



Article Corporate Governance and Financial Stability: The Case of Commercial Banks in Vietnam

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Abstract: Bank stability is a goal that bank managers aim for in addition to the goal of maximizing shareholder value. To achieve this goal, commercial banks have applied various solutions, including corporate governance because corporate governance plays an important role in the business activities of an enterprise in general as well as in that of a commercial bank in particular. The purpose of this paper is to investigate the impact of corporate governance on the stabilities of Vietnamese commercial banks in the period from 2009 to 2020. Using hand-collected data from 25 commercial banks in Vietnam, by system GMM estimation and the Bayesian Mixed-Effects approach, the paper identifies the characteristics of corporate governance affecting bank stability. Board size, women board members, and board members' education have a positive impact, and dependent board and foreign board members have a negative impact on bank stability. Our findings show important evidence for an emerging country, such as Vietnam. From the empirical results, the authors suggest several recommendations to maintain and enhance bank stability in the future time.

Keywords: board characteristic; bank stability; system GMMs; Bayesian Mixed-Effects; COVID-19

1. Introduction

In the context of deepening economic integration, commercial banks play an important role in the allocation of capital to the economy. Previously when operating, bank managers were mainly concerned with the goal of maximizing the value of the firm to maximize shareholder wealth. Up to now, in addition to the above goal, bank managers also focus on the objective of maintaining bank stability, because according to Jokipii and Monnin (2013), bank stability will be an important driving force of GDP growth in the future. Furthermore, a bank can only be financially stable when it meets its commitments to investment support, guarantees, and the establishment of a depositor protection fund (Marie et al. 2021; Nguyen et al. 2018). To maintain and enhance bank stability, managers can apply different methods, including corporate governance. In the literature, good corporate governance is considered a fundamental principle to maximize a firm's valuation and a firm's performance (Salim et al. 2016). For the banking sector, Fu et al. (2014) indicate that commercial banks can improve their public accountability, minimize risk exposure, create value, and enhance operational efficiency if they have effective corporate governance.

The prior studies on the topic of the impact of corporate governance on bank stability can be classified into two research directions. Firstly, the researchers investigated the influence of corporate governance on bank operating in general or bank performance, such as El-Chaarani and Abraham (2022); El-Chaarani et al. (2022); Bhatia and Gulati (2021); Choi



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Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). and Hasan (2005); and Liang et al. (2013). Secondly, the research examined the relationship between corporate governance and bank stability. With studies in the second direction, several researchers only considered the role of some aspects of corporate governance on financial stability, such as Bart and McQueen (2013), who considered the role of women on the board, or King et al. (2016), who investigated the impact of the board members' education on bank performance, but some others researched the impact of corporate governance on bank stability, for example, Abdelbadie and Salama (2019); Anginer et al. (2018); Marie et al. (2021); and Mihail et al. (2021). However, these studies were performed in some advantageous countries (the US, Egypt, etc.) rather than developing economies, such as Vietnam. So, the paper examines the level of impact and the direction of influence of corporate governance on bank stability, using the sample data of Vietnamese commercial banks in the period from 2009 to 2020. From the research results, the paper proposes some policy implications to maintain and enhance bank stability in an emerging economy, such as Vietnam.

In this sense, the paper has three important contributions to the existing literature on corporate governance. Firstly, our paper performs an in-depth investigation of the impact of corporate governance on bank stability with an analysis of five dimensions, including board size; dependent board, women board, and foreign board members; and board members' education. Secondly, compared with previous studies, these studies only consider the impact of corporate governance on bank performance or financial stability of commercial banks in the context of the normal or recessionary economy without considering the context of the COVID-19 pandemic. Therefore, in this paper, the authors implemented the COVID-19 pandemic variable to investigate the influence of the COVID-19 pandemic on bank stability. Finally, the prior studies indicated various factors affecting bank stability (such as competition, diversification, monetary policy, etc.). As a result, the research model is prone to the phenomenon of omitting important variables. At the same time, to explore several issues extracted from the application of a dynamic panel (autocorrelations, endogenous, heteroskedasticity, and omitted variables), the model was applied according to the system GMMs, as suggested by Arellano and Bond (1991). The paper also used the Bayesian Mixed-Effects to recheck the robustness. With some classical estimation techniques (pooled OLS, FEM, REM, and GMMs), the results of these methods are dependent only on the data without prior information, whereas in the Bayesian approach, the results are dependent on both dataset and prior observations. Hence, by combining the system GMMs and Bayesian Mixed-Effects approach, the reliability of the research results is increased.

The rest of this paper is organized into the following sections. The next section reports the background theories and a review of the previous literature. Section 3 describes the model, data, methodology, and model, and Section 4 provides some empirical results and robustness checks. The final section summarizes the main conclusions and proposes some recommendations.

2. Literature Review and Hypothesis Development

The role of the board of directors in business operations has received attention in corporate governance literature. Fundamentally, the board has the key role of ensuring the company's wealth by collectively directing the company's affairs while meeting the appropriate interests of its shareholders and relevant stakeholders. The function of corporate governance for business operations is demonstrated through the agency theory, steward-ship theory, and resource dependence theory (Abdelbadie and Salama 2019). The agency theory discusses problems regarding conflicts of interest between agents (e.g., corporate managers) and shareholders (Shapiro 2005). According to the agency theory, financial managers may pursue their own interests without realizing the goal of shareholder wealth maximization. Hence, the board of directors has to take measures for the managers to achieve the goal of maximizing shareholder value (Shapiro 2005). The stewardship theory presents a view of managerial motivation alternative to the agency theory. Under this theory, corporate managers essentially want to do a good job and be a good steward of

the corporate finances (Donaldson and Davis 1991). Hence, the firm's desire to change a company's performance should consider whether the structure the chief executive officer favors is effective. The question is whether the organizational structure helps executives to make and implement changes to achieve the goal of the company (Donaldson and Davis 1991). The resource dependence theory holds that a firm's power over the external environment (such as suppliers, customers, etc.) is important to create a competitive advantage for a corporation. By adopting a variety of strategies, a firm is able to resist contingencies and minimize uncertainty and interdependence on the environment. Based on these theories and the previous literature, the authors suggest several following hypotheses:

Firstly, board size and bank stability

Compared to a nonbanking company, banks usually have relatively large boards because their organizational structure is more complex and their scale is larger (Adams and Mehran 2012). According to Caprio et al. (2007), board members may have a lot of experience and expertise; hence, large boards might stimulate the company to better achieve its goals. As a result, banks operate more efficiently and maintain stability. In the literature, several previous studies demonstrated a positive relationship between board size and bank performance, such as Adams and Mehran (2012) and Abobakr (2017), who used data from US commercial banks in the period 1986–1999 and data from 25 Egyptian banks covering a period from 2006 to 2014, respectively. These studies are consistent with the resource dependence theory, and according to Bhatia and Gulati (2021), this theory indicates that an increase in the number of board members means an increase in the breadth and depth of expertise in the boardroom.

However, in contrast to this view, some other authors argue that there is a negative relationship between board size and bank stability. This is derived from the agency theory because this theory indicates that a firm with more directors increases agency problems, thereby reducing the effectiveness of the board's control. In support of this view, the research of Mamatzakis and Bermpei (2015) analyzed the link between corporate governance and the performance of US investment banks during the period from 2000 to 2012. The results find a strong negative relationship between board size and bank performance because the banks might have higher communication costs and information asymmetry when they increase the number of members of the board (Mamatzakis and Bermpei 2015). As a result, this does not encourage bank stability. Similar to these results, Manini and Abdillahi (2015) used data from 42 banks in Kenya and showed the negative impact of board size and bank performance.

In light of the above conflicting views, in this paper, the authors expect that executive managers are less likely to control a large board of directors. In addition, a large board of directors is likely to have several different specialists, leading to a significant improvement in bank stability. For this reason, the research believes that the extent of bank stability is positively associated with the board size.

Secondly, board independence and bank stability

Current literature addresses the role of board independence or the importance of outside directors in the banking sector business. According to Bhatia and Gulati (2021), compared to inside directors, outside directors are likely more effective monitors, which is supported by the resource dependency theory. Firstly, to maintain their reputation, independent directors are committed to improving corporation performance (Bhatia and Gulati 2021). Secondly, according to Hermalin and Weisbach (2003) and Johnson et al. (1996), outside directors usually do not have any business or social contacts with the management, and they have more relationships with external resources. These can help them avoid conflicts of interest as well as achieve the desired outcome. Thirdly, with the presence of dependent directors, executive managers reduce biases in the decision-making process (Dalton et al. 1998). Fourthly, a financial institution with a higher percentage of independent directors on its board is more motivated to improve the quality of the financial data as well as reduce the number of frauds committed in the financial statements (Marie et al. 2021). Finally, even in the context of a crisis, banks may experience a decrease in revenue, while costs increase, and independent directors can suggest new solutions to the

problems. As a result, independent directors can increase revenue and enhance the bank's performance (El-Chaarani and Abraham 2022). This leads to an increase in bank stability. From these arguments, several empirical pieces of research indicate a positive relationship between board independence and bank stability, such as Adams and Mehran (2008); Dong et al. (2017); Marie et al. (2021); El-Chaarani and Abraham (2022); and El-Chaarani et al. (2022).

In addition to the above views in favor of the resource dependency theory, an alternative view based on the stewardship theory indicates that executive managers have more internal information than outside directors. Hence, they have more information to make a decision, which enhances the bank's performance and maintains bank stability (Bhatia and Gulati 2021) even though, according to Adams and Mehran (2012), compared to inside directors, outside directors are less likely to have an exhaustive awareness of the firm's issues. This makes it difficult for them to give suggestions and make decisions in the firm's operation. Therefore, some studies suggest that independent boards are not motivated to increase bank performance as well as bank stability. For example, Mollah and Zaman (2015) use sample data from conventional banks and Islamic banks during the time of 2005–2011, and the research result indicates that the relationship between board independence and bank performance is negative.

From these above conflicting research papers, the authors of this paper expect that an increase in the number of independent members would lead to conflicts about the board's decisions. This reason is that an independent board may not have a comprehensive understanding of the bank's characteristics; hence they may not be able to make optimal decisions. Therefore, this paper suggests the hypothesis of a negative relationship between board independence and bank stability.

Thirdly, percentage of women on the board and bank stability

These days, women play an increasingly important role in society, politics, and business. In theoretical terms, Bart and McQueen (2013) documented that compared to male directors, female directors usually achieve significantly higher scores because they make fairer and more consistent decisions. In addition, generally, women have better management records than men, and the behavior of male directors is significantly improved in the presence of female directors (Adams and Ferreira 2009). In the empirical literature, Abdelbadie and Salama (2019) used sample data from 168 commercial banks listed continuously during 2009–2015; the study confirmed that women are more risk-averse, and at the same time, they have more motivation to reduce bank risks. Using panel data of US commercial banks, Palvia et al. (2015) find that after controlling the banks' risk of assets and other contributions, banks with female CEOs hold a more conservative level of capital. Moreover, research shows strong evidence that during the financial crisis, smaller banks with female board chairs and CEOs are less likely to fail. Similar to the results of these studies, Mohsni et al. (2021) indicated that gender diversity is postively related to firm performance and negatively related to both operational and financial risks in sample data of 232 firms from 27 developing countries. El-Chaarani et al. (2022) also showed a positive relationship between women directors on boards and a bank's financial performance, when the authors used sample data of 148 banks from eleven countries including Qatar, Oman, Bahrain, Saudi Arabia, Egypt, Kuwait, Jordan, Morocco, United Arab Emirates, Tunisia, and Israel. From these arguments, the paper expects a positive relationship between the percentage of women on the board and bank stability.

Fourthly, foreign board members and bank stability

According to Liang et al. (2013), firms can improve their corporate governance and supervision activities and subsequently enhance firm performance through foreign board members. The reason is that foreign board members might bring modern managerial techniques as well as new technologies (Liang et al. 2013). In addition, it is expected that a board with members of different nationalities presents more experience, heterogeneous ideas, and points of view and represents the interests of international shareholders (Carpenter et al. 2001; Lee et al. 2018). Regarding the empirical evidence, Maier and Yurtoglu (2022) used sample data of 2519 listed nonfinancial firms from 29 European countries during the period of 2012–2020. The research finds that the presence of foreign directors on the board reduces the bankruptcy risk. Ameer et al. (2010) used panel data of 277 nonfinancial listed Malaysian firms in the period from 2002 to 2007 to show that compared to boards with a majority of internal executives and affiliated nonexecutive directors, boards with a high representation of external and foreign directors have better performance. When examining the influence of governance and ownership on the performance of Korean commercial banks during 1998–2002, Choi and Hasan (2005) indicated that the presence of foreign directors on the bank's board is significantly associated with lower risks and better returns. Hence, in this paper, the authors believe that the link between the percentage of directors who are foreigners and bank stability is positive.

Fifthly, board members' education and bank stability

According to King et al. (2016), CEOs with higher MBA education scores are proficient in choosing riskier business modes including income-generating activities (such as activities that generate fee-based income or mortgage lending) or managing a portfolio of risky assets (for example derivatives and securitized assets). In addition, the bank is known for being a financial institution with a complex organizational structure. It is believed that board members with a higher education can increase their ability to understand and interpret complex risk measurement techniques. In addition, they also are able to assess the influence of different banking policies on the associated risk (Marie et al. 2021).

In terms of empirical evidence, Setiyono and Tarazi (2018) used data from Indonesian banks in the period 2001–2011, and the research finds that, in general, income volatility and a higher leverage risk are partly a result of educational diversity. Using the sample of CEOs of 172 publicly listed banks in the US, King et al. (2016) offered strong evidence that banks led by CEOs with MBAs perform better than other banks. Such CEOs improve bank performance through compensation and incentivization policies, and they also encourage banks to come up with more innovative business models. Berger et al. (2014) analyzed how the age, gender, and educational composition of CEOs affect bank risk-taking in the German banking sector during the period 1994–2010. The results indicate that adding members with a Ph.D. degree to the board reduces risks to an investment portfolio. At the same time, these executives tend to adopt better risk management techniques (Berger et al. 2014). In summary, from these previous studies, this paper believes there is a positive link between the board members' education and bank stability.

3. Methodology

3.1. Variables

In this paper, we used the Z-score as a proxy for bank stability; this measure has been widely used in various previous studies, for example, Abdelbadie and Salama (2019), Tran et al. (2020); Marie et al. (2021), etc. The Z-score was first proposed by Professor Edward I. Altman of the Leonard N. Stern School of Business of New York University to study various enterprises in the US. Although the Z-score was founded in the US, this indicator is also applicable to most other countries with high confidence. Relating to the banking sector, Boyd and Runkle (1993) and Čihák and Hesse (2010) constructed and developed the formula for calculating *Z-score* as follows:

$$Z\text{-score}_{it} = \frac{ROA_{it} + \frac{E}{A_{it}}}{\sigma(ROA)_{it}}$$

where ROA_{it} is the return on total assets of bank *i* in year *t* (calculated by the ratio of net income to an average of total assets); E/A_{it} is the ratio of equity to total assets of bank i in year *t*; $\sigma(ROA)_{it}$ is the standard deviation of *ROA* of bank *i* in year *t*. To calculate the standard deviation of *ROA*, the authors adopted the calculation of Kabir et al. (2015) using accounting data for 3 years. According to Nguyen and Nguyen (2021), the ratio of *E/A* reflects the degree of financial bank leverage, and the sd(*ROA*) indicates the volatility of bank earnings, which shows the level of bank risk. As a result, a bank with a lower risk (or higher stability) has a higher *Z*-score and vice versa. Because the sample data of this paper have large deviations, to minimize the results bias, the authors used the lnZ-score as an alternative proxy for *Z*-score.

The dependent variables represent our main explanatory variables. In this paper, we used five different measures as proxies for banking corporate governance. Firstly, we collected board size data for an idea of the number of board members in each bank each year. This variable was consistent with other previous studies, such as Adams and Mehran (2012); Karkowska and Acedański (2020); Bhatia and Gulati (2021); and Zagorchev and Gao (2015). Secondly, several prior studies used the variable of the dependent board to examine the influence of corporate governance on bank operations (for example, Mollah and Zaman (2015); Adams (2012); Dong et al. (2017); and Marie et al. (2021)). In addition, to better explain the impact of corporate governance on bank stability, the paper also considered the relationship between women board membership and bank stability. Most prior studies indicated that female board members are the driving force for bank performance as well as bank stability; for example, there is a positive association between women board members and bank stability as evidenced by Bart and McQueen (2013); Palvia et al. (2015); and Abdelbadie and Salama (2019). Next, the variable of the presence of foreign directors on a bank's board is one of the indicators used by previous studies to represent corporate governance, such as Ameer et al. (2010); Choi and Hasan (2005); and Carpenter et al. (2001). Finally, we also used the variable of the board members'education as a proxy for corporate governance. This variable was also used by King et al. (2016); Setiyono and Tarazi (2018); and Berger et al. (2014).

In addition to the main explanatory variables, this paper also used several control variables, including both bank characteristic and macroeconomic variables. Firstly, the variable bank characteristics included variables, such as bank size, ratio of equity to total assets, and ratio of total loans to total assets. Most prior studies calculated bank size by the natural logarithm of total assets (Baselga-Pascual and Vähämaa 2021). According to Salas and Saurina (2002), compared with small-sized banks, large-scale banks are usually more stable due to their management and operating capacities. In addition, large-scale banks would have conditions to invest in improving credit processes and in high-quality of risk management and high-quality human resources, so the authors expected a positive association between bank size and bank stability. Secondly, the ratio of equity to total assets (E/A). Equity is considered a buffer of commercial banks, and Nguyen (2011) indicated that shareholders of firms with more equity (or fewer debts) generally have a lower risk. Hence, this paper suggests a positive link between the ratio of E/A and bank stability. In addition to the two variables of bank size and the ratio of equity to total assets, this paper also used another control variable belonging to bank characteristics, which is the ratio of loan to total assets (LTA). The ratio of loans to total assets is considered a representative indicator of risk control and asset quality. The increase in loan balance means the bank is conducting credit expansion, which will increase the bank's income, but the credit risks will also increase (Stiroh 2004). That is why the authors believe there is a negative link between the LTA and bank stability.

Finally, the authors included several country-level and macroeconomic control variables in this paper. Prior studies have documented that inflation and economic growth may affect bank stability. It is widely indicated that an economy with a higher rate of growth is associated with a stable macroeconomic environment (Baselga-Pascual and Vähämaa 2021). In this paper, we used two indicators to represent macroeconomic conditions, including the economic growth GDP and inflation (CPI). The COVID-19 pandemic began to appear in 2019, and it was not until 2020 that the first cases of infection appeared in Vietnam. The COVID-19 pandemic has affected the activities of all industries, including the banking sector. Hence, to examine the influence of the COVID-19 pandemic on bank stability, in this paper, the authors used a dummy variable as a proxy for the COVID-19 pandemic.

3.2. Empirical Model

To investigate the impact of corporate governance on bank stability, based on the research of Marie et al. (2021); Karkowska and Acedański (2020); Abdelbadie and Salama (2019); Ciftci et al. (2019); and Liang et al. (2013), the general empirical model was as follows:

$$bank \ stability_{it} = \alpha_0 + \beta_i corporate \ governance_{it} + \gamma_i bank - characteristic_{it} + \delta_i macroeconomic_t + \mu_{it} + \varepsilon_{it}$$
(1)

where *i* and *t* refer to the bank and the year, respectively; α_0 is the constant; μ_{it} and ε_{it} are bank and time-fixed effect. In Equation (1), bank stability is the dependent variable and is measured by the LnZ score; corporate governance is the matrix of our main explanatory variables, including board size; dependent board, women board, and foreign board members; and board members'education; the bank characteristic and macroeconomic variables are the control variables, including bank size, ratio of equity to total assets, ratio of loans to total assets, GDP growth, inflation CPI, and dummy variable of COVID-19. The details of these variables are described in Table 1.

Table 1. Definition of variables.

Variables	Measure	Predicted Sign	Prior Research					
Dependent Variables								
LnZ score	Natural log of $\left(\frac{ROA_{it} + \frac{E}{A_{it}}}{\sigma(ROA)_{it}}\right)$		Abdelbadie and Salama (2019); Tran et al. (2020); Marie et al. (2021); Baselga-Pascual and Vähämaa (2021); Nguyen et al. (2018)					
	I	ndependent Variables						
	Mai	in Explanatory Variables						
Board size	The number of directors on the board	+	Adams and Mehran (2012); Karkowska and Acedański (2020); Bhatia and Gulati (2021); Zagorchev and Gao (2015)					
Dependent board	The proportion of dependent directors on the board	-	Mollah and Zaman (2015); Adams (2012); Dong et al. (2017); Marie et al. (2021); El-Chaarani and Abraham (2022)					
Women board	The proportion of women directors on the board	+	Bart and McQueen (2013); Palvia et al. (2015); Abdelbadie and Salama (2019); El-Chaarani et al. (2022)					
Foreign board	The proportion of foreigner directors on the board	+	Maier and Yurtoglu (2022); Ameer et al. (2010); Choi and Hasan (2005); Carpenter et al. (2001)					
Education board	Percentage of directors with postgraduate degree (such as Master's, MBA, DBA, or Ph.D.)	+	King et al. (2016); Setiyono and Tarazi (2018); Berger et al. (2014)					
		Control Variables						
Bank size	Natural log of total assets	+	Berger et al. (2014); Liang et al. (2013); Marie et al. (2021);					
E/A	The ratio of equity to total assets	+	Nguyen (2011)					
LTA	The ratio of total loans to total assets	-	Liang et al. (2013); Aebi et al. (2012)					
DUMMY	Dummy variable equals 1 if in year of COVID-19 pandemic and 0 otherwise	-	Suggested by the authors					
GDP	The grossdomestic product	+	Berger et al. (2014): Liang et al. (2013)					
СРІ	The consumer pricing index	-						

Source: Various authors.

3.3. Data

To examine the influence of corporate governance on bank stability in Vietnam, we needed both financial information and nonfinancial information as described in Table 1, which is not available in databases, such as Orbis or Datastream. So, we hand-collected the essential data from the audited financial reports as well as annual reports published on each bank's website during the period from 2009 to 2020. In this research, we focused on Vietnamese commercial banks, not including foreign and joint-venture commercial banks, because these bank groups only make up a minority of the banking sector in Vietnam and do not meet our information standard for empirical design. At the same time, the observations with missing data of any variables were also eliminated, which led to the research data being unbalanced. Finally, the sample data covered 324 observations of 25 commercial banks. The private joint-stock and state joint-stock commercial banks were included in this sample; the assets of these commercial banks made up approximately 90% of the total banking assets in Vietnam. Among the 25 commercial banks in the sample data, there were 23 commercial banks listed on the stock exchange (14 banks on the Ho Chi Minh Stock Exchange, 2 banks on the Ha Noi Stock Exchange, and 7 banks on the Unlisted Public Company Market). However, all of these 25 commercial banks had published enough data for the paper. In addition, the macroeconomic data of Vietnam wereextracted from the International Monetary Fund (IMF) database. The study used the statistical software Stata 17.0 to calculate and estimate the research results.

Table 2 displays a summary of the accounting statistics of the variables in the model research. Looking at the indicators of bank stability and corporate governance, we could detect some characteristic features of the banking sector in Vietnam. There was a significant difference in bank stability across banks, as reported by the standard deviation. Meanwhile, the corporate governance characteristics of Vietnamese commercial banks were also different, but in general, during the period from 2009 to 2020, the banks had an average of eight directors on the board, of which on average about 37.5% were independent members; female directors made up a mean of 32.4% of the board; the directors who were foreigners accounted for about 30.7%, and about 32.7% of the directors had a postgraduate degree.

Variable	N. Obs	Mean	Std. Dev.	Min	Max
Z score	324	88.249	148.902	0.168	1014.468
Board size	324	8.410	2.327	4.000	17.000
Dependent board	324	0.375	0.075	0.100	0.456
Women board	324	0.324	0.165	0.071	0.857
Foreign board	324	0.307	0.147	0.083	0.833
Education board	324	0.327	0.164	0.067	0.833
Dummy	324	0.083	0.277	0.000	1.000
Bank size	324	7.999	0.509	6.874	9.181
Equity to total assets	324	0.094	0.042	0.026	0.256
Loans to total assets	324	0.546	0.126	0.145	0.808
GDP	324	0.059	0.011	0.026	0.071
CPI	324	0.058	0.048	0.006	0.231

Table 2. Summary statistics.

The unbalanced panel data consist of 25 commercial banks in period 2009–2020. Source: The authors' computations.

3.4. *Methodology*

Previous studies have confirmed that there are various factors affecting bank stability. For example, Nguyen and Nguyen (2021) found that money supply M2 has a positive impact on bank stability in Vietnam, and Le (2020) indicated that bank profitability and loan growth also have an influence on bank stability, etc. So, in this paper, to avoid the omitted important variables, we used the GMM (generalized method of moments) technique as proposed by Blundell and Bond (1998). The GMM estimator is preferred for panel data with a large N and a small T. According to Judson and Owen (1999), GMM estimation

can overcome several issues of panel data (such as autocorrelation, heteroskedasticity, endogeneity, and omitted variable issues) that other estimators (Pooled OLS, FEM, and REM) cannot handle.

The GMM technique has two alternative forms; they are Different GMMs (DGMMs) and system GMMs (SGMMs). This paper used an SGMM estimator. This model uses the first difference to exclude the expected correlation between the error term and the lagged dependent variable. In addition, this estimator can solve the endogeneity issue by instrumenting the predetermined and endogenous variables with their own lags.

4. Empirical Result and Discussion

In this section, we analyze and discuss the research results in three parts. First, the authors summarize the main results of the association between the lnZ score and the corporate governance indicators; second, the paper presents some robustness tests, and finally, the paper presents some discussions.

4.1. The Main Results

Table 3 reports the correlation coefficient among the independent, main explanatory, and control variables. None of the correlations between dependent variables has Pearson correlation coefficients above 0.5, indicating that the explanatory variables are correlated with each other at a relatively low level. At the same time, the variance inflation factors (VIFs) for explanatory variables are also far below the threshold value of three (Freund et al. 2006). These suggest that the issue of multicollinearity in the model is not a concern in this paper. As a result, the study can continue to estimate regression.

 Table 3. Pearson correlation coefficient.

	lnZ Score	Board Size	Dependent Board	Women Board	Foreign Board	Education Board	Bank Size	E/A	LTA	Dummy	GDP	СРІ
lnZ score	1.000											
Board size	0.114	1.000										
Dependent board	0.183	0.132	1.000									
Ŵomen board	0.259	-0.233	0.263	1.000								
Foreign board	0.069	-0.284	0.077	0.246	1.000							
Education board	0.212	-0.189	0.201	0.491	0.426	1.000						
Bank size	0.198	0.483	0.152	0.190	0.074	0.227	1.000					
E/A	-0.140	-0.253	-0.086	-0.105	-0.004	-0.195	-0.655	1.000				
LTA	0.174	0.351	0.040	0.144	-0.078	0.203	0.280	-0.045	1.000			
Dummy	0.117	0.264	0.106	0.025	-0.078	0.055	0.204	-0.090	0.195	1.000		
GDP	0.050	-0.131	-0.052	0.064	0.107	0.099	-0.041	-0.067	-0.055	-0.746	1.000	
CPI	-0.268	-0.121	-0.175	-0.303	-0.135	-0.438	-0.222	0.203	-0.290	-0.113	-0.040	1.000

Source: The authors' computations.

Table 4 presents the fixed effects, random effects, and system GMM regression models predicting the impact of corporate governance on bank stability. From Table 3, the board size and board members' education have a positive effect on bank stability at a significance of 1%, while also at the 1% significance level, dependent board and foreign board members have a negative effect on the stability of commercial banks in Vietnam; the coefficient of the women board member variable is not statistically significant. In addition, the bank-specific and macroeconomic variables also affect bank stability.

To ensure the reliability of the results, the paper conducted robustness checks.

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	Fixed Effects	Random Effects	System GMMs
$\ln Z$ score (t - 1)			0.695 *** (0.075)
Board size	0.059 *** (0.019)	0.044 ** (0.017)	0.147 *** (0.052)
Dependent board	-0.512 (0.353)	0.014 (0.322)	-2.115 *** (0.372)

	Fixed Effects	Random Effects	System GMMs
Women beard	0.660 ***	0.541 **	-0.173
women board	(0.249)	(0.218)	(0.294)
E	-0.026	-0.001	-3.703 ***
Foreign board	(0.210)	(0.199)	(1.155)
Education board	0.328	0.276	4.479 ***
Education board	(0.235)	(0.216)	(0.843)
Paultaina	0.423 **	0.142	0.463 *
Dank Size	(0.167)	(0.105)	(0.237)
E / A	2.843 ***	1.674 **	9.389 ***
E/A	(0.846)	(0.803)	(2.225)
ΤTA	-0.176	-0.020	-5.703 ***
LIA	(0.271)	(0.247)	(1.155)
Dummy	0.118	0.271 **	-0.415 ***
Dunnity	(0.138)	(0.128)	(0.126)
CDR	5.467 *	7.549 **	-9.189 ***
GDP	(3.003)	(2.922)	(3.172)
CPI	-0.547	-0.975	-0.124
CFI	(0.551)	(0.540)	(0.587)
	-2.804	-0.655	-1.131
_cons	(1.166)	(0.778)	(1.320)
F-test p-value	0.0000	0.0000	
AR(1) p-value			0.003
AR(2) p-value			0.113
Sagan p-value			0.917
Number of groups			27
Number of instruments			28
Second stage F-test p-value			0.000

Table 4. Cont.

The numbers in () are standard errors of regression coefficients; ***, **, and * significant at 1%, 5%, and 10%, respectively. Source: The authors' computations.

4.2. Robustness Checks

The paper applied the Bayesian Mixed-Effects approach to review the influence of corporate governance on bank stability in Vietnam. These days, there are two schools of econometrics, consisting of the probabilistic and the Bayesian schools. According to Nguyen et al. (2022), the results of the methods of probabilistic inference (FEM, REM, and GMMs) are mainly based on data, whereas the results of the Bayesian inference are the combination of data and prior information. However, finding the prior choice is a complicated assignment in the Bayesian approach. Normally, prior distribution is inferred from the prior knowledge, such as theoretical or empirical results, beliefs, or expert opinion. Nevertheless, several studies might choose different priors for the same model. Here are some strict principles in the prior choice in the Bayesian approach. Firstly, with a large sample, priors do not make much sense for the data distribution. Secondly, with a small sample, the use of noninformative priors can result in Type M error of Type I error. In this situation, the researcher can rely on OLS estimation to choose an informative prior. For this paper, following the recommendation of Lemoine (2019), the authors used a normal (0,1) to assign to model parameters in previous studies (Nguyen et al. 2022).

Bayesian Mixed-Effects models are characterized as containing both random effects and fixed effects. The fixed effects are similar to standard regression coefficients and are estimated directly. Different from the fixed effects, the random effects are estimated indirectly and are summarized according to the covariance and variance. The form of random effects includes random intercepts, random coefficients, and grouping structure. So, mixed-effect models are also known as multilevel models and hierarchical models. Table 5 presents the simulation results of the Bayesian inference. From Table 5, the variables of board size, women board members, and board members'education have a strong positive relationship with bank stability, while the dependent board has a negative association with bank stability. The foreign board variables have an ambiguous impact on bank stability in Vietnam. In general, those results are quite consistent with the results of the system GMM estimators.

Variable Parameters	Mean	Std. Dev.	Monte-Carlo Standard Error	Median	Probability of Coefficient Mean >0	Equal-Tailed [95% Cred. Interval]
Board size	0.052	0.017	0.000	0.052	0.999	[0.017; 0.085]
Dependent board	-0.103	0.316	0.006	-0.097	0.378	[-0.738; 0.479]
Women board	0.584	0.220	0.004	0.582	0.996	[0.147; 1.014]
Foreign board	0.057	0.192	0.003	0.054	0.620	[-0.325; 0.433]
Education board	0.336	0.207	0.004	0.335	0.946	[-0.066; 0.748]
Bank size	0.039	0.087	0.002	0.040	0.674	[-0.136; 0.209]
E/A	0.139	0.086	0.002	0.138	0.949	[-0.030; 0.313]
LTA	0.983	0.612	0.011	0.977	0.945	[-0.205; 2.190]
Dummy	0.046	0.240	0.004	0.043	0.572	[-0.419; 0.534]
GDP	0.749	0.945	0.017	0.751	0.783	[-1.081; 2.654]
CPI	-0.714	0.482	0.009	-0.705	0.071	[-1.652; 0.240]
_cons	-0.268	0.612	0.011	-0.265	0.329	[-1.491; 0.940]
var	0.136	0.012	.000	0.136		[0.114; 0.161]

Table 5. The simulation results of Bayesian Mixed-Effects approach.

Source: The authors' computations.

4.3. Discussions

Based on the empirical results, the paper has some analyses as follows:

Firstly, both the probabilistic and Bayesian inferences confirm that board size relates strongly and positively to bank stability in Vietnam, and this finding is consistent with Adams and Mehran (2012); Abobakr (2017); Sarkar and Sarkar (2018); and Marie et al. (2021). Compared to banks with a small board, banks with larger boards will have a better role in monitoring management performance and making rational strategic decisions. Hence, the paper accepts the strong positive link between board size and bank stability.

Secondly, both the GMM estimators and the Bayesian approach indicate that the variable of the dependent board has a negative influence on bank stability. This conclusion supports the steward theory that compared with internal directors, outside directors are usually not as well-informed and they are also unable to understand the bank's performance in detail, so the dependent board is not a driving force for the bank to maintain stability. This finding is similar to that of Li and Song (2013) and Berger et al. (2016). In practical terms, independent board members usually do not have a comprehensive understanding of the bank's operations. In Vietnam, the number of independent members is quite small. This indicates that commercial banks are very scared of subjective decisions affecting the performance of banks. In addition, the increase in the number of independent boards also causes various issues. For example, they may tend to consolidate positions or desire to satisfy other members may be concerned about their interests, instead of safeguarding the shareholders' interests. From these arguments, the paper accepts the positive relationship between the dependent board and bank stability.

Thirdly, although the results of the system GMMs show that the regression coefficient of the women board member variable is not statistically significant, the Bayesian Mixed-Effects indicate a positive regression coefficient with a probability of 0.996. This means that there is a strong positive relationship between female directors and bank stability. This finding is consistent with the original expectation of the paper as well as several prior research papers, such as Bart and McQueen (2013); Palvia et al. (2015); Abdelbadie and Salama (2019), Arvanitis et al. (2022); and El-Chaarani et al. (2022). In addition, these results are also supported by the resource dependence and agency theories. Accordingly, female directors better implement their supervisory responsibility, increase the firm's legitimacy, and expand the company's external resources (Arvanitis et al. 2022). In practical terms, women on boards tend to make risk-averse and conservative financial decisions, which lead to a better financial performance and an increase in bank stability. Hence, the positive association between women board members and bank stability is accepted.

Fourth, the Bayesian inference reports that the positive regression coefficient of the foreign board member variable with the probability of 0.620 suggests ambiguity in the association between directors who are foreigners and bank stability. However, the negative regression coefficients of this variable at the 1% significance level from the system GMM estimator show that the more foreign directors a bank has, the more the bank's instability increases. This result is contrary to the original expectation of the paper, but it is similar to García-Meca et al. (2015). This can be explained in that foreign directors have management skills and experience, so they tend to operate in high-risk areas to increase profitability and increase the bank's instability. Furthermore, according to García-Meca et al. (2015), foreign board members make up a minority of the board. In addition, cultural differences reduce social cohesion between foreign and domestic directors. This slows down the decision-making process and makes it more contradictory, ultimately reducing the bank's operational efficiency (García-Meca et al. 2015). So, the authors rejected the hypothesis that there is a positive relationship between the foreign board members and bank stability.

Fifth, both the Bayesian framework and the system GMM estimator indicate that the positive regression coefficient of the board members'education variable at the 1% significance level (system GMM estimators) with the probability of 0.946 (Bayesian approach) suggests the strong positive linking between directors with postgraduate qualifications and the stability of Vietnamese commercial banks. This finding is consistent with the initial expectations and several previous studies, for example, King et al. (2016) and Setiyono and Tarazi (2018). The directors with postgraduate degrees (MBA, DBA, Ph.D, etc.) tend to adopt better risk management techniques, which help to increase the effectiveness of risk management and increase bank stability. Therefore, the paper confirms that the relationship between the board members' education and bank stability is positive.

In addition, a relationship between the factors of corporate governance and bank stability was found. The paper also indicates that the linking between bank-specific and macroeconomic variables also affects bank stability, in which bank size has a weak positive impact on bank stability (with 10% significance in the system GMMs and a probability of 0.674 in the Bayesian approach); this finding confirms that large-scale banks generally operate more safely due to their investment in the risk management process. The regression coefficient of the ratio of equity to total assets variable is positive, showing that the larger the bank's equity, the higher the bank's buffer, and this helps the bank reduce risk and increase stability. Regarding the COVID-19 variable (Dummy), the system GMMs shows a negative relationship between the dummy variable and bank stability, whereas the Bayesian approach indicates an ambiguous relationship between the two factors. So, the paper accepts the negative relationship between the COVID-19 pandemic and the stability of commercial banks in Vietnam. This result is similar to Xiazi and Shabir (2022) and Elnahass et al. (2021). According to Duan et al. (2021), when there was a strong community spread of COVID-19, governments were forced to implement some containment measures, such as social distancing, school closures, and business closures. These activities, in turn, led to adverse economic impacts on businesses and households. As a result, businesses experienced significant declines in revenues and increased costs, while households had jobs losses and reduced income (Duan et al. 2021). These increased the probability of bankruptcy of businesses and households, so they may not be able to service their debt. These effects were likely to cause banks to lose revenue and increase nonperformance loans, which negatively affect banks' profitability and solvency (Beck and Keil 2021). These reflect the actual situation in Vietnam. When the virus was spreading rapidly in the community, the government implemented various measures (for example social distancing in several provinces and cities), which affected most of the main activities of the bank, such as lending or depositing activities, which led to increased bank instability. Moreover, the variables of the macroeconomic condition also affect bank stability.

5. Conclusions and Policy Recommendations

In recent decades, the relationship between the characteristics of the board and banking performance has received great attention from academics worldwide. However, most studies were conducted independently on how each board's characteristics impact bank performance. Therefore, this paper implemented empirical evidence on the comprehensive characteristics (including board size; independent board, women board, and foreign board members; and board members' education) of bank stability—a topic that prior studies did not really focus on. For this purpose, the authors used the sample data of 25 commercial banks during the period from 2009 to 2020. By panel data regression techniques (system GMMs and Bayesian Mixed-Effects), the paper found that board size, women board members, and board members' education had a positive effect on bank stability, while dependent board and foreign board members were not the driving force for bank stability. In addition, during the COVID-19 pandemic when there was a negative impact on most industries, banking instability increased. From these results, the paper suggests several recommendations related to corporate governance to maintain and enhance bank stability.

Although in general the paper has achieved its objectives, the paper has not yet highlighted the impact of several control variables (such as the variables of loans to total assets or GDP) on bank stability. In addition, the sample data do not include foreign commercial banks or cooperative banks, a fact which also makes the results not highly representative. Therefore, in future studies, the authors will expand the research scope to foreign commercial banks, cooperative banks, and state-owned banks to confirm the association between corporate governance and bank stability. Furthermore, the study did not mention the linking of several other characteristics, such as internal control board or risk governance to bank stability. With this limitation, in the next study, the authors will analyze the impact of these characteristics on bank stability in Vietnam.

From the empirical results, the authors suggest some highlighted recommendations as follows: (i) data of corporate governance show that the percentage of independent members on the board directors has an increasing tendency; hence, commercial banks should have a roadmap to consider and increase more inside directors as members of the board; (ii) encourage more female directors to participate on the board as they can neutralize the risky operating strategies of male directors thereby increasing bank stability; (iii) consider the process of finding strategic shareholders, especially foreign strategic shareholders to ensure the safe and effective operation of Vietnamese commercial banks; (iv) encourage and motivate members of the boards to focus on postgraduate training to acquire new management methods and increase their qualifications for more stable and secure banking; (v) although the research results indicate that the board size positively affects the bank stability, in recent years, commercial banks have increased the number of board members, so in the years to come, commercial banks should also consider the number of board members when making decisions; and (vi) the results show that the ratio equity to total assets is an important factor affecting bank stability, so the State Bank of Vietnam and bank managers need to take appropriate measures to increase equity, making the bank's buffer for commercial banks during their operation.

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