrating stronger resilience.

Surprisingly, the data does not reveal any significant effect of the financial crisis triggered by the pandemic on NPL and Z-SCORE. This includes the interaction with management performance. It implies that the financial turmoil did not alter or moderate the relationship between

**Table 3.** Correlation

Variable	Z-SCORE	NPL	MGT	CAPLIB	LOANGR	LNASSET	CONS	GDPGR	INF	COVID	GOV
Z-SCORE	1.00	–	–	–	–	–	–	–	–	–	–
NPL	–0.27	1.00	–	–	–	–	–	–	–	–	–
MGT1	–0.29	0.22	1.00	–	–	–	–	–	–	–	–
CAPLIB	0.20	0.11	0.05	1.00	–	–	–	–	–	–	–
LOANGR	0.01	–0.20	–0.04	–0.06	1.00	–	–	–	–	–	–
LNASSET	0.24	–0.10	–0.42	–0.40	–0.16	1.00	–	–	–	–	–
CONS	0.20	0.00	–0.12	0.08	–0.19	0.34	1.00	–	–	–	–
GDPGR	–0.09	0.01	0.01	–0.09	0.27	–0.18	–0.51	1.00	–	–	–
INF	–0.15	0.12	0.05	–0.08	0.27	–0.26	–0.62	0.47	1.00	–	–
COVID	–0.03	0.03	0.03	0.03	–0.20	0.08	0.05	–0.54	–0.22	1.00	–
GOV	0.10	–0.21	–0.04	0.07	–0.20	0.20	0.57	–0.30	–0.73	0.08	1.00

**Table 4.** Baseline result

Variable	(1)	(2)	(3)	(4)	(5)	(6)
IB	-0.01* (-1.86)	-0.01* (-1.88)	-0.01 (-1.47)	0.31*** (2.88)	0.28*** (2.72)	0.31*** (2.88)
MGT	0.02* (1.87)	0.02* (1.86)	0.02 (1.58)	-0.44*** (-6.13)	-0.40*** (-5.54)	-0.43*** (-5.78)
MGT*COVID	-	0.00 (0.19)	-	-	-0.07 (-1.29)	-
MGT1*GOV	-	-	-0.02 (-0.70)	-	-	0.06 (0.44)
COVID	-	-0.00 (-0.33)	-	-	-0.03 (-1.02)	-
GOV	-	-	-0.01 (-0.84)	-	-	-0.05 (-0.46)
CAPLIB	0.02 (1.44)	0.02 (1.45)	0.02 (1.52)	2.30*** (15.45)	2.35*** (16.01)	2.31*** (15.26)
LOANGR	-0.04*** (-8.06)	-0.04*** (-7.98)	-0.04*** (-8.08)	0.03 (1.00)	0.02 (0.76)	0.03 (1.00)
LNASSET	-0.00 (-0.96)	-0.00 (-0.88)	-0.00 (-0.67)	-0.13*** (-6.11)	-0.10*** (-4.67)	-0.13*** (-5.81)
CONS	0.01 (0.47)	0.01 (0.45)	0.03* (1.78)	0.45** (2.51)	0.52*** (2.90)	0.45*** (2.58)
GDPGR	-0.01 (-0.25)	-0.01 (-0.56)	-0.00 (-0.14)	0.25** (2.17)	-0.43*** (-3.18)	0.25** (2.24)
INF	0.03 (0.58)	0.03 (0.57)	-0.05 (-0.92)	-0.67** (-2.15)	-0.65** (-2.11)	-0.66** (-2.07)
Constant	0.05** (2.17)	0.05** (2.13)	0.03 (1.46)	4.68*** (13.47)	4.21*** (12.04)	4.62*** (12.73)
Obs	2232	2232	2232	2232	2232	2232
Wald-chi2	73.91	75.36	89.19	489.94	526.36	537.85
R2	0.052	0.053	0.052	0.647	0.653	0.647

Note: Model 1 to Model 3 employ NPL, while Model 4 to Model 6 use Z-SCORE to measure the bank's risks. The number in parentheses expresses the value of the t-statistic. The symbols \*\*\*, \*\*, and \* describe the significance level at 1%, 5%, and 10%.

management performance and risk, as mentioned earlier. Similarly, the aggregate governance score, reflecting institutional development, exhibited no substantial influence. This could point to the robustness of the banking sector in the face of external shocks and the primacy of internal management strategies over external factors.

The regional analysis adds a new layer of complexity to the findings, revealing distinct patterns across different geographical areas. In Southeast Asia, management efficiency increases financial stability. It can be seen from the negative and significant relationship between MGT to Z-SCORE. It is the same as in South Asia and Middle East, which also have a positive and significant relationship with NPL. However, the different performance of Islamic and conventional banks is only present in Southeast Asia. The moderating role of

the financial turmoil and governance is significant in South Asia and the Middle East but not in Southeast Asia.

In essence, the regional deepening of the results uncovers intriguing variations. While the overarching relationship between management efficiency and financial stability seems consistent across the regions, the distinct behavior between Islamic and conventional banks in Southeast Asia and the varying influence of external factors like financial crises and governance in South Asia and the Middle East reflect the intricate nature of these relationships. These regional insights contribute to a more refined understanding of the banking landscape, considering local contexts, regulations, and economic conditions. Such a nuanced approach allows policymakers, regulators, and industry leaders to develop region-specific strategies that align with the observed patterns and dynamics.



**Table 5.** The baseline result at the regional level

Southeast Asia						
Variable	(1)	(2)	(3)	(4)	(5)	(6)
IB	-0.00 (-1.04)	-0.00 (-1.01)	-0.00 (-1.08)	0.26* (1.86)	0.25* (1.76)	0.26* (1.80)
MGT	0.01 (0.77)	0.01 (0.46)	0.01 (0.77)	-0.33*** (-4.24)	-0.26*** (-3.23)	-0.33*** (-4.46)
MGT1 · COVID	-	0.01 (0.76)	-	-	-0.15** (-2.38)	-
MGT1 · GOV	-	-	0.01 (0.20)	-	-	-0.15 (-0.58)
COVID	-	-0.00 (-0.74)	-	-	0.04 (1.03)	-
GOV	-	-	0.00 (0.02)	-	-	0.16 (1.28)
Bank	Yes	Yes	Yes	Yes	Yes	Yes
Macro	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1197	1197	1197	1197	1197	1197
Wald-Chi	107.24	113.53	109.31	439.43	448.80	446.58
R-Square	0.052	0.053	0.052	0.647	0.653	0.647
South Asia						
Variable	(1)	(2)	(3)	(4)	(5)	(6)
BI	-0.00 (-0.36)	-0.00 (-0.35)	-0.00 (-0.39)	0.16 (1.20)	0.16 (1.18)	0.16 (1.17)
MGT	0.04 (1.57)	0.03 (1.37)	0.08 (0.74)	-0.70*** (-4.39)	-0.67*** (-4.68)	0.72 (0.97)
MGT1 · COVID	-	0.05** (2.43)	-	-	-0.07 (-0.52)	-
MGT1 · GOV	-	-	0.04 (0.34)	-	-	1.57* (1.94)
COVID	-	-0.03** (-2.53)	-	-	-0.00 (-0.01)	-
GOV	-	-	-0.06 (-0.63)	-	-	-1.08** (-2.50)
Bank	Yes	Yes	Yes	Yes	Yes	Yes
Macro	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	567	567	567	567	567	567
Wald-Chi	45.43	45.20	48.08	355.01	362.63	473.89
R-Square	0.139	0.156	0.140	0.713	0.714	0.719
Middle East						
Variable	(1)	(2)	(3)	(4)	(5)	(6)
BI	-0.01 (-1.37)	-0.01 (-1.53)	-0.01 (-1.57)	0.31 (1.42)	0.30 (1.42)	0.29 (1.41)
MGT1	0.03* (1.95)	0.04*** (2.65)	0.04** (2.42)	-0.29* (-1.71)	-0.23 (-1.38)	-0.17 (-1.17)
MGT1 · COVID	-	-0.05** (-2.40)	-	-	-0.08 (-0.63)	-
MGT1 · GOV	-	-	-0.01 (-0.30)	-	-	-0.76*** (-2.90)
COVID	-	0.03** (2.49)	-	-	-0.03 (-0.46)	-
GOV	-	0.03 (1.38)	-	-	0.10 (0.61)	-
Bank	Yes	Yes	Yes	Yes	Yes	Yes
Macro	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	468	468	468	468	468	468
Wald-Chi	56.50	82.29	188.24	122.06	150.29	152.88
R-Square	0.105	0.126	0.101	0.497	0.512	0.526

Note: Model 1 to Model 3 employ NPL, while Model 4 to Model 6 use Z-SCORE to measure the bank's risks. The number in parentheses expresses the value of the t-statistic. The symbols \*\*\*, \*\*, and \* describe the significance level at 1%, 5%, and 10%.

**Table 6.** Robustness checks

Variable	Selected Size		2SLS Regression		Hausman-Taylor Regression	
	(1)	(2)	(3)	(4)	(5)	(6)
IB	-0.01** (-2.21)	0.42*** (3.54)	-0.01*** (-2.62)	0.34*** (3.05)	-0.01* (-1.65)	0.32*** (2.65)
MGT	0.02** (2.27)	-0.48*** (-6.62)	0.09*** (3.62)	-1.04*** (-5.07)	0.01** (2.48)	-0.44*** (-14.29)
CAPLIB	0.03* (1.83)	2.18*** (12.87)	0.02 (1.57)	2.29*** (13.97)	0.02*** (2.64)	2.28*** (43.36)
LOANGR	-0.04*** (-7.37)	0.02 (0.62)	-0.04*** (-7.19)	-0.00 (-0.15)	-0.04*** (-10.86)	0.03 (1.17)
LNASSET	0.00 (0.80)	-0.18*** (-7.13)	0.00 (1.49)	-0.19*** (-6.20)	-0.00* (-1.71)	-0.15*** (-14.21)
CONS	0.01 (0.34)	0.44* (1.92)	0.00 (0.18)	0.54*** (2.71)	0.01 (0.65)	0.41*** (3.80)
GDPGR	0.02 (0.74)	0.22 (1.63)	0.01 (0.63)	0.08 (0.58)	-0.01 (-0.34)	0.21 (1.54)
INF	0.06 (1.12)	-1.18*** (-3.41)	0.05 (1.06)	-1.08*** (-3.11)	0.01 (0.45)	-0.81*** (-3.86)
Constant	0.00 (0.11)	5.37*** (13.08)	-0.06 (-1.40)	5.92*** (10.65)	0.06*** (3.41)	4.97*** (27.03)
Obs.	1817	1817	2232	2232	2232	2232
Wald-chi2	68.14	392.08	100.17	432.24	167.99	3064.68

Note: Model 1 employs NPL, while Model 2 uses Z-SCORE to measure the bank's risks. The number in parentheses expresses the value of the t-statistic. The symbols \*\*\*, \*\*, and \* describe the significance level at 1%, 5%, and 10%.

In the robustness check, the study adopts three robustness checks which are: using selected size samples, 2SLS Regression, and Hausman-Taylor Regression. In selected size samples, it has been ensured that outliers or specific samples do not skew the findings to confirm the generalizability of the results across the entire dataset. 2SLS is an extension of the Ordinary Least Squares (OLS) method and is used to address potential endogeneity issues. By incorporating this method, the study ensures that the identified relationships between management performance and banks' stability are not confounded by hidden bias. Hausman-Taylor Regression is a specific panel data estimation technique that can control unobservable individual heterogeneity. By using this approach, the study verifies that the results are not affected by unobserved variables that might vary across banks.

Across all models and methods of robustness checks, the study finds that management performance consistently augments the level of banks' stability. This persistence of the result across different analytical techniques lends substantial credibility to the original findings. The robustness checks also reconfirm the difference

between Islamic and conventional banks, with Islamic banks consistently emerging as more stable. This result emphasizes the resilience of Islamic banks and aligns with the primary findings.

## 4. DISCUSSION

The study shows that management performance contributes significantly to bank risk-taking behavior. It can be seen from the baseline results that the management performance has a positive and significant relationship to NPL, and it is a negative and significant relationship to Z-SCORE. The findings are in line with Banna et al. (2018), Danlami et al. (2022), and Shamshur and Weill (2019). This indicates that bank management performance can manage sufficient risk, which eventually supports its stability.

Moreover, an Islamic bank is found to be different from a conventional bank. It can be seen from the baseline result that Islamic banks can reduce NPL and increase Z-SCORE, meaning that their performance is better than con-

ventional banks. The finding is supported by Safiullah (2021) and Hidayat et al. (2021), indicating that Islamic banks have better risk-management performance due to their different banking operations in some financial contracts, such as profit-sharing schemes. Moreover, the management performance of Islamic banks is more prudent and efficient in managing financial risk exposure in the banking operation. Contrary to Alsharif (2021), the argument that the management performance of Islamic banks is less efficient in covering shariah compliance risk needs more proof in this study, while the finding reveals conversely.

Surprisingly, in the baseline results, the financial turmoil during the pandemic and institutional development fail to moderate the management performance on the impact on the bank's risks. The finding is different from Danlami et al. (2022), Elnahass et al. (2021), Nabi and Suliman (2009), and Albaity et al. (2022), who emphasize the significant influence of financial distress during the pandemic and institutional development. The finding exhibits the robustness of the bank's management performance in response to external economic dynamics such as the crisis and institutional development.

Even though the findings are robust, the impact of management performance on bank risk-taking behavior differs in each region. As can be seen in Table 5, the base result is explained when the sample is separated across the region consisting of Southeast Asia, South Asia, and the Middle East. According to the finding, management performance affects a bank's risks in all regions. The result explains that management performance is pivotal in managing bank risk-taking. Banna et al. (2018) mention that management performance directly affects total quality management. When the performance fulfills a bank's needs, it impacts its risk-taking behavior, particularly when formulating a financing portfolio, increasing financial stability, managing fund allocation, and responding to external financial shocks.

In addition, the financial distress due to the pandemic can moderate the role of management in bank risks in all regions even though the di-

rection of the impact is different. In Southeast and South Asia countries, the interaction between management performance and financial distress increases a banks' financial stability level. This indicates that during the outbreak period, the financial turmoil matters for the bank, but the banks can mitigate and manage the risk well. Finally, it impacts an increase in the bank's financial stability. However, in Middle East countries, the impact of the interaction between management performance and financial distress severely affects a bank's stability. The finding aligns with Elnahass et al. (2021) and Fakhrunnas et al. (2022), who document the pandemic's negative impact on bank risk management.

Furthermore, institutional development can moderate management performance differently in South Asia and Middle East countries. In South Asia, it strengthens the level of financial stability but occurs inversely in the Middle East. The different direction of the influence indicates that institutional development in South Asia is in line with the need for management performance in the banking sector. As a result, it supports financial stability at the banking level. However, in the Middle East, institutional development does not support the bank's management performance, which finally makes the bank have financial instability. The finding in both regions indicates the importance of institutional development to banking performance, including management and risk management performance, as concluded by Nabi and Suliman (2009) and Albaity et al. (2022).

Lastly, an Islamic bank differs from a conventional bank in Southeast Asia in that the presence of an Islamic bank increases the level of financial stability at the banking level. The finding is similar to Hidayat et al. (2021), who explain that Islamic banks have better risk management than conventional banks. However, in South Asia and Middle East Countries, an Islamic bank is similar to a conventional bank. Different from what is found by Safiullah (2021), Belanes et al. (2015), and Alsharif (2021), the performance of Islamic banks in both regions mimics conventional banking operations regarding management performance on bank's risks.

## CONCLUSION

The study aims to investigate the impact of management performance on a bank's risk-taking behavior. The results find that management performance increases the bank's financial stability in all samples and when the sample is separated at the regional levels. Regarding the difference between Islamic and conventional banks, in the baseline results, an Islamic bank is better than a conventional bank in the bank's risk management in all samples and South Asia countries. In addition, it is found that Islamic banks are partly the same as conventional banks in South Asia and Middle East countries, while the financial crisis and institutional development cannot moderate the bank's management performance in baseline results using all samples.

The findings of the study lead to some implications. Firstly, the study explains a significant role of management performance in banking sectors. Practitioners and financial authorities must emphasize the importance of management performance at the banking level, particularly in determining management efficiency at a certain level. When management performance can be performed well, it increases financial stability and bank risk-taking management. Secondly, financial authorities need to allow Islamic banks to develop more. The findings reveal that an Islamic bank performs better in managing risk-taking behavior. It also explains the robustness of Islamic banks in the banking system. Increasing the market share of Islamic banks in the banking sector through several financial policies consecutively increases the level of financial stability in the banking sector. Thirdly, banking practitioners and financial authorities should be concerned about the emergence of the financial crisis and institutional development in the coming period due to its significant influence on management performance on banks' risk-taking management. Moreover, the alignment of institutional development must be ensured by related authorities to benefit banking sectors.

Finally, for future studies, the study suggests improving management performance measurement. It is crucial to have more precise and consistent results. In addition, future research must have larger samples using the global banking industry to capture the possible different behavior between developing and developed countries.

## AUTHOR CONTRIBUTIONS

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