Journal of Islamic Monetary Economics and Finance, Vol. 9, No. 3 (2023), pp. 419 - 442
p-ISSN: 2460-6146, e-ISSN: 2460-6618

SHARI'A SUPERVISORY BOARD AND ISLAMIC BANKS' INSOLVENCY RISK

Umar Habibu Umar[1], Muhamad Abduh[2] and Mohd Hairul Azrin Besar[3]

[1] Department of Accounting and Finance, School of Business and Economics, Universiti Brunei Darussalam, Brunei Darussalam, uhumar21@gmail.com
[2] Department of Accounting and Finance, School of Business and Economics, Universiti Brunei Darussalam, Brunei Darussalam, muhamad.abduh@ubd.edu.bn
[3] Department of Accounting and Finance, School of Business and Economics, Universiti Brunei Darussalam, Brunei Darussalam, azrin.besar@ubd.edu.bn

ABSTRACT

This study examines how the characteristics and quality of Shari'a supervisory board (SSB) influence the insolvency risk of Islamic banks. It employs unbalanced panel data of 43 Islamic banks in 15 countries between 2010 and 2020, which are hand-collected from the banks' annual reports. The results indicate that the SSB quality index, SSB Islamic finance professional expertise and SSB competency increase insolvency risk while the SSB members with PhDs reduce it. Meanwhile, SSB size, SSB meetings, SSB gender diversity (SSBG) and SSB members from foreign countries have no significant influence on the insolvency risk. These findings have implications for policymakers and regulators in carving policies and regulations in restraining the SSB from taking excessive risk. They can also guide the Islamic banks' board of directors and shareholders in appointing the SSB members.

Keywords: Risk-taking, Shari'a supervisory board (SSB), SSB quality index, SSB characteristics, Islamic banks.
JEL classification: G21; G32; G33.

Article history:
Received : November 7, 2022
Revised : February 25, 2023
Accepted : August 31, 2023
Available online : September 29, 2023

https://doi.org/10.21098/jimf.v9i3.1635

I. INTRODUCTION

Poor governance in banks and the resulting financial scandals are the major features of the 2008 financial crisis (Darmadi, 2013). Indeed, many view the crisis as the manifestation of the ineffectiveness of the government regulatory frameworks to restrain banks from excessive risk-taking (AlAbbad et al., 2019; Alam et al., 2022b; Purbayanto et al., 2022). While risk-taking is part of the normal decisions of banks, excessive risk-taking can lead to financial instability (Jabari & Muhamad, 2022). The operations of Islamic banks, like conventional banks, are not free from various forms of risk, such as insolvency risk, operation risk, portfolio risk, credit risk, etc. This is because Islamic banks discharge similar functions to their conventional counterparts, though they are different in their business principles where all their transactions are completely decoupled from *riba* (interest), *gharar* (uncertainty) and *qimar* (speculations/gambling). Islamic banks are also not immune to all the risks encountered by conventional banks (Hassan et al., 2019).

Islamic banks normally have two independent boards: the board of directors and the Shariá supervisory board (SSB henceforth) (Alman, 2012). However, in few countries, the functions of SSB are contracted to the Shariá consultancy firms. The SSB governance is a vital structure unique to Islamic financial institutions (Abbas, 2021; Alman, 2012; Hakimi et al., 2018). This governance structure has now become more advanced and diverse in line with the development of the Islamic finance industry around the globe (Musibah & Alfattani, 2014). It is an extra layer to undertake monitoring and oversight duties on Islamic banks (Mollah & Zaman, 2015; AlAbbad et al., 2019; Abbas et al., 2020). A study by Mollah et al. (2021) finds that integrating the SSB with a strong board reduces the risk-taking of Islamic banks because religiosity prohibits risk-taking. This indicates that the SSB can be key to restraining Islamic banks from excessive risk-taking. Consequently, the SSB has become more attractive than other forms of Shariá governance in Islamic financial institutions (Mansoor et al., 2020). It also remains a subject of discussion, particularly for Islamic banks in countries with dissimilar regulatory environments (Nomran et al., 2018).

While establishing the relationship between SSB attributes and the risk-taking of Islamic banks has emerged to be a subject of increasing interest , there are at least three limitations in existing studies. First, a few empirical studies generally examine the relationship between SSB attributes and risk-taking (Jabari & Muhamad, 2022; Khalil & Boulila Taktak, 2020; Nomran & Haron, 2020; Nguyen, 2021). The findings of these studies are inconsistent (Jabari & Muhamad, 2022; Nguyen, 2021; Serly & Oktamirza, 2022). Hence, there is a need for further investigation. Second, previous studies mostly employ a limited number of SSB attributes, like SSB size, SSB meetings and SSB gender diversity. The effects of other essential attributes of the SSB, like SSB competency, SSB members with Doctor of Philosophy (PhD), SSB Islamic finance professional expertise and SSB members from foreign countries on the risk-taking of Islamic banks have been given either little or no empirical attention. Third, previous studies show the impact of individual attributes on the risk-taking of Islamic banks instead of developing the SSB quality index, which makes it difficult, if not impossible, to know the overall effect of the SSB on their risk-taking. This is because the attributes will hardly yield similar results. For example, the results of SSB size and SSB gender diversity may indicate that they

significantly reduce risk-taking. However, the frequency of SSB meetings may show a significant positive relationship with risk-taking. Other SSB attributes like SSB members with PhDs, SSB competency and SSB members from foreign countries may insignificantly influence risk-taking. Going by these results, it is impossible to establish the overall effect of the SSB on risk-taking unless an index that captures the SSB attributes is constructed. To the authors' best knowledge, no study has examined how the SSB quality index influences the risk-taking of Islamic banks.

Against the above background, this study investigates the effects of the SSB attributes and quality index on the risk-taking of Islamic banks using a panel sample of 43 full-fledged Islamic banks from 15 countries. As earlier pointed out, some attributes have not been empirically investigated or given special attention by previous studies. A key novelty of this study is the construction of the SSB quality index for assessing the overall or aggregate impact of the SSB attributes on the risk-taking of Islamic banks. Examining the effects of the individual characteristics of SSB alone cannot be used to make a general conclusion as to whether SSB influences risk-taking. This study pioneers the development of the SSB quality index to establish the overall impact of SSB attributes on the risk-taking of Islamic banks.

The study's findings have implications for policymakers and regulators in developing or reviewing policies and regulations for revitalizing the role of the SSB for the sustainable operations of Islamic banks. Specifically, Central Banks will find this helpful in understanding the overall contribution of the SSB towards managing the risk-taking of Islamic banks to know whether some measures need to be taken to revitalize its role by issuing new or revised regulations. Islamic banks' boards of directors and shareholders will use the findings to ensure that competent and qualified scholars are appointed to the SSB. Scholars and researchers will make use of the results for further research.

The rest of the paper is structured as follows. Section 2 presents the literature review and develops hypotheses to be tested. Section 3 outlines the methodology of the study. Section 4 presents the results and analysis. Lastly, section 5 presents a conclusion and recommendations.

II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Background Theory

Though various theories have been proposed to explain the association between corporate governance and the risk-taking of Islamic banks, the agency theory and resource dependency theory are the most dominant (Khalil & Boulila Taktak, 2020). The agency theory relates to a contractual relationship between principals and agents in carrying out a certain task on their behalf under a delegation of decision authority (Jensen & Meckling, 1976). Agency conflict in the banking industry needs unique analysis, which necessitates the board of directors to protect investors' funds, including those of depositors (Farag et al., 2018). There are two sources of agency problems in Islamic banks; the traditional source, which emerges when managers deviate from the objective of the maximization of shareholders' wealth and the unique one in Islamic banks, which occurs when they provide products

and services that contravene the teachings of Islam (AlAbbad et al., 2019). Besides, the investment depositors of Islamic banks constitute a key segment in agency conflicts because they engage in profit and loss contracts like shareholders, which highly demand good governance practices to protect the interests and improve the confidence of shareholders and depositors (Darmadi, 2013).

The conflict of interest may occur because of information asymmetry, which often happens when managers use the greater valuable economic and financial information that could not be accessed by shareholders and depositors (in the case of banks) to gain at their expense. The information asymmetry will be reduced and the credibility and confidence of investors in Islamic banks will improve when the SSB provides correct and transparent information (Khalil & Boulila Taktak, 2020). In addition, the SSB discharges a unique form of supervision that can minimize the conflict of interest between the investors and the management of Islamic banks (Rahman & Bukair, 2013).

The resource dependency theory explains how the external resources of corporate bodies influence their rulings (Alam et al., 2022b). The theory indicates that companies depend significantly on resources obtainable from other entities (Pfeffer & Salancik, 1978). It also argues that coalitions should be formed between trading partners mainly to manage the uncertainty of companies (Singh et al., 2011). Besides, the resource dependency theory posits that companies are not independent but depend on the bigger networks of organizations in their environment- through which they struggle to manipulate resources for survival (Pfeffer & Salancik, 1978). Specifically, the SSB connects Islamic banks with their environment, which enables them to obtain essential resources (Elamer et al., 2019). This implies that the SSB, as an independent and external body, can provide an avenue for Islamic banks to connect with valuable external resources for their perpetual existence. The proper connection of Islamic banks with the external environment through the SSB could enable them to manage their risks properly. Hence, the SSB consisting of Shariá scholars are regarded as valuable resources in shaping Islamic banks' risk-taking (Ramly & Nordin, 2018).

2.2. Shari'a Governance Structure of Islamic Banks

The Shari'a governance of Islamic banks is commonly known as the Shari'a supervisory board (SSB). The presence of the SSB is expected to influence Islamic banks' financial soundness (Serly & Oktamirza, 2022). It is an independent committee in Islamic banks comprising Islamic scholars with sound knowledge of Fiqh Muamalat (Islamic jurisprudence guiding commercial transactions) (Aslam & Haron, 2021; Ramly & Nordin, 2018). The Accounting and Auditing Organizations of Islamic Financial Institutions (AAOIFI) governance standards describe the SSB as an independent body vested with the responsibility of leading, reviewing and overseeing the activities of Islamic financial institutions to ensure their strict compliance with the Shariá and advising them on legal issues related to Islamic banking and finance (Ramly & Nordin, 2018). It performs a similar role to the audit committee and the external auditor by mainly reviewing and monitoring the shariah-compliance of Islamic banks' products and services (Rahman and Bukair, 2013**;** AlAbbad et al., 2019; Ramly & Nordin, 2018; Jabari & Muhamad, 2022).

Moreover, while SSB members are appointed based on board of directors' recommendations, they discharge their duties independently (Aslam & Haron, 2021; Ramly & Nordin, 2018). Still, in many cases, they are expected to collaborate with the board of directors in discharging their duties. Preventing Islamic banks from excessive risk-taking is one of the important duties of the SSB. Nguyen (2021) believes that the SSB has an oversight function to play in managing the risk-taking of Islamic banks and is responsible for ensuring minimal moral hazard problem, as justified by previous studies.

2.3. Hypotheses Development

2.3.1. Shariá Supervisory Board Size

There are differing views on how SSB size influences the risk-taking of Islamic banks. Apparently, Islamic banks in various countries have different SSB sizes, as specified by their respective regulations (Nomran et al., 2018). For example, the SSB of local Islamic banks in Malaysia should comprise a minimum of five members, while Islamic windows or a foreign branch operating in the country should have at least three members (BNM, 2019). In Saudi Arabia, full-fledged Islamic banks are required to have a minimum of three SSB members and a maximum of five (SAMA, 2020). According to the Islamic Financial Service Board, the SSB should consist of at least three members who are independent non-executives (Farag et al., 2018). Besides, a study by Nomran & Haron (2020) establishes that the SSB size should be between 3 and 6, as the optimal SSB size appeared to be 5. The supervisory effectiveness and the disciplinary power of the SSB of individual banks can reduce portfolio risk when the number of members is increased (Alman, 2012).

Many empirical studies examine how SSB size affects the risk-taking of Islamic banks. For instance, Safiullah & Shamsuddin (2018) evaluate the effects of SSB attributes on the risk-taking behavior of Islamic banks operating in 28 countries. The authors find SSB size significantly and negatively influences Islamic banks' operational and insolvency risks. Alman (2012) examines the relationship between SSB attributes and loan portfolio risks of Islamic banks operating in the Middle East, North Africa and Southeast Asia between 2000 and 2010 and finds that SSB size has a significant positive association with loan portfolio risk. Khalil & Boulila Taktak (2020) conduct a similar study using data from 67 Islamic banks in 20 countries between 2005 and 2014. The study establishes a significant negative relationship between SSB size and the financial soundness of Islamic banks. In other words, SSB is directly related to insolvency risk. Aslam & Haron (2021) evaluate the association between corporate governance mechanisms and the risk-taking of Islamic banks. The study applies a two-step system generalized method of moment (2SYS-GMM) estimation technique to a panel data set of 129 Islamic banks from 29 countries between 2008 and 2017. It notes that SSB size has a significant positive relationship with liquidity risks. AlAbbad et al. (2019) investigate the association between SSB characteristics and the risk-taking using data from 70 Islamic banks from 18 countries between 2000 and 2011. The result suggests a significant positive association between the SSB size and insolvency risk. Nguyen (2021) employs the fixed effect and GMM estimators to evaluate the impact of the audit committee

and Shariá supervisory board on the risk-taking behavior of 57 Islamic banks and 102 conventional banks drawn from 10 countries from 2002 to 2018. The study shows that the SSB has a significant positive relationship with the insolvency risk of Islamic banks. Besides, Isa & Lee (2020) investigate the impact of the Shari'a supervisory attributes on the risk-taking behavior of Islamic banks in Malaysia between 2007 and 2016. The study finds that SSB size is not related to insolvency risk. Similarly, Serly & Oktamirza (2022) examine the effects of the SSB attributes on the financial soundness of Islamic banks in Indonesia between 2015 and 2019. The study indicates that SSB size does not influence Islamic banks' financial soundness. Thus, in line with these studies, we propose the following hypothesis:
H1 Ceteris paribus, SSB size increases the insolvency risk of Islamic banks.

2.3.2. The Frequency of Shari'a Supervisory Board Meetings

The SSB meeting provides an avenue for members to come together and exchange ideas with the aim of enhancing the performance of Islamic banks (Alotaibi, 2022). The SSB is expected to speak on behalf of Islamic financial institutions during annual meetings to clarify Shari'a aspects concerning any transaction to stakeholders (Hassan & Chachi, 2010). In most countries, the SSB is statutorily required to hold a certain minimum number of meetings during a particular year. For example, the SSB of Islamic banks in Indonesia is compulsorily required to hold meetings at least once a month and submit a report to the Bank Indonesia periodically (Darmadi, 2013). The Saudi Arabian Shariá governance for Islamic banks requires SSB members to hold a minimum of one meeting every three months (SAMA, 2020). In the case of Malaysia, SSB members are mandated to hold at least one meeting every two months (BNM, 2019).

Despite the importance of the SSB meetings, we find only two relevant studies. Serly & Oktamirza (2022) examine the relationship between SSB meetings and the financial soundness of Islamic banks in Indonesia. The finding indicates that the frequency of SSB meetings does not affect the banks' financial soundness. Similarly, Isa & Lee (2020) establishe that the number of SSB meetings does not affect the risk-taking behavior of Islamic banks. The lack of adequate theoretical explanation and empirical evidence on how SSB meetings influence the risk-taking of Islamic banks makes it difficult to predict whether the relationship will be positive or negative. Hence, due to the lack of adequate empirical evidence, we develop the following hypothesis:
H2 Ceteris paribus, the frequency of SSB meetings influence the insolvency risk of Islamic banks.

2.3.3. Shariá Supervisory Board Gender Diversity

Promoting board diversity has become a priority of regulatory bodies (Kachkar & Yilmaz, 2022). The effects of diversity on bank risk-taking remain a topical issue of research with little empirical evidence (Jabari & Muhamad, 2022). Gender diversity is a key indicator of board diversity. The existence of female scholars on the SSB is likely to enhance the SSB's monitoring role and compliance with the Shariá (Mansoor et al., 2020). Female scholars on the SSB are expected to effectively

perform check-and-balance in making decisions that can assist in mitigating excessive risk-taking (Isa & Lee, 2020).

Some empirical studies have been carried out to identify the effects of female scholars appointed to the SSB on the risk-taking of Islamic banks. Nguyen (2021) find that the proportion of female members on the SSB has significantly and negatively influenced the insolvency risk of Islamic banks. In addition, Mansoor et al. (2020) examine the impact of corporate governance attributes and Sharia governance attributes on the credit rating of Islamic banks. The study utilizes a sample of 22 Islamic banks between 2006 and 2018 and finds that the existence of female scholars improved the credit rating of Islamic banks. Nainggolan et al. (2022) examine how board attributes affect the risk-taking of Islamic banks in Indonesia and Malaysia. The data are collected from the annual reports of 27 Islamic banks between 2006 and 2016. Using random-effect and GMM panel estimators, they show that female scholars on the SSB lower risk-taking. Isa & Lee (2020) discover that the presence of female scholars on the SSB has an insignificant association with the risk-taking of Islamic banks. Hence, in line with the above discussion, the following hypothesis will be tested:

H3 Ceteris paribus, SSB gender diversity reduces the insolvency risk of Islamic banks.

2.3.4. Shari'a Supervisory Board Members with Philosophy of Doctorates (PhDs)

The educational qualification of SSB members is beneficial for decision-making (Almutairi & Quttainah, 2017). Considering banks' high level of opaqueness and complexity, better academic qualification of board members can improve their ability to appreciate and elucidate sophisticated risk measurement approaches and the effects of bank policies on risk-taking (Srivastav & Hagendorff, 2016). PhD is the highest educational qualification to acquire from universities and other degree-awarding institutions. According to Wang et al. (2017)**,** scholars who hold PhDs in economics and business tend to be in a better position to understand economic and financial issues and their implications for financial institutions. Besides, people with PhDs in Shariá Law or Islamic finance-related disciplines are most qualified to be appointed to the SSB (Abbas et al., 2020). Evidently, SSB members with PhDs are better versed in the applications of Islamic principles in banks (Rahman & Bukair, 2013). Also, SSB members who have high academic qualification could apply Islamic moral principles to restrain the managers of Islamic banks from excessive risk-taking (Safiullah & Shamsuddin, 2018).

Using a sample of listed companies on the Taiwan Stock Exchange between 2006 and 2012, Wang et al. (2017) find that highly educated board members are likely to discharge monitoring and advisory functions that complement corporate governance's effectiveness. Safiullah & Shamsuddin (2018) establish that SSB members with advanced academic qualification significantly reduce the operational and insolvency risks of Islamic banks. Thus, based on the above theoretical views and empirical evidence, it can be pointed out that appointing scholars with PhDs can prevent Islamic banks from investing in risky businesses and transactions. Hence, we propose the following hypothesis:

H4 Ceteris paribus, the proportion of SSB members with PhDs reduces the insolvency risk of Islamic banks.

2.3.5. Sharia Supervisory Board Members' Islamic Finance Professional Expertise
SSB members' Islamic finance professional expertise indicates the ability to discharge their duties effectively. The Accounting and Auditing Organizations for Islamic Financial Institutions (AAOIFI) is an independent international and reputable professional body that develops accounting, auditing, governance, ethics and Shari'a standards to apply by Islamic financial institutions around the globe. AAOIFI runs the following professional programs; Certified Islamic Professional Accountant (CIPA), the Shari'a Advisor and Auditor "CSAA" and the corporate compliance program to improve Islamic financial institutions' human resources and governance structures (AAOIFI, 2020). AAOIFI offers the required Shari'a expertise that enables one to accumulate both tacit and explicit knowledge (Almutairi & Quttainah, 2017). They add that SSB members with the knowledge or practice of accounting, economics and/or finance are likely to influence the performance of Islamic banks. As the SSB decisions entail appreciating Islamic Law, the practice of modern banking and finance and legal issues, the presence of more members with different professional backgrounds could allow juristic Shariá decision-making and a higher level of compliance with Shariá requirements, which in turn affect the level of risk-taking of Islamic banks (Safiullah & Shamsuddin, 2018). Hence, SSB members who are qualified members of the AAOIFI are expected to have adequate knowledge of the Shari'a and financial expertise to the extent that they could contribute to the proper risk management of Islamic banks. Despite the lack of clear empirical evidence, we propose the following hypothesis:
H5 Ceteris paribus, the proportion of SSB members with Islamic finance professional expertise reduces the insolvency risk of Islamic banks.

2.3.6. Shari'a Supervisory Board Competency
SSB members are scholars and experts in Islamic Jurisprudence and Finance (Farag et al., 2018). Appointing well-deserved people into the SSB can enable it to comfortably assimilate, assess and introduce products and services that strictly comply with the Shariá (Abbas et al., 2020). The Malaysian Shariá Governance requires that a member of SSB should either be a Shari'a-qualified person or an expert with the abilities and background necessary to support the functions and duties of the Shariá supervisory board (BNM, 2019). Similarly, the guidelines for appointing SSB members in Malaysia indicate that a majority should have Shariá degrees from recognized universities (Isa & Lee, 2020). This demonstrates that SSB members with degrees in Shariá and businesses who are appointed to the SSB tend to understand the current implications of Islamic banking practice (Masulis et al., 2012). Appointing more qualified or competent scholars to the SSB can reduce agency conflicts (Farag et al., 2018). Therefore, the Shari'a qualification obtained by SSB members indicate their competency to discharge their duties effectively.

Empirically, Isa & Lee (2020) find that SSB members with Sharia qualifications reduce the risk-taking of Islamic banks. However, Khalil & Boulila Taktak (2020) establish an insignificant association between the presence of Mufti and Islamic banks' financial soundness. The Mufti is an official expounder of Islamic legal opinion (Amanullah, 2015). Though empirical studies are few, we provide the following hypothesis:

H6 Ceteris paribus, SSB competency influences the insolvency risk of Islamic banks.

2.3.7. Shariá Supervisory Board with Foreign Members

Theoretically and empirically, little attention has been paid to the role of foreign scholars on the SSB in managing the risk-taking of Islamic banks. Foreign scholars are expected to contribute to proper risk management of Islamic banks. Getting external resources adds credence to a firm's strategic and tactical management (Alam et al., 2022a). Besides, Masulis et al. (2012) believe that foreign directors on the board could demonstrate essential international expertise and advice to companies. Nainggolan et al. (2022) provide empirical evidence showing a significant negative relationship between the presence of foreign directors on the board and the risk-taking of Islamic banks. However, Khalil & Boulila Taktak (2020) document an insignificant relationship between the presence of foreign scholars on the SSB and the financial soundness of Islamic banks. Thus, we propose the following hypothesis:

H7 Ceteris paribus, the proportion of foreign scholars on the SSB influences the insolvency risk of Islamic banks.

2.3.8. Shariá Supervisory Board Quality Index

The purpose of creating Shariá governance is to enhance confidence of investors and the general public on the authenticity and conformity of Islamic banking practices to Islamic Law and reduce the fiduciary and reputation risks of Islamic banks (Abbas et al., 2020). Ramly & Nordin (2018) believe that the risk-taking of Islamic banks could be controlled when the oversight role is integrated with the valuable resources that SSB members contribute to Islamic banks. The SSB is expected to advise the board of directors on Shariá compliance and risk-taking behavior (Isa & Lee, 2020). The result obtained by Nguyen (2021) indicates the ability of the SSB to restrain Islamic banks from excessive risk-taking.

As pointed out earlier, a novel contribution of our study is the construction of the SSB quality index. Depending on the results of the individual attributes of SSB will make it difficult to establish the overall effectiveness of SSB in constraining Islamic banks from taking excessive risks. Therefore, the SSB quality index provides the overall effectiveness of SSB on the risk-taking of Islamic banks to establish whether it restrains the managers and board of directors of Islamic banks from taking excessive risks. We construct an index comprising seven SSB attributes: size, meetings, gender diversity, members with PhDs, competency, Islamic finance professional expertise and foreign members. In developing the index, we refer to the literature and the various codes of corporate governance in order to adopt the best practices. Thus, we propose the following hypothesis:

H8 Ceteris paribus, the SSB quality index reduces the insolvency risk of Islamic banks.

III. METHODOLOGY

3.1. Data

The data are hand collected from the annual reports of Islamic banks from 2010 to 2020. The criteria that we use for the inclusion of Islamic banks are: (1) full-fledged Islamic banks, (2) annual reports are available for at least a minimum of four years, (3) the annual reports are in English, and (4) all relevant data, particularly SSB attributes, are available. Based on these criteria, we have in our sample only one bank for each of the following countries, Qatar, the United Arab Emirates (UAE), Oman, Jordan and Egypt, although there many Islamic banks in these countries. We also have one bank from the Maldives, Nigeria and Sri Lanka, that have annual reports for at least four years. For remaining countries in our sample, we are able to extract their Islamic banking data from more than one bank. Our panel data are unbalanced comprising of 43 Islamic banks operating in 15 countries: Bahrain, Kuwait, Qatar, Saudi Arabia, the United Arab Emirates (UAE), Oman, Jordan, Egypt, Indonesia, Malaysia, Maldives, Nigeria, Pakistan, Bangladesh and Sri Lanka. Table 1 presents the sample distribution of the study based on a country-wide basis.

Table 1.
Sample Distribution of the Study

Country	No. of Banks	Observations	(%)
Bahrain	7	62	15.9
Kuwait	5	43	11.03
Qatar	1	11	2.82
Saudi Arabia	4	35	8.97
United Arab Emirates (UAE)	1	7	1.79
Oman	1	8	2.05
Jordan	1	11	2.82
Egypt	1	8	2.05
Indonesia	2	17	4.36
Malaysia	5	47	12.05
Maldives	1	10	2.56
Nigeria	1	8	2.05
Pakistan	4	32	8.21
Bangladesh	8	80	20.77
Sri Lanka	1	10	2.57
Total	43	388	100

3.2. Variables and Measurements

This study investigates how Shari'a supervisory board attributes and quality influence the risk-taking of Islamic banks. Insolvency risk is the dependent variable, which represents risk-taking. The independent variables comprise eight attributes: SSB size, SSB meetings, SSB gender diversity, SSB members with PhDs, SSB competency, SSB Islamic finance professional expertise, SSB members from foreign countries and the SSB quality index. Besides, five control variables are used: the existence of a standalone risk management committee, board size, risk

management committee meetings, leverage and tangibility. Table 2 shows the description of the variables used in the study.

Table 2.
Description of the Variables

Variables	Abbreviation	Definition
Dependent variable:		
Insolvency risk	ZSCORE	(ROA plus capital asset ratio)/σ(ROA). The SD of ROA is a 3-year moving window for each bank-year observation. A higher value of ZSCORE indicates a reduction in insolvency risk and vice-versa. Therefore, Z-score represents an inverse proxy of insolvency risk.
Independent variables:		
SSB Size	SSBS	Total number of SSB members
SSB meetings	SSBM	Total number of annual meetings held by SSB
SSB gender diversity	SSBG	The proportion of female scholars on the SSB
SSB members with PhDs	SSBD	The proportion of SSB members with PhDs
SSB Islamic finance professional expertise	SSBI	The proportion of AAOIFI members on the SSB
SSB competency	SSBC	The proportion of SSB members with degrees in Shariá
SSB members from foreign countries	SSBF	The proportion of foreign scholars on the SSB
SSB quality index	SSBQ	The SSB quality index is developed based on seven essential attributes of the SSB: (1) SSB size: is the SSB size at least 3? If yes, then one; otherwise, zero. (2) SSB meetings: one, if the SSB held at least four meetings during a financial year; otherwise, zero. (3) SSB gender diversity: one if the SSB has a female scholar; otherwise, zero. (4) SSB members with PhDs: one, if the SSB has at least two members with PhDs; otherwise zero. (5) SSB competency: Do the majority (more than 50%) of SSB have the Shari'a qualifications? If yes, then one; otherwise, zero. (6) SSB Islamic finance professional expertise: one if the SSB has a member of AAOIFI; otherwise zero. (7) SSB members from foreign countries: one if a foreign scholar exists on the SSB; otherwise, zero. Finally, the SSB quality is computed as the proportion of the aggregate individual scores of the attributes to the total number of attributes.
Control variables:		
Standalone risk committee	SARC	Dummy variable, one is allocated if a bank has a standalone risk management committee, otherwise zero
Board size	BS	The total number of directors on the board.
Risk management committee meetings	RMCM	Number of annual meetings held by the RMC
Leverage	LEV	Total liabilities/Total assets
Tangibility	TANG	Total fixed assets/ total assets

3.3. Empirical Model

This study utilizes panel data gathered from the annual reports of 43 Islamic banks from 2010 to 2020. Based on the results of various tests, the heteroskedastic panels corrected standard errors (HPCSE) regression is used in the analysis. Models 1 and 2 below are used to investigate the effects of SSB attributes and SSB quality index respectively on the risk-taking of Islamic banks:

$$\begin{aligned}&\mathrm{ZSCORE}_{it}\\&=\beta_0+\beta_1\mathrm{SSBS}_{it}+\beta_2\mathrm{SSBM}_{it}+\beta_3\mathrm{SSBG}_{it}+\beta_4\mathrm{SSBD}_{it}\\&+\beta_5\mathrm{SSBI}_{it}+\beta_6\mathrm{SSBC}_{it}+\beta_7\mathrm{SSBF}_{it}+\beta_8\mathrm{SARC}_{it}+\beta_9\mathrm{BS}_{it}\\&+\beta_{10}\mathrm{RMCM}_{it}+\beta_{11}\mathrm{LEV}_{it}+\beta_{12}\mathrm{TANG}_{it}+\varepsilon_{it}\end{aligned}\tag{1}$$

$$\begin{aligned}&\mathrm{ZSCORE}_{it}\\&=\beta_0+\beta_1\mathrm{SSBQ}_{it}+\beta_2\mathrm{SARC}_{it}+\beta_3\mathrm{BS}_{it}+\beta_4\mathrm{RMCM}_{it}+\beta_5\mathrm{LEV}_{it}\\&+\beta_6\mathrm{TANG}_{it}+\varepsilon_{it}\end{aligned}\tag{2}$$

The study also employs the generalized method of moments (GMM) for robustness. The GMM estimator can address endogeneity, heteroskedasticity and autocorrelation problems (Roodman, 2009). The GMM econometric models used to assess how the SSB attributes influence the risk-taking of Islamic banks are as follows:

$$\begin{aligned}&\mathrm{ZSCORE}_{it}\\&=\beta_0+\beta_1\mathrm{ZSCORE}_{it-1}+\beta_2\mathrm{SSBS}_{it}+\beta_3\mathrm{SSBM}_{it}+\beta_4\mathrm{SSBG}_{it}+\beta_5\mathrm{SSBD}_{it}\\&+\beta_6\mathrm{SSBI}_{it}+\beta_7\mathrm{SSBC}_{it}+\beta_8\mathrm{SSBF}_{it}+\beta_9\mathrm{SARC}_{it}+\beta_{10}\mathrm{BS}_{it}+\beta_{11}\mathrm{RMCM}_{it}\\&+\beta_{12}\mathrm{LEV}_{it}+\beta_{13}\mathrm{TANG}_{it}+\varepsilon_{it}\end{aligned}\tag{3}$$

$$\begin{aligned}\mathrm{ZSCORE}_{it}=\beta_0+\beta_1\mathrm{ZSCORE}_{it-1}+&\beta_2\mathrm{SSBQ}_{it}+\beta_3\mathrm{SARC}_{it}+\beta_4\mathrm{BS}_{it}\\&+\beta_5\mathrm{RMCM}_{it}+\beta_6\mathrm{LEV}_{it}+\beta_7\mathrm{TANG}_{it}+\varepsilon_{it}\end{aligned}\tag{4}$$

In these models, ZSCORE is the insolvency risk; SSB, Shariá supervisory board; SSBS, SSB size; SSBM, SSB meetings; SSBG, SSB gender diversity; SSBD, SSB members with PhDs; SSBI, SSB Islamic finance professional expertise; SSBC, SSB competency; SSBF, SSB members from foreign countries; SSBQ, SSB quality index; SARC, standalone risk management committee; BS, board size; RMCM, risk management committee meetings; LEV, leverage; and TANG, tangibility; β_0, constant term; β_1- $\beta_{13,}$ coefficients of the explanatory variables (independent and control); Subscript i and t stand for bank and year, respectively; and ε is the error term.

IV. RESULTS AND ANALYSIS

4.1. Descriptive Statistics

Table 3 presents the descriptive statistics of the variables used in the study.

Table 3.
Descriptive Statistics

Variable	Obs	Mean	Minimum	Maximum	SD	Skewness	Kurtosis
ZSCORE	344	71.64	5.38	307.61	82.86	12.87	168.65
SSBS	386	5.00	2.00	12.00	2.30	1.43	4.47
SSBM	386	6.20	2.00	21.00	4.80	3.15	13.53
SSBG	386	0.01	0.00	0.17	0.04	3.89	17.92
SSBD	386	0.57	0.00	1.00	0.35	-0.30	1.78
SSBI	386	0.11	0.00	1.00	0.21	2.27	8.35
SSBC	386	0.98	0.80	1.00	0.05	-3.39	13.91
SSBF	386	0.08	0.00	0.80	0.05	2.40	7.97
SSBQ	388	0.81	0.00	1.00	0.00	-0.73	6.71
BS	388	10.47	3.00	26.00	4.03	1.14	4.47
RMCM	388	4.45	0.00	13.00	3.26	3.06	17.68
LEV	388	0.74	0.13	0.96	0.01	13.82	191.99
TANG	388	0.010	0.000	0.040	0.010	17.030	305.430
Observation		Frequency			Percentage (%)		
	0	1		0	1		
SARC	73	315	388	18.81	81.19	-1.60	3.55

Notes: ZSCORE is the insolvency risk; SSB, Shariá supervisory board; SSBS, SSB size; SSBM, SSB meetings; SSBG, SSB gender diversity; SSBD, SSB members with PhDs; SSBI, SSB Islamic finance professional expertise; SSBC, SSB competency; SSBF, SSB members from foreign countries; SSBQ, SSB quality index; SARC, standalone risk management committee; BS, board size; RMCM, risk management committee meetings; LEV, leverage; TANG, tangibility.

Source: Author's computation using Stata version 16

Table 3 shows that the average value of ZSCORE is 71.64, with the lowest and highest values of 5.38 and 307.61, respectively. The SSB has an average number of 5 scholars with a minimum of 2 directors and some Islamic banks appoint up to 12 scholars to the board. The average number of meetings held is six and at least two meetings are held by the SSB. Besides, some SSBs are found to have convened up to 21 meetings. In the case of gender diversity (SSBG), the result indicates that on average female scholars accounted for 1% of the total scholars. The minimum value of 0.00 implies that some Islamic banks have no female scholars on their SSBs. But in the case of other Islamic banks, female scholars constitute 17% of their members. Concerning SSB members with PhDs (SSBD), on average, they account for 57% of the members. However, while some Islamic banks have no single scholar with a PhD, in other Islamic banks, all the members have PhD. On average, SSB members of the AAOIFI account for 11% of board members. Besides, some Islamic banks have appointed no AAOIFI members to their boards, but in other Islamic banks, the entire SSB members are professional members of the AAOIFI. Regarding SSB competency (SSBC), the results indicate that the average proportion of the competent members on the SSB is 98%, with minimum and maximum values of 80% and 100%, respectively. On average, foreign scholars (SSBF) appointed to the SSB account for 8% of the members. In addition, though some SSBs have no foreign scholars (0.00%), others have up to 80% of their SSB members from other countries. The average number of directors on the board is 10, with a minimum and maximum of 3 and 26 members, respectively. The average number of risk management committee meetings (RMCM) is four, with a minimum of 0 and a maximum of 13. In the case of leverage (LEV), the average value is 74%, with 13% and 96% as minimum and maximum values, respectively. Tangibility (TANG) has an average value of 0.01 and minimum and maximum values of 0% and 4%, respectively.

Table 3 also presents the descriptive statistics of a standalone risk management committee (SARC), a dichotomous variable. There are 388 observations, out of which 73 (18.81%) show the non-existence of a standalone risk management committee. The remaining 315 (81.19%) indicate the presence of a standalone risk management committee in Islamic banks. Moreover, Table 3 also shows the skewness and kurtosis test results for the variables used in the econometric models. Following a study by Nomran & Haron (2021), all the variables with skewness and kurtosis values greater than 3 and 10, respectively, are regarded as not normally distributed. On this basis, ZSCORE, SSBM, SSBG, SSBC, RMCM, LEV and TANG have outliers. Thus, in line with earlier studies, these variables were winsorized at the 5% or 95% significance levels to control the effects of the outliers (Bala et al., 2020; Barth et al., 2012; Farber et al., 2018; Ittonen et al., 2014; Umar, 2022; Umar et al., 2022).

4.2. Univariate Analysis

Table 4 shows the correlation matrix for all the variables used in the analysis. The correlation coefficients are mostly low except between SSB and BS, which is 0.66. However, this correlation coefficient is not a serious issue because it does not exceed the threshold of 0.80 suggested by Kennedy (2008). The remaining

correlation coefficients are found between -0.02/0.01 and -0.38/0.40. These suggest that that multicollinearity is not a major concern. This is further supported by the variance inflation factor results (VIFs) presented in Table 4, which are below 5. The VIF results for the model (VIF1) showing the relationship between SSB attributes and risk-taking range from 1.18 to 2.90. The minimum and maximum values of VIF results (VIF2) for the model that indicates the impact of the SSB quality index on the risk-taking of Islamic banks are 1.05 and 1.20, respectively.

Table 4.
Pearson Correlation Matrix

Variable	ZSCORE	SSBS	SSBM	SSBG	SSBD	SSBR	SSBC	SSBF	SSBQ	VIF1	VIF2
ZSCORE	1.00									-	-
SSBS	-0.02	1.00								2.90	-
SSBM	0.14***	0.21***	1.00							1.50	-
SSBG	0.09*	0.20***	0.22***	1.00						1.36	-
SSBD	0.18***	-0.33***	0.03	0.08*	1.00					1.42	-
SSBR	-0.22***	-0.23***	-0.23***	-0.16***	-0.17***	1.00				1.33	-
SSBC	-0.03	-0.30***	0.07	0.02	0.11**	-0.09*	1.00			1.18	-
SSBF	-0.04	-0.11**	0.13***	-0.08	-0.14***	0.16***	0.12**	1.00		1.26	-
SSBQ	-0.05	0.37***	0.23***	0.38***	-0.03	0.14***	-0.06	0.40***	1.00	-	1.20
SARC	0.13**	-0.02	0.17***	0.13***	-0.07	0.01	0.02	-0.15***	0.13***	1.23	1.14
BS	-0.12**	0.66***	-0.13**	-0.07	-0.38***	-0.02	-0.25***	-0.02	0.15***	2.35	1.12
RMCM	0.15***	0.09*	0.38***	0.39***	0.01	-0.12**	0.05	-0.03	0.23***	1.41	1.16
LEV	0.06	0.40***	0.18***	0.20***	-0.33***	-0.02	-0.06	0.13***	0.31***	1.41	1.20
TANG	0.01	-0.03	-0.05	-0.19***	0.22***	0.27***	-0.07	-0.05	0.03	1.24	1.05
	SARC	BS	RMCM	LEV	TANG						
SARC	1.00										
BS	-0.05	1.00									
RMCM	0.35***	-0.10**	1.00								
LEV	0.15***	0.23***	0.10**	1.00							
TANG	0.08	0.15***	-0.04	-0.05	1.00						

Notes: ZSCORE is the insolvency risk; SSB, Shariá supervisory board; SSBS, SSB size; SSBM, SSB meetings; SSBG, SSB gender diversity; SSBD, SSB members with PhDs; SSBI, SSB Islamic finance professional expertise; SSBC, SSB competency; SSBF, SSB members from foreign countries; SSBQ, SSB quality index; SARC, standalone risk management committee; BS, board size; RMCM, risk management committee meetings; LEV, leverage; TANG, tangibility.

*p <0.10; **p <0.05; ***p <0.01

Source: Author's computation using Stata version 16

4.3. Multiple Regression Results Using the Heteroscedastic Panels Corrected Standard Errors (HPCSE)

This section presents the results using the heteroscedastic panel corrected standard errors (HPCSE) regression. Model 1 and Model 2 show the effects of SSB attributes and SSB quality index on the risk-taking of Islamic banks, respectively. We apply the HPCSE method after performing some essential tests. For both models, the Hausmans test is statistically significant (Model 1: 21.09, p=0.0491; Model 2: 20.30, p=0.0024). Thus, the FE panel estimator is preferred for both models. Furthermore, the heteroscedasticity statistics for model 1 and model 2 are 1.1e+07 (p=0.0000) and

1.2e+07 (p=0.0000), respectively. These indicate the presence of heteroscedasticity problems. Hence, we used heteroscedastic panels corrected standard errors (HPCSE) regression.

Table 5.
Multiple Regression Results Using HPCSE

	Model 1		Model 2	
EV				
	coef.	p-value	coef.	p-value
SSBS	-0.8645	0.330	-	-
SSBM	0.3341	0.759	-	-
SSBG	9.4069	0.934	-	-
SSBD	41.2365	0.005***	-	-
SSBI	-86.1585	0.000***	-	-
SSBC	-148.4469	0.097*	-	-
SSBF	19.5444	0.443	-	-
SSBQ	-	-	-69.7693	0.043**
SARC	22.1036	0.052**	20.9386	0.076*
BS	-2.2178	0.133	-2.5892	0.027**
RMCM	1.8504	0.276	3.3293	0.024**
LEV	32.5567	0.079**	26.0406	0.110
TANG	938.4345	0.033**	239.4909	0.585
Constant	162.4679	0.075	88.468	0.000
Prob>chi2	0.0000***		0.0027***	
Wald chi2	70.88		20.09	
R^2	0.1288		0.0572	
Hausman's test	21.09 (p=0.0491) ***		20.30 (p=0.0024) ***	
Hetero. test	1.1e+07 (p=0.000) ***		1.2e+07 (p=0.000) ***	

Notes: DV, means dependent variable; EV, means explanatory variables (independent and control); Notes: ZSCORE is the insolvency risk; SSB, Shariá supervisory board; SSBS, SSB size; SSBM, SSB meetings; SSBG, SSB gender diversity; SSBD, SSB members with PhDs; SSBI, SSB Islamic finance professional expertise; SSBC, SSB competency; SSBF, SSB members from foreign countries; SSBQ, SSB quality index; SARC, standalone risk management committee; BS, board size; RMCM, risk management committee meetings; LEV, leverage; TANG, tangibility.

*p <0.10; **p <0.05; ***p <0.01

Source: Author's computation using Stata version 16

The regression result of model 1 in Table 5 indicates that SSB size has an insignificant association with insolvency risk (β= -0.8645, p=0.330). This finding supports the ones obtained by Isa & Lee (2020) and Serly & Oktamirza (2022), which indicate that SSBS does not influence the stability of Islamic banks. Hence, the hypothesis (H1) stating that SSBS increases the insolvency risk of Islamic banks is rejected. Similarly, the frequency of the SSB meetings (SSBM) has an insignificant association with insolvency risk (β= 0.3341, p=0.759). This finding corresponds to the result of Serly & Oktamirza (2022), which reveals that the frequency of SSB meetings does not influence the financial soundness of Islamic banks in Indonesia. Thus, the hypothesis (H2), which states that the number of SSB meetings influences the insolvency risk of Islamic banks, is also rejected. Regarding the SSB gender

diversity (SSBG), the result shows an insignificant association with insolvency risk (β=9.4069, p=0.934). This result corresponds to the finding of Safiullah and Shamsuddin (2018), who find that the presence of female scholars on the board has insignificantly affected the risk-taking of Islamic banks in Malaysia. This indicates the rejection of the hypothesis (H3), which states that SSBG reduces the insolvency risk of Islamic banks. In the case of SSB members with PhDs (SSBD), the result shows a significant positive association with insolvency risk (β=41.2365, p=0.005**).** This result indicates that SSB members with PhDs improve the stability of Islamic banks, which signifies that they constrain the managers from taking excessive risks. Therefore, SSB members with PhDs are risk-averse. This justifies the argument of Safiullah & Shamsuddin (2018) that SSB members who have high academic qualifications possibly apply Islamic moral principles to constrain the managers of Islamic banks from excessive risk-taking. Hence, the finding implies the acceptance of the hypothesis (H4), that that the proportion of SSB members with PhDs reduces the insolvency risk of Islamic banks.

However, the association between SSB Islamic finance professional expertise (SSBI) and insolvency risk is significantly negative (β= -86.1585 p=0.000). This result implies a reduction in the stability of Islamic banks and excessive risk-taking, which contradicts the view that Shariá scholars on the SSB with expertise in accounting and finance tend to contribute to conformity with the Sharia, which in turn lead to a high credit rating of Islamic banks in Asia (Mansoor et al., 2020). Hence, the result supports the rejection of hypothesis (H5). Similarly, evidence from the regression result shows that SSB competency (SSBC) has a significant negative association with risk-taking (β=-148.4469, p=0.097). This signifies that SSBC reduces Islamic bank stability and increases the level of risk-taking. Therefore, it contradicts the finding of Isa and Lee (2020), which indicates SSB members with Sharia qualifications reduce the insolvency risk of Islamic banks. Hence, this result indicates that the hypothesis (H6), which states that SSBC influences Islamic bank insolvency risk, is accepted. Concerning the foreign scholars appointed to SSB (SSBF), the result indicates that it has an insignificant association with risk-taking (β= 19.5444, p=0.443). This finding implies the inability of foreign scholars appointed to the SSB to influence the risk-taking of Islamic banks. This result is similar to the one obtained by Khalil & Boulila Taktak (2020), which shows the inability of foreign scholars on the SSB to influence the financial soundness of Islamic banks. Thus, The finding indicates the rejection of the hypothesis (H7), which states that SSBF influences the insolvency risk of Islamic banks. Regarding the control variables in model 1, the existence of a standalone risk management committee (SARC), leverage (LEV) and tangibility (TANG) have a significant positive association with insolvency risk. However, board size (BS) and risk management committee meetings (RMCM) do not influence risk-taking.

Moreover, the regression results presented in model 2 show that the SSB quality index (SSBQ) has a significant negative association with insolvency risk (β= -69.7693, p=0.043). This finding implies that SSB plays a significant role in supporting Islamic banks to take excessive risks, which indicates a reduction in Islamic bank stability. Therefore, the SSB is a risk-taker, as it encourages Islamic banks to take more risks. Thus, the hypothesis (H8), which indicates that the SSB quality index reduces the insolvency risk of Islamic banks is rejected. Regarding

the control variables, SARC and RMCM have significant positive associations with risk-taking. On the other hand, Board size (BS) has a significant negative association with risk-taking. Also, LEV and TANG have insignificant association with risk-taking.

4.4. Robustness Results Analysis Using the Two-Step System GMM

Table 5 shows the results from the dynamic panel data models estimated using a two-step system generalized method of moments (GMM). Model 3 shows the results of the association between SSB attributes and the risk-taking of Islamic banks. Model 4 represents the association between the SSB quality index and the risk-taking of Islamic banks. The GMM results for each model are valid because the number of groups (43) exceeds the number of instruments (31). The tests for autocorrelation (AR1 and AR2) also validate the consistency of the stimates, as the p-value for AR1 indicates significance while AR2 insignificance. Moreover, the Hansen test results suggest that the instruments used in the model are valid for both models.

Table 6.
Multiple regression results using the two-step system GMM

	Model 3		**Model 4**	
EV				
	coef.	p-value	coef.	p-value
l.	0.3763	0.053*	0.4409	0.000***
SSBS	-4.1559	0.557	-	-
SSBM	-1.8473	0.372	-	-
SSBG	-16.1058	0.976	-	-
SSBD	93.1373	0.044**	-	-
SSBR	-223.511	0.016**	-	-
SSBC	-182.5006	0.238	-	-
SSBF	-17.2921	0.854	-	-
SSBQ	-	-	-276.4016	0.002***
SARC	-1.7978	0.954	49.8504	0.021**
BS	0.5204	0.892	-6.9862	0.000***
RMCM	-0.1079	0.892	6.291	0.000***
LEV	-108.8591	0.067	10.903	0.721
TANG	3565.44	0.086	688.832	0.186
Constant	254.8942	0.069	199.503	0.001
Prob>chi2	0.000***		0.0000***	
Wald chi2	6.60E+06		388.15	
AR1	-1.96(p=0.050) *		-2.69 (p=0.007) ***	
AR2	-0.92 (p=0.355)		0.18 (p=0.856)	
Hansen test	0.840		0.420	
No. of groups	43		43	
No. of instruments	31		31	

Notes: DV means dependent variable; EV, explanatory variables (independent and control); l.is the lagged value of DV; ZSCORE is the insolvency risk; SSB, Shariá supervisory board; SSBS, SSB size; SSBM, SSB meetings; SSBG, SSB gender diversity; SSBD, SSB members with PhDs; SSBI, SSB Islamic finance professional expertise; SSBC, SSB competency; SSBF, SSB members from foreign countries; SSBQ, SSB quality index; SARC, standalone risk management committee; BS, board size; RMCM, risk management committee meetings; LEV, leverage; TANG, tangibility.

*p <0.10; **p <0.05; ***p <0.01

Source: Author's computation using Stata version 16

Interestingly, the regression results of HPCSE presented in Table 6 and Table 5 are similar except for SSBC. Specifically, the regression results of model 1 (Table 5) and model 3 (Table 6) indicate that SSBS, SSBM, SSBG and SSBF do not influence the insolvency of Islamic banks. They also indicate that SSBD and SSBI significantly increase and reduce insolvency risk, respectively. The only difference is that while model 1 shows a significant negative association between SSBC and risk-taking, the result is statistically insignificant in the case of model 3. Besides, the association between SSBQ and risk-taking is significantly negative in both model 2 and model 4.

4.5. Analysis

The study reveals that the SSB quality index (SSBQ) increases the insolvency risk of Islamic banks, which signifies a reduction in their stability. This result contradicts the view of Mollah & Zaman (2015) that SSB could prevent the board of directors and management from aggrieving lending behavior and participating in major risk-taking activities. Theoretically, it does not support the view of the agency theory that SSB plays a vital role in minimizing the conflicts of interest between management and shareholders and depositors as it supports Islamic banks to take more risks which in turn decreases their stability. Besides, the finding contradicts the argument of the resource dependency theory, which regards SSB as an essential resource that can help Islamic banks to maintain a good relationship with stakeholders, particularly shareholders and depositors. Similarly, SSB members with Islamic finance professional expertise (SSBI) encourage Islamic banks to take more risks, which suggests a reduction in their stability. This is contrary to the expectation that SSB who are professionally qualified as members of AAOIFI, can constrain Islamic banks from excessive risk-taking with a view to minimizing agency conflicts and protecting the interest of stakeholders. Also, the effect of SSB competency in increasing the insolvency risk might be due the fact that they are primarily appointed based on their Shariá knowledge without necessarily considering their knowledge of finance and banking. Therefore, apart from Shari'a knowledge of Shari'a, SSB members are expected to have basic skills and knowledge in banking and finance. In this regards, the Saudi Arabian Shariá governance for Islamic banks provides that SSB competency entails that the members must demonstrate a high level of education, training, knowledge and willingness to learn, as well as have diverse experience of a minimum of five years across a range of industries, including the Shariá auditing of financial transactions, Islamic banking and compliance (SAMA, 2020).

However, the ability of SSB members with PhDs to constrain Islamic banks from investing in excessively risky products indicates that they utilize their educational qualification to make useful decisions (Almutairi & Quttainah, 2017). Therefore, though most SSB members have their PhDs in Sharia, they are able to understand the implications of taking excessive risks. This attitude toward the risk-taking of Islamic banks tends to reduce agency conflicts in Islamic banks. Also, following the view of the resource dependency theory, we argue that the PhD holders on SSB are essential resources that are capable of investigating and understanding the implications of excessive risk-taking, with a view to discouraging Islamic banks

from excessive risk-taking toward attaining more stability and reducing their exposure to insolvency risk.

Moreover, the inability of SSB size to influence the insolvency risk of Islamic banks aligns with the view that a larger SSB size comprising many Scholars with different opinions would not effectively monitor the managers' behavior toward the risk-taking of Islamic banks (AlAbbad et al., 2019). This contradicts the view of the agency theory that a large SSB is capable of minimizing the conflict of interest in Islamic banks (Farag et al., 2018). Hence, in line with Nomran & Haron (2020), the SSB should be between three and six members. Similarly, SSB meetings do not prevent Islamic banks from investing in risky products. This signifies that SSB pays little attention to the ways of restricting Islamic banks from investing in risky financial products during its meetings. Women scholars appointed to the SSB also do not constrain Islamic banks from excessive risk-taking. This study find that most Islamic banks, particularly in the GCC countries, have not appointed a single female Shariá scholar to the SSB. The lack of an adequate number of female scholars on the board could make them unable to influence the risk-taking of Islamic banks. Therefore, a few female Shariá scholars on the SSB cannot carry out check-and-balance before deciding to restrain Islamic banks from excessive risk-taking (Mansoor et al., 2020). Finally, lack of regular and easy access to operational activities and non-familiarity with the environment due to the distance barrier could be among the key reasons why SSB members from foreign countries could not significantly reduce the insolvency risks of Islamic banks.

V. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

This study examines the effects of Shari'a supervisory board (SSB) attributes and quality index on the insolvency risk of Islamic banks using heteroskedastic panel corrected standard errors (HPCSE) regression. The results show that the SSB quality index, SSB Islamic finance professional expertise and SSB competency increase the insolvency risk of Islamic banks. However, SSB members with PhDs reduce the risk-taking of Islamic banks. Besides, SSB size, SSB meetings, SSB gender diversity and SSB foreign scholars have insignificantly affected the risk-taking of Islamic banks. These findings are further substantiated using the two-step system GMM estimation.

5.2. Recommendation

The contributions of this study to both policy and academic discussions are three-fold. First, the findings have implications for regulators and policymakers. Specifically, the Central Banks in various countries could utilize the findings in developing or revising their Shari'a governance for Islamic banks to ensure that SSBs contribute significantly to restraining Islamic banks from taking excessive risks. The new or revised Shariá governance regulations and policies should emphasize appointing more PhD holders to SSB to improve Islamic bank stability and overturn the attitude of SSB Islamic finance professional expertise and SSB competency to become risk-averse. They should also be capable of revitalizing the

effectiveness of SSB size, SSB meetings, SSB gender diversity and SSB members from foreign countries toward improving the stability of Islamic banks. Second, the results will be useful to the boards of directors and shareholders of Islamic banks in appointing scholars to SSBs who can contribute to minimizing excessive risk-taking. Third, the study contributes to the literature by constructing a comprehensive SSB quality index for assessing the overall impact of the SSB on the risk-taking of Islamic banks. The study also provides empirical evidence of the essential SSB attributes that can influence risk-taking, which have either not been empirically investigated or not used in a few prior studies, particularly in the case of Islamic banks.

Despite the study's contributions, three limitations could be attributed to it. First, the study use only seven SSB attributes and thus may have ignored some others. It is therefore recommended that future studies should consider other SSB attributes not considered in this study. Second, this study considers only the insolvency risk. Hence, future research should investigate how the SSB quality index and attributes influence other forms of risk, such as credit risk, portfolio risk, liquidity risk, operational risk, etc. Third, the study utilizes only a sample of 43 Islamic banks. Many full-fledged Islamic banks are excluded because their annual reports are published in languages other than English. The study also do not also consider some Islamic banks because their annual reports were not up to 4 years during this research. By now, some Islamic banks are expected to have annual reports for a minimum of four years. Hence, it is highly recommended that future studies make all necessary efforts to overcome these challenges to increase sample size and make their findings more generalizable.

REFERENCES

AAOIFI. (2020). *Accounting and Auditing Organizations for Islamic Financial Institutions*. http://aaoifi.com/?lang=en

Abbas, Q. (2021). Corporate governance, risk-taking and efficiency of Islamic banks: Comparative study between Pakistan and Malaysia. *SEISENSE Business Review*, *1*(1), 45–55.

Abbas, Q., Yussof, S. A., & Anjum, M. N. (2020). A quantitative study of the role shariah boards and bank ownership structures play in enhancing the financial performance of Islamic banks: A case of Pakistan. *ICR Journal, 11*(2), 204-224.

AlAbbad, A., Hassan, M. K., & Saba, I. (2019). Can Shariah board characteristics influence risk-taking behavior of Islamic banks? *International Journal of Islamic and Middle Eastern Finance and Management*, *12*(4), 469–488.

Alam, A. W., Banna, H., & Hassan, M. K. (2022a). ESG activities and bank efficiency: Are Islamic banks better?. *Journal of Islamic Monetary Economics and Finance*, *8*(1), 65–88.

Alam, M. K., Rahman, M. M., Runy, M. K., Adedeji, B. S., & Hassan, M. F. (2022b). The influences of Shariah governance mechanisms on Islamic banks performance and Shariah compliance quality. *Asian Journal of Accounting Research*, *7*(1), 2–16.

Alman, M. (2012). Shari'ah supervisory board composition effects on Islamic banks' risk-taking behavior. Available at *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2140042

Almutairi, A. R., & Quttainah, M. A. (2017). Corporate governance: Evidence from Islamic banks. *Social Responsibility Journal*, *13*(3), 601–624.

Alotaibi, H. A. (2022). Compound index of Sharia governance and its impact on banks performance. *Journal of Positive School Psychology*, *6*(2), 3229-3240.

Amanullah, M. (2015). Islamic ethics and guidelines for using Facebook: A maqasidic analysis. *South East Asia Journal of Contemporary Business, Economics and Law, 8*(4), 17–31.

Aslam, E., & Haron, R. (2021). Corporate governance and risk-taking of Islamic banks: Evidence from OIC countries. *Corporate Governance (Bingley)*, *21*(7), 1460–1474.

Bala, H., Amran, N. A., & Shaari, H. (2020). Audit committee attributes and cosmetic accounting in Nigeria: The moderating effect of audit price. *Managerial Auditing Journal*, *35*(2), 177–206.

Bank Negara Malaysia (BNM) (2019). Shariah governance. *Bank Negara Malaysia*, *BNM/RH/PD 028-100*, 1–22.

Barth, M. E., Landsman, W. R., Lang, M., & Williams, C. (2012). Are IFRS-based and US GAAP-based accounting amounts comparable? *Journal of Accounting and Economics*, *54*(1), 68–93.

Darmadi, S. (2013). Corporate governance disclosure in the annual report: An exploratory study on Indonesian Islamic banks. *Humanomics*, *29*(1), 4–23.

Elamer, A. A., Ntim, C. G., Abdou, H. A., Zalata, A. M., & Elmagrhi, M. (2019). The impact of multi-layer governance on bank risk disclosure in emerging markets: The case of Middle East and North Africa. *Accounting Forum*, *43*(2), 246–281.

Farag, H., Mallin, C., & Ow-Yong, K. (2018). Corporate governance in Islamic banks: New insights for dual board structure and agency relationships. *Journal of International Financial Markets, Institutions and Money*, *54*, 59–77.

Farber, D. B., Huang, S. X., & Mauldin, E. (2018). Audit committee accounting expertise, analyst following, and market liquidity. *Journal of Accounting, Auditing and Finance*, *33*(2), 174–199.

Hakimi, A., Rachdi, H., ben Selma Mokni, R., & Hssini, H. (2018). Do board characteristics affect bank performance? Evidence from the Bahrain Islamic banks. *Journal of Islamic Accounting and Business Research*, *9*(2), 251–272.

Hassan, A., & Chachi, A. (2010). Corporate governance of the Islamic financial services industry in Brunei Darussalam. *Journal of Islamic Economics, Banking and Finance*, *4*(1), 40–59.

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*(October 2018), 17–31.

Isa, M., & Lee, S. P. (2020). Does the Shariah committee influence risk-taking and performance of Islamic banks in Malaysia? *Journal of Islamic Accounting and Business Research*, *11*(9), 1739–1755.

Ittonen, K., Miettinen, J., Vähämaa, S., & Miettinen, J. (2014). Does female representation on audit committees affect audit fees?. *Quarterly Journal of Finance and Accounting*, *49*(3), 113–139.

Jabari, H. N., & Muhamad, R. (2022). Diversity and risk taking in Islamic banks: Does public listing matter? *Borsa Istanbul Review*, *22*(3), 546–559.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360.

Kachkar, O., & Yilmaz, M. K. (2022). How diverse are Shariah supervisory boards of Islamic banks? A global empirical survey. *International Journal of Ethics and Systems, 39*(2), 312-341.

Kennedy, P. (2008). A guide to econometrics. Malden, MA: Blackwell Publishing.

Khalil, A., & Boulila Taktak, N. (2020). The impact of the Shariah board's characteristics on the financial soundness of Islamic banks. *Journal of Islamic Accounting and Business Research*, *11*(9), 1807–1825.

Mansoor, M., Ellahi, N., Hassan, A., Malik, Q. A., Waheed, A., & Ullah, N. (2020). Corporate governance, Shariah governance, and credit rating: A cross-country analysis from Asian Islamic banks. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(4), 1–15.

Masulis, R. W., Wang, C., & Xie, F. (2012). Globalizing the boardroom-The effects of foreign directors on corporate governance and firm performance. *Journal of Accounting and Economics*, *53*(3), 527–554.

Mollah, S., & Zaman, M. (2015). Shari'ah supervision, corporate governance and performance: Conventional vs. Islamic banks. *Journal of Banking and Finance*, *58*, 418–435.

Mollah, S., Skully, M., & Liljeblom, E. (2021). Strong boards and risk-taking in Islamic banks. *Review of Corporate Finance*, *1*(1–2), 135–180.

Musibah, A. S., & Alfattani, W. S. B. W. Y. (2014). The mediating effect of financial performance on the relationship between shariah supervisory board effectiveness, intellectual capital and corporate social responsibility, of Islamic banks in gulf cooperation council countries. *Asian Social Science*, *10*(17), 139–164.

Nainggolan, Y. A., Prahmila, D. I., & Syaputri, A. R. (2022). Do board characteristics affect bank risk-taking and performance? Evidence from Indonesian and Malaysian Islamic banks. *Journal of Management and Governance*, 1-31. https://doi.org/https://doi.org/10.1007/s10997-022-09625-w

Nguyen, Q. K. (2021). Oversight of bank risk-taking by audit committees and Sharia committees: Conventional vs Islamic banks. *Heliyon*, *7*(8), e07798.

Nomran, N. M., & Haron, R. (2020). Shari'ah supervisory board's size impact on performance in the Islamic banking industry: An empirical investigation of the optimal board size across jurisdictions. *Journal of Islamic Accounting and Business Research*, *11*(1), 110–129.

Nomran, N. M., & Haron, R. (2021). Financial performance in Islamic banking and Shari'ah supervision under interventionist regulatory approach: A system-GMM dynamic panel analysis. *Turkish Journal of Islamic Economics*, *8*(1), 59–86.

Nomran, N. M., Haron, R., & Hassan, R. (2018). Shari'ah supervisory board characteristics effects on Islamic banks' performance: Evidence from Malaysia. *International Journal of Bank Marketing*, *36*(2), 290–304.

Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations: A resource dependence perspective*. New York: Harper & Row.

Purbayanto, M. A. H., Faturohman, T., Yulianti, & Aliludin, A. (2022). Do Islamic banks in Indonesia take excessive risk in their financing activities? *Journal of Islamic Monetary Economics and Finance*, *8*(1), 149–160.

Rahman, A. A., & Bukair, A. A. (2013). The influence of the Shariah supervision board on corporate social responsibility disclosure by Islamic banks of gulf co-operation council countries. *Asian Journal of Business and Accounting*, *6*(2), 65-104.

Ramly, Z., & Nordin, N. D. H. M. (2018). Sharia supervision board, board independence, risk committee and risk-taking of Islamic banks in Malaysia. *International Journal of Economics and Financial Issues*, *8*(4), 290–300.

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata Journal*, *9*(1), 86–136.

Safiullah, M., & Shamsuddin, A. (2018). Risk in Islamic banking and corporate governance. *Pacific Basin Finance Journal*, *47*, 129–149.

Saudi Arabian Monetary Authority (SAMA) (2020). *Shariah Governance Framework for Local Banks Operating in Saudi Arabia*.

Serly, V., & Oktamirza, S. (2022, July). The characteristics of the Sharia supervisory board towards financial soundness in Indonesia Islamic bank. Proceedings of the *Eighth Padang International Conference on Economics Education, Economics, Business and Management, Accounting and Entrepreneurship (PICEEBA-8 2021) (pp. 40-46). Atlantis Press*.

Singh, P. J., Power, D., & Chuong, S. C. (2011). A resource dependence theory perspective of ISO 9000 in managing organizational environment. *Journal of Operations Management*, *29*(1–2), 49–64.

Srivastav, A., & Hagendorff, J. (2016). Corporate governance and bank risk-taking. *Corporate Governance: An International Review*, *24*(3), 334–345.

Umar, U. H. (2022). Relationship between board independence and CSR spending of Islamic banks in Bangladesh. *Journal of Islamic Monetary Economics and Finance*, *8*(2), 201–218.

Umar, U. H., Jibril, A. I., & Musa, S. (2022). Audit committee characteristics and corporate philanthropic donations before and during COVID-19. *Corporate Governance: The International Journal of Business in Society*, (ahead-of-print). https://doi.org/10.1108/CG-10-2021-0387

Wang, M. J., Su, X. Q., Wang, H. da, & Chen, Y. S. (2017). Directors' education and corporate liquidity: Evidence from boards in Taiwan. *Review of Quantitative Finance and Accounting*, *49*(2), 463–485.