The nonlinear relationship between governance structures and Islamic bank stability: Evidence of GCC countries

1-Sameh said daher

sameh.said.Mahmoud@iaems.edu.eg

Finance and Accounting Department. International Academy for Engineering & Media Science - IAEMS

2-Ebtehal Orabi

ebtehal.awad@sadatacademy.edu.eg

Accounting department Sadat Academy for Management Sciences

Abstract:

The main objective of this paper is to examine the nonlinear relationship between governance structure and the financial stability of Islamic banks in the GCC during the period 2010-2019. The findings of fixed effects regression show that there is an inverted U-shaped non-linear relationship between governance and financial stability, thus indicating aversion banks to insolvency risks and vice versa. This study has significant political implications.

Keywords: bank risk, corporate governance, GCC

1. Introduction

The 2008 financial crisis revealed several weaknesses in the financial system, including poor governance. Since then, the link between governance structure and financial stability has been the subject of several theoretical and empirical studies. Governance structure is one of the fundamental elements in the development of any financial institution as it plays a key role in designing and promoting the principles of fairness, accountability, and transparency. In addition, it plays an important role in ensuring the stability of the Islamic banking. It enables Islamic banks to achieve their banking objectives in accordance with Shariah principles. Good governance to protect the interests of stakeholders and improve compliance with Shariah principles will ensure the stability and efficiency of banks (Seyowati et al., 2017). It helps to provide sound Islamic practice, enhance public confidence in non-interest banking and ensure that all activities are conducted in accordance with Shari'ah requirements. As the Islamic finance industry grows, governance is recognized as an ideal tool to facilitate its expansion and is essential to manage risk, ensure good Shariah practice, guarantee fairness for all stakeholders, and emphasize a high degree of transparency and accountability (Majid et al, 2017, Adam et al, 2019).

In theory, the relationship between governance structure and financial stability has been discussed by several theories, of

which the most known are the agency and stakeholder theories. Under agency theory, the implementation of appropriate governance practices enhances financial stability by reducing conflicts of interest between the shareholder and the manager (Jensen & Meckling, 1976). Under stakeholder theory, meeting the needs of all stakeholders and adopting better governance strategies ensures financial stability (Freeman, 1984). Empirically, the governance-stability nexus has not received much attention in the literature (see, e.g., Pathan, 2009; Mollah et al., 2017; Raouf & Ahmad, 2022). More specifically, the results obtained are mixed. This is mainly due to the divergence of governance indicators, type of banks (Islamic or conventional).

Based on this literature, it appears that the non-linear relationship between governance structure and financial stability, according to our knowledge, is the least exploited in the Islamic literature. In this study, our contribution is to examine the non-linear relationship between governance and financial stability in Islamic banks operating in CCGs. To do so, we use a sample of 31 listed Islamic banks (IBs) operating in six Gulf Cooperation Council (GCC) countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates UAE) covering the period between 2010-2019.

The rest of this paper is organized as follows. Section 2 presents the literature review related to governance-risk nexus.

Section 3 describes data and methodology. Section 4 presents and discuss the findings. Section 5 concludes the paper.

2. Literature review and hypotheses development

In governance literature, there are several theories that have addressed the impact of corporate governance on financial stability. In fact, the topic of corporate governance mechanisms has its origins in agency theory. This theory was developed by Jensen & Meckling, (1976). It deals with agency problems (particularly conflicts of interest between shareholders and managers) in a context of asymmetric information. To anticipate this information asymmetry and minimize agency costs, agency theory supports the idea that good corporate governance and behavioral incentives are essential. It is clear from this that good governance reveals the financial stability of the firm and its ability to properly manage its investment projects.

This idea is like the one indicated in the stakeholder theory, where its theorist Freeman (1984) proves that the firm is socially responsible towards all its stakeholders. These parties can influence or be influenced directly or indirectly through the activities of the firm. It pretends the satisfaction of all the stakeholders. To explain this idea, Freeman (1984) states that the management of a firm holds a relationship structure (groups) with added values, such as customers, suppliers, potential customers, and business partners. It follows from this theory that

value creation is not limited to maximizing shareholder value. It needs the consideration of other stakeholders in the creation of the firm's value (Freeman, 1999). In terms of governance, maintaining effective and good governance provides more transparency and trust among all stakeholders. This is likely to improve the firm's performance and ensure its financial stability (Vicnente-Ramos et al., 2020). There is another theoretical approach to corporate governance. This approach corresponds mainly to the stewardship theory (Donaldson, 1990). According to this theoretical approach, managers will act as responsible managers of the assets they control. It supports the idea that a manager will favor cooperation over defection when faced with a choice between self-serving and pro-organizational behavior.

According to the previous literature, empirical studies on governance and financial stability of banks have shown mixed results. This could be attributed to the nature of banks (Islamic or conventional) which differ in terms of efficiency, stability, listed or unlisted, Size and even governance structures. For example, in a study of 212 banks in the US, Pathan (2009) provided evidence of a positive relationship between boards and risk taking. However, he finds that CEO power affects it negatively. In addition, Čihák & Hesse (2010) conducted an empirical study to analyze the impact of Islamic (IB) and conventional (CB) bank governance on financial stability (measured by Z-score). They construct a sample of 474 banks from 19 countries over the

period 1993-2004. The authors find that small (large) Islamic banks (IBs) are more (less) stable than small (large) conventional banks (CBs). This study suggests that the size of the bank affects financial stability. In the same line, Beck et al. (2013) showed that conventional banks (CB) are more stable than their Islamic counterparts are. Abedifar et al. (2013) funded similar results. The conclusion drawn from this study is that conventional banks face too high credit risk compared to Islamic banks. They are characterized by a high sensitivity of their loan quality to domestic interest rates, thus generating financial instability.

Using a panel of 193 banks in 13 countries during the period 2000 -2012, Kabir et al. (2015) explored credit risk in Islamic and non-Islamic banks and found, as expected, that Islamic banks have lower credit risk compared to conventional banks. In a similar line, Mollah et al. (2017) conducted an econometric study to investigate the impact of governance mechanisms on risk taking and performance of Islamic and conventional banks in 14 countries. Their study finds that the governance mechanisms of Islamic banks generate real instability. They attribute this to the Islamic dichotomous variable, which has no significant effect on financial instability. In a recent study, Raouf & Ahmad (2022) examined the impact of risk governance on financial stability of conventional and Islamic banks in the GCC during the period 2006 to 2012. The results of the dynamic GMM method show that risk governance in Islamic banks negatively affects financial

stability. The study finds that poor risk governance in Islamic banks generates financial instability. Based on the previous literature, our first hypothesis can be developed as follows:

Hypothesis 1. Bank governance affects the financial stability of Islamic banks.

Hypothesis 1. (a). Bank governance positively affects the financial stability of Islamic banks.

Hypothesis 1. (b). Bank governance negatively affects the financial stability of Islamic banks.

Based on the existing literature, it should be noted that the non-linear relationship between governance and financial stability, to our knowledge, has not been addressed in the previous literature. To fill these various gaps, it would be useful to examine the non-linear relationship between governance and financial stability in Islamic banks operating in CCGs.

Hence, the second research hypothesis is the following:

Hypothesis 2. There is a non-linear relationship between bank governance and financial stability of Islamic banks.

In the light of this literature, the following section presents the sample and research methodology adopted in this study.

3. Data and methodology

3.1 Data

In this paper, we used a sample of 31 listed IBs from the six GCC countries – Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE) – covering the period 2010–2019. We use hand-collected data for governance structures from the annual reports published on the websites of respective banks. The financial data for banks were sourced from the Compustat database. Macro-economic variables are collected from World Bank's World Development Indicator (WDI). Table 1 presents the sample characteristics of each country.

Table.1
Sample characteristics.

Country	Number of banks	Bank–year observations	% of observations
Bahrain	5	50	16%
Kuwait	6	60	19%
Oman	4	40	13%
Qatar	3	30	10%
Saudi Arabia	6	60	19%
UAE	7	70	23%
Total	**31**	**310**	**100%**

3.2 Definition of variables and model specification

In this section, we descript the variables employed in our model, which classified into three types. Table 4 reports a full definition and description of theses variables. Firstly, the main dependent variable is the Z-score, witch measure financial

stability. Z-score has been employed in a large literature (see, among others, Boyd & Runkle, 1993; Čihák & Hesse, 2007; Laeven & Levine, 2009) including the studies relating to Islamic banking (see, e.g., Čihák & Hesse, 2010; Beck et al., 2013). This ratio is determined as follows:

$$Zscore = (ROA + E/A) / \sigma(ROA)$$

Where ROA is return on assets; E/A is the ratio of total equity to total assets; and $\sigma(ROA)$ is the standard deviation of ROA. We follow Berger et al. (2009) and Beck et al. (2013), we employ over the entire sample period to calculate the standard deviation of ROA. A higher value of Z-score indicate less insolvency risk.

Second, the main independent variable is the governance structure. It is measured by an index composed by six dimensions of the governance structure (Board size (BOARDSIZE), chief executive officer duality (DUALTY), independent non-executive directors (INDEP), gender diversity (GENDER), audit committee (CAUDIT), risk committee (CRISK)). To construct a composite measure of GOVSCORE, the principal component analysis (PCA) method is employed. Table 2 summarize the result of PCA method. The result of the Kaiser-Meyer-Olkin (KMO) shows that sampling adequacy for each factor is appropriate for statistical analysis that measures sampling adequacy is above 0.50 (Kaiser, 1974).

Table 2.
PCA (eigenvectors)

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Unexplained	KMO
BOARDSIZE	0.5411	-0.2508	0.0266	0.2538	-0.6909	-0.3192	0	0.6064
DUALTY	-0.0743	0.2267	0.9471	0.1908	-0.0945	-0.0267	0	0.5881
GENDER	0.4585	-0.2434	0.2654	-0.7920	0.0690	0.1675	0	0.6851
INDEP	0.4333	-0.4167	0.0990	0.4917	0.6094	0.1255	0	0.6409
CAUDIT	0.4025	0.5606	-0.1278	0.1496	-0.1432	0.6816	0	0.5030
CRISK	0.3764	0.5819	-0.0753	-0.0883	0.3422	-0.6238	0	0.5137
Eigenvalue	2.0110	1.5277	0.9834	0.6469	0.5009	0.3300		
Proportion	0.3352	0.2546	0.1639	0.1078	0.0835	0.0550		
KMO								0.5739

Notes: This table summarizes the results of PCA (eigenvectors). Comp refers to component related to each dimension of governance structure. KMO represent the Kaiser-Meyer-Olkin test, which measure of sampling adequacy.

Finally, the control variables are divided into two types. We use three bank-specific variables (bank size (SIZE), liquidity (LIQ), and deposit (DETA)) and two country-specific variables (economic growth (GDPG) and inflation rate (INF)). Table 3 summarizes the definitions and sources of all the variables employed in the main model.

Table 3.
Description of Variables.

Variables	Definition and Coding	Source
Zscore	Z-score is computed as the natural logarithm of the ratio of the sum of the mean of ROA and the bank's capital-asset ratio, over the standard deviation of ROA.	Compustat & Authors' calculation
NPLs	Non-performing loans is the ratio of non-performing loans to gross loans	Compustat
GOVSCORE	Governance score consisting of following six dimensions (Board size (BOARDSIZE), chief executive officer duality (DUALTY), independent non-executive directors (INDEP), gender diversity (GENDER), audit committee (CAUDIT), risk committee (CRISK)) using PCA method.	Hand collected from Annual Reports
BORDSIZE	Board of Directors size measured by number of directors on the board of directors	Hand collected from Annual Reports
DUALTY	CEO duality, dummy variable that takes the value of 1 if the general manager is also the chairman of the board and 0 otherwise	Hand collected from Annual Reports
GENDER	Gender represents the participation of the woman on the board of directors, dummy variable that takes the value of 1 if there are women on the board and 0 otherwise	Hand collected from Annual Reports
INDEP	Independent of board directors measured by the number of independent directors on the Board of Directors	Hand collected from Annual Reports
CAUDIT	Audit committee, dummy variable that takes the value of 1 when it has an audit committee and 0 otherwise	Hand collected from Annual Reports
CRISK	Risk committee, dummy variable that takes the value of 1 when it has a risk committee and 0 otherwise	Hand collected from Annual Reports
SIZE	Natural log of total assets	Compustat
LIQ	Liquidity: net loans to total deposits.	Compustat
DETA	Deposits measured by total deposit to total asset	Compustat
GDP	GDP per capita growth (annual %)	World Bank, WDI
INF	Inflation, which is consumer prices (annual %)	World Bank, WDI

To examine the Hypothesis 1, we employ the panel data fixed effects regression technique, based on the Hausman test (Hausman, 1978) result. In addition, based on Modified Wald

test of for groupwise heteroskedasticity, we use heteroskedastic panels corrected standard errors. Therefore, the equation of this model is written as follows:

$$Zscore_{it} = \alpha_i + \beta_1 GOVSCORE_{it} + \beta_2 SIZE_{it} + \beta_3 LIQ_{it} + \beta_4 DETA_{it}$$
$$+ \beta_5 GDP_{it} + \beta_6 INF_{it} + \varepsilon_{it}$$

$$(1)$$

where $\ln z_{it}$ is a proxy of bank risk of bank i at the date t, $GOVSCORE$ is the governance structure score, SIZE is the bank size, LIQ is the liquidity, DETA is the share of deposit, GDP is the GDP per capita growth, INF is the inflation rate, γ is the dummy year and ε is the error term.

To examine the Hypothesis 2, we also employ the panel data fixed effects regression technique using heteroskedastic panels corrected standard errors. Therefore, the equation of this model is written as follows:

$$Zscore_{it} = \alpha_i + \beta_1 GOVSCORE_{it} + \beta_2 GOVSCORE_{it}^2 + \beta_3 SIZE_{it} + \beta_4 LIQ_{it}$$
$$+ \beta_5 DETA_{it} + \beta_6 GDP_{it} + \beta_7 INF_{it} + \gamma_t + \varepsilon_{it}$$

$$(2)$$

4. Analysis and discussions of the results

4.1 Descriptive analysis

The descriptive statistics of all variables are summarized in Table 4. The average of financial stability of banks measured by Z-score and NPL are 3.396 and 0.054 respectively. This result indicates that Islamic banks (IBs) in the GCC are stable and financially sound. They do not have too many non-performing loans (NPLs) to grant to their investors. In addition, the average of GOVSCORE is 0.569. It is evident that the high financial stability of GCC Islamic banks (IBs) is due to the establishment of appropriate governance practices. The average BOARDSIZE is estimated to be 8.809 approximately 9 directors, with a minimum of 6 and a maximum of 12. This result is in line with the recommendations of the OECD and the MENA Corporate Governance Code concerning the adoption of best governance practices. The average CEO DUALTY is equal to 0.026. The average of (GEND) is equal to 0.142. It shows that the participation of women on the boards of Islamic banks remains low. Similarly, it is evident that the independence of the board of directors (INDEP) of GCC Islamic banks is relatively low, as its mean is equivalent to 4.472. The average of variable CAUDIT is equal 0.958. In sum, except for the GDP variable, the means of all other variables are positive.

Table 4.
Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
Zscore	310	3.396	0.839	0.898	5.274
NPL	310	0.054	0.066	0	0.537
GOVSCORE	310	0.569	0.184	0	1
BOARDSIZE	310	8.809	1.377	6	12
DUALTY	310	0.026	0.159	0	1
GENDER	310	0.142	0.35	0	1
INDEP	310	4.472	2.557	1	11
CAUDIT	310	0.958	0.201	0	1
CRISK	310	0.903	0.297	0	1
SIZE	310	4.18	0.876	1.999	5.915
LIQ	310	0.196	0.226	-1.542	2.137
DETA	310	0.586	1.26	0.004	22.203
GDP	310	-0.249	3.069	-7.945	6.704
INF	310	0.019	0.017	-0.024	0.058

Note: The table summarizes descriptive statistics for the variables employed in the empirical model.

Table 5 presents the correlation matrix between the variables. The Pearson test shows that the correlation between the variables is low as it is less than 0.8. This indicates the absence of a multi-collinearity problem.

Table 5.

Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) Zscore	1.000													
(2) NPL	-0.228*	1.000												
(3) GOVSCORE	0.071	-0.193*	1.000											
(4) BOARDSIZE	-0.020	-0.115*	0.767*	1.000										
(5) DUALTY	-0.009	-0.100	-0.105	-0.126*	1.000									
(6) GENDER	0.127*	0.074	0.650*	0.414*	-0.008	1.000								
(7) INDEP	-0.110	-0.194*	0.614*	0.485*	-0.086	0.356*	1.000							
(8) CAUDIT	0.167*	-0.285*	0.571*	0.229*	0.054	0.085	0.014	1.000						
(9) CRISK	0.085	-0.145*	0.554*	0.121*	0.053	0.134*	0.001	0.629*	1.000					
(10) SIZE	0.167*	-0.100	-0.304*	-0.113*	-0.245*	-0.327*	-0.225*	-0.194*	-0.166*	1.000				
(11) LIQ	-0.092	0.006	0.026	-0.059	-0.212*	0.071	-0.042	0.048	0.052	-0.053	1.000			
(12) DETA	0.020	-0.071	-0.074	-0.106	-0.009	-0.058	-0.008	-0.081	-0.020	-0.073	0.114*	1.000		
(13) GDP	-0.036	0.138*	-0.213*	-0.132*	-0.054	-0.134*	-0.076	-0.159*	-0.287*	0.303*	0.004	0.041	1.000	
(14) INF	0.185	-0.048	-0.055	0.051	0.079	-0.016	0.119*	-0.071	-0.273*	-0.091	-0.137*	0.048	0.130*	1.000

Note: *Significance at the 5% level

4.2 Results of first hypothesis

This subsection presents and discuss the results of the first hypothesis, presenting in table 6. In column 1 of table 6, the coefficient of the *GOVSCORE* is positive and statistically significant. It can be indicated that the adoption of appropriate governance practices enhances the stability of GCC's Islamic banks. In this case, the hypothesis H1 (a) is accepted.

The *BOARD SIZE* variable has a positive effect, but not significant. This result indicates that the board of directors of Islamic banks in CCG enhances their financial stability and soundness. Specifically, this could be attributed to the small

board size of these banks. A small board size then helps to enhance the quality of control, make relevant decisions, and meet the needs of stakeholders. This suggests that board size plays an significant role in minimizing agency costs and avoiding conflicts of interest, arising from information asymmetry. In this case, the agency theory is validated since this theory predicts that improving performance and strengthening financial soundness requires limiting the size of the board (Jensen & Meckling (1976), Fama et Jensen (1983)).

The same result is confirmed for the variable *DUALTY,* where its regression coefficient is negative and insignificant. This result contrasts with that found by Pathan (2009). In his study, Pathan (2009) shows a negative and statistically significant relationship between CEO duality and financial stability.

However, the *GENDER* has a positive effect on Z-score (see columns (1) and (8)). This result seems to be very interesting from both theoretical and empirical points of view. The participation of women on the GCC Islamic banks' boards of directors helps Islamic banks to make more appropriate decisions and creative strategies. Specifically, women, with important qualifications and experience, can challenge the management to adopt an overly conservative strategy and inevitably make Islamic banks less competitive. This is likely to prevent risk-taking and bank failure. This result shows that the financial soundness of GCC Islamic banks is enhanced through

the participation of women on their boards. This result is consistent with those found by Pathan and Faff (2013) and Khan et al. (2019).

The *INDEP* variable does not affect the financial stability of IBs. In line with our expectations, it seems that the variable *COM AUDIT* positively affects the financial stability of IBs (see columns (6) and (8)). This is because the establishment of audit and control systems by GCC Islamic banks minimizes the problems of information asymmetry between stakeholders. It requires them to ensure more transparency (publication of annual reports) and objectivity in the management of their operations. This strategy in turn serves to strengthen their financial strength. We found the same results from Choi, 2013). In this case, the agency theory is still accepted.

In addition, in column (7), the variable *COM RISK* has a positive effect on Z-score. The risk committees of the Islamic banks of GCC make great efforts to deal with certain types of risk during the execution of their operations (credit, operational, insolvency and liquidity risks). More specifically, the integration of a banking risk management strategy by Islamic banks makes governance practices more effective and guarantees better financial stability.

Turning to the control variables. The *IB-specific variables* and the *macroeconomic variables* also have effects on Z-score. Bank size (size) has a positive effect on Z-score, indicating that GCC's smaller Islamic banks are more creditworthy and financially sound. However, the liquidity (LIQ) has no effect on Z-score.

On the other hand, the deposit (*DETA*) has a negative effect on Z-score, showing that Islamic banks do not hold enough deposits to lend agent to these customers. This lack of liquidity generates financial insolvency.

Turning to the macroeconomic variables. The *GDP* has a negative effect on Z-score in all the regressions. The economic instability of the MENA region (Arab spring, revolution, fluctuations in oil prices) has a negative effect on the soundness of Islamic banks.

However, the coefficients of the variable *Inflation* are positive and statistically significant. Based on columns (4) and (7), they have different degrees of significance. Although inflation rates undergo a real increase during the period of our study, they remain low since they do not lead to insolvency of Islamic banks. The inflation rates remain low. They ensure more stability of Islamic banks. This could be attributed to the specificity of Islamic banks, which do not require the payment of interest rates on the loans granted to these customers. As a result, their financial strength cannot be greatly influenced by inflationary effects.

Table 6.

Governance structure and financial stability: linear regression

VARIABLES	(1) Zscore	(2) Zscore	(3) Zscore	(4) Zscore	(5) Zscore	(6) Zscore	(7) Zscore	(8) Zscore
GOVSCORE	1.337***							
	(0.443)							
BOARD SIZE		0.045						-0.064
		(0.055)						(0.069)
DUALTY			-0.309					-0.357
			(0.444)					(0.433)
GENDER				0.681***				0.713***
				(0.226)				(0.262)
INDEP					-0.011			-0.025
					(0.030)			(0.035)
COM AUDIT						1.738***		1.919***
						(0.323)		(0.463)
COM RISK							0.740***	-0.139
							(0.281)	(0.332)
SIZE	0.729***	0.652***	0.632***	0.700***	0.639***	0.722***	0.689***	0.775***
	(0.090)	(0.087)	(0.092)	(0.098)	(0.090)	(0.088)	(0.089)	(0.102)
LIQ	-0.209	-0.173	-0.235	-0.150	-0.189	-0.261	-0.207	-0.411
	(0.282)	(0.277)	(0.286)	(0.315)	(0.279)	(0.272)	(0.279)	(0.313)
DETA	-0.252***	-0.264***	-0.270***	-0.248***	-0.269***	-0.257***	-0.268***	-0.249***
	(0.045)	(0.047)	(0.050)	(0.058)	(0.049)	(0.047)	(0.048)	(0.055)
GDP	-0.105***	-0.111***	-0.114***	-0.077***	-0.114***	-0.106***	-0.105***	-0.108***
	(0.028)	(0.029)	(0.029)	(0.027)	(0.029)	(0.028)	(0.029)	(0.028)
Inflation	0.070	0.061	0.064	0.140***	0.066	0.069	0.099*	0.081
	(0.050)	(0.050)	(0.050)	(0.046)	(0.050)	(0.049)	(0.053)	(0.050)
Constant	-0.848	-0.198	0.277	0.187	0.277	-1.721***	-0.636	-1.426*
	(0.602)	(0.685)	(0.501)	(0.478)	(0.530)	(0.593)	(0.585)	(0.759)
Observations	309	309	309	309	309	309	309	309
Number of banks	31	31	31	31	31	31	31	31
R-square	0.306	0.284	0.284	0.203	0.283	0.331	0.300	0.351
Hausman (p-value)	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hetero (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wald chi2	112.86	105.89	102.62	99.84	102.48	127.34	110.55	119.85
P_value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: this table represents the results of fixed effect regression. The dependent variable is Zscore. Hausman is Hausman's (1978) specification test, comparing fixed-effects and random-effects linear regression models. Hetero is modified Wald statistic for groupwise heteroskedasticity in the residuals of a fixed effect regression model. Wald chi2 is the Wald test, indicating the global significance of model. Heteroskedastic panels corrected standard errors are in parenthesis. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

4.3 *Results of second hypothesis*

In this subsection, we discuss the findings of the relationship between the governance structure and banking stability. Table 7 summarizes the results of the panel fixed effect regression. In column 1, the coefficient of the GOVSCORE variable is positive and statistically significant, while the coefficient of the squared term of GOVSCORE ($GOVSCORE^2$) is negative and statistically significant.

This finding indicates that the relationship between governance structure and banking stability is non-linear. It is inverted U-shaped as it changes from positive to negative. This result proves the existence of an optimal level of governance which is equivalent to -1.077. It seems that below this optimal level, the governance structure allows to reinforce the financial stability of IBs. However, above this level, IBs need to be risk-aware since governance generates financial instability in this case

(see *Figure 1*). There is a maximum governance threshold below which Islamic banks implement adequate governance practices, thus seeking to strengthen their financial health. However, above this threshold Islamic banks face a risk of insolvency even if they engage in better governance strategies. This situation undeniably reflects banks' aversion to risk. This aversion could be explained by the participation of women in the boards of directors who behave in a responsible and suspicious way to keep the stability and solidity of their banks. *The hypothesis H2* is accepted.

On the other hand, in column (2), our results show that the GOVSCORE coefficient has a negative and statistically significant, while the GOVSCORE^2 coefficient has a positive and statistically significant. This shows that the relationship between GOVSCORE and NPL changes from negative to positive. In this case, it is obvious that there is a nonlinear U-shaped relationship, with an optimal level equal to -0.175. In fact, this optimal level indicates the maximum level from and beyond which IBs must exceed it to strengthen their financial stability. However, if IBs set a governance level below -0.175, they face financial risks and stability issues (*Figure 2*). Specifically, there is an optimal governance threshold below which weak governance does not encourage GCC's Islamic banks to grant credit for its clients because this could generate a reduction in their profits and high costs. On the other hand, beyond this threshold a strong governance structure urges Islamic banks to grant necessary

loans to firms for investment purposes. *The hypothesis H2* is confirmed.

Table 7.
Nonlinear relationship between Governance structure and financial stability: quadratic regression.

VARIABLES	(1) Zscore	(2) NPL
GOVSCORE	4.257***	-0.391***
	(1.267)	(0.115)
GOVSCORE^2	-2.667**	0.283***
	(1.131)	(0.090)
SIZE	0.709***	-0.015***
	(0.094)	(0.005)
LIQ	-0.258	-0.002
	(0.273)	(0.020)
DETA	-0.254***	-0.006**
	(0.046)	(0.003)
GDP	-0.103***	0.003**
	(0.028)	(0.001)
Inflation	0.066	-0.005**
	(0.049)	(0.002)
Constant	-1.434**	0.253***
	(0.610)	(0.045)
Observations	309	309
Number of banks	31	31
R-square	0.317	0.207
Wald chi2	112.86	44.69
p-value	0.000	0.000
Year fixed effect	YES	YES

Notes: this table represents the results of fixed effect regression. The dependent variable is Zscore or NPL. Wald chi2 is the Wald

test, indicating the global significance of model. Heteroskedastic panels corrected standard errors are in parenthesis. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

Figure 1.

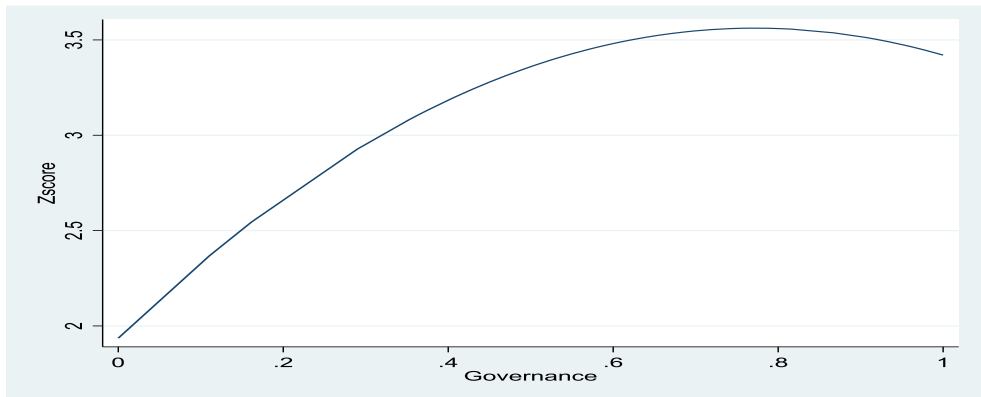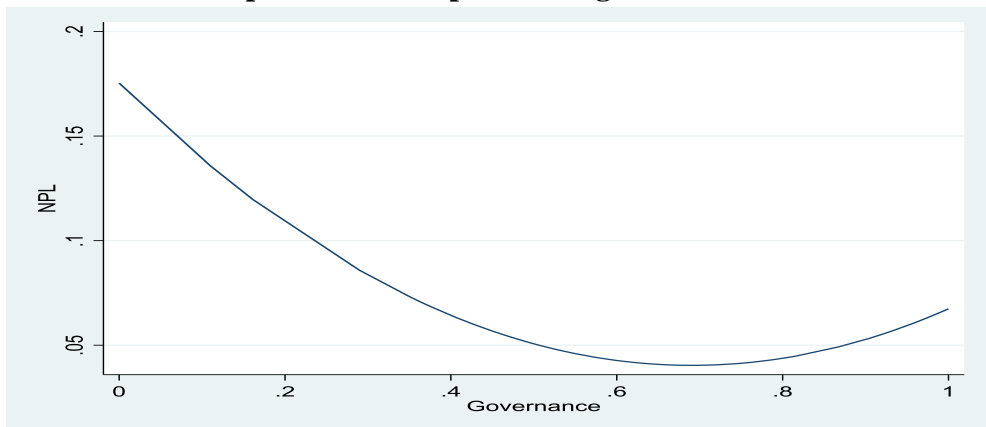**The inversed U-shaped relationship between governance and Zscore**

Figure 2.

The U-shaped relationship between governance and NPL.

5. Conclusion

In this paper, we analyzed the relationship of governance structure and financial stability. To do this, we constructed a sample of 31 Islamic banks operating in GCC countries over the period 2010-2019 in two steps. In a first step, we examined the impact of governance mechanisms on financial stability, using a panel fixed effect regression. The results showed that governance score, board size, gender, audit committee and risk committee affect financial stability (measured by the Z-score). In addition, economic variables (GDP and inflation) are important determinants for financial stability.

To further enrich the previous literature, we studied in the second step the nonlinear relationship between governance structures on financial stability. To measure financial stability, we used the Z-score and NPL. The results of the quadratic regression are more important, showing the existence of an inversed U-shaped relationship (U-shaped) between governance and financial stability, measured by Z-score (PNL), thus indicating the aversion (taking) of banks to insolvency (liquidity) risks. It appears from this study that the nonlinear relationship between governance and financial stability differs according to the type of risk faced by Islamic banks in GCC.

In sum, bankers should be advised to put in place appropriate governance measures, audit and risk management systems and

executive compensation controls to reduce excessive risk taking. In addition, it is important to set an optimal governance threshold to reduce non-performing loans and avoid agency costs between stakeholders. This will help avoid insolvency and credit risks.

References

Abedifar, P., Molyneux, P., & Tarazi, A. (2013). Risk in Islamic Banking*. *Review of Finance*, *17*(6), 2035–2096.

Adams, D., Adams, K., Ullah, S., & Ullah, F. (2019). Globalisation, governance, accountability and the natural resource 'curse': Implications for socio-economic growth of oil-rich developing countries. *Resources Policy*, *61*, 128–140.

Beck, T., Demirgüç-Kunt, A., & Merrouche, O. (2013). Islamic vs. Conventional banking: Business model, efficiency and stability. *Journal of Banking & Finance*, *37*(2), 433–447.

Boyd, J. H., & Runkle, D. E. (1993). Size and performance of banking firms: Testing the predictions of theory. *Journal of Monetary Economics*, *31*(1), 47–67.

Čihák, M., & Hesse, H. (2010). Islamic Banks and Financial Stability: An Empirical Analysis. *Journal of Financial Services Research*, *38*(2), 95–113.

Donaldson, L. (1990). The Ethereal Hand: Organizational Economics and Management Theory. *Academy of Management Review*, *15*(3), 369–381.

Freeman, R. E. (1984). *Strategic Management: A Stakeholder Approach*. Cambridge University Press.

Freeman, R. E. (1999). Divergent Stakeholder Theory. *Academy of Management Review*, *24*(2), 233–236.

Hausman, J. A. (1978). Specification Tests in Econometrics. *Econometrica*, *46*(6), 1251–1271.

Hesse, H., & Čihák, M. (2007). *Cooperative Banks and Financial Stability* (SSRN Scholarly Paper No. 956767). Social Science Research Network.

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.

Kabir, Md. N., Worthington, A., & Gupta, R. (2015). Comparative credit risk in Islamic and conventional bank. *Pacific-Basin Finance Journal*, *34*, 327–353.

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, *39*(1), 31–36.

Laeven, L., & Levine, R. (2009). Bank governance, regulation and risk taking. *Journal of Financial Economics*, *93*(2), 259–275.

Majid, M., Samad, S., Tazilah, M. D. A. K., & Hanaysha, J. R. (2017). HUMAN CAPITAL AND ORGANIZATIONAL PERFORMANCE OF MALAYSIAN GOVERNMENT AGENCIES: A CONCEPTUAL PAPER. *International Journal of Business, Economics and Law*, *13*(2).

Mollah, S., Hassan, M. K., Al Farooque, O., & Mobarek, A. (2017). The governance, risk-taking, and performance of Islamic banks. *Journal of Financial Services Research*, *51*(2), 195–219.

Pathan, S. (2009). Strong boards, CEO power and bank risk-taking. *Journal of Banking & Finance*, *33*(7), 1340–1350.

Raouf, H., & Ahmed, H. (2020). Risk governance and financial stability: A comparative study of conventional and Islamic banks in the GCC. *Global Finance Journal*, 100599.

Setyowati, R., Abubakar, L., & Rodliah, N. (2017). SHARIA GOVERNANCE ON ISLAMIC BANKING: SPIRITUAL RIGHTS PERSPECTIVE ON CONSUMER PROTECTION IN INDONESIA. *Diponegoro Law Review*, *2*(1), 227–244.

Vicente-Ramos, W., Reymundo, K., Pari, L., Rudas, N., & Rodriguez, P. (2020). The effect of good corporate governance on banking profitability. *Management Science Letters*, *10*(9), 2045–2052.