BEYOND GOVERNANCE NORMS: HOW BOARD FINANCIAL EXPERTISE RESHAPES RISK DISCLOSURE IN EMERGING MARKETS

Shehabaddin Abdullah Abdulwadod Al-Dubai *, Yahya Ali Al-Matari **

* *Corresponding author,* Department of Accounting, School of Business, King Faisal University, Al-Ahsa, Saudi Arabia
Contact details: Department of Accounting, School of Business, King Faisal University, P. O. Box 400, 31982 Al-Ahsa, Saudi Arabia
** Department of Accounting, School of Business, King Faisal University, Al-Ahsa, Saudi Arabia

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Abstract

This study explores the relationship between board characteristics, specifically independence, size, and meeting frequency, and financial risk disclosure (FRD) in Saudi financial firms, focusing on the moderating role of board financial expertise. By addressing a gap in the existing literature, this study examines how financial expertise among board members influences the relationship between these governance attributes and FRD. The research was undertaken using content analysis and Hausman-Taylor estimations to mitigate endogeneity issues and ensure robust results. Based on data from 39 Saudi financial firms (117 firm-year observations) spanning 2019 to 2021, board financial expertise plays a crucial role in influencing FRD. Specifically, it highlighted that board financial expertise significantly enhances the relationship between FRD and the frequency of board meetings, indicating a positive moderating effect on FRD. These findings underscore the critical role of board members with financial expertise in enhancing the disclosure of financial risks. They suggest that optimizing board structure by incorporating financial expertise can be a strategic approach to improving FRD.

Keywords: Corporate Governance, Board of Directors, Board Financial Expertise, Board Independence, Board Size, Board Meeting Frequency, Financial Risk Disclosure, Financial Firms, Saudi Arabia

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1. INTRODUCTION

In the wake of the global financial crisis and corporate scandals, large institutions have become more exposed to various risks that threaten their performance and stability (Brown et al., 2011). These developments have diminished the relevance of traditional reports, prompting a growing demand

for more detailed and meaningful information (Gonidakis et al., 2020). Consequently, stakeholders are pushing for greater transparency, better quality disclosures, and a reduction in information asymmetries to manage risks more effectively and reduce uncertainty in decision making (Elshandidy & Neri, 2015; Cordazzo et al., 2017). In addressing these concerns, effective corporate governance is crucial for ensuring transparency and accountability in financial reporting, particularly regarding risk disclosure (Beasley et al., 2005; Elshandidy & Neri, 2015). The board of directors, as the primary oversight body, plays a significant role in shaping a company's risk management and disclosure practices (Carcello & Neal, 2000). Among the various board attributes, its composition, including the expertise of its members, has been recognized as a critical factor influencing risk disclosure practices (Beasley et al., 2005; Elshandidy & Neri, 2015).

Although there is a growing interest in the impact of board of directors characteristics on risk disclosure, research remains scarce, particularly within the financial sectors of emerging markets such as Saudi Arabia (Al-Maghzom et al., 2016; Alshirah et al., 2020). Bufarwa et al. (2020) highlighted the need for further research to extend the focus to both developing and emerging economies and consider additional variables, such as corporate board characteristics, in relation to firms' financial risk disclosure (FRD). In alignment with this, Elamer et al. (2019) recommended that future research should investigate the effects of various corporate governance mechanisms, such as the presence of independent non-executive board members, audit committees, and risk committees, on the quality of risk disclosure. Moreover, Elamer et al. (2021) suggested that the scope of governance variables should be broadened to include factors like the frequency of board meetings. In response to these calls, this study aims to fill the existing gap in the literature by examining the effect of board characteristics, including independence, size, and meeting frequency, on FRD in Saudi financial firms. Furthermore, this study explores the moderating influence of board financial expertise on the relationship between board characteristics and FRD. This aspect represents a significant contribution, as, to the best of our knowledge, the specific role of financial expertise on the board in influencing risk disclosure practices has not yet been thoroughly investigated in the existing literature.

Among the various attributes of the board, its composition, including the expertise of its members, has been recognized as a critical factor influencing risk disclosure practices (Adusei, 2020; Beasley et al., 2005; Elshandidy & Neri, 2015; Pham et al., 2025; Shekhar & Chadda, 2023; Yakubu et al., 2023). Board expertise, particularly in finance, risk management, and industry-specific knowledge, equips board members with the skills to address complex risk scenarios. Research shows that boards with specialized expertise are better at overseeing and enhancing risk disclosures. For instance, Beasley et al. (2005) find that financial expertise improves risk reporting quality through better oversight and decision-making. Similarly, Elshandidy and Neri (2015) found that board expertise positively impacts the extent of risk disclosure by enabling more accurate and comprehensive risk assessment. In addition to expertise, attributes such as board independence, size, and meeting frequency play crucial roles in risk disclosure. Larger boards may offer diverse perspectives but face coordination challenges (Yermack, 1996), whereas independent directors enhance transparency (Klein, 2002). The frequency of board meetings indicates active engagement in risk management, with regular meetings fostering thorough discussions and timely decision-making (Vafeas, 1999; Xie et al., 2003; Viljoen et al., 2016).

Risk disclosure in Saudi Arabia has significantly improved in recent years owing to regulatory reforms and the push for increased transparency. The Capital Market Authority (CMA, 2017) has enhanced disclosure requirements, mandating detailed reporting of risk management policies and exposures for listed companies. This shift towards more comprehensive risk disclosure aligns with the adoption of International Financial Reporting Standards (IFRS), which has furthered transparency and comparability with global practices (PricewaterhouseCoopers [PwC], 2019). Despite these advancements, challenges persist, including issues with the consistency and depth of risk information provided, which are often influenced by cultural and regulatory factors. In addition, the CMA's regulations emphasize the importance of board independence, the composition of directors, and their responsibilities in ensuring effective risk management and financial reporting. Boards are required to include independent directors to provide objective oversight and improve governance practices (Ibrahim et al., 2019).

This study employs a multi-theoretical framework incorporating critical theories such as agency theory, stewardship theory, resource dependence theory, and information asymmetry theory. Agency theory posits that independent directors and those with relevant expertise can mitigate conflicts of interest and enhance the accuracy and comprehensiveness of risk disclosures, while board meetings facilitate timely discussions on risk issues (Jensen & Meckling, 1976; Fama & Jensen, 1983). Contrary to agency theory, stewardship theory posits that managers act as stewards of a company's assets and interests. Stewardship theory suggests that boards with appropriate expertise and size support effective stewardship, leading to improved risk management and disclosures (Donaldson & Davis, 1991). Resource dependence theory highlights how boards provide crucial resources and expertise, enhancing risk disclosure practices, with size affecting the availability of these resources (Pfeffer & Salancik, 1978). Information asymmetry theory further supports this by emphasizing that boards with specialized knowledge reduce information imbalances, leading to more detailed risk disclosure (Spence, 1976). These theories collectively illustrate how various board attributes influence risk reporting quality and transparency. These theories collectively underscore the importance of board attributes in shaping effective risk disclosure practices, illustrating how board expertise, independence, size, and meeting frequency contribute to enhanced transparency and accountability in the banking sector.

The existing body of research extensively discusses the effect of various board characteristics,

including board independence, size, and meeting frequency, on FRD. However, the potential moderating impact of board financial expertise has received limited attention. This study aims to address this gap by examining how board financial expertise moderates the association between board characteristics and FRD. Data from 117 firm-year observations of Saudi financial firms listed on Tadawul between 2019 and 2021 were analyzed using content analysis and Hausman-Taylor estimations to mitigate endogeneity issues and ensure robust results. The study's findings indicate that while the individual board characteristics examined do not significantly affect FRD, board financial expertise emerges as a critical factor. Specifically, this study uncovers the positive moderating influence of board financial expertise on the link between FRD and board meeting frequency.

The results of this study underscore the importance of having board members with financial expertise in financial firms to facilitate the transparent disclosure of financial risks, highlighting the need for an optimized board structure to advance this goal. One proposed strategy involves increasing the representation of board members with financial expertise, which could enhance FRD through proactive measures, such as regular meetings. Despite the insights gleaned from this study, there are limitations that should be considered in future research. It is recommended that forthcoming studies delve into additional board characteristics and undertake international analyses spanning non-financial sectors to deepen the understanding of FRD practices. Furthermore, future researchers should evaluate the quality of risk disclosure to offer a more holistic view of this subject. The implications of this study are significant for both policymakers and firm owners, suggesting that having board members with financial expertise in financial firms can elevate the quality of FRD by complementing other internal governance mechanisms tied to the board of directors.

The remainder of this paper is structured as follows. Section 2 provides a comprehensive literature review and formulates the hypotheses. Section 3 describes the research materials and methodology in detail. Section 4 reports the findings and provides an in-depth discussion. Finally, Section 5 concludes with a summary of the main findings, discusses the implications, addresses the study's limitations, and suggests directions for future research.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Board financial expertise and financial risk disclosure

Board members with specialized expertise, particularly in areas such as finance, risk management, and industry-specific knowledge, are better positioned to understand and assess the complex risks that companies may face (Al-Matari et al., 2012). This depth of understanding enables them to advocate for more comprehensive and transparent risk-disclosure practices, ensuring that stakeholders have a clear understanding of the potential risks facing the organization (Beasley et al., 2005). Board expertise directly affects the quality and extent of risk disclosure. Members with relevant knowledge are more likely to ask probing questions, challenge management's risk assessments, and demand detailed and accurate reporting (Mangena & Pike, 2005). Their expertise ensures that directors not only meet regulatory requirements but also provide meaningful insights into the risks encountered by the company. This level of scrutiny and understanding leads to more accurate and thorough risk reporting, which is essential for investor confidence and informed decision-making (Khlif & Samaha, 2016). Furthermore, the presence of experts on the board can foster a culture of transparency and accountability within the organization (Naheed et al., 2021). These board members often emphasize the importance of risk management and disclosure in board discussions, encouraging the company to adopt best practices in these areas. Companies with boards that have a high level of expertise tend to exhibit higher levels of risk disclosure, which can lead to better risk management and potentially lower the cost of capital by reducing information asymmetry between the company and its investors (Ntim et al., 2013).

Agency theory posits that conflicts of interest between management and shareholders arise because of information asymmetry. According to Fama and Jensen (1983) and Jensen and Meckling (1976), boards with expertise in finance and risk management are better equipped to monitor management's actions and reduce this asymmetry by ensuring more thorough and transparent risk disclosures, thereby protecting shareholders' interests. Resource dependence theory highlights the importance of external resources, with board expertise acting as a crucial asset that enhances the board's ability to monitor and control financial reporting processes, thereby improving transparency and disclosure. Pfeffer and Salancik (1978) and Hillman and Dalziel (2003) argued that board members with specialized knowledge provide valuable insights that improve the quality of risk disclosure and help the company navigate complex risk environments. In contrast, stewardship theory views board members as stewards of the company who, driven by their expertise, prioritize transparent and comprehensive risk disclosure as part of their duty to safeguard and enhance shareholder value (Donaldson & Davis, 1991).

Several studies have revealed a positive relationship between board expertise and risk disclosures. For example, Mangena and Pike (2005) found that companies with board members with financial expertise tend to disclose more detailed risk information. Similarly, Elzahar and Hussainey (2012) observed that boards with higher financial and industry-specific expertise are associated with more comprehensive risk disclosure. Samaha et al. (2012) also noted that board members with accounting or financial expertise contribute to higher levels of voluntary risk disclosure. Additionally, Mohd Ghazali and Weetman (2006) found that expertise in finance and risk management enhances the extent of risk reporting in Malaysian firms. However, some studies have explored the negative relationship between board expertise and risk disclosure. For instance, Allini

et al. (2016) examined the risk disclosures in Italian listed companies and found that greater board expertise led to less disclosure. However, Allegrini and Greco (2013) found no significant link between board expertise and risk disclosure.

Based on these arguments and relevant theories, this study proposes the following hypothesis:

H1: Boards with higher levels of financial expertise are positively associated with increased financial risk disclosure.

2.2. Board independence and financial risk disclosure

Board independence plays a critical role in corporate governance by enhancing the objectivity and effectiveness of oversight (Jensen & Meckling, 1976). Independent directors, who are not part of the company's executive management, bring an unbiased perspective to board decisions, particularly in areas such as financial reporting and risk management (Fama & Jensen, 1983). Many studies support the notion that independent boards are more likely to promote transparency and accountability, leading to increased risk disclosure. (Alkurdi et al., 2019; Elshandidy & Neri, 2015; Eng & Mak, 2003; Haj-Salem et al., 2020; Moumen et al., 2016; Nkuutu et al., 2021). However, Cheng and Courtenay (2006) and Lim et al. (2007) observed that highly independent boards may disclose less risk information. Conversely, Allini et al. (2016), Al-Maghzom et al. (2016), and Barako et al. (2006) found no significant association between board independence and risk disclosure.

The moderating effect of board financial expertise has not been fully investigated in prior studies, particularly the association between board independence and FRD. However, research in the broader context of corporate governance suggests that financial expertise on the board can affect the extent to which board independence influences FRD. For example, financial expertise is suggested to enhance board oversight and influence the effect of board independence on financial reporting (Carcello et al., 2006). Supporting this, Obeitoh et al. (2023) investigated the moderating role of board expertise in the association between board independence and firm performance. Their results revealed that the interaction of board expertise as a moderator with board independence enhances firm performance. Although these studies do not explicitly address the moderating impact of financial expertise on the association between board independence and FRD, they suggest that such expertise can enhance the effectiveness of independent directors in ensuring high-quality financial reporting. Financial expertise likely strengthens the board's ability to monitor and control financial reporting processes, thereby improving transparency and reducing information asymmetry.

Considering these arguments and consistent with related theories, this study proposes the following hypotheses:

H2: Boards with a higher proportion of independent directors have greater financial risk disclosure.

H3: Board financial expertise moderates the relationship between board independence and the financial risk disclosure.

2.3. Board size and financial risk disclosure

The size of a board, which indicates the total number of directors, has a substantial influence on both corporate governance and disclosure practices (Jensen & Meckling, 1976). Larger boards can bring a greater diversity of expertise and viewpoints, potentially enhancing risk management and disclosure through more rigorous oversight and discussions (Viola et al., 2023). However, Al-Maghzom et al. (2016) noted that excessively large boards may encounter coordination challenges and inefficiencies that potentially diminish the effectiveness of risk disclosure. Thus, while larger boards might improve transparency by leveraging diverse skills, they can also introduce challenges that impact risk disclosure quality.

Previous studies have highlighted the varying effects of board size on risk disclosure. Al-Dubai and Alotaibi (2023), Moumen et al. (2016), and Viola et al. (2023) supported this positive association, showing that larger boards are related to more comprehensive risk disclosures due to improved oversight and diverse perspectives. Ntim et al. (2013) also revealed that larger boards in South Africa positively influence risk disclosure by enhancing their ability to address complex issues. Conversely, Alkurdi et al. (2019) and Al-Maghzom et al. (2016) found a negative relationship, where larger boards led to less detailed risk disclosures due to coordination issues and strategic withholding of information. Additionally, Alshirah et al. (2020) and Bufarwa et al. (2020) found no significant impact of board size on risk disclosure, suggesting that other factors might be more influential in determining disclosure practices.

While previous research has not specifically addressed how board members' expertise moderates the relationship between board size and disclosure practices, some studies have examined related moderating effects in corporate governance. For example, Obeitoh et al. (2023) investigated how board expertise influences the relationship between board size and firm performance, showing that expertise enhances performance alongside board size. Similarly, Obeitoh et al. (2024) studied the effect of audit committee expertise on the link between board size and earnings quality, finding that audit committee expertise significantly moderates this relationship.

Given the arguments presented and consistent with related theories, this study proposes the following hypotheses:

H4: Boards with a larger number of directors have higher levels of financial risk disclosure.

H5: Board financial expertise moderates the association between board size and the financial risk disclosure.

2.4. Board meeting frequency and financial risk disclosure

Board meeting frequency is a critical component of corporate governance that influences the board's effectiveness in overseeing management and addressing risk (Vafeas, 1999). Conger et al. (1998) argue that boards that meet more frequently are better positioned to actively oversee a company's management. This perspective is reinforced by

Barros et al. (2013), who found that frequent meetings increase the pressure on management to provide more detailed information. Likewise, Brick and Chidambaran (2010) highlighted the importance of regular board meetings in maintaining a consistent and reliable flow of information between managers and shareholders. Furthermore, regular meetings improve the board's ability to effectively carry out its responsibilities and oversee financial reporting processes (Alshirah et al., 2020).

Prior studies have explored the relationship between the frequency of board meetings and various aspects of FRD, yielding mixed results. For instance, Aliyu (2019) demonstrated a significant positive association between the frequency of board meetings and the extent of environmental corporate disclosure. This finding suggests that when boards meet more frequently, they are likely to engage more thoroughly with environmental issues, leading to comprehensive disclosures. Similarly, Majumder et al. (2017) supported this perspective by arguing that regular board meetings contribute to improved corporate social disclosures. According to their research, frequent meetings provide board members with more opportunities to discuss and address social responsibility issues, ultimately resulting in better transparency and reporting. In addition, Nkuutu et al. (2021) showed that the frequency of board meetings has a significant positive impact on compliance with risk disclosure. Conversely, Al-Dubai and Alotaibi (2023) and Alshirah et al. (2020) found no significant relationship, suggesting that meeting frequency does not influence risk disclosure practices.

Most existing studies, such as those by Al-Dubai and Alotaibi (2023), Allini et al. (2016), and Nkuutu et al. (2021), have primarily examined the direct relationship between board meeting frequency and risk disclosure. However, there is a notable gap in the research regarding the role of board financial expertise as a moderating factor in this context. This study aims to address this gap by investigating how board financial expertise moderates the relationship between board meetings and the FRD. While Obeitoh et al. (2023) explored the moderating role of board expertise on the relationship between board meetings and firm performance, they found no significant effect. Conversely, Obeitoh et al. (2024) demonstrated that audit committee expertise significantly moderates the relationship between board meetings and earnings quality.

Based on these arguments and relevant theories, this study proposes the following hypotheses:

H6: Boards that hold meetings more frequently have a higher level of financial risk disclosure.

H7: Board financial expertise moderates the relationship between board meeting frequency and financial risk disclosure.

3. RESEARCH METHODOLOGY

This study analyzes data from the audited financial and annual reports of 117 firms in the financial sector on Tadawul from 2019 to 2021. Drawing upon the methodologies adopted by previous studies (Al-Dubai & Abdelhalim, 2021; Dey et al., 2018), an index was developed comprising five elements: credit risk, liquidity risk, currency risk, interest rate risk, and capital structure risk. The examination focused on evaluating the information disclosed in these reports. Each clear expression of risk received a score of 1, and the absence of qualitative or quantitative data received a score of 0.

The disclosure index ($FRDI_j$) for each company was calculated using the formula:

$$0 \leq FRDI_j = \frac{Score\ of\ the\ j-th\ company}{Maximum\ possible\ score} \leq 1 \quad (1)$$

This rigorous analysis provides valuable insights into the risk disclosure practices of firms in the financial sector, shedding light on the levels of transparency and information they provide to stakeholders.

To analyze the direct impact of the independent variable, a comprehensive examination was conducted on five different models (Models 1–5). Additionally, to investigate the moderating effect of board financial expertise, three distinct models (Models 3, 5, and 7) were scrutinized.

Model 1

$$FRD\_indx = \alpha_0 + \beta_1(\ bfexp\_dummy)_{it} + \beta_2(roa)_{it} + \beta_3(leverage)_{it} + \beta_4(sector)_{it} + \mu_i + \varepsilon_{it} \quad (2)$$

Model 2

$$FRD\_indx = \alpha_0 + \beta_1(bindep)_{it} + \beta_2(roa)_{it} + \beta_3(leverage)_{it} + \beta_4(sector)_{it} + \mu_i + \varepsilon_{it} \quad (3)$$

Model 3

$$FRD\_indx = \alpha_0 + \beta_1(bfexp\_dummy)_{it} + \beta_2(bindep)_{it} + \beta_3(bfexp\_dummy * bindep)_{it} + \beta_4(roa)_{it} \beta_5(leverage)_{it}\mu_i + \beta_6(sector)_{it} + \varepsilon_{it} \quad (4)$$

Model 4

$$FRD\_indx = \alpha_0 + \beta_1(bsize)_{it} + \beta_2(roa)_{it} + \beta_3(leverage)_{it} + \beta_4(sector)_{it} + \mu_i + \varepsilon_{it} \quad (5)$$

Model 5

$$FRD\_indx = \alpha_0 + \beta_1(bfexp\_dummy)_{it} + \beta_2(bsize)_{it} + \beta_3(bfexp\_dummy * bsize)_{it} + \beta_4(roa)_{it} \beta_5(leverage)_{it}\mu_i + \beta_6(sector)_{it} + \varepsilon_{it} \quad (6)$$

Model 6

$$FRD\_indx = \alpha_0 + \beta_1(bmeet)_{it} + \beta_2(roa)_{it} + \beta_3(leverage)_{it} + \beta_4(sector)_{it} + \mu_i + \varepsilon_{it} \quad (7)$$

Model 7

$$FRD\_indx = \alpha_0 + \beta_1(bfexp\_dummy)_{it} + \beta_2(bmeet)_{it} + \beta_3(bfexp\_dummy * bmeet)_{it} + \beta_4(roa)_{it} \beta_5(leverage)_{it}\mu_i + \beta_6(sector)_{it} + \varepsilon_{it} \quad (8)$$

This study investigates the moderating impact of board financial expertise on the relationship between three key board characteristics on FRD (*FRD_indx*): board independence (*bindep*), board size (*bsize*), and board meeting frequency (*bmeet*). To ensure the robustness of the results, firm-level characteristics, including firm profitability (*roa*), firm leverage (*leverage*), and sector (*sector*), are controlled for in the analysis. The detailed definitions of the variables are presented in Table 1.

Table 1. Variable definitions and measurements

Variable	*Acronym*	*Measurement*
Dependent variable		
Financial risk disclosure	*FRD_indx*	The assessment of FRD involves assigning a score to each item based on the clarity of information, with a score of 1 indicating clear expression and 0 indicating a lack of qualitative or quantitative information. The total scores assigned to the risk items are then compared to the maximum possible score, which is determined by the total number of items assessed. The disclosure index of each financial risk is estimated using the formula: $0 \leq FRDI_j$ = Score obtained from the j-th company / Maximum possible score ≤ 1.
Independent variables		
Board independence	*bindep*	The number of independent directors on the board.
Board size	*bsize*	The number of board members.
Board meeting frequency	*bmeet*	The number of meetings held by the board during the year.
Moderating variable		
Board financial expertise	*bfexp_dummy*	A dummy variable that takes the value of 1 if at least one board member holds a university degree in finance or accounting, and 0 otherwise.
Control variables		
Firm's profitability	*roa*	Return on assets, which is the percentage of net income to total assets.
Firm's leverage	*leverage*	The ratio of the firm's total liabilities to total assets at the end of the current period.
Firm's sector	*sector*	A dummy variable takes a value of 1 for banks and 0 for insurance.

Source: Authors' elaboration.

4. RESULTS AND DISCUSSIONS

The analysis of the descriptive statistics presented in Table 2 highlights a prevalent trend in the financial sector, with a significant majority (87.18%) of firms in the sample possessing financial expertise. This observation underscores the importance of financial expertise in corporate governance regulations. Moreover, the study reveals that most firms in the sample belong to the insurance sector (69.23%).

Table 2. Descriptive analysis

Financial sector	*N*	*Percentage (%)*
Firms with board financial expertise	102	87.18
A firm without board financial expertise	15	12.82
Banks	36	30.77
Insurance	81	69.23
Total	117	100%

Source: Authors' elaboration.

Examining Table 3, we find that the average *FRD_indx* stands at 0.738, indicative of relatively high levels of disclosure across the sample. However, the noteworthy standard deviation of 0.169 implies considerable disparities in disclosure practices among firms. Significant variations are also evident in *bindep,* with a mean of 3.76 and standard deviation of 1.19, as well as *bsize* (mean = 8.85, std dev = 1.56) and *bmeet* (mean = 5.64, std dev = 1.75). Such diversity affords valuable insights into the analysis of governance characteristics. Further analysis uncovers a negative mean return on assets (*roa*) of -0.014, indicating that a substantial portion of firms in the sample may face financial challenges, potentially impacting their disclosure behaviors.

Table 3. Descriptive statistics for independent, dependent, and control variables (all data sample)

Variable	*Obs.*	*Mean*	*Std. Dev.*	*Min*	*Max*	*VIF*	*1/VIF*
FRD_indx	117	0.7384616	0.1690981	0.4	1		
bindep	117	3.760684	1.186487	1	10	1.48	0.677815
bsize	117	8.854701	1.555108	5	13	1.77	0.566127
bmeet	117	5.641026	1.749195	2	11	1.08	0.925030
roa	117	-0.0141026	0.0734748	-0.46	0.06	1.32	0.756954
leverage	117	0.7029915	0.1393288	0.33	1.1	2.24	0.445567
bfexp_dumm						1.12	0.891081
sector						2.52	0.396905
Mean VIF						1.65	

Note: VIF — variance inflation factor.
Source: Authors' elaboration.

Table 4 presents the descriptive statistics of the study sample, classified into two groups: firms with boards of directors with financial expertise and firms without such expertise. As shown, the average risk disclosure level differs between the two groups. To assess the statistical significance of this difference, a t-test was conducted, and the results are reported in Table 5.

Table 4. Descriptive statistics of the continuous variables based on the existence of GC and sector

Variable	*Mean*	*Std. dev.*	*Min*	*Max*
Firms with board financial expertise (n = 102)				
FRD_indx	0.7372549	0.1664549	0.4	1
bindep	3.862745	1.177674	2	10
bsize	8.980392	1.482441	5	13
bmeet	5.72549	1.780849	2	11
roa	-0.0128431	0.0729082	-0.46	0.06
leverage	0.7156863	0.1325045	0.33	1.1
Firms without board financial expertise (n = 15)				
FRD_indx	0.7466667	0.19223	0.4	1
bindep	3.066667	1.032796	1	5
bsize	8	1.812654	5	11
bmeet	5.066667	1.437591	3	8
roa	-0.0226667	0.0793245	-0.21	0.06
leverage	0.6166667	0.1581892	0.39	0.94

Source: Authors' elaboration.

The investigation of firms with and without board financial expertise yielded intriguing results. The t-test analysis shown in Table 5 reveals that there is no significant difference in *FRD_indx* between the two groups ($p = 0.8415$), which contrasts with the prevailing theoretical views on the positive impact of financial expertise on disclosure quality. However, the group lacking financial expertise consisted of a small sample size ($n = 15$), limiting the statistical power of the findings. Remarkably, firms with financial expertise exhibited higher average values for board independence, board size, and meeting frequency, hinting at a potential link between financial expertise and other favorable governance practices.

Table 5. T-test results

Variable	*FFs with board financial expertise (n = 102) Mean*	*FFS without board financial expertise (n = 15) Mean*	*Mean difference*	*t-statistic*	*Degrees of freedom*	*Two-tailed p-value*
FRD_indx	0.7372549	0.7466667	0.0094118	0.2004	115	0.8415

Source: Authors' elaboration.

In Table 6, the pairwise correlation coefficient matrix highlights significant relationships worth noting in *FRD_indx*. The data show a strong positive correlation between *FRD_indx* and *sector* ($r = 0.5922$, $p < 0.01$), indicating that banks generally exhibit higher levels of disclosure than insurance companies. Conversely, *FRD_indx* is negatively correlated with *bsize* ($r = -0.3621$, $p < 0.01$) and *leverage* ($r = -0.3770$, $p < 0.01$), implying that smaller boards are more inclined to disclose financial information. These findings contrast with those of AL-Dubai and Alotaibi (2023), who reported a positive correlation for power companies in Saudi Arabia. Additionally, *bfexp_dummy* is positively correlated with *bindep, bsize*, and *leverage*, suggesting that firms with such expertise tend to have larger boards, a higher number of independent members, and increased leverage. Table 3 confirms the absence of multicollinearity issues, as there are no high correlations among the independent variables. This conclusion is further supported by the VIF estimates, which indicate that all variables have values below 2.6 (Al-Dubai, 2023).

Table 6. Pairwise correlation coefficients matrix

Variable	*FRD_indx*	*bfexp_dummy*	*bindep*	*bsize*	*bmeet*	*roa*	*leverage*	*sector*
FRD_indx	1							
bfexp_dummy	-0.0187	1						
bindep	-0.0998	0.2253**	1					
bsize	-0.3621***	0.2117*	0.4716*	1				
bmeet	-0.0462	0.1265	0.1369	0.2564***	1			
roa	-0.1232	0.0449	-0.0628	0.2354**	0.0401	1		
leverage	-0.3770***	0.2386***	0.3178***	0.2957***	0.0430	-0.1315	1	
sector	0.5922***	-0.2557***	-0.1664*	-0.4692***	-0.1055	-0.2601***	-0.6477***	1

*Note: * p < 0.10, ** p < 0.05, *** p < 0.01.*
Source: Authors' elaboration.

In the analysis presented in Table 7, a series of tests, including Hausman's specification test, the Wooldridge test for autocorrelation in panel data, and the modified Wald test for groupwise heteroskedasticity, supported the utilization of the random effects model for all seven models investigated. These tests also indicate the presence of heteroscedasticity in the dataset. To mitigate potential endogeneity concerns, this study employed Hausman-Taylor estimations (Hausman & Taylor, 1981). This method accommodates both time-varying and time-invariant endogenous regressors,

consistent with Beaudry and Larivière (2016). Recognized for its capacity to provide reliable estimates in models with endogenously correlated explanatory variables, the Hausman-Taylor technique has gained substantial acceptance, as underscored by Hausman (2019). Following prior research suggestions (Arora & Gaur, 2022), all key variables were treated as endogenous in the analysis to validate the hypotheses of this study.

Regarding potential sample bias, while our dataset comprises 30.77% banks and 69.23% insurance companies, this imbalance is unlikely to significantly bias our risk disclosure findings, given that both sectors operate under the unified regulatory framework of the Saudi Central Bank and are subject to identical corporate governance requirements, capital market regulations, and disclosure standards within Saudi Arabia's integrated financial services oversight system. We further mitigate any remaining sectoral effects by including a dummy control variable that takes the value of 1 for banks and 0 for insurance companies in our regression models.

The results of the Hausman-Taylor estimations in Table 7 show the effects of various board characteristics and firm-specific variables on FRD. This study integrates both exogenous and endogenous variables into seven distinct models. Noteworthy variables include *bfexp_dummy*, *bindep*, *bsize*, and *bmeet*, along with their corresponding interaction terms and control variables such as *roa*, *leverage*, and *sector*. In Model 1, the significant and positive coefficient for *bfexp_dummy* aligns with agency theory, as proposed by Fama and Jensen (1983), which suggests that board members with financial expertise play a crucial role in enhancing monitoring and transparency. Al-Dubai (2023) highlighted that a broad education in accounting and finance can have a favorable impact on FRD through various mechanisms. Primarily, board members with accounting and finance backgrounds are more adept at overseeing disclosure processes, enabling them to identify irregularities or suspicious trends indicative of risks. Moreover, they are inclined to scrutinize the accuracy and comprehensiveness of financial information prior to its release to stakeholders, recognizing the significance of transparent data disclosure in evaluating investment opportunities and risks.

Conversely, the negative and statistically insignificant coefficient for *bindep* in Model 2 suggests that the presence of independent directors alone does not significantly influence FRD. This finding contradicts the common belief in the literature that independent directors lead to improved disclosure (Alkurdi et al., 2019; Haj-Salem et al., 2020; Moumen et al., 2016; Nkuutu et al., 2021). This implies that the effectiveness of independent directors may rely on other factors, such as their collaboration with financially knowledgeable members. In Model 4, the negative and insignificant coefficient for *bsize* indicates that smaller boards have a limited impact on FRD. This result is consistent with previous research that found no substantial relationship between board size and disclosure (Allini et al., 2016; Alshirah et al., 2020; Bufarwa et al., 2020). This suggests that the advantages of larger boards in terms of diverse expertise may be offset by coordination challenges.

Table 7. Hausman-Taylor estimations (financial risk disclosure)

Variable	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*	*Model 7*
Time-varying exogenous							
roa	0.122	0.185	0.167	0.195	0.218	0.153	0.1
leverage	0.0324	0.0759	0.0799	0.0401	0.0497	0.0343	0.0595
*bfexp_dummy * bindep*			0.0319				
*bfexp_dummy * bsize*					0.0203		
*bfexp_dummy * bmeet*							0.0541*
Time-varying endogenous							
bfexp_dummy	0.133**		-0.00327		-0.0568		-0.197
bindep		-0.0173	-0.0412				
bsize				-0.0115	-0.0335		
bmeet						0.00133	-0.0470*
Time-invariant exogenous							
sector	0.252***	0.231***	0.252***	0.214***	0.234***	0.230***	0.249***
_cons	0.175	0.362**	0.309	0.453**	0.499*	0.321*	0.443**
sigma_u	0.08262564	0.08520432	0.0854471	0.07699665	0.08802475	0.0776657	0.07717601
sigma_e	0.10826063	0.11041396	0.10668251	0.11105255	0.10583054	0.11172971	0.10586492
Rho	0.36808452	0.37323373	0.39080742	0.32465003	0.40891747	0.32577922	0.34702306
Wald chi^2	40.57	35.13	39.91	38.49	41.16	37.12	47.53
Prob > chi^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Number of obs.	117	117	117	117	117	117	117
Number of groups	39	39	39	39	39	39	39
Hausman's specification test							
chi^2	1.34	2.08	2.59	0.60	2.50	0.46	2.43
Prob > chi^2	0.7193	0.5556	0.7628	0.8954	0.7758	0.9272	0.7863
Model	Random effect model	Random effect model	Random effect model	Random effect model	Random effect model	Random effect model	Random effect model
Modified Wald test for groupwise heteroskedasticity							
chi^2	6.1e+08	7.6e+09	1.5e+08	3.6e+07	4.9e+11	1.1e+13	5.2e+08
Prob > chi^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Model	Hetero	Hetero	Hetero	Hetero	Hetero	Hetero	Hetero
Wooldridge test for autocorrelation in panel data							
F(1, -25)	0.481	0.258	0.424	0.405	0.294	0.356	0.486
Prob > F	0.4923	0.6146	0.5188	0.5286	0.5908	0.5542	0.4899
Model	No auto	No auto	No auto	No auto	No auto	No auto	No auto

*Note: * p < 0.10, ** p < 0.05, *** p < 0.01.*
Source: Authors' elaboration.

In Model 6, despite the positive but statistically insignificant coefficient associated with *bmeet*, it indicates that the frequency of board meetings does not significantly impact FRD. This aligns with previous research findings that have also found no significant correlation between board activity and risk disclosure (Al-Dubai & Alotaibi, 2023; Allini et al., 2016; Alshirah et al., 2020). However, a shift in the results occurs when board financial expertise is considered. In Model 7, the significant and positive coefficient of the interaction term between board financial expertise and board meeting frequency (*bfexp_dummy * bmeet*) highlights the crucial role played by board financial expertise in enhancing the effectiveness of frequent meetings in improving FRD. This discovery is in line with both agency theory and resource dependence theory perspectives, which suggest that boards holding more frequent meetings are better equipped for advisory and monitoring functions, thereby mitigating agency issues (Ntim & Osei, 2011). Moreover, frequent board meetings attract external resources during discussions, ultimately enhancing the effectiveness of monitoring functions.

In Models 2 to 5, it was observed that both the size and independence of the board of directors had no significant impact on FRD. This outcome remains consistent, regardless of whether board members have financial expertise. These findings deviate from the resource dependence theory, which suggests that larger boards with financial knowledge should be able to utilize their collective expertise for enhanced oversight (Abdullah et al., 2017). Contrary to the assertions of agency theorists who argue that larger boards are more effective in enforcing financial reporting standards and enhancing corporate transparency through superior managerial supervision and monitoring capabilities (Al-Dubai & Alotaibi, 2023; Elzahar & Hussainey, 2012; Ntim et al., 2013), our results indicate otherwise. Moreover, this study challenges the notion held by agency theorists that independent directors play a key role in ensuring control and oversight, leading to more informative disclosures. Notably, our results align with those of prior research that has similarly found no significant link between board independence and risk disclosure (Allini et al., 2016; Al-Maghzom et al., 2016).

5. CONCLUSION

Extensive research has highlighted the impact of various board of directors' characteristics, such as board independence, size, and meeting frequency, on FRD. However, the potential moderating role of board financial expertise in this context remains unexplored. This study seeks to fill this gap by examining how board financial expertise moderates the relationship between board characteristics and FRD. Data from 117 firm-year observations of Saudi financial firms listed on Tadawul between 2019 and 2021 were analyzed using content analysis and Hausman-Taylor estimations to address endogeneity issues and ensure robust results.

The study findings demonstrate that while individual board characteristics do not significantly impact FRD, board financial expertise plays a crucial role. Specifically, the study reveals that board financial expertise positively moderates the association between FRD and board meeting frequency. These results emphasize the significance of having board members with financial expertise in financial firms to enhance the transparency of FRD, underlining the necessity of an optimized board structure to support this objective. One suggested approach is to increase the number of board members with financial expertise, which can facilitate proactive measures, such as regular meetings, to increase FRD.

While this study offers valuable insights, it has limitations that warrant consideration in future research. The study employed a dummy variable to capture the presence of financial and accounting expertise among board members, assigning a value of 1 if at least one member held a university degree in accounting or finance. This measure is consistent with the requirements of the financial institutions' governance system in Saudi Arabia, which, under the first principle, qualifications of board members, stipulates that members should possess the ability to read and understand financial statements, reports, and performance ratios. However, this measure does not account for the depth of financial expertise, such as whether the degree is at the bachelor's level or higher, nor does it consider professional certifications or practical experience in financial or accounting positions, which are crucial determinants of financial competence. Therefore, this study suggests that future research should re-examine the relationship in different contexts, considering the level of board members' university education, attainment of professional certifications, and the number of years of practical experience in financial and accounting positions. In addition, it is advised that upcoming studies explore additional board characteristics and conduct cross-sector international analyses to deepen the understanding of FRD practices. Moreover, future researchers should evaluate the quality of risk disclosure to present a more comprehensive view of this subject. The implications of this research extend to policymakers and firm owners, suggesting that increasing the number of board members with financial expertise in financial firms could enhance the quality of FRD by complementing other internal governance mechanisms associated with the board of directors.

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