

Article

Does Ownership Structure Moderate the Relationship between Systemic Risk and Corporate Governance? Evidence from Gulf Cooperation Council Countries

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Abstract: The objective of this paper is to empirically examine the moderating effect of ownership structure on the relationship between systemic risk and corporate governance. It complements prior research by studying the relationship between the proportion of capital held by state institutions and systemic risk. It also examines the internal governance mechanisms that mitigate systemic risk. For this purpose, this research used a dataset consisting of 22 banks from Gulf Cooperation Council (GCC) countries (10 Islamic banks and 12 conventional banks) over the period 2004–2018. We used a three-stage least squares (3SLS) regression to test our research hypotheses. The findings revealed that the structure of the board of directors (BOD) reduced systemic risk in the banking sector. In particular, we provide evidence that board composition and board meetings negatively affect systematic risk. In addition, we provide empirical evidence that the state plays a key role in moderating the relationship between governance mechanisms and systemic risk. As such, our paper provides significant contributions to the governance and corporate finance literature.

Keywords: systemic risk; corporate governance; ownership structure; JEL Classification: G21; G28; G32



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1. Introduction

The collapse of the world economy in 2007 called into question the effectiveness of certain governance mechanisms and financial institutions in preventing financial risks. This has led to the need to review good risk assessment and management practices. Despite the regulations and directives imposed by the supervisory authorities, systemic banking failures do not cease to persist. These failures gave rise to new prudential reforms such as the solvency ratio and safety mattresses to guarantee the stability of the banking system.

In 2009, the Organization for Economic Co-operation and Development (OECD 2009) highlighted the importance of the implementation of the new micro-prudential slides while stating that the management of banking risks should be managed at the level of financial institutions and by their models. In this regard, the Basel Committee requires, in the Basel III agreement, the presence of an oversight and risk management committee to be headed by a director who is a member of the board of directors (BOD). However, these regulatory devices, of Basel II and Basel III, have been criticized for having certain limitations (Iqbal et al. 2015; Illueca et al. 2014; Buch and DeLong 2008). However, bank managers exploit these regulatory weaknesses in their interest and renew shadow banking techniques (Mselmi and Boutheina 2018). According to Acharya and Volpin (2010), a capital shortage is damaging to the economy and the global financial system. If this capital shortage occurs at a time when the financial sector is already financially constrained, the government will question whether to save the bank or the taxpayers' money (Acharya and Volpin 2010). As a result, the state becomes the first resort to stabilize the activity of

financial institutions and will therefore bear the consequences of any financial instability. Therefore, it would be interesting to wonder about this line of research and to know the effect of the presence of the state as a shareholder on the prevention of financial risks and problems of asymmetry of information.

We are mainly interested in the percentage of capital held by state institutions because we believe that the state shareholder will reduce the systemic risk. Likewise, we support the idea that governance mechanisms will be more effective if the state is one of the majority shareholders.

The majority of the work on this subject has focused on US and European banks, including the work of [Saghi et al. \(2018\)](#), [Battaglia et al. \(2014\)](#), [Pais and Stork \(2013\)](#), [Pathan and Faff \(2013\)](#), [Acharya et al. \(2012\)](#) and [Pathan \(2009\)](#). The objective of this paper is to complement prior research and test to see whether corporate governance mechanisms affect banks' systematic risk in a unique cross-country context, Gulf Cooperation Council (GCC) countries. We also aim to examine whether ownership structure plays a moderating role on the relationship between systemic risk and corporate governance.

We are motivated to examine GCC countries because the majority of banks in GCC countries operate in commodity markets, which are characterized by high volatility. Hence, they can be the source of a systemic crisis. Additionally, little attention has been paid to these banks in previous studies. So, we contribute to the existing literature by providing the first empirical evidence—to the best of our knowledge—on the impact of governance mechanisms on systematic risk in GCC countries.

This paper is structured as follows. Section 2 reviews the literature and develops the research hypotheses. Section 3 discusses the research method. Section 4 reports and discusses the findings. Section 5 concludes this paper.

2. Literature Review

2.1. Governance Code and Systemic Risk (SR)

The 2007 financial crisis has led to the review of the specific attributes of governance to relieve the systemic risk (SR). Before the subprime crisis, the main concern of executives was to maximize shareholders' wealth. However, this conduct increased interventions in financial institutions in the off-balance sheet items. Similarly, the bad practice of corporate governance has increased the risk incurred by financial institutions ([Beltratti and Stulz 2012](#); [De Haan and Razvan 2015](#)). However, [Crockett \(2000\)](#) and [Acharya \(2009\)](#) suggest that financial institutions must comply with micro and macro-prudential regulation of the financial sector. In addition, [De Andrés Alonso and Vallelado De Andrés Alonso and González \(2008\)](#) argued that the efforts by regulators to reduce SR may conflict with shareholders' interests, especially when they begin riskier strategies to increase their wealth. In contrast, [Acharya \(2009\)](#) states that regulatory oversight and traditional market discipline cannot limit excessive risk taking by global systemically important banks (G-SIBs). Similarly, corporate governance codes are considered, by the supervisory authorities and risk managers, as the main causes of the outbreak of the subprime crisis. In the same vein, [Mselmi and Boutheina \(2018\)](#) and [Beltratti and Stulz \(2012\)](#) affirmed the failure of regulatory standards relating to corporate governance since banks with board structures that comply with standards and corporate governance regulations were the most exposed to systemic risks at the onset of the 2007 financial crisis.

2.2. Internal Governance Mechanisms and Systemic Risk

The board of directors (BOD) is a crucial element in any strong and effective corporate governance system. It plays a significant role in the protection of its shareholders' interests. Moreover, it represents the most essential governance mechanism in banking institutions since its fiduciary responsibilities extend beyond shareholders to reach depositors ([Battaglia et al. 2014](#)). Consequently, analyzing the characteristics of the BOD could provide a better understanding of the causes of corporate governance failures and their effect on exposure to banking risk ([Battaglia et al. 2014](#)).

Ballester et al. (2020) are interested in the effectiveness of internal mechanisms during times of health crisis. They point out that credit risk increases with foreign ownership in countries with cultural peculiarities such as Asian or Islamic countries. In contrast, in European countries, family ownership has a negative effect on credit risk. In the same vein, Djebali and Zaghdoudi (2020) examined the impact of internal governance on the performance of Tunisian banks. They showed that the size of the board of directors, the presence of independent directors and the participation of the state are positively correlated with the net interest margin. On the other hand, the presence of foreign and institutional investors and the remuneration of the Chief Executive Officer (CEO) reduce the performance of Tunisian banks by increasing the credit risk.

According to Iqbal et al. (2015), internal corporate governance mechanisms can influence risk taking, so the level of systemic risk of financial institutions. In the study, Iqbal et al. (2015) examined the effectiveness of governance mechanisms in explaining the cross-sectional variation in systemic risk during the last financial crisis. The findings of this study show that financial institutions with stronger structures of corporate governance and board of directors are exposed to higher levels of systemic risk. Thus, good corporate governance can encourage, rather than limit, excessive risk taking in the financial sector.

In the same vein, Battaglia et al. (2014) examined if the structure of the BOD of European banks is linked to risk exposure, under stressful financial market conditions. The estimation results indicate that European banks with a larger board size and fewer meetings are associated with higher systemic risk. Likewise, Francis et al. (2012), De Andrés Alonso and Vallelado De Andrés Alonso and González (2008), and Adams and Ferreira (2007) point out that board meetings are important channels in the process of collecting company-specific information. In other words, frequent and timely meetings will ensure rapid response of the BOD to market events and therefore reduce systemic risk. Likewise, they found that independent directors can make the board less effective because they are outside directors and have the wrong or incomplete information. In this regard, their supervisory power will be reduced and they will then be liable to blindly support managers in their decisions.

In addition, Minton et al. (2014) indicated that the advanced level of study and expertise of managers motivates them to invest in risky products. This stems from the fact that the financial expertise of independent directors is strongly associated with the decline in the performance of American banks before and during the crisis period. Thus, the advanced level of study and expertise of managers motivates them to invest in risky products. In this study, Minton et al. (2014) used the experience of independent directors and short-term gains. However, Fahlenbrach et al. (2012) and Mehran et al. (2011) assert that internal corporate governance mechanisms can positively affect the level of incurring risk. These studies showed that experts can be engaged to justify and increase risk taking in financial institutions. Moreover, Battaglia and Gallo (2015) have shown that a bank's performance is only influenced by the presence of the chairman of the risk management committee on the BOD. Nonetheless, Pathan and Faff (2013), Vahamaa and Peni (2012), and Pathan (2009) found that the performance of US banks is positively affected by the size and the independence of the BOD. Thus, the smaller BODs are associated with higher risk, whereas a high number of independent directors seem to imply exposure lowers profitability and higher-risk exposure and market valuations. In contrast, Erkens et al. (2012) found that financial firms with more independent BODs and greater institutional ownership achieved lower stock returns during the crisis period. In this study, Erkens et al. (2012) explored the positions taken by investors in the face of risk. The empirical results of this study show that before the onset of the crisis, the presence of institutional investors on the BOD encourages managers of financial companies to increase shareholder returns while taking more risks.

In short, the studies outlined above show that corporate governance mechanisms and a shareholder-friendly BOD, or combined to maximize shareholder value, are positively associated with financial risks. However, these studies have been criticized since they

ignored the ownership structure and the subject of shareholder status. So, in our paper, we ask: will the stake be changed? Will internal governance mechanisms be negatively associated with systemic risk? As far as we are concerned, and based on agency theory, we suspect the existence of a negative relationship between systemic risk and governance mechanisms, except the size of the board of directors, if state institutions are among the majority shareholders of financial institutions. Based on these alternatives, we assume that:

Hypothesis 1 (H1). *There is a negative relationship between systemic risk and the composition of the board of directors (independent, institutional and foreign directors).*

Hypothesis 2 (H2). *There is a negative relationship between systemic risk and the number of meetings.*

Hypothesis 3 (H3). *There is a positive relationship between systemic risk and the board size.*

2.3. Systemic Risk and the ‘Too-Big-to-Fail’ Problem

Over the past decade, banking professions have rapidly changed and moved away from financial intermediation, in its classic sense, due to the development of derivatives. Off-balance sheet activities, such as speculation and securitization, have increased the financial sphere in comparison with the real economy (ATTAC France and Basta Association 2015). In this regard, Pais and Stork (2013) analyzed the effect of the size on the unvariable and systemic risk of ten countries of the European Union. In their paper, Pais and Stork (2013) showed that large banks have considerably higher systemic risk and that the development of derivatives has amplified the size of multinational banks. Additionally, Cerutti et al. (2017) have shown the existence of a positive and significant relationship between systemic risk and the size of a bank. Anginer et al. (2018) have analyzed the effect of the state’s financial safety net on the relation between corporate governance and banking risk. In addition, Anginer et al. (2018) tried to verify whether corporate governance, favorable to shareholders, leads to excessive risk taking by large banks compared to small ones. The chosen sample is justified by the financial protection provided by the state to large banks because they are too big to fail. To do this, and following the work of Aggarwal et al. (2009), Anginer et al. (2018) used a global corporate governance index covering the composition of the BOD, remuneration, audit, and control. Since they profit from the state guarantee, large banks indulge in risky activities. In this regard, we hypothesize that:

Hypothesis 4 (H4). *There is a positive relationship between systemic risk and the size of banks.*

2.4. Ownership Structure and Systemic Risk

Iqbal et al. (2021) tried to determine the level of systemic risk faced by large banks when all external and internal governance mechanisms are fully implemented. They conducted an empirical study to see if institutional investor monitoring complements or replaces internal and external corporate governance mechanisms. They have also looked into the role of these mechanisms in determining the systemic risk level of large European banks. In the same vein, Díez-Esteban et al. (2021) investigated the relationship between property concentration and systemic risk using data from 87 European banks. The findings of this study suggest that for large banks, the relationship between concentration of ownership and systemic risk is an inverted U shape. In contrast, the systemic risk of small banks varies depending on the composition of the board of directors.

In addition, Correa and Goldberg (2022) tested the risk of bank holding companies. They studied the impact of regulatory actions on banking risk. They investigated the average relationship between diversification and risk using instrumental variable approaches, based on the hypothesis that diversification can reduce risk. The findings of this study show that, despite the costs and complexity of diversification, it is capable of lowering the systemic risk of holding companies. Son et al. (2015) showed that weak corporate

governance is positively linked to systemic risk. Similarly, a less transparent information environment would make stock price volatility dependent on general market information, which will increase systemic risk (Vu et al. 2020). In addition, Son et al. (2015) suggest that the ownership structure accepts a crucial role in improving the risk management process and in improving the quality of the information disclosed. Alike, Vu et al. 2020 examined the factors influencing the systemic risk of companies listed in Vietnam. The results of this study showed that state shareholders and foreign investors were positively related to systemic risk, while national, or local investors, had a negative relationship with systemic risk. By contrast, He and Shen (2014) and Gul et al. (2010) state that foreign investors often have better governance and greater experience in risk management. Therefore, this contributes to the reduction in the synchronization of stock prices in the market by reducing systemic risk.

Romulo et al. (2011) explored the effect of ownership concentration on the risk and profitability of commercial banks. Empirical studies of this line of research have shown a U-shaped relationship between the concentration of ownership and the volatility of earnings. This relation supports the idea that the incentive of the shareholder to take risks prevails when his participation in the capital is higher than a threshold. However, Saghi et al. (2018) state that the incentives to take risks and the risk culture may vary between various categories of shareholders. The findings of this study indicate that a higher ownership concentration is correlated with a higher exposure to systemic risk. Furthermore, Saghi et al. (2018) indicate that banks' contribution to systemic risk is even greater for banks where institutional investors and the state are the primary controlling owners. In contrast, Black et al. (2016) state that family or predominantly institutional banks can develop risky strategies to preserve their human and financial capital skills. Likewise, they can choose less diversified portfolios and invest in areas where they have sufficient expertise.

On the other hand, Black et al. (2016) argue that state ownership can be seen as government support. This stimulated our reflection to orient ourselves on this line of research to study the moderating role of the state in terms of governance and risk taking. Based on the principle that the state is the economic prisoner of its institutions, we suspect that the relationship between corporate governance and systemic risk can be moderated by the state shareholder. In this regard, and based on the work presented above, we hypothesize that:

Hypothesis 5 (H5). *The state shareholder can moderate the relationship between corporate governance and systemic risk.*

In short, the work described above, for example, the work of Vu et al. (2020), Anginer et al. (2018), Iqbal et al. (2015), Battaglia and Gallo (2015) and Battaglia et al. (2014), have shown that corporate governance mechanisms and shareholder-friendly boards of directors are positively associated with financial risks. However, these studies have been criticized since they ignored the ownership structure and especially the subject of shareholder status. In this regard, we will study the moderating effect of the ownership structure of the relationship between systemic risk and corporate governance. Indeed, we are interested in studying the relatedness between the proportion of capital held by state institutions and SR. Additionally, we note the absence of works in GCC countries. Undoubtedly, the majority of the work on this topic, including the work of Saghi et al. (2018), Black et al. (2016), Battaglia et al. (2014), Pais and Stork (2013), Pathan and Faff (2013), Vahamaa and Peni (2012), Acharya et al. (2012) and Pathan (2009), worked on European and American banks.

3. Data and Sample

Banks are the backbone of the financial system. However, the instability of the financial system is always associated with bank failures since banks are always the source of financial crises due to the variety and severity of risks to which they are exposed. On this subject,

the aim of this research paper is to study the moderating effect of ownership structure on the relation between systemic risk and corporate governance before, during, and after the crisis period. We choose GCC countries because the majority of banks in GCC countries operate in commodity markets, which are characterized by high volatility (Saif-Alyousfi et al. 2021). They can therefore cause a systemic crisis. Our sample is composed of 22 banks (10 Islamic banks and 12 conventional banks) from GCC countries. The choice of these banks is justified by their classification according to the banker's ranking of the largest banks over the last 10 years. This study covers the period leading up to the 2019 health crisis 2004–2018. Data relating to governance and ownership structure indicators were collected from the annual reports of the banks in question and the two databases Zawya and Market screener. Systemic risk data are collected from the V-Lab database. As for financial data, they were extracted from the database “Thomson One Banker”. Table 1 shows the distribution of our sample.

Table 1. Description of the sample.

Country	Number of Bank	Bank Type	
Bahrain	1	CB	1
		IB	0
Jordan	2	CB	2
		IB	0
Kuwait	4	CB	2
		IB	2
Qatar	3	CB	2
		IB	1
Saudi Arabia	7	CB	3
		IB	4
United Arab Emirate (UAE)	5	CB	2
		IB	3
Total	22	CB	12
		IB	10

CB = conventional banks; IB = Islamic banks.

3.1. Methodology

We establish two empirical models. In the first model, we will study the specific attributes of governance that can mitigate systematic risk (SR). Thereafter, in a second model, we will extend our analysis to study the moderating effect of ownership structure on the relation between systemic risk and corporate governance. Indeed, we are mainly interested in the percentage of capital held by state institutions (OW) since we accept that the systemic risk will be reduced by the intervention of the state shareholder on the BOD. Likewise, we support the idea that the governance mechanisms will be more effective if the state is one of the majority shareholders. In this regard, the first model is formulated as follows:

$$\text{Dependent variable}_{it} = \beta_0 + \beta_i \sum \text{Governance variables}_{it} + \beta_j \sum \text{Control variables}_{it} + \varepsilon_{it} \quad (1)$$

Then, following the work of Acharya et al. (2017) we formulated three alternative models expressed as follows:

$$\text{Cor}_{it} = \beta_0 + \beta_1 \text{Inta} + \beta_2 \text{Ininter} + \beta_3 \text{lv} + \beta_4 \text{n_meetings} + \beta_5 \text{board_size} + \beta_6 \text{foreign} + \beta_7 \text{instit} + \beta_8 \text{ind} + \varepsilon_{it}$$

$$\text{Lrme}_{it} = \beta_0 + \beta_1 \text{Inta} + \beta_2 \text{Ininter} + \beta_3 \text{lv} + \beta_4 \text{n_meetings} + \beta_5 \text{board_size} + \beta_6 \text{foreign} + \beta_7 \text{instit} + \beta_8 \text{ind} + \varepsilon_{it}$$

$$\text{Beta}_{it} = \beta_0 + \beta_1 \text{Inta} + \beta_2 \text{Ininter} + \beta_3 \text{lv} + \beta_4 \text{n_meetings} + \beta_5 \text{board_size} + \beta_6 \text{foreign} + \beta_7 \text{instit} + \beta_8 \text{ind} + \varepsilon_{it}$$

Further, the second model is expressed as follows:

$$\text{Dependent variable}_{it} = \beta_0 + \beta_i \sum \text{Governance variables}_{it} + \beta_h \text{Ownership} * \sum \text{Governance variables}_{it} + \beta_j \sum \text{Control variables}_{it} + \varepsilon_{it} \quad (2)$$

On this basis, we formulated three alternative models expressed as follows:

$$\begin{aligned} \text{Cor}_{it} = & \beta_0 + \beta_1 \text{Inta} + \beta_2 \text{Ininter} + \beta_3 \text{lv} + \beta_4 \text{n_meetings} + \beta_5 \text{board_size} + \beta_6 \text{foreign} \\ & + \beta_7 \text{instit} + \beta_8 \text{ind} + \beta_9 \text{OW} * \text{n_meetings} + \beta_{10} \text{OW} * \text{board_size} + \beta_{11} \text{OW} * \text{foreign} \\ & + \beta_{12} \text{OW} * \text{instit} + \beta_{13} \text{OW} * \text{ind} + \varepsilon_{it} \end{aligned}$$

$$\begin{aligned} \text{Lrme}_{it} = & \beta_0 + \beta_1 \text{Inta} + \beta_2 \text{Ininter} + \beta_3 \text{lv} + \beta_4 \text{n_meetings} + \beta_5 \text{board_size} + \beta_6 \text{foreign} \\ & + \beta_7 \text{instit} + \beta_8 \text{ind} + \beta_9 \text{OW} * \text{n_meetings} + \beta_{10} \text{OW} * \text{board_size} + \beta_{11} \text{OW} * \text{foreign} \\ & + \beta_{12} \text{OW} * \text{instit} + \beta_{13} \text{OW} * \text{ind} + \varepsilon_{it} \end{aligned}$$

$$\begin{aligned} \text{Beta}_{it} = & \beta_0 + \beta_1 \text{Inta} + \beta_2 \text{Ininter} + \beta_3 \text{lv} + \beta_4 \text{n_meetings} + \beta_5 \text{board_size} + \beta_6 \text{foreign} \\ & + \beta_7 \text{instit} + \beta_8 \text{ind} + \beta_9 \text{OW} * \text{n_meetings} + \beta_{10} \text{OW} * \text{board_size} + \beta_{11} \text{OW} * \text{foreign} \\ & + \beta_{12} \text{OW} * \text{instit} + \beta_{13} \text{OW} * \text{ind} + \varepsilon_{it} \end{aligned}$$

3.2. Definition of Variables

3.2.1. Dependent Variables

Following the work of [Acharya et al. \(2012, 2017\)](#), we use the variables Long Run Marginal Expected Shortfall (LRMES), Beta and the correlation between the banks in our sample and the financial market. However, the dependent variables were calculated using the Marginal Expected Shortfall method. The choice of this method is justified by the fact that it explicitly incorporates the sensitivity of banks to market conditions, it can be aggregated for banks and by the fact that the resulting aggregate provides a reasonable financial interpretation. This method was expressed by [Acharya and Volpin \(2010\)](#) as follows ([Acharya and Volpin 2010](#)):

$$\text{MES} = -(\gamma_{i,t+1} + \beta_{i,t}) E_{t-1} (r_{m,t} \setminus r_{m,t} < c)$$

Following this method, we announced three dependent variables.

The first dependent variable represents the expected marginal deficit at 6 months (LRMES).

This measure is expressed by [Brownlees and Engle \(2010\)](#) and [Acharya et al. \(2012\)](#) as follows ([Brownlees and Engle 2010](#)):

$$\text{LRMES}_{i,t,t+T} = 1 - \exp(-k \times \text{MES}_{i,t})$$

The second dependent variable in this paper is the correlation between the banks in our sample and the financial market, and it is expressed as follows:

$$\prod_t^{i,j} = \frac{\sum_t^{i,j}}{\sqrt{\sum_t^{i,i} \sum_t^{j,j}}}$$

where

$\sum_t^{i,i}$ is the conditional variance of the returns r_t^i ,

$\sum_t^{j,j}$ is the conditional variance of the returns r_t^j , and
 $\sum_t^{i,j}$ is the conditional variance of the returns r_t^i and r_t^j .

The last dependent variable in this paper is Beta. The choice of this variable is justified by the fact that it makes it possible to measure the volatility of a stock in comparison to that of the market. In other words, it measures the risk exposure of a share relative to the market.

$$\text{Beta coefficient } (\beta) = \frac{\text{Covariance (Re, Rm)}}{\text{Variance (Rm)}}$$

where

R_e = the return on an individual stock, and

R_m = the return in the overall market.

3.2.2. Independent Variables

We follow prior research and choose a number of independent variables. Table 2 shows each dependent variable's definition and measurement as well as the related literature. We could not consider all variables used in prior research due to the availability of data for GCC countries.

Table 2. Definition of independent variables.

Variables	Definition and Measurement	References
Lnta	Bank size is measured by the logarithm of total assets.	Vu et al. (2020), Díez-Esteban et al. (2021), Choi et al. (2019), Liu et al. (2016), Corten et al. (2017), Ebrahim et al. (2014), Srairi (2013) and Romulo et al. (2011).
Lninter	Net interest margin is measured by the difference between interest received and interest paid, and reflects a bank's intermediation margin.	Angori et al. (2019), Angbazo (1997), and McShane and Sharpe (1985).
Lvg	Leverage is expressed by the total debt divided by the total assets.	Corten et al. (2017), Ebrahim et al. (2014), Srairi (2013), and Romulo et al. (2011).
N_meetings	Number of meetings.	Hussain et al. (2018) and Liu et al. (2016).
Board_size	Size of the board of directors is measured by the total number of directors.	Choi et al. (2019), Hussain et al. (2018), Kabir and Thai (2017), Detthamrong et al. (2017), Black et al. (2016).
Foreign	Proportion of foreign directors is expressed by the number of foreign directors divided by the total number of directors.	Vu et al. (2020), Ftouhi and Moez (2019), Ebrahim et al. (2014) and Wu and Wu (2014).
Instit	Proportion of institutional directors is expressed by the number of institutional directors divided by the total number of directors.	Ftouhi and Moez (2019) and Hussain et al. (2018).
Ind	Proportion of independent directors is expressed by the number of independent directors divided by the total number of directors.	Díez-Esteban et al. (2021), Ftouhi and Moez (2019), Hussain et al. (2018), Uribe-Bohorquez et al. (2018), Liu et al. (2016), Mu'azu (2016), Vandebeek et al. (2016) and Wu and Wu (2014).

Since the existing literature is devoid of risk analyses of financial systems in GCC countries, this document provides a comprehensive analysis of systemic risk, the structure of governance and ownership of GCC banks. Additionally, this paper highlights the effect of profitability on banks' exposure to systemic risk. To this end, we used the control

variable net interest margin, which measures the difference between the interest paid and the interest paid by the banks in our sample. In addition, we used two other control variables, namely the size of the bank and the leverage, which have been used widely in the literature review, for example in the work of [Vu et al. \(2020\)](#), [Díez-Esteban et al. \(2021\)](#), [Choi et al. \(2019\)](#), [Corten et al. \(2017\)](#), and [Ebrahim et al. \(2014\)](#).

4. Results and Interpretations

Table 3 presents the results of the descriptive statistics of the dependent and independent variables. These results reveal that the Qatari banking system is the riskiest compared to the banking system of the UAE and Saudi Arabia, with an average Beta value of 0.16, 0.14 and 0.13, respectively. Likewise, in the long run, Saudi Arabia, the UAE and Qatar have the banking systems that are most correlated with the market. Similarly, in the long run, the banking systems of Saudi Arabia, the UAE and Qatar are the most correlated with the market. However, the exploratory analysis reveals that banks with a larger size are the most sensitive to systemic risks. Indeed, the systemic banks of GCC countries, in our sample, are Abu Dhabi Commercial Bank, Doha Bank, Dubai Islamic Bank, Abu Dhabi Islamic Bank and Ahli United Bank. These banks have an average value of risk equal to 23.87 during the year 2008–2009, and 2.01 during the period 2004–2018.

Table 3. Summary statistics and univariate analysis.

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
cor	330	0.0479697	0.076324	−0.18	0.27
lrms	330	5.579091	9.093015	−50.98	43.9
beta	330	0.121697	0.1902793	−0.81	1.13
lnta	330	16.89229	1.768268	9.949989	21.56339
lninter	330	12.30507	2.603159	5.634789	18.70752
lvg	330	5.11535	2.606313	1.32	19.81
n_meetings	330	6.072727	1.643126	4	13
board_size	330	9.630303	1.238806	5	12
foreign	330	0.0933058	0.1184045	0	0.429
instit	330	0.2039379	0.1125308	0	0.455
ind	330	0.1779955	0.1362643	0	0.455

Although Islamic banks are exposed to additional risks and operational concerns, they present a lower systemic risk than conventional banks ([Pejman Abedifar and Tarazi 2013](#); [Čihák and Hesse 2010](#); [Srairi 2013](#)). However, this exploratory analysis shows that conventional banks have average systemic losses equal to 2603 MD against 481.1 MD for Islamic banks. Table 4, Panels A, B and C, shows the Pearson correlation matrix of the independent variables. This analysis provides a synthetic measure of the strength of the relationship between the variables in our sample. Thus, the use of these variables will only be allowed in the absence of a linear relationship.

Table 4. Pearson correlation matrix of the independent variables.

Panel A	Cor	Lnta	Lninter	Lvg	N_Meetings	Board_Size	Foreign	Instit	Ind
Cor	1.0000								
Lnta	0.2227	1.0000							
Lninter	−0.0438	0.7339	1.0000						
Lvg	0.0277	−0.0814	−0.0238	1.0000					
n_meetings	0.0637	0.1751	0.0741	−0.0629	1.0000				
board_size	−0.0171	0.1435	0.1411	0.1551	−0.1780	1.0000			
foreign	−0.0149	−0.1581	−0.3381	0.0258	−0.2966	0.0915	1.0000		
instit	0.1275	−0.3895	−0.3485	0.1993	−0.1147	−0.1907	0.0033	1.0000	
Ind	−0.0971	−0.1746	−0.2626	0.1004	−0.3041	0.2511	0.3020	0.0386	1.0000
Panel B	lrmes	Lnta	Lninter	Lvg	n_meetings	board_size	foreign	instit	ind
lrmes	1.0000								
Lnta	0.1699	1.0000							
Lninter	0.0298	0.7339	1.0000						
Lvg	0.2105	−0.0814	−0.0238	1.0000					
n_meetings	−0.0403	0.1751	0.0741	−0.0629	1.0000				
board_size	0.0227	0.1435	0.1411	0.1551	−0.1780	1.0000			
foreign	−0.1200	−0.1581	−0.3381	0.0258	−0.2966	0.0915	1.0000		
instit	−0.0049	−0.3895	−0.3485	0.1993	−0.1147	−0.1907	0.0033	1.0000	
Ind	−0.0809	−0.1746	−0.2626	0.1004	−0.3041	0.2511	0.3020	0.0386	1.0000
Panel C	beta	Lnta	Lninter	Lvg	n_meetings	board_size	foreign	instit	ind
beta	1.0000								
Lnta	0.1454	1.0000							
Lninter	0.0196	0.7339	1.0000						
Lvg	0.1976	−0.0814	−0.0238	1.0000					
n_meetings	−0.0601	0.1751	0.0741	−0.0629	1.0000				
board_size	0.0245	0.1435	0.1411	0.1551	−0.1780	1.0000			
foreign	−0.1155	−0.1581	−0.3381	0.0258	−0.2966	0.0915	1.0000		
instit	−0.0137	−0.3895	−0.3485	0.1993	−0.1147	−0.1907	0.0033	1.0000	
Ind	−0.0765	−0.1746	−0.2626	0.1004	−0.3041	0.2511	0.3020	0.0386	1.0000

The results presented in Table 4 identify the lack of an autocorrelation problem between the independent variables since they have correlation coefficients of less than 0.8. This result is confirmed by the variance inflation factor test (VIF). Table 4 also suggests that governance mechanisms are negatively related to systemic risks. Likewise, the results of the correlation matrix reveal a positive relationship between the control variables; net interest (Lninter) and leverage (LVG). The relationship between the board size and the variable (COR) is negative. In addition, the correlation coefficient of the size of banks, represented by the logarithm of total assets, is positive for the three systemic risk indicators, namely COR, LRMES and BETA. Table 5 summarizes the results of pooled regression of systemic risk governance mechanisms using the three-stage least squares method. Indeed, we estimate the determinants of systemic risk via three different models.

Table 5. Corporate governance and systemic risk (three-stage least squares).

	Cor	Lrmes	Beta
Inta	0.0277207 *** (8.34)	2.251612 *** (5.53)	0.0428929 *** (4.99)
lninter	−0.0145355 *** (−6.12)	−1.329037 *** (−4.57)	−0.0269977 *** (−4.40)
Lvg	0.0010472 (0.69)	0.8818706 *** (4.76)	0.017498 *** (4.48)
n_meetings	−0.0017472 (−0.68)	−0.9669525 *** (−3.06)	−0.0223154 *** (−3.35)
board_size	0.0015108 (0.45)	−0.1135205 (−0.28)	−0.0020918 (−0.24)
foreign	−0.037391 (−1.02)	−15.45642 *** (−3.43)	−0.3269569 *** (−3.44)
instit	0.1373521 *** (3.59)	−2.888826 (−0.62)	−0.0928791 (−0.94)
Ind	−0.0711953 ** (−2.26)	−7.814451 ** (−2.03)	−0.1673759 ** (−2.06)
_cons	−0.2626651 *** (−4.75)	−10.22585 (−1.51)	−0.1252071 (−0.88)
P	0.0000	0.0000	0.0000
R-sq	0.2013	0.1563	0.1424
chi2	82.92	60.97	54.65
Obs	329	329	329

Superscripts *** and ** indicate statistical significance at 1%, 5%, and 10%, respectively.

Theoretically, if the correlation (Cor) changes, the coverage ratio should be adjusted to consider the updated information. Then, we established a first model which presents the correlation (Cor) according to the size of the banks, the net interest margin, the leverage ratio, as well as the variables linked to the governance of the banks. The estimation results suggest that the relationship between correlation (Cor) and bank size is statically significant and positive. This confirms the “too big to fail” phenomenon, which states that banks with a large size are the most sensitive to the risks. These results have been confirmed by the work of Anginer et al. (2018), Alin and Simona (2016) and Cerutti et al. (2017), who showed that big banks are the most exposed to the risks. On the other hand, this model reveals the existence of an inverse relationship between the net interest margin and the correlation (Cor) of the banks in our sample with the market. However, the estimation results show that only the variable proportion of institutional directors and the proportion of independent directors is significant, but have different meanings. In other words, the presence of independent members reduces the risk while institutional members fuel the systemic risk. This can be justified by the fact that in an environment where information asymmetry is large, institutional administrators may serve their interests because of the specific information they hold.

Consistent with the first model, the second and third models present Beta and LRMES as an increasing function of the size and the spread of the banks in our sample. In other words, the more the bank is in debt, the more it will be linked to the financial market and consequently it witnessed an increase in the systemic risk. This seems logical since the credit subprime has shown that the debt is one of the main explanatory factors of systemic risk. As for governance indicators, the empirical results of the last two models show that they represent a decreasing function of systemic risk. However, increasing the number of meetings will allow strict oversight, which will improve risk management, and therefore reduce systemic risk. The more frequent the meetings, the tighter the control

exercised over the leaders and the more relevant the advisory role of the board. These results were confirmed by the work of Battaglia et al. (2014), Francis et al. (2012), De Andrés Alonso and González (2008), and Adams and Ferreira (2007), who have shown that a lower number of meetings is associated with a high systemic risk. Similarly, Battaglia et al. (2014), Francis et al. (2012), De Andrés Alonso and González (2008), and Adams and Ferreira (2007) have shown that frequent and timely meetings will ensure a rapid board response to market events and thus reduce systemic risk. On the other hand, the presence of foreign directors on the BOD constitutes an effective governance mechanism due to the experience and knowledge brought in the management of systemic risk. They help to increase transparency and facilitate investors' access to bank information. In addition, the estimation results suggest that the presence of independent members on the board of directors can help to improve the quality of information on the stock market, which will therefore reduce the synchronization of bank stock prices and reduce systemic risk. Table 6 summarizes the results of the moderating effect of ownership structure on the relationship between governance and systemic risk. As illustrated above, we were mainly interested in the effect of the percentage owned by the state.

Table 6. Ownership structure and the relationship between systemic risk and corporate governance (three-stage least squares).

	Cor	Lrmes	Beta
Inta	0.0227238 *** (6.27)	1.961416 *** (4.40)	0.0382067 *** (4.06)
lninter	−0.0110833 *** (−3.97)	−0.9720989 *** (−2.83)	−0.0209113 *** (−2.88)
Lvg	0.0021892 (1.42)	1.009578 *** (5.34)	0.0196876 *** (4.92)
n_meetings	−0.0092631 *** (−2.94)	−1.603543 *** (−4.13)	−0.0345097 *** (−4.21)
board_size	0.0103273 ** (2.38)	0.7301062 (1.37)	0.0140684 (1.25)
foreign	0.0804905 (1.22)	−17.30047 ** (−2.12)	−0.3591832 ** (−2.09)
instit	0.1634359 * (1.96)	17.3729 * (1.69)	0.3269356 (1.50)
Ind	−0.2774285 *** (−4.06)	−27.65271 *** (−3.29)	−0.6103246 *** (−3.43)
ow_n_meetings	0.0338795 *** (2.78)	2.621555 * (1.75)	0.0426388 (1.35)
ow_board_size	−0.0333541 *** (−3.51)	−2.658952 ** (−2.28)	−0.0498746 ** (−2.02)
ow_foreign	−0.2851881 (−1.48)	20.37096 (0.86)	0.3916414 (0.78)
ow_instit	0.0307295 (0.16)	−39.17501 (−1.62)	−0.7907163 (−1.55)
ow_ind	0.6344353 *** (3.09)	62.63276 ** (2.48)	1.420336 *** (2.66)
_cons	−0.2408273 *** (−4.13)	−13.60506 * (−1.89)	−0.1883679 (−1.24)

Table 6. *Cont.*

	Cor	Lrmes	Beta
P	0.0000	0.0000	0.0000
R-sq	0.2482	0.1975	0.1813
chi2	108.64	80.98	72.84
Obs	329	329	329

Superscripts ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

The study results show that the ownership structure does not affect the relationship between institutional, foreign administrators and systemic risk. Indeed, an increase in foreign and institutional members will not have a significant impact on systemic risk, unless the percentage held by the state is reduced. Moreover, the results indicate that the increase in the number of board meetings will trigger some destabilization in the management of systemic risk. In other words, meetings become irrelevant for systemic risk management when the number of meetings exceeds six meetings per year. Furthermore, the results showed a higher intensity of the moderating relationship between independent members and systemic risk. Indeed, the relationship between the percentage of independent members and systemic risk has improved and changed direction. In this perspective, the contribution of independent members will be reduced, in particular, when the interest of the latter is pursued by excessive risk taking. This result can be justified by the fact that the independent members can change their view and defend the interests of the other shareholders, other than the state, and aim to increase their returns by taking more risk.

On the other hand, the increasing size of the board of directors may reduce systemic risk. This can be explained by the improvement in the systemic risk management systems which provided by the administrators. Additionally, the appointment of new directors such as women directors may reduce systemic risk, but women directors have been presented in numerous works as risk reduction measures because they generally avert risk more than men. Likewise, they are less radical in the decision-making process than men. We quote in this context, the work of [Jan Luca Pletzer et al. \(2015\)](#) and [Croson and Gneezy \(2009\)](#). Similarly, recent evidence, such as the work of [Nadeem et al. \(2019\)](#), [Bernile et al. \(2018\)](#) and [Karren et al. \(2016\)](#), has shown that more diverse boards have higher levels of disclosure and better oversight, which has improved the quality of information available to investors. In other words, women directors reduce the information asymmetry between the principal and the agent. Overall, our empirical results suggest that board structure has an important impact on reducing systemic risk. In particular, some features of the board structure appear to be more effective, such as board composition and the number of meetings. These two variables had a negative impact on systemic risk. In contrast, the size of the bank, the size of the BOD and the leverage all fuel systemic risk. Hence, this allows us to validate our assumptions relating to systemic risk and the specific attributes of corporate governance.

In addition, the results of this empirical study suggest that the state plays a key role in moderating the relationship between governance mechanisms and systemic risk. In other words, governance mechanisms will be more effective if the state is one of the majority shareholders. However, and in accordance with the work of [Vu et al. \(2020\)](#), the results of this research paper stipulate that the financial safety net provided by the state, for the benefit of systemic banks, constitutes a generator of incentives to risk taking. Indeed, our empirical investigation proves that the state shareholder prevents managers and other shareholders from developing risky strategies. Consequently, the incentives to take risks and the risk culture may vary among different categories of shareholders.

5. Conclusions

In this paper, we examined the impact of different corporate governance mechanisms on systematic risk for a sample of banks in GCC countries. We also examined the moderating role of ownership structure on the relationship between systemic risk and corporate

governance. We provided evidence that some governance mechanisms reduce systematic risk and that state ownership moderates the relationship between governance and systematic risk. Our findings are in line with the recent literature (e.g., [Vu et al. 2020](#)). A summary of the key findings are shown in Table 7.

Table 7. Summary of the Key Findings.

H1: There is a negative relationship between systemic risk and the composition of the board of directors (independent, institutional and foreign directors).	Accept
H2: There is a negative relationship between systemic risk and the number of meetings.	Accept
H3: There is a positive relationship between systemic risk and the board size.	Reject
H4: There is a positive relationship between systemic risk and the size of banks.	Accept
H5: The state shareholder can moderate the relationship between corporate governance and systemic risk.	Accept

The findings provide important practical implications to regulators and policy makers in GCC countries and worldwide. Indeed, they confirm the hypothesis which stipulates that the state shareholder has a regulatory effect of risk taking by managers. Additionally, they confirm that the ownership structure has a positive impact on the relationship between governance and systemic risk. Thus, the states of GCC countries are called upon to invest in banks to minimize the risk incurred. In practice, the states of GCC countries must put in place intervention strategies in the financing and management of banking risks. This funding should be in the form of a stock purchase rather than a safety net or rescue, in the event of a crisis. However, it would be interesting to focus on the optimal proportion of capital held by the state. Our findings suggest that to reduce systematic risk, efforts are needed to revise corporate governance codes in GCC countries and regulators need to introduce appropriate policies and guidance to improve the quality of corporate governance systems in the banking sector.

Our paper is not free from limitations which offer opportunities for further research. First, the sample size is relatively small, hence it might be difficult to generalize the findings. A large-scale study is needed, especially in the context of developing countries. Second, we limit our analysis to the banking sector in GCC countries. Looking at other financial and non-financial instructions will increase our understanding on the role of corporate governance on the systematic risks in other sectors. We also suggest that further research could explore the impact of other governance variables such as gender diversity, nationality diversity and education diversity on systematic risk. Finally, it would be interesting to examine the governance–risk relationship in times of crisis (e.g., the COVID-19 pandemic).

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