



How does internal governance affect banks' financial stability? Empirical evidence from Egypt

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Abstract

This paper investigates whether internal governance mechanisms were associated with the financial stability of Egyptian banks over the period 2010–2019. To this end, a GMM regression analysis was employed using 252 firm-year observations. The results, in general, indicate that the level of banks' financial stability is positively associated with board size, board meetings, and board gender. In contrast, the results show that board education and the ownership of shares by directors are negatively associated with banks' financial stability. More interestingly, our results demonstrate that higher financial stability is significantly associated with lower board independence, the presence of CEO duality, and fewer audit committee meetings. These striking results can be attributed to the argument that the presence of independent directors on the board may reduce the CEO's willingness to share information with board members, causing a high level of uncertainty in the decision-making process, which ultimately leads to a reduction in the financial stability of their bank.

Keywords Corporate governance · Banks' financial stability · Board of directors · Ownership structure · Audit committee · Egypt

Introduction

It is well-documented that a bank can be financially stable when it meets its commitments with regard to investment support, the establishment of a deposit protection fund, and the application of strong corporate governance mechanisms, among other things (Uhde and Heimeshoff 2009). At the same time, the poor performance of many banks has often been linked to the poor governance practices and the failure of boards of directors to perform in the best interests of the related stakeholders (Aebi et al. 2012; Beltratti and Stulz 2012; Erkens et al. 2012). The collapse of a number of banks during the recent global financial crisis in 2008 has

consequently led many international institutions (such as the International Monetary Fund, the World Bank, the Organization for Economic Cooperation and Development, and the Organization of Basel) to focus on the need for the banking sector to strengthen its internal governance framework. This increased attention is a reflection of a general consensus among academics and practitioners that the origin of this financial crisis may be attributed to a number of shortcomings that act to limit the effectiveness of the existing paradigm of corporate governance in mitigating the effects of the financial irregularity or fraud (Bai and Elyasiani 2013; Kirkpatrick 2009).

Historically, the concept of corporate governance has emerged in the academic literature to control for the agency problems that may result from the separation between ownership and management. It is believed that the lack of sound bank rules for applying governance mechanisms provides managers with greater opportunities to engage in corrupt practices at the expense of bank stakeholders. Meanwhile, it is agreed that governance mechanisms in the banking sector are designed to: (1) enhance the performance and financial stability of banks during crises through certain risk and financing policies, and (2) ensure that banks retain the central banks' estimate of the minimum acceptable capital for

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reducing risks and maintaining stability (Peni and Vähämaa 2012). Accordingly, financial firms with effective governance mechanisms are expected to have management bodies which can reduce the incidence of risky financial decisions and cope with bad news; a matter that would ultimately leads to a reasonable level of financial stability in these financial institutions (Karamanou and Vafeas 2005).

Nevertheless, the accumulated empirical evidence on the association between the presence of strong governance mechanisms and banks' financial stability is rather mixed. On the one hand, Jiang et al. (2012) find that banks that apply the principles of corporate governance are more competitive in the long term, because they display a reasonable level of transparency in their financial transactions and accounting and auditing procedures, and this has given them greater financial stability. Dong et al. (2017) also demonstrate that the defective application of corporate governance in the banking sector has many negative effects, creating higher financial volatility and lower assets quality. On the other hand, Anginer et al. (2016) show that well-implemented internal governance mechanisms in banks are associated with increased financial instability, due to the involvement in high social costs that is intended to improve the personal privileges of board members at the expense of banks' shareholders. Similarly, Laeven and Levine (2009) find that the risk of conflicts between managers and shareholders, when internal governance mechanisms are applied, has several different effects on the financial stability of a bank, depending on the relative power of shareholders in its management structure.

A review of the literature on the association between corporate governance and the level of financial stability in the banking sector reveals the scarcity of research on this topic in the developing economies. This greatly motivated us to investigate whether internal governance mechanisms are associated with the financial stability of banks operating in the context of Egypt, which is currently keen to attract more foreign investment and form many international joint ventures and alliances. In this sense, our present paper contributes to the extant literature on banks' governance in two specific ways. First, it provides the first evidence of the way in which internal governance mechanisms affect the levels of financial stability in Egyptian banks, using a hand-collected dataset that contains details about several aspects of their boards of directors, ownership structures, and audit committees. Second, by considering the banking sector in this paper, it complements the prior studies in the MENA countries that have mostly relied on nonfinancial institutions in their exploration of the determinants and economic consequences of adopting good corporate governance practices (e.g., Al-Bassam et al. 2018; Sarhan et al. 2019). Consequently, our results are expected to provide useful insights to these academic researchers, practitioners, and regulators

who are interested in strengthening the governance mechanisms in the banking sector in order to maintain high levels of financial stability and prevent any future failure in this vital sector of the economy.

The remainder of the paper is organized as follows: "Literature review and hypotheses development" section discusses the relevant literature and develops the research hypotheses. "Data collection and methodology" section introduces the data collection and the methodology employed. "Empirical results and discussion" section discusses the empirical results and provides further analysis and a robustness check. "Conclusions" section concludes and suggests some avenues for future research.

Literature review and hypotheses development

Board of directors and banks' financial stability

The role of board of directors as a governance mechanism is particularly important in the banking sector, since this, due to its complexity, is characterized by the existence of limited competition, intensive regulations and considerable asymmetry of information. According to Adams and Mehran (2008), banks with effective supervisory and advisory boards are better at implementing governance mechanisms, thereby improving performance, maintaining financial stability and creating higher shareholder value. In support of this argument, several banking regulators and decision-makers have stressed the importance of strengthening the role of boards of directors in the banking industry, with specific emphasis on their risk management responsibilities (see, for example, the Basel Committee Reports on Banking Supervision 2006, 2010). Consequently, seven specific aspects of the board of directors in the banking sector are discussed in the following subsections: board size, board independence, board meetings, CEO duality, board education, board gender, and the inclusion of foreign members on boards.

Board size

As suggested by the agency theory, a large board of directors can play a critical role in monitoring the performance of management and in making strategic decisions. It is argued that a large board of directors is less likely to be controlled by the executive managers, whilst the diversity of expertise on the board is expected to increase, leading to a significant improvement in the financial stability of the financial institutions (Adams and Mehran 2012; Kiel and Nicholson 2003; Whiting and Birch 2016). Consistent with this view, a number of previous studies have reported that there is a positive relationship between the size of the board of directors



and the financial stability of banks, implying that boards of directors which represent all shareholders reasonably well serve the best interests of financial institutions (Berger et al. 2016; Sarkar and Sarkar 2018). However, Anginer et al. (2016) in contrast claim that large boards of directors may be less effective in promoting the best interests of shareholders, due to the problem of free riding by board members. In support of this claim, several other studies have found a negative relationship between the size of the board of directors and the effectiveness of board oversight, as well as the performance and financial stability of banks (see, for example, Karamanou and Vafeas 2005; Hermalin and Weisbach 2003; Pathan and Faff 2013).

In light of the above conflicting results, we were motivated in the present paper to investigate the relationship between the size of boards of directors and banks' financial stability in Egypt, through examining the following hypothesis:

H₁ The extent of banks' financial stability is positively associated with the board size.

Board independence

A number of recent studies have addressed the importance of board independence in the banking sector and concluded that enhancing this aspect leads to fewer risky decisions and higher financial performance and stability among banks (e.g., Adams and Mehran 2008; Dong et al. 2017; Harris and Raviv 2006; Raheja 2005). In addition, a positive relationship has been found between the percentage of independent directors on the board and the quality of control over the work of management during the last financial crisis. This high level of control has been reflected in an improvement in the quality of financial data and a reduction in the number of frauds committed in the financial statements of the banking sector (Booth et al. 2002; Frankel et al. 2011).

Nevertheless, another group of studies has found that banks with more independent board members were associated with poorer performance and an inability to maintain their financial stability during the financial crisis. These unexpected findings are attributed to the presence of independent directors on the board, which might have reduced the CEO's willingness to share information with board members, causing a high level of uncertainty in decision-making which may have led banks to become financially unstable (Adams and Ferreira 2007; Berger et al. 2016; Li and Song 2013; Pathan and Faff 2013; Sarkar and Sarkar 2018). These conflicting results provide further motivation for the present paper to investigate the relationship between board independence and banks' financial stability in Egypt, through examining the following hypothesis:

H₂ The extent of banks' financial stability is positively associated with the board independence.

Board meetings

Unlike nonfinancial institutions, banks require frequent board meetings with the aim of overseeing the performance of senior management, in order to prevent risky decisions that might adversely affect financial stability (Adams and Mehran 2008). These meetings are supposed to provide board members with the opportunity to discuss ways of monitoring the performance of executive managers and banking strategy. Thus, the greater the number of meetings, the greater the degree of control over managers, which ultimately produces a positive impact on banks' performance (De Andres and Vallelado 2008). Yet, given the fact that no prior research has been conducted in Egypt with a specific focus on the relationship between the number of board meetings and the extent of banks' financial stability, the present paper was motivated to investigate this relationship by examining the following hypothesis in the Egyptian environment:

H₃ The extent of banks' financial stability is positively associated with the number of board meetings.

CEO duality

Theoretically, combining the roles of CEO and chairman under the authority of the same person (i.e., CEO duality) would enable executive managers to use such authority to serve their own interests. Therefore, CEO duality is presumed to result in lower performance by financial institutions and may negatively affect their financial stability (Dey et al. 2011; Grove et al. 2011; Dong et al. 2017). In support of this contention, Pathan (2009) and Sarkar and Sarkar (2018) have documented a positive correlation between the separation of the CEO and chairman's roles and the financial stability of banks. Nevertheless, Carty and Weiss (2012) find the reverse: they claim that there is no significant association between the extent of banks' financial stability and CEO duality. Consequently, the fourth hypothesis of this paper has been formulated in the following alternative form:

H₄ The extent of banks' financial stability is negatively associated with the CEO duality.

Board education

It has been proposed by previous studies that the educational level of bank board members could enhance the practices of corporate governance (Berger et al. 2014). Recalling the organizational complexity of banks, it has been anticipated that having higher levels of education might increase the



ability of board members to understand and interpret sophisticated risk measurement techniques, and these skills would help the board members in assessing the impact of different bank policies on the associated risk. Consistent with this anticipation, Graham and Harvey (2001) and De Jonghe et al. (2012) find that banks with well-educated board members exhibit more risk/return efficiency.

Nevertheless, Setiyono and Tarazi (2018) find that, in general, education diversity leads to higher income volatility and leverage risk. King et al. (2016) show that CEOs with MBAs have a significant impact on bank's performance, since they usually perform better than their counterparts. This impact is found to be more pronounced when compensation structures adopt greater risk-taking incentives and when banks follow riskier or more innovative business models. Likewise, Bertrand and Schoar (2003) report that executives holding MBAs tend to be more aggressive and run more levered firms, suggesting that MBA graduates are more likely to engage in riskier firm policies. Berger et al. (2014) contradict this by demonstrating that boards with a higher representation of individuals with doctorate degrees are negatively related to bank risk taking, which would result in higher financial stability. In light of the preceding discussion, we formulate the following hypothesis:

H₅ The extent of banks' financial stability is positively associated with the board's education levels.

Board gender

It has recently been argued that the representation of women on the board of directors would enhance the board's oversight role that typically includes monitoring the CEO and other top executives, approving the organization's strategy and monitoring the control system. Hence, it is expected that the presence of more female directors on the board would lead to a reduction in the agency costs that might occur due to the separation between ownership and management control. Adams and Ferreira (2009), for instance, investigate the governance and performance of a sample of US firms to assess the impact of female board members and find that gender diverse boards allocate more effort to monitoring, but gender diversity on firm performance has a negative effect.

In the banking sector, De Cabo et al. (2012) postulate that women are more conservative and more risk averse than men and their presence is therefore associated with lower risk taking. Similarly, De Cabo et al. (2012) find that bank risk is likely to decrease if more female executives are present. Nevertheless, Adams and Funk (2012) have found the reverse: they demonstrate that female directors, more than their male counterparts, are inclined to take risks. Berger et al. (2014) have also found that a higher proportion of female board members increases two different measures of

portfolio risk, and this positive relationship has been attributed to the lower job experience of the female executives.

Following the notion that the presence of female directors enhances the interactions between boardroom members through their more diverse thinking, which would lead to a more extensive analysis, we hypothesize that:

H₆ The extent of banks' financial stability is positively associated with the proportion of female directors on the board.

Foreign members of boards

The growing internationalization of businesses has led to a higher demand for directors who possess the necessary knowledge of and contacts in foreign markets, since these attributes are deemed vital for linking business entities to the different countries in which they operate. In addition, it is believed that directors with different nationalities introduce greater heterogeneity of ideas, experiences, and points of view (Carpenter et al. 2001). Consistent with this argument, Oxelheim and Randoy (2003) find that the inclusion of an outside (Anglo-American) member on the board has a significant positive impact on the corporate performance of a sample of firms in Norway and Sweden.

More interestingly, Choi and Hasan (2005) report empirical evidence to show that the extent of outside board membership has no significant impact on Korean banks' performance. Rather, the presence of a foreign director on the board is significantly positively associated with the banks' return and risk measures. Similarly, Ameer et al. (2010) demonstrate that the proportion of outside and foreign directors on the board is positively associated with the firms' performance as measured by Tobin's Q ratio. These consistent findings with regard to the improved performance because of the presence of foreigners on the board can be attributed to a variety of factors. For instance, foreign members, due to their different backgrounds, can add valuable and diverse expertise to the board composition which domestic members do not possess (Choi and Hasan 2005). Moreover, foreign board members can also help to assure foreign minority investors that the firm is managed professionally in their best interests (Oxelheim and Randoy 2003). Consequently, we formulate the following hypothesis:

H₇ The extent of banks' financial stability is positively associated with the presence of foreign directors on the board.

Ownership structure and banks' financial stability

The impact of ownership structure on banks' financial stability is addressed in the following subsections from two perspectives: the administrative ownership and the institutional ownership.



Administrative ownership

According to Nurleni et al. (2018), the high proportion of administrative ownership could provide bank executives with greater incentive to reduce their banks' exposure to risk and maximize the value of these banks. This articulation is supported by Aebi et al. (2012), who have reported empirical evidence that higher administrative ownership reduces the risky decisions in banks and increases the level of their financial stability. In addition, it has been found that the extent of administrative ownership has a positive impact on the profitability and, hence, the financial stability of the banking sector (i.e., Beltratti and Stulz 2012; Li and Song 2013; Westman 2011). As a result, it can be inferred that the increase of ownership among executive board members serves to harmonize the interests of management and shareholders, which tends ultimately to generate higher profits and maintain a high level of financial stability in banks (Beltratti and Stulz 2012).

However, the agency theory assumes that an increased level of executive ownership may have an adverse effect on the value and long-term stability of banks. According to this assumption, management could use the higher ratio of administrative ownership to maximize its personal benefits through reducing the level of disclosure, which would incline the related stakeholders to mistrust the information that management had given them and thereby lower the degree of banks' financial stability (Laeven and Levine 2009). Consistent with this view, Lee (2002) postulates a negative correlation between financial stability and the contribution of executive directors to the ownership structure of banks, with potential failure to maintain high levels of financial stability in these financial institutions. To explore this relationship in the Egyptian banking sector, the following hypothesis has been formulated, after taking into account the agency theory predictions:

H₈ The extent of banks' financial stability is negatively associated with the ownership of shares by directors.

Institutional ownership

The findings of Aebi et al. (2012) indicate that the presence of major shareholders, such as institutional investors, does not appear to be helpful for providing effective risk control and maintaining the financial stability of banks. In this sense, Barry et al. (2011) illustrate that there is a positive relationship between large institutional ownership and the adoption of aggressive risk-taking strategies. Moreover, Becht et al. (2011) and Erkens et al. (2012) document that before the financial crisis of 2008, there was a negative relationship between financial firms with higher institutional ownership and the financial stability of these institutions, resulting in

greater losses to the shareholders during the crisis period itself (2007–2008). Therefore, the ninth hypothesis of this paper has been formulated as follows:

H₉ The extent of banks' financial stability is negatively associated with the percentage of institutional ownership.

Audit committee and banks' financial stability

The audit committee is a supervisory mechanism that is designed to improve the quality of bank disclosures and enhance the oversight activities of board members with the aim of maintaining high levels of financial stability in these institutions (Basel Committee Report on Banking Supervision 2006). In the following subsections, two specific aspects of the audit committee are addressed in detail, namely, audit committee size and audit committee meetings.

Audit committee size

Although it has been believed that larger audit committees might be better at detecting financial problems, due to the higher likelihood of having members in these committees with corporate or financial expertise (Karamanou and Vafeas 2005), a number of recent studies have found a negative relationship between the size of audit committees and the performance of financial firms, leading to financial stumbling and the failure to maintain the financial stability of these firms (e.g., Sun and Liu 2014). In line with the agency theory that perceives a larger audit committee as a favorable signal for the effectiveness of monitoring functions, the present paper was motivated to investigate the relationship between audit committee size and banks' financial stability in Egypt, through examining the following hypothesis:

H₁₀ The extent of banks' financial stability is positively associated with the size of the audit committee.

Audit committee meetings

The presence of independent and competent audit committee members does not guarantee the effectiveness of an audit committee unless it is actively functioning. One of the proxies that are typically used in the literature to judge whether an audit committee is active or not is the frequency of audit committee meetings per fiscal year. Several studies have used this proxy to investigate whether there is a relationship between the activity of an audit committee and the likelihood of fraudulent financial reporting. The results, in general, indicate that greater meeting frequency is likely to be associated with a lower incidence of financial reporting problems (e.g., Abbott et al. 2000; Beasley et al. 2000). Meanwhile, it is also documented that there is a negative



association between the frequency of audit committee meetings and the occurrence of financial distress (Salloum et al. 2014). Again, given that the present research endeavor is the first to examine such an association in the Egyptian context, the last hypothesis of this paper has been formulated as shown below:

H₁₁ The extent of banks' financial stability is positively associated with the frequency of audit committee meetings.

Data collection and methodology

Sample and data

The initial sample included all banks operating in the Egyptian context (i.e., 40 banks). 12 banks were, however, excluded due to the unavailability of a complete series of their annual reports across the sample period, 2010–2019. As a result, the final sample consisted of 28 banks, representing 70% of the banking sector in Egypt (see “Appendix A,” which shows the full list of banks included in the final sample). We chose to start our observations with the year 2010 because this was the year when the Basel Committee issued Basel III, and when the Egyptian Financial Supervisory Authority issued the Egyptian Governance Guide.

2016; Fu et al. 2014; Laeven and Levine 2009). Thus, a higher z -score is interpreted as a decrease in the associated risk and an indication that a bank with this score has become financially more stable.

Empirical model

To test hypotheses H1–H11, a dynamic regression analysis (i.e., Generalized Method of Moments) was used to investigate the impact of each internal governance mechanism on the financial stability of Egyptian banks. The use of the generalized method of moments (GMM) technique allows us to control for the endogeneity bias that could be induced by the dynamic nature of our panel data across the sample period 2010–2019 (Akbar et al. 2017; Chen et al. 2017; Lee and Hsieh 2014; Wintoki et al. 2012). In addition, five bank-specific variables (i.e., Bank size, ROA, Leverage, Competition and the BIG4 audit firms) were incorporated in the regression analysis to control for the correlated omitted variables problem, which otherwise might lead to erroneous inferences about the impact of governance mechanisms on the level of banks' financial stability (Dong et al. 2017; Erkens et al. 2012).

In general, the regression model that we employed can be mathematically expressed as follows:

$$\begin{aligned} Z_score_{it} = & \beta_0 + \beta_1 Board\ Size_{it} + \beta_2 Board\ Independence_{it} + \beta_3 Board\ Meetings_{it} \\ & + \beta_4 CEO\ duality_{it} + \beta_5 Board\ Education_{it} + \beta_6 Board\ Gender_{it} + \beta_7 Board\ Foreign_{it} \\ & + \beta_8 Admin_Ownership_{it} + \beta_9 Instit_Ownership_{it} + \beta_{10} AC_Size_{it} + \beta_{11} AC_Meetings_{it} \\ & + \beta_{12} Bank\ Size_{it} + \beta_{13} ROA_{it} + \beta_{14} Leverage_{it} + \beta_{15} Competition_{it} + \beta_{16} BIG4_{it} + \epsilon_{it} \end{aligned}$$

The financial data were extracted directly from the published annual reports of our final sample, while the governance data were obtained from three different sources: the published annual reports, the annual disclosure book (i.e., the kompass book) and the banks' websites.

Measurement of financial stability

As in previous studies, the employed proxy for banks' financial stability in this paper is a score (i.e., the z -score) equal to the sum of the means of return on assets and the capital asset ratio (equity capital/total assets) divided by the standard deviation of the return on assets (Barth et al. 2004). This calculation has been used in the finance literature as a measure of banks' financial stability since it represents the inverse probability of the insolvency of banks (Almamy et al. 2016; Bai and Elyasiani 2013; Berger et al. 2014; Fernández et al.

where

Z_score	Our proxy for banks' financial stability, which is equal to the sum of the means of return on assets and the capital asset ratio (equity capital/total assets) divided by the standard deviation of the return on assets (see “Appendix B” for more information on the computation of this proxy);
$Board\ Size_{it}$	The log of the total number of directors on the board;
$Board\ Independence_{it}$	The proportion of independent nonexecutive directors on the board;
$Board\ Meetings_{it}$	The log of the number of board meetings held in a year;



CEO duality _{it}	A dummy variable that was given the value of 1 if the CEO is also chairman of the board of directors and 0 otherwise;	Competition _{it}	The market share of deposits measured as a proportion of the bank's total deposits relative to the total deposits in the entire banking sector;
Board Education _{it}	A dummy variable that was given the value of 1 when there was at least one board member holding a postgraduate degree (such as Master, MBA, DBA, or PhD) in any of the business disciplines and 0 otherwise;	BIG4 _{it}	A dummy variable that was given the value of 1 if the external auditor was one of the "big 4" audit firms and 0 otherwise;
Board Gender _{it}	The proportion of female directors on the board;	ε_{it}	Standard error
Board Foreign _{it}	A dummy variable that was given the value of 1 when there was at least one foreign director on the board and 0 otherwise;		
Admin_Ownership _{it}	A dummy variable that was given the value of 1 if the ownership of shares by directors was at least 5% and 0 otherwise;		
Instit_Ownership _{it}	The number of shares held by the institutional investors divided by the total number of outstanding shares of the bank;		
AC_Size _{it}	The log of the total number of audit committee members;		
AC_Meetings _{it}	The log of the number of audit committee meetings held in a year;		
Bank Size _{it}	The natural logarithm of total assets;		
ROA _{it}	The return on assets ratio, which is equal to the net income after taxes divided by total assets;		
Leverage _{it}	Measured as a proportion of total debt relative to total equity;		

Empirical results and discussion

Descriptive statistics

Table 1 presents the descriptive statistics of all the variables included in our regression analysis. As can be seen from this table, the mean value of our main proxy for banks' financial stability (Z_score) is almost 2.6. This average is quite similar to that reported by Laeven and Levine (2009) for a sample of 270 banks across 48 different countries (i.e., 2.88). Nevertheless, our average, as expected, is substantially lower than the scores reported in the developed countries, which are, for instance, 19.74 for a sample of 212 large US bank

Table 1 Descriptive statistics

Variable	Obs	Mean	Min	Max	SD	Pro. Jarque–Bera
Z_score	280	2.599	0.844	5.910	1.150	0.000
CAR	280	0.166	0.085	0.286	0.044	0.001
Board Size	280	9.000	5.000	16.000	0.120	0.437
Board Independence	280	0.744	0.500	0.889	0.097	0.000
Board Meetings	280	6.000	4.000	8.000	0.050	0.000
CEO Duality	280	0.361	0.000	1.000	0.481	0.000
Board Education	280	0.821	0.000	1.000	0.384	0.000
Board Gender	280	0.126	0.000	0.500	0.131	0.000
Board Foreign	280	0.679	0.000	1.000	0.468	0.000
Admin_Ownership	280	0.157	0.000	1.000	0.365	0.000
Instit_Ownership	280	0.844	0.486	1.000	0.153	0.000
AC_Size	280	3.000	3.000	5.000	0.051	0.000
AC_Meetings	280	5.000	3.000	7.000	0.096	0.000
Bank Size	280	5.482	4.076	7.939	0.716	0.000
ROA	280	0.014	-0.008	0.033	0.008	0.246
Leverage	280	0.900	0.748	0.962	0.038	0.000
Competition	280	0.037	0.011	0.382	0.065	0.000
BIG4	280	0.754	0.000	1.000	0.432	0.000



holding companies (Pathan 2009) and 14.73 for a sample of commercial banks from the Chinese context (Dong et al. 2014).¹

In addition, Table 1 shows that the average size of the board of directors is 9 members and boards range between 5 and 16 members. This result is consistent with the principles of corporate governance that have been adopted in Egypt since 2011, which dictate that the number of members on the board should be at least 5. Table 1 also reports that the mean ratio of independent directors on the board is almost 74%, indicating that three-quarters of the board members could be classified as independent nonexecutive directors.

As a reflection of the mandate that “the board should meet at least once every 3 months,” Table 1 illustrates that, on average, Egyptian banks hold 6 meetings for their board of directors each year, while the minimum and maximum statistics for this governance mechanism are 4 and 8 meetings, respectively. Furthermore, Table 1 indicates that, on average, the CEO in 36% of the sampled banks takes in the role of chairman of the board, implying that almost two thirds of the Egyptian banks have a role for the CEO that is separate from being chairman of the board of directors. Again, these results reflect the general trend of Egyptian banks in recent years after they adopted the new principles of corporate governance.

The mean value of board education is 82%, which indicates that the majority of boards comprise at least one director who holds a postgraduate degree (such as Master, MBA, DBA, or Ph.D.) in any of the business disciplines. In addition, most of the sampled banks have few female directors on their boards, as reflected by the low mean of 12.6%. It is evident in Table 1 that the proportion of women on boards ranged between 0 and 50%. Moreover, almost 68% of the sampled banks had one foreign director or more on their boards.

As regards the ownership structure, Table 1 demonstrates that Egypt features a low ownership of shares by the banks' directors since the mean value of administrative ownership is only 16%. More interestingly, it is noted that the mean ratio of the institutional ownership is 84%, which is clear evidence of the great reliance of Egyptian banks on institutional investors in setting up their ownership structure.

The descriptive statistics in Table 1 show that the average size of the audit committee is almost three members and the average number of committee meetings is five per year. Finally, the results indicate that the average bank size is 5.48

(measured by the natural logarithm of total assets) and the average ratio of leverage (measured by total debts over total equity) is 90%, which implies that most Egyptian banks are financially stable. Table 1 also shows that about 75% of the sampled banks are audited by one of the “big 4” audit firms. Furthermore, the Pro. Jarque–Bera test demonstrates that the normal distribution assumption is rejected at the 1% level of significance for all variables, with the exception of the Board Size and ROA. To overcome this problem, the natural logarithms of all the dependent and independent continuous variables were computed before employing the regression model.

Correlation matrix

In regard to the Pearson correlation matrix, Table 2 illustrates that our proxies for banks' financial stability were significantly correlated with most of the governance variables. It was found, for example, that board size, board meetings, board gender, board foreign, and administrative ownership had significant positive correlations with our main proxy for banks' financial stability (Z_score) at one of the statistical levels of significance. Moreover, CEO duality and institutional ownership were found to be negatively correlated with the same proxy at the 1% and 5% levels of significance, respectively. Nevertheless, unexpected significant negative associations were also reported in Table 2 between our main proxy for banks' financial stability (Z_score) and board independence, board education, and audit committee meetings.²

Table 2 also reveals that, among the independent variables, a high and negative correlation existed between board independence and institutional ownership ($\beta = 46.8\%$). All the other correlations were either lower than 46.8% or insignificant. Hence, the documented results in Table 2 demonstrate that there was no multicollinearity problem among the independent variables of this paper since the correlation estimates between all the variables were less than 80% (Field 2005, p. 224). In the meantime, the variance inflation factor (VIF) was also checked for the employed regression model to make sure that the problem of multicollinearity was not present. The unreported results illustrate that all the VIFs of the independent variables were less than 10, indicating that the results obtained from the multivariate analysis were not affected by the well-known problem of multicollinearity (Gujarati 1995; Field 2005).

¹ Table 1 also displays that the average CAR (i.e., our alternative proxy for banks' financial stability in the robustness check) is 16.6%. This average is above the minimum ratio of capital to risk-weighted assets that is required by Basel II (8%) and Basel III (10.5%). On the basis of this finding, one might argue that Egyptian banks are less likely to become insolvent if unexpected losses occur.

² Table 2 shows that the coefficient estimate between our two proxies for banks' financial stability (i.e., -0.009) is not statistically correlated. This insignificant correlation indicates that these two proxies have completely different approaches to measuring the financial soundness of our sampled banks.



Table 2 Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Z_score	1.000									
(2) CAR	-0.009	1.000								
(3) Board Size	0.028*	-0.154***	1.000							
(4) Board Independence	-0.004***	-0.058**	0.449***	1.000						
(5) Board Meetings	0.048***	-0.009*	-0.094	-0.262***	1.000					
(6) CEO Duality	-0.185***	0.039***	0.097	0.087	0.085	1.000				
(7) Board Education	-0.132**	-0.067**	0.067	0.289***	-0.029	0.059	1.000			
(8) Board Gender	0.058**	0.133**	-0.057	-0.151**	0.095	0.060	-0.462***	1.000		
(9) Board Foreign	0.103*	0.024***	0.012	0.168***	0.108*	-0.279***	0.278***	-0.330***	1.000	
(10) Admin_Ownership	0.178***	0.136**	0.399***	0.076	0.062	-0.018	-0.234***	0.125**	-0.018	1.000
(11) Instit_Ownership	-0.142**	-0.017*	-0.448***	-0.468***	0.076	0.036	-0.234***	0.245***	-0.059	-0.250***
(12) AC_Size	-0.049	0.035*	0.025	0.197***	0.002	0.290***	-0.042	0.134**	0.037	-0.109*
(13) AC_Meetings	-0.251***	-0.347***	0.165***	-0.029	0.011	0.387***	0.053	-0.308***	0.008	-0.223***
(14) Bank Size	0.001*	-0.026*	0.087	-0.007	-0.084	0.239***	0.037	-0.066	-0.263***	-0.059
(15) ROA	0.340***	0.014**	0.071	0.112*	-0.090	0.040	0.018	-0.006	0.251***	0.231***
(16) Leverage	-0.233***	-0.079**	-0.075	-0.109*	0.172***	-0.024	-0.105*	-0.037	-0.221***	-0.078
(17) Competition	0.040	-0.027	-0.120**	-0.310***	0.061	-0.126**	-0.359***	0.204***	-0.311***	-0.117*
(18) BIG4	-0.147**	0.027***	0.151**	0.142**	0.157***	-0.036	-0.094	-0.010	0.458***	0.133**
	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)		
(11) Instit_Ownership	1.000									
(12) AC_Size	0.098	1.000								
(13) AC_Meetings	0.179***	0.299***	1.000							
(14) Bank Size	0.191***	0.005	0.310***	1.000						
(15) ROA	0.039	0.225***	-0.119**	-0.069	1.000					
(16) Leverage	-0.037	0.057	-0.079	-0.370***	-0.136**	1.000				
(17) Competition	0.250***	0.033	-0.107*	0.010	-0.017	-0.017	1.000			
(18) BIG4	0.011	0.136**	0.148**	-0.028	-0.069	-0.030	0.305***	1.000		
									-0.080	1.000

This table presents the correlation coefficients between all the included variables. Definitions of variables are given in "Appendix B". *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively

Table 3 Multiple (GMM) regression analysis results

Variables	Panel A—Full sample		Panel B—Listed banks		Panel C—Unlisted banks	
	Dependent variable: Z_score		Dependent variable: Z_score		Dependent variable: Z_score	
	<i>b</i> (unstandardized coefficients)	Sig	<i>b</i> (unstandardized coefficients)	Sig	<i>b</i> (unstandardized coefficients)	Sig
Z_score(−1)	0.713	0.000***	0.609	0.000***	0.408	0.000***
Board Size	1.254	0.008***	0.341	0.004***	0.145	0.846
Board Independence	− 1.129	0.021**	− 0.984	0.049**	− 0.390	0.005***
Board Meetings	0.805	0.042**	0.394	0.078*	0.227	0.006***
CEO Duality	0.050	0.063*	0.178	0.050**	− 0.586	0.060*
Board Education	− 0.263	0.045**	1.044	0.161	− 0.899	0.106
Board Gender	0.188	0.007***	0.229	0.132	0.030	0.003***
Board Foreign	0.076	0.600	1.138	0.055*	− 0.405	0.308
Admin_Ownership	− 0.164	0.062*	− 0.853	0.003***	− 0.987	0.072*
Instit_Ownership	− 0.239	0.582	0.086	0.944	− 0.892	0.402
AC_Size	0.913	0.244	− 0.173	0.938	0.447	0.809
AC_Meetings	− 1.230	0.012**	− 3.310	0.092*	− 2.414	0.096*
Bank Size	− 0.051	0.213	0.423	0.111	0.180	0.021**
ROA	1.788	0.007***	0.934	0.525	0.659	0.041**
Leverage	− 4.004	0.001***	− 0.986	0.006***	− 0.894	0.031**
Competition	− 0.299	0.377	− 0.415	0.229	− 0.783	0.009***
BIG4	− 0.192	0.034**	− 0.907	0.045**	− 0.189	0.332
Constant	5.181	0.010***	0.472	0.116	0.358	0.010***
Year-fixed effects	Yes		Yes		Yes	
R ²	73.1%		61.5%		46.7%	
Adjusted R ²	70.1%		53.8%		35.5%	
Durbin Watson	1.970		1.873		1.996	
Wald Chi2	263***		377***		104***	
Observations	252		108		144	

*, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively

Multivariate analysis

Table 3 panel A shows the results of the regression model using the full sample (i.e., 252 observations), while panels B and C of Table 3 are devoted to reporting the statistics of the same model using two sub-samples, which represent the observations of listed and unlisted banks, respectively, on the Egyptian stock exchange. The results in Table 3 demonstrate that the employed regression models were statistically significant at the 1% level of significance, as indicated by the probability of Wald Chi2 statistic, and the adjusted R² ranged between 35 and 70%. But, before interpreting the results that we obtained, it was important to make sure that the assumption of independent errors (autocorrelation) had been met. Therefore, the Durbin–Watson statistic was calculated for the regression analyses and its value was consistently found to be close to 2, implying that the assumption was almost satisfied (Field 2005). Moreover, Breusch–Pagan

tests were performed in order to detect the presence of the heteroscedasticity problem, and the results showed clear evidence that this problem did not exist in the GMM regression models that we employed.

Turning to the empirical hypotheses, H₁ had proposed that board size has a positive association with the financial stability of Egyptian banks. Driven by the effect of listed banks, the results of Table 3 indicate that board size is, in general, positively associated with the level of banks' financial stability, and this association is statistically significant at the 1% level of significance. This finding is in harmony with a number of previous studies, which have found that a larger board is more likely than a small one to play a critical role in monitoring the performance of management and in making rational strategic decisions (e.g., Adams and Mehran 2012; Barakat and Hussainey 2013; Sarkar and Sarkar 2018; Whiting and Birch 2016). Consequently, H₁ is accepted in the present paper.



Unexpectedly, the results of Table 3 show that there is a consistent negative association between the extent of board independence and our proxy for banks' financial stability. This surprising result stands in sharp contrast to the agency theory, which expects that the inclusion of independent directors will enhance the effectiveness of the board in making credible judgments on a firm's financial decisions (Fama and Jensen 1983). Nevertheless, these unexpected findings may be justified in view of the contention that the presence of independent directors on the board may reduce the CEO's willingness to share information with board members, causing a high level of uncertainty in decision-making, which ultimately leads to a reduction in the bank's financial stability (Berger et al. 2016; Li and Song 2013). In line with this view, Table 3 also illustrates that there is an unexpected positive association between CEO duality and the level of financial stability, driven mainly by the effect of listed banks, indicating that CEO duality is not necessarily associated with weak governance and performance (Brickley et al. 1997). In conclusion, the results of Table 3 do not support the expectations stated in our H_2 and H_4 .

Consistent with the previous literature, the empirical results in Table 3 reveal that there is a significant positive association between the annual number of board meetings and banks' financial stability. This positive association suggests that increasing the frequency of board meetings will improve board members' effectiveness in monitoring the performance of their banks (De Andres and Vallelado 2008). Accordingly, our third hypothesis, H_3 , is accepted in the present paper. However, it can also be seen from Table 3 that the mechanism of audit committee meetings has a negative influence on the financial stability of Egyptian banks; a result that leads to the rejection of the alternative form of H_{11} . This unexpected finding contradicts the conjecture of some earlier studies (e.g., Abbott et al. 2000; Beasley et al. 2000), but could be explained on the basis of the two following arguments: (1) It has previously been highlighted by Kamel and Elbanna (2012, p. 347) that the formation of audit committees in Egypt is largely ceremonial, and the interviewees for the latter study expressed their concerns over the level of awareness of audit committee members with regard to their proposed role within the governance system; and (2) Audit committees are mostly composed of independent directors who primarily depend on the information provided to them by management in performing their monitoring functions. Hence, it is expected that these independent directors will always have less information advantage than the internal directors (Adams and Ferreira 2007), and this possibly led us earlier to find a negative association between the proportion of independent directors on the board and the financial stability of Egyptian banks.

With regard to the impact of board gender on banks' financial stability, Table 3 provides empirical evidence,

driven only by the observations of unlisted banks, that this governance mechanism is significantly positively associated with the extent of financial stability in the Egyptian banking sector. This finding is consistent with those of Abbott et al. (2012) and De Cabo et al. (2012), who reported that women on corporate boards are more inclined to take conservative and risk averse financial decisions, which subsequently resulted in better financial performance. Therefore, H_6 is accepted in the present paper. As for board education, our H_5 predicted a positive association between board education and banks' financial stability. However, the results in Table 3 show, in general, a negative and significant association between these two variables, leading to the rejection of H_5 . The latter results are inconsistent with those of Berger et al. (2014), who demonstrated that the level of board education is significantly negatively associated with bank risk taking; a finding that can lead to higher financial stability. In addition, we found a negative and significant association between the ownership of shares by directors and the financial stability of Egyptian banks, implying that banks with high managerial ownership are more likely to experience some deterioration in their financial stability. Hence, the results of Table 3 support our predictions as stated in H_8 .

Finally, the results of Table 3 display no significant indications that board foreign, institutional ownership and audit committee size have any influence on the financial stability of Egyptian banks. Therefore, the alternative forms of H_7 , H_9 and H_{10} are rejected. In terms of the control variables, Table 3 shows that there is a significant negative impact of leverage and BIG4 on banks' financial stability, while the association between profitability (proxied by the ROA ratio) and banks' financial stability is significantly positive.

Robustness check

Table 4 presents the results of our employed regression model based on an alternative measure of banks' financial stability, namely, the capital adequacy ratio (CAR). This ratio is computed by dividing a bank's capital over its risk-weighted assets. Hence, the higher the value of CAR, the lower the risk of insolvency in the bank in question (Berger and Mester 1997; Dong et al. 2014; Mester 1997).

Generally, our results remain qualitatively unchanged after the use of this alternative proxy for banks' financial stability, with only three exceptions: (1) the insignificant positive association between board foreign and banks' financial stability (under the proxy of Z_score) turns out to be significantly negative (under the CAR); (2) the insignificant coefficient on institutional ownership has changed from a negative sign (under the proxy of Z_score) to be positive (under the CAR); and (3) the significant negative association between BIG4 and banks' financial stability (under the proxy of Z_score) turns out to be significantly positive



Table 4 Multiple (GMM) regression analysis results, using alternative measure

Variables	Panel A—Full sample		Panel B—Listed banks		Panel C—Unlisted banks	
	Dependent variable:CAR		Dependent variable:CAR		Dependent variable:CAR	
	<i>b</i> (unstandard- ized coeffi- cients)	Sig	<i>b</i> (unstandard- ized coeffi- cients)	Sig	<i>b</i> (unstandard- ized coeffi- cients)	Sig
CAR(−1)	0.720	0.000***	0.323	0.005***	0.518	0.000***
Board Size	0.012	0.004***	0.075	0.040**	0.019	0.685
Board Independence	− 0.046	0.009***	− 0.139	0.003***	− 0.038	0.036**
Board Meetings	0.021	0.035**	− 0.089	0.203	0.162	0.015**
CEO Duality	0.004	0.003***	0.035	0.000***	− 0.001	0.087*
Board Education	− 0.008	0.029**	0.018	0.358	− 0.012	0.417
Board Gender	0.038	0.027**	0.021	0.699	0.070	0.026**
Board Foreign	− 0.011	0.004***	0.030	0.154	− 0.045	0.001***
Admin_Ownership	− 0.009	0.020**	− 0.012	0.296	0.022	0.332
Instit_Ownership	0.003	0.748	0.037	0.213	0.007	0.876
AC_Size	0.079	0.116	− 0.074	0.332	0.126	0.257
AC_Meetings	− 0.093	0.012**	− 0.166	0.035**	− 0.116	0.018**
Bank Size	− 0.001	0.472	0.002	0.837	− 0.006	0.141
ROA	0.345	0.021**	− 0.253	0.626	0.748	0.001***
Leverage	− 0.087	0.064*	− 0.268	0.099*	− 0.213	0.200
Competition	− 0.035	0.110	− 0.244	0.149	− 0.094	0.027**
BIG4	0.007	0.039**	− 0.010	0.653	0.025	0.004***
Constant	0.166	0.003***	0.524	0.001***	0.130	0.040**
Year-fixed effects	Yes		Yes		Yes	
<i>R</i> ²	71.9%		51.4%		60.5%	
Adjusted <i>R</i> ²	68.8%		36.6%		52.1%	
Durbin Watson	2.107		2.023		2.003	
Wald Chi2	274***		138***		88***	
Observations	252		108		144	

*, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively

(under the CAR). These three differences can be attributed to the dissimilarity in the composition of the proxies, given that *Z_score* is computed on the basis of several income statement and balance sheet items, whilst CAR focuses only on items extracted from the balance sheet.

Conclusions

The aim of this paper was to investigate the impact of certain internal governance mechanisms on the financial stability of Egyptian banks during the period 2010–2019. To this end, a GMM regression analysis was employed using 252 firm-year observations.

The results, in general, illustrated that the level of banks' financial stability is positively associated with board size, board meetings, and the percentage of female directors on the board. In contrast, the results showed that board education and the ownership of shares by directors are negatively

associated with banks' financial stability. More remarkably, our results also demonstrated that higher financial stability is significantly associated with lower board independence, the presence of CEO duality, and fewer audit committee meetings. These striking results can be attributed to the argument that the presence of independent directors on the board may reduce the CEO's willingness to share information with board members, causing a high level of uncertainty in the decision-making process, which ultimately leads to a reduction in the bank's financial stability. Additionally, no significant indications were found to support the view that the following mechanisms are important drivers of banks' financial stability in Egypt: the presence of foreign directors on the board, the level of institutional ownership and the size of the audit committee.

The present paper contributes to the extant literature on banks' governance in two specific ways. First, it provides the first evidence of the way in which internal governance mechanisms affect the levels of financial stability in



Egyptian banks, using a hand-collected dataset that contains details about several aspects of their boards of directors, ownership structures, and audit committees. Second, by considering the banking sector in this paper, it complements the prior studies in the MENA countries that have mostly relied on nonfinancial institutions in their exploration of the determinants and economic consequences of adopting good corporate governance practices (e.g., Al-Bassam et al. 2018; Sarhan et al. 2019). Consequently, our results are expected to provide useful insights for these academic researchers, practitioners and regulators who are interested in strengthening the governance mechanisms in the banking sector in order to maintain high levels of financial stability and prevent any future failure in this vital sector of the economy.

Given that this paper is the first to examine the association between internal governance mechanisms and the financial stability of banks operating in Egypt, it is believed that a fruitful extension of this paper would be the replication of the same investigation in other emerging economies in the MENA region or in the GCC countries, to rule out the alternative explanations proposed for the findings that we obtained. In addition, since the focus of this paper is limited to only a specific selection of the internal governance mechanisms due to the availability of their data in the Egyptian context, future research is recommended to consider other internal mechanisms, such as the expertise of the members of boards of directors and audit committees, and the percentage of state ownership. Moreover, further studies might also benefit from using different measures of banks' financial stability such as the volatility of banks' profits, the ratio of nonperforming loans to total loans (NPL), and the ratio of losses from loans to total loans.

Appendix A

See Table 5.

Table 5 List of banks included in the final sample

No	Bank name
1	Egyptian Gulf Bank
2	Commercial International Bank
3	QNB Alahli
4	Al Baraka Bank
5	Faisal Islamic Bank of Egypt
6	Export Development Bank of Egypt
7	Abu Dhabi Islamic Bank
8	Suez Canal Bank
9	Housing & Development Bank
10	Credit Agricole Egypt
11	Union National Bank
12	National Bank of Egypt
13	Banque Misr
14	Arab African International Bank
15	Arab International Bank
16	Bank ABC
17	HSBC Bank
18	Emirates NBD
19	The United Bank of Egypt
20	BLOM Bank Egypt
21	Al Ahli Bank of Kuwait
22	Alex Bank
23	National Bank of Kuwait
24	Ahli United Bank
25	SAIB Bank
26	Barclays Bank
27	Bank Audi
28	Industrial Development and Workers Bank of Egypt

Appendix B

See Table 6.



Table 6 Variable definitions/measurements

Variable	Definition/measurement
<i>Dependent variable</i>	
Z_score	Our main proxy for the level of banks' financial stability; it is computed as follows: $Z_score_{it} = \frac{ROA_{it} + TE_{it}/TA_{it}}{\sigma ROA_{it}}$ where $\overline{ROA_{it}}$ is the average return on assets in years t and $t - 1$. Specifically, $\overline{ROA_{it}} = \frac{(ROA_{it} + ROA_{it-1})}{2}$; $\overline{TE_{it}/TA_{it}}$ is the average of total equity to total assets ratio in years t and $t - 1$. Specifically, $\overline{TE_{it}/TA_{it}} = \frac{\frac{TE_{it}}{TA_{it}} + \frac{TE_{it-1}}{TA_{it-1}}}{2}$; and σROA_{it} is the standard deviation of the return on assets
Capital adequacy ratio (CAR)	Risk-weighted capital adequacy ratio
<i>Explanatory variables</i>	
Board Size	The log of the total number of directors on the board
Board Independence	The proportion of independent nonexecutive directors on the board
Board Meetings	The log of the number of board meetings held in a year
CEO Duality	A dummy variable that was given the value of 1 if the CEO is also chairman of the board of directors and 0 otherwise
Board Education	A dummy variable that was given the value of 1 when there is at least one board member holding a postgraduate degree (such as Master, MBA, DBA, or PhD) in any of the business disciplines and 0 otherwise
Board Gender	The proportion of female directors on the board
Board Foreign	A dummy variable that was given the value of 1 when there is at least one foreign director on the board and 0 otherwise
Admin_Ownership	A dummy variable that was given the value of 1 if the ownership of shares by directors is at least 5% and 0 otherwise
Instit_Ownership	The number of shares held by the institutional investors divided by the total number of outstanding shares of the bank
AC_Size	The log of the total number of audit committee members
AC_Meetings	The log of the number of audit committee meetings held in a year
<i>Control variables</i>	
Bank Size	The natural logarithm of the total assets
ROA	The return on assets ratio, which is equal to the net income after tax divided by total assets
Leverage	The proportion of total debt relative to total equity
Competition	The market share of deposits measured as a proportion of the bank's total deposits relative to the total deposits in the entire banking sector
BIG4	A dummy variable that was given the value of 1 if the external auditor is one of the "big 4" audit firms and 0 otherwise

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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