EXAMINING THE RELATIONSHIP BETWEEN BOARD CHARACTERISTICS AND FINANCIAL RISK DISCLOSURE: A LONGITUDINAL ANALYSIS BASED ON AGENCY THEORY

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Abstract

The aim of this research is to enhance existing literature pertaining to corporate disclosure through an investigation of financial risk information that has been reported in annual reports. The study also seeks to determine the extent of disclosure and how it has changed over time. Furthermore, it examines the effects of board busyness, size, independence, and meetings on financial risk disclosure. The content analysis method was used to evaluate the annual reports of 4 energy companies over a 13-year period, resulting in 52 firm-year observations. The study used secondary data sources and focused on companies that were listed between 2009 and 2021. The findings indicate that board size has a positive impact on financial risk disclosure, whereas board independence has a negative impact. However, no significant effects were found for board busyness and board meetings. These results were robust across various estimation techniques. However, the study is limited in that it only considered certain board characteristics, and future research should explore the effects of other board characteristics and incorporate additional committee characteristics.

Keywords: Financial Risk Disclosure, Board Busyness, Board Size, Board Independence, Board Meetings, Saudi Arabia

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1. INTRODUCTION

Annual reports serve as traditional and necessary formal communications between reporting organizations and interested users (Sharma & Davey, 2013). Such reports include both mandatory and voluntary disclosures (Al-Dubai & Abdelhalim, 2021), where mandatory disclosure represents information that is necessary as per the act and regulations (Veltri et al., 2020). Beyond such mandatory disclosure, any additional information provided is unregulated and voluntary by the management

(Md Zaini et al., 2020). Annual reports may consist of such voluntary disclosures, which can contribute to both the company's and stakeholders' understanding of the performance of the company (Veltri et al., 2020; Wang et al., 2013) and its riskiness (Carlon et al., 2008). Investors are anticipated to find risk disclosure to be advantageous as it highlights the extent of plausible and potential losses for a business. Additionally, it unveils the steps taken by management to mitigate the expected negative impacts (Al-Dubai & Abdelhalim, 2021; dos Santos & Coelho, 2018).

According to the literature (Serrasqueiro & Mineiro, 2018), the general objective of financial reporting, as prescribed by the International Accounting Standards Board's (IASB) conceptual framework, is to provide useful information that includes risks and uncertainties to help investors and stakeholders make informed decisions. Companies disclose risk factors in their financial statements to provide transparency and help investors understand the potential risks associated with investing in their business. However, not all companies disclose risks equally (Carlon et al., 2008), and there are numerous factors that affect the quality and quantity of risk-related information. According to a recent study by Azim and Nahar (2022), an organization's approach to risk reporting at a micro-level is dependent on its perspective and approach towards risk and risk management. Nonetheless, it should be noted that regulators' initiatives are particularly influential in determining the appropriate framework for an institution's risk reporting procedures at the macro level. This is essential for providing financial statement users with a more comprehensive understanding of an organization's risk management efforts. Furthermore, the socio-cultural environment surrounding an organization plays a crucial role in determining the amount and clarity of the risk information that it reports in its financial statements (Azim & Nahar, 2022). Weber and Müßig (2022) suggest that to maintain a good reputation for risk management, companies should not disclose too little information. However, they should also be careful not to over-disclose information as it could potentially give competitors a strategic advantage. Companies that rely heavily on external financing should consider being more transparent in their disclosure of information to show their willingness to be accountable to their stakeholders, both existing and potential (Weber & Müßig, 2022).

Recent decades have seen an increase in corporate risk disclosure research, which has revealed that the information provided is often insufficient (Hassan & Marston, 2010) due to many factors, leading to doubts about its quality and utility (Serrasqueiro & Mineiro, 2018). In comparison to developed countries, accounting and reporting systems demonstrate significant variations in developing countries, as indicated by existing research (Azim & Nahar, 2022; Hassan & Marston, 2010; Nahar et al., 2016), where regulatory standards are often not followed in developing countries (Azim & Nahar, 2022; Uddin & Choudhury, 2008). According to Weber and Müßig (2022), the key to enhancing risk disclosure lies in the incentives and unique characteristics of individual firms, rather than regulatory bodies setting standards. Nonetheless, it is important for standard setters to comprehend the factors that affect corporate risk disclosure and the limitations of regulatory actions aimed at improving it.

The crucial role of the board of directors in business cannot be ignored. It has a direct impact on the organization's capacity to gain investor trust and boost financial results (Yakob & Abu Hasan, 2021). Previous studies have confirmed that there are many factors related to the characteristics of the board of directors that directly impact the level of risk disclosure quality. Board busyness is one such factor that impacts the risk disclosure of companies. Fich and Shivdasani (2006) have demonstrated that having multiple outside directorships undermines the effectiveness of board monitoring. According to Eulaiwi et al. (2016), previous research has emphasized the role of board members in outside directorships. Many board members hold several directorships in various organizations across the world, and Saudi Arabia is no exception. The Gulf Cooperation Council (GCC), including Saudi Arabia, has many directors who are heavily engaged in multiple non-financial firms' boards. This scenario raises concerns regarding the effective implementation of corporate governance practices and the timely disclosure of information in the region, as highlighted by studies conducted by Eulaiwi et al. (2016) and Alsheikh and Alsheikh (2023). In addition, having multiple directorships may result in less time available for each board, leading to inadequate monitoring (Fich & Shivdasani, 2006) and a lower quality of risk disclosure. This debate surrounding the impact of board busyness on risk disclosure remains contentious.

This study offers fresh perspectives and aims to discuss how board busyness and its other characteristics influence the financial risk disclosure of companies listed in Saud Arabia. Specifically, companies that are listed under the energy sector. The rationale for selecting financial risk as the focus of this study is due to the fact that previous research has tended to prioritize the investigation of corporate overall risk, rather than financial risk (Dey et al., 2018). Various studies have found that board characteristics are associated with the disclosure of financial risk in various contexts (Bufarwa et al., 2020; Elzahar & Hussainey, 2012; Hady, 2019; Ntim et al., 2013). The energy sector was selected because the renewable energy industry is a key focus area of the Kingdom's Vision 2030. This is due to several advantages that Saudi Arabia enjoys: firstly, it has a large regional market in the Arab Gulf region, the Arab world, and North Africa. Secondly, it is a hub for the development and manufacturing of various energy products and equipment, made possible by its strategic geographic location as noted by SIDF (n.d.). Notably, Saudi Arabia has recently shifted its attention to renewable energy and made significant investments in this field over the last two decades, in line with the country's aim of achieving sustainable economic, social, and environmental development outlined in Vision 2030 (Almulhim & Al Yousif, 2022).

The objective is to expand on the current literature surrounding corporate disclosure by determining whether financial risk information had been reported in the annual reports, to what degree, and how it had evolved over time. In addition, it

examines the impact of board busyness, size, independence, and meetings on financial risk disclosure. The study employed manual content analysis methods to evaluate the amount of financial risk information contained in the annual reports of four energy companies over 13 years (52 firm-year observations) in order to establish the current method used to present such financial risks. The study used secondary data sources such as the Tadawul, Argaam, and Tradingview websites, with a focus on companies listed continuously between 2009 and 2021. Lombardi et al.'s (2016) approach was adopted to conduct this study, which involved analyzing the financial statements of companies. The focus was on the "financial risk management" notes, as well as any other notes related to financial instruments that were held to cover risks during the period between 2009 and 2021.

Regarding the findings of this study, the results indicate that board independence and board size have a positive and significant effect on the quantity of financial risk disclosure, suggesting that these variables are key determinants. Consistent with prior research, larger boards tend to display higher levels of financial risk disclosure, supporting the agency theory perspective. As board size increases, companies are more likely to incorporate members with diverse financial and accounting backgrounds, leading to greater levels of corporate risk disclosure. However, the findings also reveal that independent board members demonstrate a low level of financial risk disclosure, which may raise concerns. It is possible that these independent members lack the necessary expertise or knowledge to identify the financial risks associated with the company's operations. Therefore, it is recommended to further examine the impact of financial and accounting knowledge and experience of board members on financial risk disclosure. Also, we found that having a significant number of board members who serve in directorship positions in other companies can improve the quantity of financial risk disclosure to a certain extent. Nevertheless, as other factors are taken into account, this favorable outcome may decline.

The rest of the paper is organised as follows. Section 2 presents the literature review and hypotheses of the study. Section 3 discusses our research methodology. Results are discussed in Section 4 with robustness analyses. Section 6 provides conclusions and a discussion of our contribution and the limitations of this study.

2. LITERATURE REVIEW AND RESEARCH HYPOTHESES DEVELOPMENT

2.1. Financial risk disclosure

Cabedo and Tirado (2004) depict risk in the business realm as the potential depletion of a company's wealth resulting from the convergence of challenges and threats within the business environment. The utilization of the term "possible loss" to define risk implies its negative nature (Abdullah et al., 2017). In accordance with Abdullah et al.'s (2017) approach, this research adopts a definition of risk encompassing both "harm and threat" or "opportunity and prospect", arising from alterations in the business environment. This definition aligns with that of AICPA/CICA, where risk refers to the likelihood of an adverse event impeding objective attainment (Abdullah et al., 2017).

Companies have always grappled with finding a balance between risk and reward, a challenge that has amplified in today's backdrop of the global financial crisis and global economic uncertainty (Abdullah et al., 2017). Corporate scandals and failures have highlighted the importance of risk disclosure by companies (Azim & Nahar, 2022; Said Mokhtar & Mellett, 2013). Thus, companies are being pressured to provide better risk-related information (Solomon et al., 2000). The global pressure of the 1990s (Carlon et al., 2008) and the financial crisis of some European companies in 2007–2008 (Lombardi et al., 2016), resulted in increased public and regulatory scrutiny of risk management practices, and risk management reporting (Carlon et al., 2008), where companies are expected to not only report their activities but also the risks surrounding them and their ability to manage those risks.

Previous studies (Dey et al., 2018; Abraham & Cox, 2007) emphasize the integral role of corporate risk disclosure within business reporting, as it fosters increased transparency and bolsters investor confidence, particularly within developed countries and markets. Information asymmetry between company management and shareholders is expected to decrease through disclosure (Watts & Zimmerman, 1983). Managers, or agents, typically possess more information regarding the company's condition compared to shareholders, who are the principals (Hady, 2019). According to Jensen and Meckling (1976), it is crucial for principals to delegate company management to agents who have expertise in business operations. However, this delegation creates information asymmetry between managers and principals. Board of directors play a critical role in ensuring the effective stewardship of a firm's resources and protecting the interests of shareholders. As part of their monitoring function, boards are required to oversee the identification, management, and disclosure of risks faced by the company. To enhance transparency and provide stakeholders with comprehensive information, the corporation has adopted the practice of including risk disclosures in its financial statements (Almunawwaroh & Setiawan, 2023).

2.2. Board busyness and financial risk disclosure

Al-Yahyaee and Al-Hadi (2016) stated that the main focus of previous studies on the role of the board of directors has been on their involvement in outside directorships. In many cases, board members hold multiple directorships simultaneously in different organizations. Theoretically, busy board directors have less time to dedicate to each individual board, and thus are less able to provide adequate monitoring (Core et al., 1999; Fich & Shivdasani, 2006), and this could lead to less quality risk disclosures, as busy board members may not have sufficient attention to devote to the company's risk profile (Al-Yahyaee & Al-Hadi, 2016). In contrast, other studies argue that busy boards are likely to have more resources at their disposal, increasing their capacity to disclose risk. However, the impact of board busyness on risk disclosure remains a controversial issue.

While having board members with multiple directorships can provide advantages such as transferable skills (Fich & Shivdasani, 2006), networking opportunities (Al-Yahyaee & Al-Hadi, 2016), and increased transparency, the disadvantages should not be overlooked. The potential problems of time constraints (Al-Yahyaee & Al-Hadi, 2016; Lipton & Lorsch, 1992), conflict of interest (Al-Yahyaee & Al-Hadi, 2016), and burnout and fatigue can lead to negative outcomes for both the board members and the organizations they serve on (Core et al., 1999; Fich & Shivdasani, 2006).

Agency theory focuses on the relationship between the principal (shareholders) and the agent (board of directors). It posits that the interests of shareholders and management may diverge due to the separation of ownership and control, creating agency costs (Jensen & Meckling, 1976). The concept of agency theory can help shed light on managers' inclination to disclose corporate information when rules and regulations are not present. The underlying principle of this theory is that agency costs result from shareholders delegating the control of the firm to the managers and inevitably reducing their monitoring intensity since shareholders are dispersed and management is concentrated. The principal–agent relationship should effectively exploit information within the organization to minimize any gaps in information and risk-bearing expenses (Nahar et al., 2016). Addressing these information gaps can also be done by monitoring managers' behavior (Jensen & Meckling, 1976).

According to agency theory, the board's primary responsibility is to safeguard the interests of shareholders by overseeing managerial actions, including risk management and disclosure (Al-Yahyaee & Al-Hadi, 2016). The effectiveness of the board's oversight depends on the board's ability to monitor managerial actions, which is assumed to be negatively impacted by board busyness (Core et al., 1999). Ferris et al. (2003) stated that according to the agency cost view of multiple board memberships, being a member of a board comes with certain fees and privileges that can be seen as a form of taking advantage of perks. On the other hand, the busyness hypothesis suggests that occupying multiple board memberships may indicate that directors have too much free time, leading to a conflict of interest. Directors may reduce their oversight responsibilities and allow managers to impose greater costs on shareholders because they prioritize obtaining the prestige and other benefits associated with sitting on multiple boards (Ferris et al., 2003).

Directors have differing opinions when it comes to holding multiple directorships. According to Ferris et al. (2003), Korn/Ferry International conducted a survey on directors of Fortune 500 companies and found that a significant number of directors feel that holding too many board appointments can be overwhelming. In fact, 56% of outside directors admitted to declining an invitation to serve on another board due to time constraints. These directors are of the belief that having too many board positions can distract them from properly overseeing management. The findings support the argument made by Lipton and Lorsch (1992). They argued that the main concern among directors is the lack of time to fulfill their professional duties. Busy directors may lack time to adequately review the company's risk profile and provide meaningful feedback to management. Thus, Ferris et al. (2003) have suggested directors to not hold multiple outside directorships and be too preoccupied to function effectively as monitors. This view is supported by Core et al.'s (1999) findings that participating in several outside directorships reduces the ability of outside directors to carry out their monitoring responsibilities.

Beasley (1996) found a positive correlation between the likelihood of accounting fraud and the average number of outside directorships held. Core et al. (1999) indicate that directors with a lot of responsibilities tend to set CEO compensation at an overly high level, which can negatively impact a company's performance. However, a study conducted by Ferris et al. (2003), did not find any evidence that having multiple directors is connected to a higher chance of fraud litigation related to securities and a company's performance measured by market-to-book ratio.

Based on the previous discussion, the following hypothesis can be formulated:

H1: Board busyness negatively impacts risk disclosure.

2.3. Board size and financial risk disclosure

The board of directors has a crucial role in the corporate governance of publicly listed firms (Elzahar & Hussainey, 2012). However, some suggest that corporate governance soft regulations allow companies to have weaker monitoring by their boards because they can choose a board size that suits their own needs (Guest, 2008). The idea put forward by agency theorists is that bigger boards have a positive impact on financial reporting and corporate disclosure through better managerial supervision and effective monitoring roles (Elzahar & Hussainey, 2012; Ntim et al., 2013). The incorporation of multiple areas of expertise becomes a more feasible goal as boards begin to expand in size. As a result, the diffusion of individual directors' responsibility for risk oversight may occur more readily. The implication of this phenomenon is that there is likely to be a constructive correlation between board size and the degree of corporate risk disclosure (Bufarwa et al., 2020; Elzahar & Hussainey, 2012; Hady, 2019; Ntim et al., 2013). Bufarwa et al. (2020) and Ntim et al. (2013) stated that stakeholder theory also argues in favor of larger boards, which are capable of protecting critical business resources and reducing uncertainty by increasing access to external resources.

Hady (2019) indicated that to improve business reputation, companies may opt to disclose risks to stakeholders, which can differentiate them from competitors. Agency theory stipulates that shareholders would be more likely to receive signals of risk management performance from larger boards' members, and a large board would increase the number of members with financial and accounting backgrounds, which could affect managers' voluntary disclosure decisions and ultimately extend corporate risk disclosure levels (Elzahar & Hussainey, 2012). A larger board can

bring a broader range of perspectives to financial risk discussions. This diversity of viewpoints can help ensure that all types of financial risks are identified, mitigated, and disclosed in a way that considers the interests of all stakeholders.

However, in the context of agency theory, a divergent theoretical stance posits that smaller boards are conducive to improving corporate performance and disclosure, whereas larger boards can be detrimental in these aspects (Jensen & Meckling, 1976; Ntim et al., 2013). Jensen (1993) elaborates that larger boards tend to suffer from issues of coordination, communication, and monitoring, where the phenomenon of director free-riding can significantly affect corporate responsibility and performance adversely. Based on this perspective, larger boards may experience communication challenges when it comes to risk disclosure. It can be difficult to ensure that all members of the board are fully informed and up-to-date on all the risks facing the organization. This can make it more challenging to effectively disclose and manage risks. Proponents of smaller boards suggest the efficiency in promoting disclosure and performance (Jensen & Meckling, 1976; Ntim et al., 2013). Smaller boards are found to be characterized by frequent discussions that are both candid and effective, which can positively contribute to enhancing corporate disclosure (Ntim et al., 2013).

Empirical studies have found that larger boards of directors tend to be more effective than smaller ones. Ntim et al. (2013), in their study on South Africa, demonstrate that board size is positively related to the extent of corporate risk disclosure. In the same vein, Hady (2019) evidenced the same impact from the Indonesian banking sector. In their research, Almunawwaroh and Setiawan (2023) investigated the potential influence of audit committee size on banks' risk disclosure. Contrary to previous studies, their findings indicated no significant impact on risk disclosure. These conclusions were further supported by Elzahar and Hussainey (2012) who examined financial risk disclosure in interim reports. Likewise, Zango et al. (2016) observed a lack of significant association.

Based on agency theory, the following hypothesis can be formulated:

H2: Board size positively impacts risk disclosure.

2.4. Board independence and financial risk disclosure

According to Abraham and Cox (2007) and O'Sullivan (2000), non-executive directors play a crucial role in the board by representing the interests of the company's owners. According to Gul and Leung (2004), the corporate disclosure policy is determined by the board and they are also responsible for preparing the annual report. Based on this, it can be argued that companies with a greater number of non-executive directors are more capable of meeting the demands of shareholders in terms of accountability and transparency. In other words, non-executive directors bring a necessary balance to the board and enable greater corporate transparency (Abraham & Cox, 2007).

Although all non-executive directors are not the same, dependent non-executive directors have a business or other association with management that might hinder their autonomous judgment (Mallin et al., 2005). It suggests that dependent non-executive directors may be prone to outside influences that might not align with the interests of the shareholders. On the other hand, independent non-executive directors are considered to be free from any management-related associations, making them crucial in maintaining good corporate governance, as stated by Higgs (2003) and Beekes and Brown (2006).

Chen and Jaggi (2000) conducted empirical research and discovered that there is a favorable correlation between having independent board directors and financial information disclosure, which is consistent with Forker's (1992) study. Gul and Leung (2004) also found that independent directors are associated with higher levels of voluntary corporate disclosure, and Beasley's (1996) research revealed that independent directors have a positive effect on disclosure quality. These studies prove that having independent directors in a company is beneficial to corporate reporting. Consequently, it is expected that having independent directors can also aid in corporate risk reporting due to the observed positive relationship. Ntim et al. (2013), in their study on South Africa, demonstrate that independent non-executive directors are positively related to the extent of corporate risk disclosure. Their findings are in line with those of Hady (2019) and Abraham and Cox (2007). In the financial sector, Hady (2019) found strong evidence of the positive impact of board independence on financial risk disclosure in the annual report of Indonesian Sharia banks between the period of 2012 and 2016. Also, Abraham and Cox (2007) examined the relationship between board independence and found that independent directors are positively related to the level of corporate risk reporting in UK non-financial companies listed in the FTSE 100 index for the year 2002.

Based on the previous discussion, the following hypothesis can be formulated:

H3: Board independence positively impacts risk disclosure.

2.5. Board meetings and financial risk disclosure

As a result of the direct association between company directors, management, and shareholders, scholarly research has focused on evaluating the impact of board meetings as a corporate governance mechanism (Hashim et al., 2014; Yakob & Abu Hasan, 2021). Board effectiveness is influenced by several factors, and can be measured through the frequency of board meetings (Cormier et al., 2010; Zango et al., 2016). When financial report users observe that meetings are infrequent, they perceive it as an indication of members' lack of commitment to overseeing the reporting process (Zango et al., 2016). In the field of corporate governance, research conducted by Conger et al. (1998) and Jackling and Johl (2009) has demonstrated the crucial impact of board meeting frequency on protecting the rights of shareholders. Furthermore, Hashim et al. (2014) designate boards with high meeting frequency as "active", which highlights the significance of such governance practices. It is believed that the board should meet frequently to ensure that they can adequately monitor

the performance of the organization and top management's activities (Shan & Xu, 2012). Frequent meetings consequently lead to optimal information sharing, better communication and collaboration among board members, and a more robust decision-making process.

Shan and Xu (2012) hypothesized that board meetings provide a useful platform for discussing and resolving the most commonly faced issues by directors. Additionally, they suggested that the frequency of such meetings can enhance the overall effectiveness of a board. As per their hypothesis, the number of board meetings held has a significant impact on the effectiveness of a board, with a higher frequency of meetings resulting in lower levels of bad debt provisions. According to the research conducted by Cormier et al. (2010), they discovered a negative correlation between the number of board meetings held and the disclosure of information regarding operations efficiency. On the contrary, Zango et al. (2016) arrived at a different conclusion in their study, stating that frequent board meetings do not have any effect on the financial risk disclosure carried out by Nigerian banks. Likewise, Almunawwaroh and Setiawan (2023) found that there is no significant relationship between the frequency of audit committee meetings within Indonesian banks and the disclosure of risks in their annual reports.

Based on the previous discussion, the following hypothesis can be formulated:

H4: Board meetings positively impact risk disclosure.

3. RESEARCH METHODOLOGY

3.1. Research model and measurements

The research model being proposed for this study consists of one dependent variable, specifically financial risk disclosure, along with four independent variables: board busyness, board size, board independency, and board meetings. In order to address concerns pertaining to endogeneity and heterogeneity, as well as to account for firm-specific characteristics, control variables sourced from previous studies are also incorporated into our analysis. A comprehensive overview of these variables can be found in Table 1. The aim of our study is to investigate the factors that influence financial risk disclosure, and to accomplish this, we have developed the following model:

$$FRD = \alpha_0 + \beta_1(bodbusy)_{it} + \beta_2(bodsize)_{it} + \beta_3(bodindep)_{it} + \beta_4(bodmeeting)_{it} + \beta_5(Logasst)_{it} + \beta_6(Logdebt)_{it} + \beta_7(ROA)_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

where,
FRD = Financial risk disclosure;
bodbusy = Board busyness;
bodsize = Board size;
bodindep = Board independence;
bodmeeting = Board meetings;
Logasst = Natural logarithm of total assets;
Logdebt = Natural logarithm of debt;
ROA = Return on assets.

Studies in the field have taken different approaches, including content analysis and regression analysis to identify the nature of risk information and understand the underlying variables affecting risk disclosure (Serrasqueiro & Mineiro, 2018).

One approach to researching this topic involves analyzing risk disclosures made by companies, which has been popularized by a seminal stream of research. This involves using a codification instrument to define risk types and semantic features, and then manually analyzing the narrative portions of annual reports. Coders read the text and classify it to create indexes of risk disclosure, which can be compared to draw conclusions about the quality of the disclosed information. This method has been utilized by various researchers in different settings (Serrasqueiro & Mineiro, 2018).

According to a recent study conducted by Dey et al. (2018), there are various interpretations of the concept of risk, and the definition and context of risk disclosure vary among researchers. Following their method, as well as the method employed by Lombardi et al. (2016), our analysis solely centered on the financial risks. According to Dey et al. (2018), corporate overall risk is often given more attention in previous research than financial risk. We initially conducted a thorough examination of the financial statements within the "risk management" section and any notes pertaining to financial instruments. We did not delve into general types of risks such as contextual, operational, or strategic risks.

Table 1 of this study highlights the financial risk disclosure index (FRDI), developed by Dey et al. (2018), which was utilized in the analysis. The index comprises thirty items that are categorized based on credit risks, liquidity risks, currency risks, interest rate risks, capital structure risks, and general items. The number of items in each category is inconsistent, with seven items under credit risks, six items for liquidity risks, four items for currency risks, four items for interest rate risks, six items for capital structure risks, and three items for general items. The financial risk disclosure index takes into account all five types of financial risks, ensuring a comprehensive coverage of each category. Should a company encounter any form of financial risk, such risk is included in the computation of the FRDI. The index features the most crucial items for each category of risk, indicating the information that companies must specify to provide comprehensive information on that particular risk (Dey et al., 2018).

3.2. Financial risk disclosure index

The creation of a financial risk disclosure index (FRDI) serves as a measuring tool to gauge the extent to which listed companies are disclosing financial risks. Utilizing Dey et al.'s (2018) index, we reviewed the annual reports of various companies within the study period. Our examination entailed comparing the disclosed information with the FRDI items by calculating the disclosure index pertaining to each financial risk category, as well as an overall financial risk disclosure index. The degree of completeness of information detailed within each document played a vital role in the assignment of scores for each item. A clear and systematic expression of an item will receive a score of 1 while

an absence of qualitative or quantitative information regarding an item earns a score of 0. In order to evaluate the level of risk associated with a particular activity or situation, an analysis is undertaken whereby individual scores are allocated to each separate element under examination. These scores are then compiled to give an overall total, which is subsequently measured against the maximum possible score. The maximum score represents the sum total of all the items that comprise the risk assessment, allowing for a comparative analysis of the degree of risk inherent in the activity under scrutiny. The following formula is used to estimate the disclosure index of each financial risk assessed (Dey et al., 2018). Despite the use of the three-directorship criterion by various studies, the present study defines a busy board member as one holding at least two additional director positions. This definition was chosen for several reasons. Firstly, the three-directorship criterion is considered arbitrary by some (Fich & Shivdasani, 2006). Secondly, it aligns with the Council for Institutional Investors' suggestion that directors sit on a maximum of two boards. Finally, we contend that this definition is more reliable and provides a clearer indication of a board member's level of busyness.

$$0 \leq FRDIj = \frac{Score\ obtained\ from\ the\ jth\ company}{Maximum\ possible\ score} \leq 1 \quad (2)$$

3.3. Variables definitions and measurements

A similar methodology as used by Ntim et al. (2013) and Zango et al. (2016) was adopted to measure board independence and board size. Board independence is measured as the percentage of independent non-executive directors to the total number of directors on the board of a firm, while board size is measured as the total number of directors on the board of a firm. Board busyness is measured as the total number of directors who have another directorship. Following Zango et al. (2016), we define board meetings as the number of board meetings per annum.

According to prior research on voluntary disclosure (Oh & Park, 2017), the control variables consist of firm characteristics that change over time and are anticipated to have an impact on corporate disclosure. In the field of risk disclosure, numerous studies have explored multiple influencing factors, including a company's size and profitability (Allini et al., 2016; Hady, 2019; Ntim et al., 2013). In line with previous research, this study included three control variables that reflect the role of general firm characteristics, such as company size, profitability, and debt, in determining the level of financial risk disclosure.

While Beretta and Bozzolan (2004) argued that company size is a stronger driver of disclosure, their findings were inconclusive. On the other hand, Linsley et al. (2006) found that there is a positive correlation between company size and risk disclosure. More recently, Hady (2019) discovered that company size plays a significant role in financial risk disclosure. As per his findings, stakeholders tend to be more concerned about the condition of larger companies, which typically have more shareholders. As per the principles of agency theory, larger companies may face higher agency costs, thereby making information disclosure a practical way of reducing such costs. Company size is measured as the natural logarithm of total assets (Ntim et al., 2013; Oh & Park, 2017).

Hady (2019) suggested that companies with higher levels of profitability tend to disclose financial statements more extensively, particularly with regard to financial risks. In contrast, companies with lower profitability may disclose financial statements less extensively. However, the relationship between profitability and risk disclosure is still inconclusive based on empirical evidence. Although Allini et al. (2016) found a negative association, indicating that higher profitability may lead to less risk disclosure, others have reported a positive effect (Hady, 2019; Ntim et al., 2013). Therefore, company profitability is measured as the return on assets which is the percentage of net income to total assets (Hady, 2019).

Table 1. Variables definitions and measurements

Variable	*Acronym*	*Measurement*	*Expected sign*
Dependent variable			
Financial risk disclosure	*FRD*	A clear and systematic expression of an item will receive a score of 1 while an absence of qualitative or quantitative information regarding an item earns a score of 0. The total sum of scores assigned to each item within the analyzed risk is compared to the maximum score, which is equivalent to the total number of items making up the assessed risk. The following formula is used to estimate the disclosure index of each financial risk assessed. $0 \leq FRDI_j = (Score\ obtained\ from\ the\ jth\ company)/(Maximum\ possible\ score) \leq 1$	
Independent variables			
Board busyness	*bodbusy*	Total number of directors who have another directorship	(-)
Board size	*bodsize*	Total number of directors on the board of a firm	(+)
Board independence	*bodindep*	Percentage of independent non-executive directors to the total number of directors on the board of a firm	(+)
Board meetings	*bodmeeting*	Number of board meetings per annum	(+)
Control variables			
Company size	*Logasst*	Natural logarithm of total assets	
Company debts	*Logdebt*	Natural logarithm of long-term and short-term debts	
Company profitability	*ROA*	Return on assets which is the percentage of net income to total assets	

In a study conducted by Eng and Mak (2003), it was found that firms with lower debt and larger sizes tend to have increased disclosure practices. Recent studies have suggested that firms value credit ratings highly as they reflect the evaluation of the firm in the capital markets, thereby affecting their financial decisions including target leverage (Oh & Park, 2017). Jensen and Meckling (1976), among others, have posited that companies with higher levels of debt in their capital structure incur increased agency costs. To mitigate these costs, firms could boost their disclosure levels (Ahmed, 1996). Additionally, companies with higher borrowings are closely monitored by financial institutions and as such, may be required to provide information more frequently than their counterparts with lesser debt (Ahmed, 1996). Hence, firms with greater levels of debt are expected to offer more detailed information in their annual reports than those with lesser debt. Similar to the work of Ahmed (1996), company debts are measured as the total book value of debt. To eliminate normality issues we calculate its natural logarithm.

4. RESULTS AND DISCUSSION

4.1. Results of the main model

The descriptive statistics for all the variables of this study are shown in Table 2; dependent, independent, and control variables. With regard to financial risk disclosure, an average ratio of 37% has been identified. The range of financial risk disclosure varies from the lowest of 0% to the highest of 63%. Interestingly, there is a particular company that has refrained from disclosing its financial risks for a considerable period of seven years. The results are less than what Bufarwa et al. (2020) reported, where the average, minimum, and maximum risk disclosure are 65.2%, 30%, and 100%, respectively. The size of the corporate board in terms of directors ranges from 7 to 9 members with an average of 8 members and a standard deviation of 1. The results indicate the companies' adherence to the specified number for the formation of the board of directors, as the Saudi corporate governance code specifies that the number should not exceed 11 or be less than 3 members. The results are similar to a previous study in Saudi Arabia (Al-Dubai & Abdelhalim, 2021) regarding the average size of the board of directors while differing in the range of sizes of those boards. This difference is due to the study sample, where the previous study included 10 different sectors while the current study only focused on one sector. However, the findings of this research appear to align with the viewpoint presented by Bufarwa et al. (2020) stating that for a corporate board to operate efficiently, it should not have more than 7 or 8 directors. A large number of directors could lead to a decline in the board's effectiveness.

Also, the table shows the descriptive statistics of the level of financial risk disclosure categories. As can be seen, the sample recorded a level of zero disclosure for all items of the financial risk disclosure index adopted in this study during a period of time. The results also show that the lowest level of disclosure occurred with regard to the capital structure risks.

Table 2. Descriptive statistics of the variables

Descriptive statistics of the variables				
Variable	***Mean***	***S.D.***	***Minimum***	***Maximum***
FRD	0.37	0.20	0	0.63
bodindep	0.50	0.18	0.25	1
bodsize	8	1	7	9
bodbusy	7	1	5	9
bodmeeting	6	2	2	13
Logasst	8.51	1.95	5.74	11.21
Logdebt	7.23	3.25	1.37	11.08
ROA	0.04	0.4	-0.05	0.11
Descriptive statistics of the level of financial risk disclosure categories				
General	0.60	0.48	0	1
Credit risk	0.44	0.27	0	0.86
Liquidity risk	0.46	0.31	0	0.83
Currency risk	0.57	0.23	0	0.67
Interest rate risk	0.41	0.26	0	0.75
Capital structure risk	0.03	0.07	0	0.2

Note: FRD = Financial risk disclosure, bodindep = Board independence, bodsize = Board size, bodbusy = Board busyness, bodmeeting = Board meetings, Logasst = Natural logarithm of total assets, Logdebt = Natural logarithm of debt, ROA = Return on assets.

Table 3 shows the transition probabilities. In cross-sectional time-series data, we can estimate the probability that $x_{i,t+1} = v_{i,t+1}$ given that $x_{it} = v_1$ by counting transitions using the xttrans command in STATA. As can be shown from the table above, the recorded levels of financial risk disclosure in the study sample showed an improvement compared to the previous year in 7 levels out of 11. For example, 14% of the study sample recorded an improvement in the disclosure level from nothing to 10% in the following year, and another 14% to a level of 20% of the total disclosures. In the same vein, 67% of the study sample recorded a probability to improve their *FRD* from 40% level into 53% and from 53% level into 60%. This development may be due to the possibility of changes occurring in the size of the board of directors, its busyness, independence, and number of its meetings, or perhaps, to other variables out of the scope of this study.

Table 3. Financial risk disclosure transition probabilities

	0	*0.1*	*0.2*	*0.3*	*0.33*	*0.37*	*0.4*	*0.53*	*0.57*	*0.6*	*0.63*	*Total*
0	71.43	14.29	14.29	0	0	0	0	0	0	0	0	100
0.1	100	0	0	0	0	0	0	0	0	0	0	100
0.2	0	0	50	0	50	0	0	0	0	0	0	100
0.3	0	0	0	80	10	0	0	0	10	0	0	100
0.33	0	0	0	0	75	12.5	0	0	0	12.5	0	100
0.37	0	0	0	0	0	0	100	0	0	0	0	100
0.4	0	0	0	0	0	0	66.67	33.33	0	0	0	100
0.53	0	0	0	0	0	0	0	66.67	0	33.33	0	100
0.57	0	0	0	0	0	0	0	0	100	0	0	100
0.6	0	0	0	0	0	0	0	0	0	80	20	100
0.63	0	0	0	0	0	0	0	0	0	0	100	100
Total	12.5	2.08	4.17	16.67	16.67	2.08	6.25	6.25	10.42	12.5	10.42	100

The probability of change in the level of disclosures for the 7 groups that make up the financial risk disclosure index was tested and reported in Tables 4, 5 and 6. As noted in Table 4, 11% of sample companies that had not made any public disclosures fully disclosed all items in that category. As for credit risks, as shown in Table 4, 14% of the sample companies that did not disclose any credit risks, the level of disclosure of those risks increased in the following year to a level of 14%, and to a level of 29% for 14% of other companies.

Table 4. Transition probabilities

	Credit risk disclosure								*General risk disclosure*			
	0	*0.14*	*0.29*	*0.43*	*0.57*	*0.71*	*0.86*	*Total*	*0*	*0.33*	*1*	*Total*
0	71.43	14.29	14.29	0	0	0	0	100	88.89	0	11.11	100
0.14	0	50	50	0	0	0	0	100				
0.29	10	0	70	10	10	0	0	100				
0.33									0	75	25	100
0.43	0	0	6.25	81.25	0	6.25	6.25	100				
0.57	0	0	0	0	100	0	0	100				
0.71	0	0	0	0	0	100	0	100				
0.86	0	0	0	0	0	0	100	100				
1									0	0	100	100
Total	12.5	4.17	20.83	29.17	4.17	10.42	18.75	100	33.33	6.25	60.42	100

In addition, for liquidity risks, Table 5 shows a general development in disclosing liquidity risk items in the following year. Regarding currency risks, companies that had a disclosure level of 33% and 67% for currency risks, their disclosure level did not change in the following year, while companies that did not disclose at all recorded an increase in their disclosure levels to a level of 33% (14% of sample companies) and to a level of 67% (also 14% of sample companies).

Table 5. Transition probabilities

	Liquidity risk disclosure					*Currency risk disclosure*			
	0	*0.17*	*0.33*	*0.83*	*Total*	*0*	*0.33*	*0.67*	*Total*
0	87.5	0	12.5	0	100	71.43	14.29	14.29	100
0.17	0	50	50	0	100				
0.33	0	0	86.36	13.64	100	100	0	0	100
0.67						0	0	100	100
0.83	0	0	0	100	100				
Total	14.58	2.08	43.75	39.58	100	12.5	2.08	85.42	100

As seen in Table 6, around 14% of the sample companies that achieved a disclosure level of 25% regarding interest rate risk, did not disclose these risks at all in the following year. The results show also a slight improvement in the disclosure levels of capital risks.

Table 6. Transition probabilities

	Board busyness						*Board size*			
	5	*6*	*7*	*8*	*9*	*Total*	*7*	*8*	*9*	*Total*
5	78.57	14.29	7.14	0	0	100				
6	0	77.78	11.11	11.11	0	100				
7	0	0	63.64	18.18	18.18	100	100	0	0	100
8	0	0	12.5	62.5	25	100	0	93.33	6.67	100
9	0	16.67	0	50	33.33	100	0	0	100	100
Total	22.92	20.83	20.83	22.92	12.5	100	25	29.17	45.83	100

Regarding board busyness, Table 6 shows that, while all boards recorded an increase in the number of busy members in the following years, 50% of the study sample, in which all board members were busy, saw a reduction in the number of those members by one member and approximately 17% by

three members. The sizes of the board of directors remained stable without any change in the number of members in the following years, except for about 7% of the study sample which recorded an increase in the number of members from 8 to 9, as can be shown from the table.

Table 7. Board independence transition probabilities

	0.25	*0.33*	*0.38*	*0.43*	*0.44*	*0.57*	*0.63*	*0.67*	*0.75*	*Total*
0.25	66.67	33.33	0	0	0	0	0	0	0	100
0.33	0	92.31	0	0	7.69	0	0	0	0	100
0.43	0	0	0	100	0	0	0	0	0	100
0.44	0	0	0	0	100	0	0	0	0	100
0.57	0	0	0	20	0	80	0	0	0	100
0.63	0	0	12.5	0	0	0	87.5	0	0	100
0.67	0	25	0	0	0	0	0	75	0	100
0.75	0	0	0	0	0	0	33.33	0	66.67	100
1	0	0	0	0	0	0	0	50	50	100
Total	4.17	29.17	2.08	16.67	8.33	8.33	16.67	8.33	6.25	100

From Table 7, it can be observed that there is a clear decrease in the percentage of independent members on the boards of directors. One-third of the study sample recorded a decrease in the percentage of independent members from 75% in the following years to 63%. Additionally, in companies where all members were independent, half of them saw a decline in independence to 75%, and the other half to 67%. This could affect the level of financial risk disclosure according to previous studies.

Table 8. Board meetings transition probabilities

	2	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*Total*
2	0	0	0	0	0	0	100	0	0	0	0	100
4	7.14	50	28.57	0	0	14.29	0	0	0	0	0	100
5	0	40	20	30	10	0	0	0	0	0	0	100
6	0	23.08	15.38	30.77	7.69	0	15.38	0	7.69	0	0	100
7	0	0	0	100	0	0	0	0	0	0	0	100
8	0	0	33.33	33.33	0	0	0	0	0	0	33.33	100
9	0	0	50	50	0	0	0	0	0	0	0	100
10	0	0	0	100	0	0	0	0	0	0	0	100
12	0	0	0	0	0	0	0	100	0	0	0	100
13	0	0	0	0	0	0	0	0	0	100	0	100
Total	2.08	29.17	20.83	25	4.17	4.17	6.25	2.08	2.08	2.08	2.08	100

With regard to board meetings, it is evident from Table 8 that a significant decrease occurred in the following years' meetings for sample companies with 8 annual meetings. Where, the meetings decreased by 2 meetings for one-third of the sample, and by 3 meetings for the other third. While companies with 2, 7, 10, 12, and 13 annual meetings remained stable and did not change in the following years.

In the model estimation, the Breusch–Pagan/ Cook–Weisberg test for heteroscedasticity and the Wooldridge test for autocorrelation in panel data were performed using STATA software. Based on the heteroscedasticity test results, the null hypotheses of constant variance were accepted ($Chi^2 = 5.06$, $p < 0.2813$), which indicates that the data is homoscedastic. Wooldridge test shows there is an autocorrelation problem ($F(1,3) = 18.313$, $p < 0.0234$). Thus, to obtain a robust estimation against autocorrelation problems, linear regression, and correlated panels corrected standard errors (PCSEs) model are used (Greene, 2018).

Displayed in Table 9 is a thorough correlation analysis of the variables investigated in this study. Upon examining the table, it becomes apparent that a negative correlation exists between board independence and ROA in relation to financial risk disclosure. On the other hand, board size and board busyness demonstrate a positive correlation, which was observed at a significant level of 1%.

Table 9. Correlations among variables

Variable	*FRD*	*bodindep*	*bodsize*	*bodbusy*	*bodmeeting*	*Logasst*	*Logdebt*	*ROA*
FRD	1.00							
bodindep	-0.61***	1.00						
bodsize	0.51***	-0.21	1.00					
bodbusy	0.37***	0.05	0.55***	1.00				
bodmeeting	-0.10	0.39***	0.06	0.26*	1.00			
Logasst	-0.08	-0.33**	-0.02	0.30**	-0.62***	1.00		
Logdebt	-0.06	-0.35**	-0.02	-0.28**	-0.63***	0.97***	1.00	
ROA	-0.38***	0.36***	-0.67***	-0.18	0.24*	-0.39***	-0.41***	1.00

*Note: * p < 0.1, ** p < 0.05, *** p < 0.01 (two-tailed significance); n52 = firm-year observations. FRD = Financial risk disclosure, bodindep = Board independence, bodsize = Board size, bodbusy = Board busyness, bodmeeting = Board meetings, Logasst = Natural logarithm of total assets, Logdebt = Natural logarithm of debt, ROA = Return on assets.*

The study used panel data regression to analyze the relationship between financial risk disclosure and various independent variables. The analysis included five models, one of which used linear regression with corrected standard errors as proposed by Greene (2018), while the other

four used the same method for each independent variable. The results in Table 4 showed that all models had a good fit, with adjusted R^2 values ranging from 0.164 to 0.6889. The study's findings reveal that a considerable amount of variation in financial risk disclosure could be attributed to the independent variables analyzed, as suggested by the significant F-statistics. Specifically, the outcomes demonstrate that board size and board independence are the main factors that hold a significant influence on financial risk disclosure, consistent with initial predictions. However, board independence did not affect the disclosure in the expected manner. On the other hand, when analyzed separately, board busyness was found to have a positive influence on financial risk disclosure, regardless of other independent variables.

In the primary model of the study, referred to as Model 1, the board busyness coefficient was positive, but it did not have any statistical significance. However, when the variable was separately analyzed with financial risk disclosure in Model 2, the outcomes became significant with a p-value of 5%. The implication is that an abundance of board members with a directorship in other companies can enhance the quantity of financial risk disclosure to some degree. This is due to the fact that busy boards generally have more resources available, which increases their ability to disclose risk and they can provide advantages such as transferable skills, networking opportunities, and more transparency, as found in studies by Fich and Shivdasani (2006) and Al-Yahyaee and Al-Hadi (2016). However, this favorable outcome may diminish when other factors are considered. Ferris et al. (2003) found no evidence for the notion that having board members with multiple directorships correlates with company performance.

Table 10. Results of regression analyses

Variable	*Model 1*		*Model 2*		*Model 3*		*Model 4*		*Model 5*		*Model 6*		*Model 7*	
	Coeff.	*z*	*Coeff.*	*z*	*Coeff.*	*z*	*Coeff.*	*z*	*Coeff.*	*z*	*Coeff.*	*z*	*Coeff.*	*z*
bodbusy	0.00331	0.23	0.0432**	2.55							0.00331	0.22	0.00331	0.20
bodsize	0.214***	4.18			0.322***	6.25					0.214***	4.16	0.214***	3.83
bodindep	-0.540***	-4.24					-0.767***	-5.86			-0.540***	-5.06	-0.540***	-4.66
bodmeeting	-0.00403	-0.40							-0.0174	-1.44	-0.00403	-0.45	-0.00403	-0.41
Logasst	-0.288***	-4.40	-0.169***	-3.12	-0.442***	-6.13	-0.0635*	-1.78	-0.126**	-2.48	-0.288***	-4.66	-0.288***	-4.29
Logdebt	0.158***	3.85	0.0878***	2.99	0.257***	5.91	0.0166	0.81	0.0507*	1.74	0.158***	4.19	0.158***	3.86
ROA	-0.403	-0.65	-2.470**	-2.13	-0.829	-1.00	-1.155	-1.58	-2.432**	-2.17	-0.403	-0.63	-0.403	-0.58
Intercept	0.213	0.83	0.972***	3.13	-0.333	-1.12	1.213***	6.80	1.270***	4.55	0.213	0.73	0.213	0.67
Dependent variable: FRD														
R^2	0.6889		0.207		0.520		0.546		0.164		--		--	
R^2 within													0.4185	
R^2 between													0.9754	
R^2 overall													0.6889	
Prob. > Chi^2	0.0000		0.0009		0.0000		0.0000		0.0056		0.0000		0.0000	
Obs.	52		52		52		52		52		52		52	

*Note: 1) *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. 2) FRD = Financial risk disclosure, Bodindep = Board independence, bodsize = Board size, bodbusy = Board busyness, bodmeeting = Board meetings, Logasst = Natural logarithm of total assets, Logdebt = Natural logarithm of debt, ROA = Return on assets.*
Model 1 = Linear regression, correlated panels corrected standard errors (PCSEs), Models 2–5 = Linear regressions, correlated panels corrected standard errors (PCSEs) for each independent variable separately, Model 6 = Cross-sectional time-series feasible generalized least squares (FGLS) regression, Model 7 = Random-effects generalized least squares (GLS) regression.

According to the results of Model 1 and Model 3 of Table 10, the independent variable bodsize has a positive and significant coefficient at the 1% level. This suggests that a firm's board size is a determinant of the level of financial risk disclosure. The positive coefficient further implies that firms with larger board sizes are more likely to engage in high levels of financial risk disclosure. These findings support the theory of agency and are consistent with previous research by Bufarwa et al. (2020), Elzahar and Hussainey (2012), Hady (2019), and Ntim et al. (2013). The growth of a board can result in the incorporation of diverse expertise, including members with financial and accounting backgrounds. This can affect a manager's voluntary disclosure decisions and ultimately lead to an increase in corporate risk disclosure levels (Elzahar & Hussainey, 2012). Furthermore, a board that is bigger in size has the potential to provide diverse viewpoints in deliberations about financial risks. Nevertheless, the results of the study could reveal additional features that could have an impact on the size of the board, such as the competencies, skills, and expertise of its members, as posited by Zango et al. (2016).

In terms of board independence, independent board members are expected to provide a high level of financial risk disclosure to ensure meeting shareholder expectations in terms of accountability and transparency. The findings in Model 1 and Model 4 of Table 10 do not support our expectation: board independence (*bodindep*) has a significant negative impact at the 1% level, which indicates that independent board members have a low level of financial risk disclosure, which can be concerning. One possible justification for this could be that the independent board members may not possess the required expertise or knowledge of the financial risks associated with the company's operations. In such cases, these board members may be unable to provide the expected level of financial risk disclosure, even if they are highly committed to fulfilling their duties in this regard. Another possible reason could be the lack of access to the relevant information. If the independent board members do not have access to the necessary financial data or the company's financial risk management strategies, they may be unable to make informed decisions or provide detailed risk disclosures accordingly. The results are in contrast with previous studies on financial risk disclosure (Abraham & Cox, 2007; Hady, 2019), financial information disclosure (Chen

& Jaggi, 2000; Forker, 1992), voluntary corporate disclosure (Gul & Leung, 2004) and on disclosure quality (Beasley, 1996).

With respect to board meetings, we expect that frequent meetings by the board can enhance levels of financial risk disclosure. The results of Model 1 and Model 5 of Table 10 do not support our expectations. The coefficient on board meetings (*bodmeeting*) is negative and insignificant, suggesting that frequent board meetings alone may not be enough to drive meaningful improvements in financial risk disclosure. In order to be effective, boards must be well-equipped with the right skills and knowledge of the financial risks associated with the company's operations and operate in a culture of transparency and risk management. If the organization does not prioritize transparency and risk management, board meetings are unlikely to change this. Even if board members are pushing for greater disclosure, other stakeholders may push back, limiting the board's effectiveness. The results are in line with the findings of Hady's (2019) and Zango et al.'s (2016) studies.

Regarding the control variables, the coefficient for company size (*logasst*) is noted as being statistically significant and negative ($p < 0.01$). This finding contradicts previous studies (Abraham & Cox, 2007; Amran et al., 2009; Beretta & Bozzolan, 2004; Hady, 2019; Linsley et al., 2006), which suggest that there exists a positive correlation between company size and risk disclosure. These results indicate that smaller companies are more likely to disclose information on their financial risks than larger companies, which is in opposition to the principles stated in agency theory, where information disclosure is considered a means to reduce agency costs. One possible justification for this could be that smaller companies may view increased transparency and disclosure as a way to earn the trust and loyalty of their investors. By disclosing financial risks and vulnerabilities, smaller companies may be able to demonstrate their commitment to ethical business practices and responsible financial management. This can help to attract investment in the long term. A company's debt (*logdebt*) is, also, statistically significant but positive ($p < 0.01$), and this indicates that companies with higher debt tend to disclose financial risks more than their counterparts because they are under more pressure to do so. When a company has a lot of debt, it is at a greater risk of defaulting on its obligations, and this can lead to serious consequences for both the company and its creditors. As a result, many investors and regulatory bodies demand greater transparency from companies that have significant financial liabilities. The coefficient on the firm's performance (*ROA*) is negative and insignificant. The result is in contrast to the findings of Hady (2019) where the profitability of the company has been found to have a positive influence on the level of financial risk disclosure. One reason for this could be that companies performing exceptionally well might be inclined to highlight their successes while neglecting to disclose the various risks involved. Conversely, high profitability may indicate that the company operates in a relatively low-risk industry or has effective risk management practices in place (Allini et al., 2016).

4.2. Robustness analysis

To ensure the accuracy and reliability of our previously presented findings, we conducted two regressions: cross-sectional time-series FGLS regression (as displayed in Model 6) and random-effects GLS regression (as displayed in Model 7). The results from both regressions as shown in Table 10 were consistent and similar. Specifically, the coefficient for board size (*bodsize*) was positive and statistically significant at the 1% level, with a coefficient of 0.214 and z-statistics of 4.16 and 3.83, respectively. Additionally, the coefficient for board independence (*bodindep*) was negative and significant at the 1% level, with a coefficient of -0.540 and z-statistics of -5.06 and -4.66, respectively. However, we did not find any significant impact for board busyness (*bodbusy*), board meetings (*bodmeeting*), and return on assets (*ROA*) on financial risk disclosure in these regressions. Furthermore, the results from these two robust regressions revealed that the coefficient estimates on company size (*Logasst*) and company debts (*Logdebt*) were negative and positive, respectively, and both were significant at the 1% level.

5. CONCLUSION

The study aimed to examine how the characteristics of board directors impact the financial risk disclosure of companies listed in the energy sector in Saudi Arabia. Spanning a time frame of 13 years from 2009 to 2021, the analysis included 52 firm-year observations. The study's results demonstrate that varying degrees of financial risk disclosure can be linked to the examined independent variables. Specifically, board size and independence were found to be the primary factors that have a significant influence on financial risk disclosure, which aligns with the study's initial hypotheses. However, the impact of board independence was not as predicted. Conversely, an analysis of board busyness as an independent variable showed a positive, albeit statistically insignificant, influence on financial risk disclosure. However, when analyzed separately with financial risk disclosure, the outcomes became significant, indicating that an abundance of board members with directorships in other companies can enhance the quantity of financial risk disclosure to a certain extent. The findings further indicate that board size is a determinant of the level of financial risk disclosure, with large board sizes more likely to engage in high levels of financial risk disclosure. These results support the theory of agency and past research, as larger boards can incorporate a range of expertise, including members with financial and accounting backgrounds. However, the expectation of independent board members providing a high level of financial risk disclosure was not supported by the results — instead, it was found that independent board members had a low level of financial risk disclosure, which could be a cause for concern. One possible explanation is that these members may lack the knowledge and expertise to provide detailed risk disclosures. Finally, the study explores the potential impact of board meetings on financial risk disclosure. While frequent board meetings were expected to enhance levels of

financial risk disclosure, the results did not support this hypothesis. The coefficient on board meetings was negative and insignificant, suggesting that regular meetings alone may not be enough to drive meaningful improvements in financial risk disclosure. Instead, boards must operate in a culture of transparency and risk management, with the right skills and knowledge of the financial risks associated with the company's operations, in order to effectively drive meaningful improvements in financial risk disclosure.

The findings of this study have significant implications for both academia and practice. Firstly, the theoretical implications of this study point to the critical role of board sizes and board independence in financial risk disclosure. Secondly, the results can guide companies to reconsider some characteristics that promote financial disclosure practices. Specifically, the study shows the positive impact of larger board sizes with less board independence. Based on the research findings that board size has a significant positive impact on financial risk disclosure, it can be inferred that larger boards are better equipped to monitor and oversee financial disclosures, potentially leading to greater transparency. However, the negative impact of board independence on financial risk disclosure suggests that a board consisting solely of independent directors may not be as effective in promoting transparent financial disclosures. Additionally, the lack of significant impact for board meetings suggests that simply holding more meetings may not be sufficient in promoting financial risk disclosure. Instead, attention should be paid to the composition of the board, particularly with regard to size and independence, to ensure the effectiveness of board oversight of financial risk disclosures.

The current study is not without its limitations, and these limitations provide guidance for future research. Firstly, the scope of the study only covers the factors that may affect the level of financial risk disclosure. Hence, future studies could expand on the potential effects of non-financial risk disclosure. Secondly, this study only examines the relationship between board business, board size, board independence, board meetings, and financial risk disclosure in a single sector and country. Future research could benefit from broadening the investigation to an international level, incorporating multiple sectors and diverse ownership structures. Finally, this study primarily concentrates on the characteristics of the board of directors, whereas future research could focus on the characteristics of other board committees, such as the audit committee, which have a direct impact on financial disclosure.

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