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# The influence of corporate governance and Shariah governance on insolvency risk: Evidence from developing market

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## ABSTRACT

The goal of the study was to determine how corporate governance and Sharia governance affected the risk of insolvency in banks located in Iraq and the Gulf Cooperation Countries (GCC). The moderating influence of foreign ownership in banks on the association between the two levels of governance and bankruptcy risk was also examined in this study. For the years 2012–2021, the study covered 70 banks listed in Iraq and the seven GCC countries. Three distinct regression models were utilized in the study: ordinary least squares, variable effect model, and fixed effect model. To select the best model and discover the analysis's findings, a comparison of the models was done. The findings showed that insolvency risk and corporate governance had a negative association. While there was no effect of Sharia governance on insolvency risks. The study found that foreign ownership also plays a major role in the interaction. The study provides a valuable unified indicator through which corporate governance and Sharia law can be measured in the GCC and Iraq. It gives decision-makers an accurate view of the risks of insolvency and ways to control them.

**Keywords**: Banking Engineering, Corporate Governance, Sharia Governance, Insolvency Risk, Banks, Foreign Ownership, Regression Models, Ordinary Least Squares, Variable Effect Model, Fixed Effect Model, Unified Indicator, Decision-Makers, Control Measures.

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## 1. Introduction

For many years, Islamic banking has been expanding throughout markets in Africa, the Middle East, and Southeast Asia, making it the fastest-growing sector of the global financial system [1]. Shariah-compliant assets are a large part of GCC banking assets. In MENA, Islamic Banking represents 14% of total banking assets. Islamic banks are systemically significant in the GCC, where their market share surpassed 25%. GCC Islamic financial assets in GCC are the largest ($ 1,253 billion by 2019) compared with other regions. In Kuwait, Saudi Arabia, and the United Arab Emirates, Islamic banking has grown to be a systemic presence [2]. Some problems have made banks less capable, impacted governance effectiveness, and altered the relationship between governance and insolvency risk. The environment around Islamic banks has an impact on how well they operate. According to Mansour et al. [3] and Rizwan et al. [4], for example, the COVID-19 epidemic has caused a decrease in their ROA and ROE and increased systematic risk. The 2008–2009 financial crisis has had an impact on Islamic banks. Due to their close linkages to the global market and their exposure to the credit, liquidity, and market risk of the US and Europe, Middle Eastern countries have suffered considerably, especially in the banking sector [5]. Political stability is another matter that is associated with the danger of insolvency. There has also been political unrest in the Middle East. Following the 2011 Arab Spring, a number of regional regime collapses and escalating demonstrations that impacted the majority of the region's nations undermined the political stability of the Middle East. In the Middle East, it is linked to feeble formal institutions [6]. A growing amount of cash is leaving the Middle East for other nations as a result of this circumstance [7]. Factors

contributing to capital outflow include political instability, high corruption, weak regulation, and government effectiveness, the weak rule of law, and slow economic and GDP growth [7]. In line with this finding, international transparency organizations classified the countries of the Middle East as highly corrupt countries (Transparency International-2020). This situation has concerned scholars and policymakers on the importance of governance to ensure bank solvency. However, to what degree the bank-level and country-level governance can affect banks' risk is still an unresolved issue [5]. Effective governance must be in place to convince depositors (who are religiously sensitive to interest) in line with Islamic teaching and rules [8]. However, Shariah governance is still in its early stage compared to corporate governance. Thus far, no standardized Shariah governance index can fit Islamic countries like the Middle East [9] [10]. Most countries started developing their code of governance after the financial crisis in 2008-2009 [11].

Scholars have endeavoured to establish an index of corporate governance. For instance, Bhagat et al. [12] added 30 additional areas to Brown and Caylor's [13] index, including ownership, progressive practices, audit, board of directors, charter/by-laws, director education, executive and director remuneration, and state of incorporation. As before, important features like an external auditor and shareholders' rights are absent from the Bhagat et al. [12] and Brown and Caylor [13] indexes. Thirty factors, including disclosure, board effectiveness and composition, and shareholders' rights, were used by Al-Malkawi et al. [14] to assess the corporate governance of non-financial companies in the GCC. In the UK, Anginer et al. [15] included board attributes, compensation and ownership attributes, auditing attributes, and anti-takeover attributes to measure the corporate governance index. In their seminal work, Pillai and Al-Malkawi [16] deployed the Al-Malkawi et al.'s [14] index to measure the corporate governance of financial and non-financial companies in GCC. The work of Al-Malkawi et al. [14] focused on non-financial companies and mainly on disclosure. Similarly, Pillai and Al-Malkawi [16] focused on the disclosure of CG. However, previous studies produced a cross-countries variation of corporate governance models specific to the governance code of individual countries. No standardized corporate governance index has been developed to fit countries in a region sharing similar characteristics. In contrast, studies on the Shariah governance index are still limited. An index of Shariah governance for Malaysian banks was created by Mohd Ariffin et al. [17]. It covers the following areas: loans, Shariah committee, finance, zakat and charity, deposits and investments, and Shariah non-compliance. A comparison of Shariah governance in Islamic banks was conducted using the Shariah governance index in Malaysia by Masruki et al. [18], which had 28 elements. These items included features such transparency disclosure, Shariah committee, Shariah risk management, Shariah audit, and Shariah review. The index of Mohd Ariffin et al.'s [17] focused on zakat and also with Masruki et al. [18] was designed specifically for Malaysian Islamic banks. Moreover, previous studies provide cross-countries variations of the Shariah governance index depending on their legal and financial structure. More studies are needed to develop and examine the Shariah governance index on bank performance [19] [20].

Furthermore, Jensen [21] opined that the ownership structure is the most crucial of all corporate governance mechanisms in controlling the manager's behavior and decisions. There is no space for personal power to drive decision-making and corporation activities when the corporation has an efficient ownership structure. Therefore, management choices cannot damage shareholders since all shareholders can vote on critical matters affecting firm performance based on their ownership. Previous studies have shown that ownership structure affects governance [22]. Governance issue is more critical in concentrated ownership, which is most prevalent in Middle Eastern banks. Concentrated governance (e.g., local vs foreign ownership), would raise governance challenges in decision-making. The conflicts between the controlling and minority shareholders will influence voting power, discretion, monitoring, and engagement in policymaking and thus, bank performance [23]. For instance, the ownership structure has mixed findings on the insolvency risk. Ownership concentration negatively affects the credit risk but insignificantly the insolvency risk, government ownership has a positive effect on credit risk and insolvency risk, and foreign ownership has a positive effect on credit risk, and a negative effect on insolvency risk [24]. Moreover, local vs foreign ownership and the restrictions limiting foreign investments are other governance challenges and opportunities [25]. In this regard, the Middle Eastern countries' specificities that characterize concentrated ownership, weak law enforcement, developing financial markets, strong kinship, and trust define how banks are governed. Based on the review, cross-country studies have ignored the rule of one-size-fits-all for governance models that can be standardized across countries in a region sharing similar country-specific characteristics. The governance models are particularly skewed in the corporate governance context, either shareholder-oriented or stakeholder-oriented [26]. Therefore, there is an urge to contextualize governance research based on models and practices appropriate for their specific regional and institutional context. Moreover, very few studies have comprehensively examined corporate, shariah, and institutional

governance and their impact on insolvency risk. Elamer et al. [27] are closest to this study examining Shariah and institutional governance on risk disclosures of MENA banks. This study examines the effect of the two different governance levels: Shariah governance and corporate governance on insolvency risk for Islamic banks and conventional banks in the GCC and Iraq. This study focuses on GCC and Iraqi banks because they provide a suitable context of governance-insolvency risk for several reasons. First, GCC and Iraq are oil-exporting countries which highly exposed to price volatilities [28] [29] and, thus, insolvency risk.

Second, the nations' shared unique governance norms and practices with relation to institutional and national regulations and their implementation result in increased levels of corruption and economic instability. It requires improvements and reforms in the governance system and suggests advanced governance standards that can fit the region. Third, the GCC and Iraq have witnessed plausible growth of the banking sector (both Islamic and conventional) in recent years, which exposed banks to additional governance and management conflicts, given different internal governance practices between Islamic and conventional banks. On top of institutional and corporate governance, Islamic banks have additional Shariah governance to ensure compliance with Islamic law. Moreover, previous studies mainly focused on a single country study or a small group of countries, thus warranting additional research examining cross-national governance practices across more prominent sample countries. As a result, the focus of our research is on oil-exporting nations, such as Iraq and the GCC (United Arab Emirates, Kuwait, Saudi Arabia, Qatar, Bahrain, and Oman). The data, which covers the most recent developments on banking expansion in the observed countries, spans the years 2012 to 2021. Thus, the goal of this research is to create a framework that academics, decision-makers, and bankers can utilize to comprehend the relationship between bank-level governance (corporate and shariah governance) in relation to bankruptcy risk. It also looks at how ownership structure affects governance and insolvency risk in a moderating way.

## 2. Literature review and hypotheses development

### 2.1. Corporate governance and insolvency risk

Agency theory explains how duties and responsibilities are delegated by the principal and shareholders to management and agents [30-32]. Agents represent managers and their management decisions must serve the interests of the company's shareholders, far from their interests [30]. Many problems can arise as a result of the agency relationship. Agency theory aims to solve the problem of conflicting goals and interests between parties, where the principal intends to ensure the agent's loyalty by providing a reasonable system of compensation [31] [33]. Management receives incentives to achieve the company's goals and work to enhance shareholders' wealth and protect their interests [34] [35]. One of the roles of corporate governance in companies is how to keep the agency problem from getting worse. Boards of directors work as an oversight mechanism to ensure that senior management's decisions do not deviate from the main goal of protecting the interests of shareholders, meaning that boards of directors' act as an intermediary between the two parties [36]. Boards of directors can work to prevent opportunistic behavior and illegal or disorderly actions taken by managers before their effects on the company worsen (Hadi Saeidi; Shaban Mohammadi). The study shows contradictory findings about insolvency risks. According to several research [37] [38], shareholder-friendly governance structures may also stimulate the adoption of riskier business strategies, which might increase the likelihood of financial institutions going bankrupt. Incentives for managers to take on hazardous initiatives that might hurt debt holders by raising the cost of agency debt can come from shareholder-friendly governance frameworks [39] [40]. However, Switzer et al. [41] found that larger, more independent boards had greater insolvency risks as evaluated by distance to default using a sample of Canadian financial institutions from 2010 to 2013 (post-crisis). Nonetheless, Switzer and Wang [42] provide evidence that US commercial banks with larger and more independent boards of directors experienced lower levels of bankruptcy risk between 2001 and 2007 before the global financial crisis. Agency behavior arises from the theory that corporate managers may be more risk-averse than shareholders because of their desire to protect their undiversified human resources and their investment in the company [37]. Consequently, we presume:

***H1:*** *Corporate governance will influence insolvency risk negatively.*

### 2.2. Shariah governance and insolvency risk

The principles of Islamic Shariah must be followed by Islamic banks, and they must have a Shariah governance structure in place to guarantee the banks' adherence to Shariah. This is how the governance in the Islamic bank is different from that of traditional banks [43]. Islamic banks have a stronger governance system than regular banks since they are subject to two different kinds of governance: the Shariah Supervisory Board and the board

of directors [44]. The board of directors oversees the bank's overall management, and the Shariah board oversees banking services and transactions. Therefore, according to Ben Zeineb and Mensi [45], shariah and corporate governance increase stakeholder confidence and credibility. According to Almutairi and Quttainah [46], corporate governance and shariah governance in banks have complementary roles and responsibilities. In order to ensure Islamic financial institutions, follow Shariah, reduce the risks connected with Shariah, and enhance their financial stability, the board of directors and the Shariah Supervisory Board properly oversee these institutions. Safiullah and Shamsuddin [47] have shown that operational risks and bankruptcy in Islamic banks operating under Shariah governance increase in tandem with the number and qualifications of the Shariah board. Additionally, managers and management may feel pressure from shariah governance to curtail ambitious and hazardous initiatives [48]. Consequently, our hypothesis is:

***H2**: Shariah governance will influence insolvency risk negatively.*

### 2.3. Ownership structure as a moderation

The increase in foreign ownership in the banking industry and the admission of foreign banks have attracted several scholars to study the effects of foreign ownership on banks' risk-taking behavior and performance [49]. Let foreign banks compete with domestic banks, claims ElBannan [50], and that might boost the banking sector. The stability, safety, and financial performance of the system will all improve as a result. Because of intense rivalry, the infusion of knowledge, experience, and technology, the fortification of the regulatory and legislative framework governing banks, and the facilitation of access to global capital markets, the existence of foreign ownership has the potential to elevate the caliber of financial services [51]. In this context, Laeven [52] discovered that, in comparison to other banks, foreign-owned banks in East Asia do not face significant risk. Foreign-owned banks are less financially fragile and less likely to become insolvent [53]. International banks may also provide local banks with new technology and knowledge, manage the firm with a greater level of experience than local banks, and assist the board of directors in implementing more transparent and effective operating procedures [54]. According to Grassa [8], international investors are putting pressure on the board of directors to divulge more information about the company's financial status and capacity to meet its financial commitments. The need for and pressure to increase information disclosure increases with the amount of foreign ownership, which improves the caliber of accounting information. A higher degree of openness in the information that is revealed results in better management oversight, which benefits all shareholders [55]. Consequently, the existence of foreign ownership in the bank is regarded as a sign of openness and dedication to corporate governance standards for stakeholders, increasing the company's value [56]. Furthermore, Almutairi and Quttainah [46] contend that when foreign investors voice their own ideas, they are less afraid to bring up contentious topics on the board of directors, which motivates other board members to take part in better governance. Consequently, we should anticipate that the presence of foreign ownership in developing country banks will be more significant, since these nations' banking sectors greatly benefit from the advantages that come with foreign ownership, including advanced technology, knowledge, and skills, financial services, and other privileges. Consequently, this research assumes that:

***H3**: Foreign ownership has an interaction on the link corporate governance, Shariah governance, and insolvency risk.*

Figure 1 shows the conceptual design of this research.

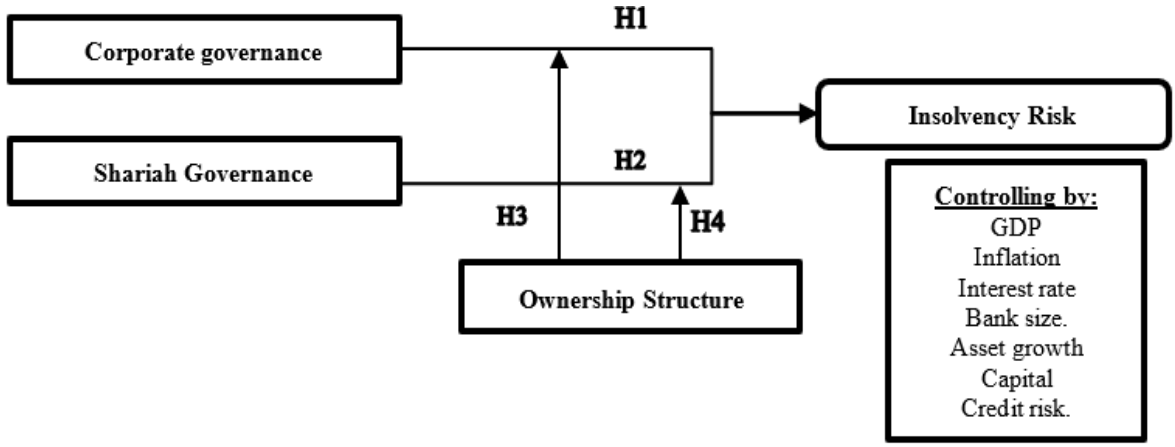


Figure 1. Conceptual representation of the model

## 3. Methodology

### 3.1. Sampling

The purpose of this study is to look at how governance affects insolvency risk across Middle Eastern banks. The study focuses on seven countries: Saudi Arabia, Kuwait, the UAE, Bahrain, Qatar, Oman, and Iraq. The pick of these nations assumes that they are oil exporters with comparable cultural and economic structures. Furthermore, banks in these nations are heavily affected, linked, and exposed to the American and European markets, making the impact of the economic crisis on these countries more severe. The study will focus on Islamic and commercial banks in these countries. Previous studies examined the regulation and its relationship with risk in these countries until 2012 and the studies suggested examining the post-2012. Because most countries in the Middle East focused on corporate governance after the financial crisis in 2008-2009. Furthermore, the Arab Spring started in 2011 and it has caused political instability in the region that has eventually affected most of the countries in the region. Thus, the time frame of this study will be from 2012-2021. The population of this study includes the banks. The focus on banks is due to the notion that the corporate governance of these banks is different from other companies such as listed public companies. The study has collected data from 70 banks working in Iraq and GCC after excluding the banks that started after 2012 or who faced liquidation during 2012-2021.

### 3.2. Measurements

Dependence variable: The insolvency risk refers to the risk that results from other primary risks such as credit risk, liquidity risk, and market risk [57]. Insolvency risk is measured using a z-score. Safiullah and Shamsuddin [47], measured the z-score using the formula below.

$$\text{Z-score}_{i,t} = [\text{ROA}_{i,t} + \text{CAR}_{i,t} / \text{SDROA}_{i,t}]$$

Where:

- ROA is the return on assets.
- CAR is the capital-to-asset ratio.
- SDROA is the standard deviation of ROA for bank i at time t.
- In this study, the formula of Safiullah and Shamsuddin [47] will be deployed. The data of ROA and CAR will be collected from the annual reports of banks.

*Independent variable:* Corporate governance is measured using an index. The index was originally adopted from previous studies [12]; Brown & Caylor 2006). Further modifications were conducted based on a review of other indices in the seven selected countries and the indices of the GC [58] [59]. The indices of the seven countries as well as the indices from the literature were compared. The index has been validated using input from experts in the region of the Middle East. A copy of the index with a cover letter that explains the purpose of using the index has been mailed to experts to finalize the index and to make it more suitable for the context of the Middle East. The corporate governance index's characteristics, item count, and data extraction source are displayed in Appendix 1. There is an indicator that is used to gauge Shariah governance. The index for SG was developed by reviewing indices in the chosen countries and using findings from earlier research (Masruki et al. 2020; [17]. There are thirteen items on the Shariah committee, five items on the Shariah review, four on the Shariah audit, four on the Shariah risk management, eight on transparency and disclosure, and six on non-Shariah compliant operations. The index has also been validated by experts in the Middle East. The measurement as well as the source of the measurement are given in Appendix 2.

*Moderating variable:* the study employed code 1 if the bank has foreign ownership and 0 otherwise.

*Control Variable:* According to the literature review, numerous factors are used as control variables in this study. Since the study includes various nations, the GDP [60] [45], inflation rate [60] [61], interest rate, and market competition are computed from a simplified form as the sum of the elasticities of the firm's total income with respect to its input prices. González et al. [62] are identified as the control variable at the national level. Control factors for bank size [63], include capital, asset growth, and credit risk. GDP represents the natural logarithm of real GDP in USD. The inflation rate is the average percentage rate of inflation across the research period. Interest rate is defined as a percentage of interest rate. The book value of a bank's total assets determines its size. Asset growth is the difference between assets last year and this year. Capital is the natural logarithm of total assets. Finally, credit risk is the provision for loan loss based on the total loan.

### 3.3. Models

Model 1: $Z\text{-score} = \beta 0 + \beta 1\ CG\ index_{it-1} + \beta 2\ SG\ index_{it-1} + \beta 3\ Control\ variables_{it-1} + u$ …… (1)

Model 2: *The moderating effect of ownership structure and Bank type*

$Z\text{-score} = \beta_0 + \beta 1\ CG\ index_{it-1} + \beta 2\ SG\ index_{it-1} + \beta 3\ CG\ index_{it-1} * OS_{it-1} + \beta 4\ SG\ index_{it-1} * OS_{it-1} + \beta 5\ Control\ variables + u$ ..... (2)

Where:

- GC index= Corporate governance index
- SG index= Shariah governance index
- OS= Ownership structure
- i = a bank
- t = year
- $\beta_0$= intercept, measures the expected value of the risk-free rate if the regression equals to zero
- $\beta_1$= the coefficient of the independent variable
- u = the error term

## 4. Analysis and findings

The range of numbers between 0.000 and 7.9233 represents the least and maximum bankruptcy risk, with the mean being 0.6769 and the median being 0.3480. As per Rahman [64], a bank that has a lower value is considered safer, but a larger value suggests that the bank is riskier. When compared to the values of 16.889 for Islamic banks in Malaysia, the study's mean value of 0.6765 is rather low [64], and the values reported for G20 countries [65]. This suggests that the banks in GCC and Iraq countries are highly risky due to geopolitical instability, regional conflicts, and economic uncertainty [66] [67]. Concerning governance mechanisms, the mean values of the corporate governance and shariah governance indexes are 0.0002 and 0.0063. Table 1 shows that the frequency of ownership structure for local ownership is 13%, while 87% of the sampled banks have foreign stakes in their ownership structure. This implies that the firms having foreign stakes in their ownership structure could be better managed efficiently than those with 100% owned by local shareholders, which could help strengthen banking competition in banking sectors of GCC countries and stabilize credit in periods when GCC and Iraq countries are faced with idiosyncratic shocks.

Table 1. Descriptive Statistics

| Variables | N | Mean | Median | Std. Dev. | Min. | Max. |
|---|---|---|---|---|---|---|
| Z-score | 700 | 0.6769 | 0.3480 | 1.0281 | 0.0000 | 7.9233 |
| CG | 700 | 0.0002 | 0.4185 | 1.4669 | -9.3528 | 0.4185 |
| SG | 700 | 0.0063 | 1.5325 | 1.8811 | -2.5545 | 1.7456 |
| Interest Rate | 700 | 5.80983 | 4.94 | 9.5144 | -17.3916 | 40.8599 |
| GDP | 700 | 11.4139 | 11.2525 | 11.3233 | 11.44 | 11.8510 |
| Inflation | 700 | 1.5638 | 1.8313 | 1.7239 | -2.5403 | 6.1000 |
| Bank Size | 700 | 10.8298 | 10.8706 | 1.2099 | 6.8 | 14.250 |
| Asset Growth | 700 | 0.1720 | 0.1600 | 0.0748 | 0.0400 | 0.4900 |
| Capital | 700 | 0.3127 | 0.2848 | 0.1364 | 0.0600 | 0.8900 |
| Credit Risk | 700 | 0.4726 | 0.4700 | 0.1798 | 0.0700 | 0.9010 |
| For_ow | 700 | 0.8700 | 1.0000 | 0.3400 | 0.0000 | 1.0000 |

One common assumption of least squares is multicollinearity, which is useful when utilizing the regression technique to examine relationships between independent variables. Typically, multicollinearity testing is done using correlation analysis. As to Hair et al. [68], every other correlation coefficient in this context is less than 0.830, meaning that none of them exceeds 0.9. Multicollinearity is thus not a significant issue.

Table 2. Correlation Matrix

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Z-score | 1.000 | | | | | | | | | | |
| (2) CG | -0.006 | 1.000 | | | | | | | | | |
| (3) SG | 0.147 | 0.167 | 1.000 | | | | | | | | |
| (4) Interest Rate | -0.068 | 0.830 | 0.672 | 1.000 | | | | | | | |
| (5) GDP | 0.004 | 0.815 | 0.443 | 0.724 | 1.000 | | | | | | |
| (6) Inflation | -0.052 | 0.721 | 0.590 | 0.369 | 0.640 | 1.000 | | | | | |
| (7) Bank Size | -0.030 | 0.478 | 0.705 | 0.596 | 0.813 | 0.822 | 1.000 | | | | |
| (8) Asset Growth | 0.011 | 0.138 | 0.106 | 0.029 | 0.015 | 0.056 | 0.318 | 1.000 | | | |
| (9) Capital | -0.011 | 0.043 | -0.167 | 0.127 | 0.104 | 0.100 | 0.530 | 0.238 | 1.000 | | |
| (10) Credit Risk | 0.462 | -0.240 | -0.477 | 0.036 | 0.394 | 0.122 | 0.153 | 0.749 | 0.224 | 1.000 | |
| (11) For_ow | 0.125 | 0.013 | -0.794 | -0.723 | -0.645 | 0.001 | -0.364 | 0.060 | 0.065 | -0.366 | 1.00 |

Table 3. Corporate governance and insolvency risk

| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** |
|---|---|---|---|---|---|
| | OLS | FIXED EFFECT MODEL | RANDOM EFFECT MODEL | ROBUST FIXED EFFECT MODEL | VIF |
| CG | -0.3457* | -0.0168** | -0.0961** | -0.0168** | 1.08 |
| | (0.0822) | (0.0257) | (-2.0653) | (0.0328) | |
| Interest rate | -0.1587* | 0.0109 | -0.1274* | 0.0109 | 1.18 |
| | (0.0586) | (0.3911) | (0.0935) | (0.3730) | |
| GDP | -0.0426** | 0.0155 | 0.0327 | 0.0155 | 1.14 |
| | (0.0373) | (0.2608) | (0.5029) | (0.3018) | |
| Inflation | -0.0706** | -0.0880** | -0.0253** | -0.0880** | 1.02 |
| | (0.0206) | (0.0209) | (0.0425) | (0.0314) | |
| Bank size | -0.4185 | 0.0114 | -0.0039 | 0.0114 | 1.27 |
| | (0.2308) | (0.3824) | (0.9016) | (0.2649) | |
| Asset growth | -0.1163* | -0.1043* | -0.0893** | -0.1043* | 1.19 |
| | (0.0736) | (0.0618) | (0.0148) | (0.0703) | |
| Capital | -0.4803 | -0.2001** | -0.0394*** | -0.2001** | 1.25 |
| | (0.1274) | (0.0258) | (-2.3863) | (0.0348) | |
| Credit Risk | 1.5468*** | 1.8602*** | 2.0847*** | 1.8602*** | 1.22 |
| | (0.0000) | (0.0000) | (6.8750) | (0.0000) | |
| Constant | 1.5490*** | 1.6104*** | 2.5674*** | 6.6104 | |
| | (0.0000) | (3.3485) | (2.8484) | (5.7308) | |
| Observations | 699 | 699 | 699 | 699 | |
| R-squared/Pseudo $R^2$ | 12.32 | 16.54 | 19.20 | 22.40 | |
| Adj $R^2$ | 10.35 | 15.50 | 18.50 | 20.50 | |
| F-stat/Prob. | 5.5748 | 3.6225 | 43.8496 | 121.83 | |
| Wald $R^2$/Prob. | - | - | 49.85 | 51.77 | |
| | | | 0.000 | 0.000 | |
| Year Dummies | Yes | Yes | Yes | Yes | |
| Country Dummies | Yes | Yes | Yes | Yes | |
| **Diagnostic tests:** | | | | | |
| Multicollinearity (Mean VIF) | 1.17 | | | | |
| Heteroskedasticity | | 5844.12***(0.0000) | | | |
| Serial Correlation | 12.891***(0.0000) | | | | |
| Poolability Test | | 21.97***(0.0000) | | | |
| Breusch-Pagan LM Test | | 187.21***(0.0000) | | | |
| Hausman Test | | | 32.54(0.0000) | | |

p-values are in parentheses***
p<.01, ** p<.05, * p<.1

This section presents the findings on the correlation between bankruptcy risk and corporate mechanisms. The empirical regression analysis may be carried out, provided the multicollinearity and linearity assumptions are met. The Poolability test, as presented in Table 3, reveals a significance at (0.000), indicating that FEM outperforms POLS. Furthermore, REM is superior to the POLS model, as indicated by the Breusch-Pagan LM test, which demonstrates significance at (0.000). Thus, because steps 1 and 2 indicate that the fixed effects model and random effects model are suitable, the third step is to determine if the FEM is more appropriate than the REM. The fixed effect model is preferred, as indicated by the Hausman test result, which is significant (0.0000).

The diagnostic test results are also reliable and noteworthy. The fixed effect model's dependability was evaluated in the first stage using the heteroskedasticity, serial correlation, and multicollinearity tests. According

to Hair et al. [68], there was no discernible multicollinearity problem because the average VIF value was 1.17, which is below the 3.00 criterion. The heteroskedasticity test findings (Chi2 = 5844.12***; prob. = 0.000) showed that the model exhibits heteroskedasticity problems. Additionally, a substantial autocorrelation problem was found by the serial correlation test (F=12.891***; prob.=0.0000). Therefore, the research tackles problems resulting from serial correlation as well as heteroskedasticity by employing a powerful fixed-effect model. The robust fixed effect appears to be a good match for the model based on the probability of the F-statistic. As a result, the last column in Table 4.4 is utilized to validate or disprove the hypotheses developed for this investigation. Consequently, the findings indicate that corporate governance and bankruptcy risk have a negative and significant connection (coefficient= -0.0168**; p-value = 0.0328< 5%). This suggests that the bankruptcy risk is less in GCC and Iraqi enterprises with stronger corporate governance standards, and vice versa. Thus, hypothesis H1 that corporate governance has negative effects on insolvency risk across countries is supported. Furthermore, the R square for the relationships between corporate governance and insolvency risk with control variables is 22.40%. It implies that corporate governance, interest rate, GDP, inflation, bank size, asset growth, and capital can explain about 22.40% variations in insolvency risk in GCC banks.

The findings on the correlation between Shariah governance and insolvency riskare displayed in Table 4. Based on an analysis of the correlation between Shariah governance and insolvency risk, the diagnostic tests show that the FEM is suitable for this connection. It can be seen from the Poolability test that FEM outperforms POLS, with a significance at (0.000). Additionally, REM performs better than the POLS model according to the Breusch-Pagan LM test, which demonstrates significance at (0.000). The Hausman test is not statistically significant at (0.0000) when comparing FEM with REM. Shariah governance has a negative but insignificant effect on insolvency risk (Beta = -0.8490; p-value = 0.5820 > 0.10). This suggests that Shariah governance will not lead to a lower insolvency risk across banks in GCC and Iraqi countries.

The result is inconsistent with Safiullah and Shamsuddin [47] that banks reduce their operational and insolvency risks following the composition and size of their Shariah supervisory board (SSB). This finding indicates that banks with better shariah committees with sound members' attributes can complement other governance mechanisms and have lower insolvency risk. The results, also, contradict the study of AlAbbad et al. [69] that shariah governance measured by SSB size positively enhances insolvency risks. This may be due to the level and extent of busy directors in Shariah committees and SSB. Therefore, based on the results, hypothesis H2 which states that shariah governance negatively impacts insolvency risk is not accepted and not supported.

Table 4. Shariah governance and insolvency risk

| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** |
|---|---|---|---|---|---|
| | OLS | FIXED EFFECT MODEL | RANDOM EFFECT MODEL | ROBUST FIXED EFFECT MODEL | VIF |
| SG | -0.0853* | -0.8490 | 0.1204* | -0.8490 | 1.24 |
| | (0.0842) | (0.5820) | (0.0583) | (0.5820) | |
| Interest rate | 0.0514 | -0.2736 | -0.4785 | -0.2736 | 1.18 |
| | (0.6485) | (0.1538) | (0.3984) | (0.1538) | |
| GDP | -0.0051*** | -0.1955* | -0.0191** | -0.1955* | 1.14 |
| | (0.0007) | (0.0836) | (0.0002) | (0.0836) | |
| Inflation | -0.6831 | -0.2548* | -0.6145 | -0.2548* | 1.02 |
| | (0.3804) | (0.0937) | (0.5208) | (0.0937) | |
| Bank size | -1.8754*** | -0.0642** | -0.1826* | -0.0642** | 1.27 |
| | (0.0000) | (0.0158) | (0.0723) | (0.0158) | |
| Asset growth | 0.1470* | -0.4982 | -0.3758 | -0.4982 | 1.19 |
| | (0.0833) | (0.4708) | (0.2688) | (0.4708) | |
| Capital | -0.0071*** | -0.0188** | 0.0352** | -0.0188** | 1.25 |
| | (0.0030) | (0.0286) | (0.0351) | (0.0286) | |
| Credit Risk | 0.2789*** | 0.3147*** | 0.2122** | 0.3147*** | 1.22 |
| | (0.0000) | (0.0000) | (0.0358) | (0.0000) | |
| Constant | 11.7635*** | 158.322*** | 92.3861*** | 158.322*** | |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | |
| Observations | 699 | 699 | 699 | 699 | |

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | OLS | FIXED EFFECT MODEL | RANDOM EFFECT MODEL | ROBUST FIXED EFFECT MODEL | VIF |
| R-squared/Pseudo $R^2$ | .1284 | .1380 | .1154 | .1380 | |
| Adj $R^2$ | .1043 | - | .1088 | - | |
| F-stat | 49.8562 | 102.86 | 82.6238 | 86.6316 | |
| Wald $R^2$/Prob. | - | 39.56 0.0000 | 86.93 0.0000 | 38.95 0.0000 | |
| Year Dummies | Yes | Yes | Yes | Yes | |
| Country Dummies | No | Yes | Yes | Yes | |
| **Diagnostic tests:** | | | | | |
| Multicollinearity (Mean VIF) | 1.19 | | | | |
| Heteroskedasticity | | 98.6438***(0.0000) | | | |
| Serial Correlation | 9.8734***(0.0032) | | | | |
| Poolability Test | | 49.47***(0.0000) | | | |
| Breusch-Pagan LM Test | | 75.7986***(0.0000) | | | |
| Hausman Test | | | 37.3508(0.0000) | | |

p-values are in parentheses***
p<.01, ** p<.05, * p<.1

Model 4 of Table 5 depicts the effects of local and foreign ownership and corporate governance on insolvency risk. While corporate governance has a significant negative effect on insolvency risk, local and foreign ownership has a more significant negative effect on insolvency risk. This is inconsistent with the argument of Zheng et al. [70] that banks' ownership structure in GCC countries is highly concentrated through either significant government ownership or institutional or high family-group membership. The authors also noted that a sizeable proportion of banks in GCC countries have dissimilar ownership structures. Table 5 presents also the results for moderating effects of local and foreign ownership on corporate governance and insolvency risk. The results show that the interaction term has negative and significant effects (Beta = -0.0016***; p-value < 0.01) on insolvency risk. This indicates that foreign ownership significantly moderates the relationship between corporate governance and insolvency risk. This implies large foreign owners across banks in GCC and Iraqi countries exhibit higher concern for monitoring and protecting the minority shareholders [23].

Table 5. the moderating effect of ownership structure on the relationship between corporate governance and insolvency risk

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | POLS | FIXED EFFECTS MODEL | RANDOM EFFECTS MODEL | ROBUST FIXED EFFECT MODEL |
| CG | -0.0936* | -0.1053* | -0.0204** | -0.1053* |
| | (0.0782) | (0.0685) | (-2.2470) | (0.0635) |
| Loc-for_ow | -0.1603** | -0.0753*** | -0.3381*** | -0.0753*** |
| | (0.0194) | (0.0002) | (-5.0284) | (0.0009) |
| CG* Loc-for_ow | -0.1285** | -0.0016*** | -0.1369*** | -0.0016*** |
| | (0.0427) | (0.0000) | (-4.1752) | (0.0000) |
| Interest rate | -0.0406 | -0.0938** | -0.0884** | -0.0938** |
| | (0.1744) | (0.0114) | (-2.3875) | (0.0227) |
| GDP | -0.0921** | -0.1183* | -0.1704** | -0.1183* |
| | (0.0438) | (0.0726) | (-3.4625) | (0.0731) |
| Inflation | -0.0893** | -0.1099** | 0.0473 | -0.1099** |
| | (0.0191) | (0.0438) | (0.3715) | (0.0373) |
| Bank size | -0.2263** | -0.8714** | -0.0591 | -0.8714** |
| | (0.0378) | (0.0287) | (0.1287) | (0.0406) |
| Asset growth | -0.0452*** | -0.0729* | -0.9101** | -0.0729* |
| | (0.0013) | (0.0641) | (-2.5294) | (0.0643) |

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | POLS | FIXED EFFECTS MODEL | RANDOM EFFECTS MODEL | ROBUST FIXED EFFECT MODEL |
| Capital | 0.0170 | -0.1350* | -0.1460** | -0.1350* |
| | (0.1153) | (0.0801) | (-0.0289) | (0.0639) |
| Credit Risk | 0.2419*** | 0.1583** | 0.2847*** | 0.1583** |
| | (0.0025) | (0.0310) | (1.0148) | (0.0361) |
| Constant | 0.3496 | 0.8194 | 0.4593 | 0.8527 |
| | (0.5503) | (0.2358) | (0.6085) | (0.2512) |
| Observations | 700 | 700 | 700 | 700 |
| R-squared/Pseudo $R^2$ | .3858 | .3691 | .3032 | .4714 |
| Adj $R^2$ | .3597 | .3165 | - | .4522 |
| F-stat/Wald x2 | 51.4730 | 38.8216 | 42.4136 | 33.7639 |
| Wald $R^2$/Prob. | - | - | 28.13 | 37.44 |
| | | | 0.0000 | 0.0000 |
| Year Dummies | Yes | Yes | Yes | Yes |
| Country Dummies | No | Yes | Yes | Yes |
| **Diagnostic tests:** | | | | |
| Multicollinearity (VIF) | 1.17 | | | |
| Serial Correlation | | 115.546***(0.0000) | | |
| Heteroskedasticity (chi2) | 6436.45***(0.0000) | | | |
| Poolability test | | 11.6538***(0.0000) | | |
| Breusch-Pagan LM test | | 13.27***(0.0000) | | |
| Hausman test | | | 27.81*** (0.0000) | |

p-values are in parentheses***
p<.01, ** p<.05, * p<.1

Table 6 presents the results for moderating effects of local and foreign ownership on the relationship between Shariah governance and insolvency risk. The results show that the interaction term has negative and significant effects (Beta = -1.5937***; p-value 0.0000< 0.01) on insolvency risk. This indicates that foreign investors significantly support the Shariah governance to reduce insolvency risk. This suggests that the foreign ownership in GCC countries and Iraq that are characterized by domestic and family ownership share strong philosophical thoughts with the tenets of Islamic law and Shariah and the fundamental principle of Islamic finance is the prohibition of excessive risk-taking. Thus, giving the sampled firms the incentives to reduce bank exposure to insolvency risk by enhancing their Shariah governance frameworks and implementation strategies.

Table 6. the moderating effect of ownership structure on the relationship between Shariah governance and insolvency risk

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | POLS | FIXED EFFECTS MODEL | RANDOM EFFECTS MODEL | ROBUST FIXED EFFECT MODEL |
| SG | -0.2359** | -0.1942** | -0.0149*** | -0.1942** |
| | (0.0228) | (0.0277) | (0.0041) | (0.0194) |
| Loc-for_ow | -0.0837** | -0.1643** | -0.0035*** | -0.1643** |
| | (0.0256) | (0.0273) | (0.0000) | (0.0304) |
| SG* Loc-for_ow | -1.5875*** | -1.5937*** | -1.8725*** | -1.5937*** |
| | (-5.0463) | (-3.0296) | (-1.3528) | (-5.1784) |
| Interest rate | -0.1042** | -0.1130** | -0.2938* | -0.1130** |
| | (0.0439) | (0.0305) | (0.0631) | (0.0418) |
| GDP | -0.3805*** | -0.2460** | -0.2269** | -0.2460** |
| | (0.0000) | (0.0273) | (0.0275) | (0.0400) |
| Inflation | -0.0932** | -0.2496** | 0.1083* | -0.2496** |
| | (0.0284) | (0.0296) | (0.0764) | (0.0257) |

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | POLS | FIXED EFFECTS MODEL | RANDOM EFFECTS MODEL | ROBUST FIXED EFFECT MODEL |
| Bank size | -0.0963* | -0.1927** | -0.1803** | -0.1927** |
| | (0.0703) | (0.0386) | (0.0339) | (0.0481) |
| Asset growth | -0.4288*** | -0.2917** | -0.2290*** | -0.2917** |
| | (0.0000) | (0.0491) | (0.0000) | (0.0365) |
| Capital | -0.0097 | -0.2235** | -0.0993** | -0.2235** |
| | (0.8263) | (0.0317) | (0.0493) | (0.0219) |
| Credit Risk | 0.1286** | 0.2801*** | 0.2385*** | 0.2801*** |
| | (0.0270) | (0.0000) | (0.0000) | (0.0000) |
| Constant | 0.9584 | 0.5392 | 0.6326 | 0.5710 |
| | (0.2695) | (0.1748) | (0.2742) | (0.2306) |
| Observations | 700 | 700 | 700 | 700 |
| R-squared/Pseudo $R^2$ | .2933 | .3584 | .3706 | .3915 |
| Adj $R^2$ | .2819 | .3401 | - | .3875 |
| F-stat/Wald x2 | 19.1588 | 24.2010 | 87.1943 | 12.2129 |
| Wald $R^2$/Prob. | - | - | 22.10 | 95.08 |
| | | | 0.0000 | 0.0000 |
| Year Dummies | Yes | Yes | Yes | Yes |
| Country Dummies | No | Yes | Yes | Yes |
| **Diagnostic tests:** | | | | |
| Multicollinearity (VIF) | 1.18 | | | |
| Serial Correlation | | 5.2194***(0.0028) | | |
| Heteroskedasticity (chi2) | 2409.28***(0.0000) | | | |
| Poolability test | | 31.4013***(0.0000) | | |
| Breusch-Pagan LM test | | 25.91***(0.0000) | | |
| Hausman test | | | 63.32*** (0.0000) | |

p-values are in parentheses***
p<.01, ** p<.05, * p<.1

## 5. Discussion

This study examined the influence of corporate governance and Sharia governance on insolvency risks in the GCC and Iraq. Furthermore, the study investigated the moderating influence of foreign ownership on the link between corporate governance, Shariah governance, and insolvency risk. Stata software was used to analyze the data obtained from the banks in the sample. The findings revealed a negative link between corporate governance and insolvency risk. The results of this study are consistent with the point of view of agency theory theorists that corporate governance mechanisms in the bank are important for monitoring the behavior of senior management at work to serve the interests of stakeholders by not deviating from the basic goal of protecting the interests of all shareholders [71] [72]. Our findings are consistent with the study of Ben Zeineb and Mensi [45] who found that corporate governance mechanisms had a positive role in reducing insolvency risk in US commercial banks before the 2007 financial crisis. Darrat et al. [73] also found that corporate governance characteristics had A negative impact on bankruptcy risk for a group of companies listed on Compustat during the period 1996 to 2006. Therefore, our hypothesis that corporate governance has a negative impact on insolvency risk is supported and is consistent with the agency argument. However, the study showed that Shariah governance does not have a statistically significant impact on the insolvency risks of banks in the GCC countries and Iraq. The result is unusual for previous studies in this regard; In particular, previous studies indicated that Shariah governance and corporate governance complement each other in reducing risks. In Islamic banks, there is governance represented by the Shariah Supervisory Board and a second governance represented by the board of directors, which makes the governance framework in Islamic banks strong [44]. Ben Zeineb and Mensi [45] point out that the bank's Shariah governance is responsible for banking transactions and services, while the board of directors is responsible for the bank's governance in general. As a result, this leads to enhancing the level of stakeholders' confidence in the system. Therefore, our results are not consistent with the

study hypothesis that Shariah governance has a negative impact on insolvency risk; Therefore, hypothesis 2 is not supported. Perhaps the reason for this is that the members of the Shariah board are well-versed in areas other than Islamic Shariah, or the members of the board of directors are not familiar with matters of Islamic Shariah. That is, there is a lack of consensus between the board of directors and the Shariah board of the bank. The lack of consensus between the two boards of the bank makes it difficult to make decisions in Islamic banks [74]. The results also showed that foreign ownership had a positive interaction on the relationship between corporate governance, Shariah governance, and insolvency risk. Therefore, our hypothesis 3, which states that foreign ownership interacts with the relationship between corporate governance, Shariah governance, and insolvency risk, was supported. This result is consistent with the argument that through foreign ownership, skills, experience, knowledge, technology, and other advantages are transferred to the bank [50]. Foreign investors are also bold in discussing important, sensitive, and controversial issues in the bank, which encourages other members of the board of directors and the Shariah board to participate in more effective governance [8] [46].

## 6. Implication, limitations, and future directions

The current study presents a set of important implications from a theoretical and practical perspective that serves researchers, regulators, and decision-makers. Theoretically, the study addressed governance at two levels: corporate governance and Shariah governance. This approach differs from previous studies that dealt with corporate governance directed either toward shareholders or towards stakeholders. The study adopted a one-size-fits-all rule by developing and testing corporate governance and Shariah governance indicators and standardizing them across countries with similar characteristics. Accordingly, the study is considered important, especially since it provides a unified index to measure corporate governance and Shariah governance in the GCC region and Iraq. In addition, the current study resolves the contradiction in the literature regarding the relationship between governance and risk in banks by using the latest data from selected countries and providing an updated view of this relationship. The study also contributes by testing the moderating role of foreign ownership in banks on the relationship between corporate governance, Shariah governance, and insolvency risk. Practically, the study provides an accurate view to stakeholders and regulators in the banks sampled in the study on the importance of different banking models and risk profiles that affect how banks control and manage their insolvency risks. The study also helps decision-makers by providing an idea about effective corporate governance practices by identifying current supervisory and regulatory gaps in order to introduce the necessary reforms and amendments to reform the approved governance standards and create more effective standards. Despite the study's implications, the study has some limitations. First, the study is limited to only 70 banks because the authors were not able to obtain data for some banks from annual reports. Secondly, the current study focused on 7 Arab oil-exporting countries only (UAE, Kuwait, Saudi Arabia, Qatar, Bahrain, and Oman); Therefore, the results of the study cannot be generalized to all Arab countries in the continent of Asia or elsewhere. Third, there is a need to conduct more research on governance and risks in the Gulf Cooperation Council countries and Iraq. In other words, future studies should pay attention to how different other models of governance, such as (institutional governance), affect risk-taking, especially considering the presence of other controlling variables such as local, family, governmental, or institutional ownership.

## 7. Conclusion

Currently, Islamic banks need the Shariah board and the board of directors to work together, especially concerning financial issues [44]. Ramly and Nordin [75] add that the Shariah board and the board of directors complement each other in control and oversight and share tasks and responsibilities in supervision and direction. Therefore, the study aimed to determine the impact of corporate governance and Shariah governance on insolvency risks in banks in the GCC and Iraq. In addition, the study tested the moderating effect of the presence of foreign ownership in banks on the relationship between corporate governance, Sharia governance, and insolvency. A sample of 70 banks operating in 7 GCC countries (UAE, Kuwait, Saudi Arabia, Qatar, Bahrain, and Oman) and Iraq during the period 2012-2021 was used. The study used the Stata program to analyze the data by adopting three models (FEM, REM, and OLS) to analyze the results, compare the models, and choose the preferred model according to the tests mentioned previously. The results showed a negative relationship between corporate governance and insolvency risk. However, the study did not find an effect of Shariah governance on insolvency risk. Finally, the study found that foreign ownership interacted positively with the relationship between corporate governance, Shariah governance, and insolvency risk. This research provides valuable and practical implications for academics, regulators, and decision-makers. The peculiarity of this study is that it provides a unified index that measures corporate governance and Sharia governance in banks in the

GCC and Iraq. The study also provides decision-makers with governance mechanisms that can affect risks in banks and ways to support them.

**Declaration of competing interest**

The authors declare that they have no known financial or non-financial competing interests in any material discussed in this paper.

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**Author contribution**

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Appendix 1. Measurement of Corporate Governance Index

| Variable | Measurement | Source | Data Source |
|---|---|---|---|
| Audit | 10 items using Yes =1, No=0 | [12] [13] [16] [20] [58] [59] [76] | Annual report |
| Board of director | 20 items using Yes =1, No=0 | | |
| Charter/by-laws | 7 items Yes =1, No=0 | | |
| Director education | 3 item using Yes =1, No=0 | | |
| Executive and director compensation | 10 items using Yes =1, No=0 | | |
| Ownership | 6 items using Yes =1, No=0 | | |
| Shareholder rights | 8 items using Yes=1, No=0. | | |
| Progressive practices | 7 items using Yes=1, No=0 | | |
| State of incorporation | 1 item using Yes=1, No=0. | | |
| Total items | 72 items | | |

Appendix 2. Measurement of Shariah Governance

| Variable | Measurement | Source | Source of data |
|---|---|---|---|
| Shariah committee | 13 items using Yes=1, No=0 | [17] [18] and indices of countries. | Annual reports |
| Shariah Review | 5 items using Yes=1, No=0 | | |
| Shariah Audit | 4 items using Yes=1, No=0 | | |
| Shariah risk management | 4 items using Yes=1, No=0 | | |
| Transparency and disclosure | 8 items using Yes=1, No=0 | | |
| Non-Shariah Compliant Activities | 6 items using Yes=1, No=0. | | |
| Shariah supervisory council at national level | 3 items using Yes=1, No=0 | [77] | Annual reports |
| Total | 43 items | | |