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Board characteristics and the likelihood of financial statements fraud: empirical evidence from an emerging market

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Abstract

This study examines the relationship between board characteristics and the likelihood of fraud in financial statements in the Saudi stock exchange as one of the emerging markets. Financial statements of 67 companies listed on the Saudi Stock Exchange have been collected over six years from 2014 to 2019. The modified Beneish M-score model (Beneish in *Financ Anal J* 55(5):24–36, 1999) has been used to measure fraudulent financial statements. Panel data techniques have been used to examine the relationship between financial statement fraud and four characteristics of the board: independence, size, meetings frequency, and gender diversity. The findings indicate that the likelihood of fraud in financial statements is negatively and significantly related to board independence and it is positively and significantly related to the board size. The results also indicate that the representation of women on the board and the frequency of meetings have no significant relationship with the likelihood of fraud in the financial statements. The results of this study provide insight into the importance of corporate governance mechanisms, including the board of directors, in preventing corporate managers from engaging in fraudulent financial reporting activities. In emerging markets such as the Saudi Stock Exchange, financial statements are the main and almost the only source of information about the company. Therefore, examining the factors that reduce financial statement fraud in these markets is important.

Keywords Corporate governance, Financial reporting, Fraud, Saudi Arabia

Introduction

Companies generally provide information to users through financial statements. The financial information provided by these statements has a direct impact on social and economic life. The effectiveness of the economic system, efficiency of capital markets, as well as socio-economic dynamics such as a fair tax structure are directly related to the correct and honest transfer of financial information [74]. Fraud is one of the main reasons for reducing the reliability of financial information.

Financial statement fraud is defined by the Statement of Auditing Standards 99 as intentional misstatement or omission of disclosures in financial statements designed to deceive users of financial statements (AICPA [13]). According to the Association of Certified Fraud Examiners (ACFE), fraud in financial statements includes all actions taken by executive directors and senior managers in a company to cover actual financial conditions and manipulate the presentation of financial statements to their advantage (ACFE [19]). Various types of financial statement fraud include manipulation of a company's earnings and cash flows, intentional omissions of critical information (such as large expenses), and misapplication of accounting standards when preparing financial statements [80, 96].

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A company's management might engage in fraudulent activities to increase their personal rewards such as job security, salaries, and bonuses [84]. Financial statement fraud has received widespread attention from investors, academia, press, regulators, and the economic community in general as a result of the occurrence of many financial scandals such as Enron, Tyco, WorldCom, Qwest, and Lehman Brothers [59, 69, 75, 81, 90]. These high-profile scandals have not only caused substantial losses to these companies but have also led to the loss of billions of dollars in market capitalization from various stock exchanges around the world as well as damaged the credibility of the accounting profession and negatively affected public confidence in the financial statements [32, 85].

The frequent occurrence of financial statement fraud may indicate ineffective corporate governance mechanisms. Several studies provide evidence of the importance of effective corporate governance mechanisms in reducing incidences of fraudulent financial statements (e.g., [20, 60–62, 68, 70, 73, 75, 82, 94]). One of the most important mechanisms of corporate governance that affects the integrity of financial statements is the board of directors (Anderson et al., [8, 71]). Jensen and Meckling [41] argue that principal-agent problems such as financial fraud can be mitigated through two types of internal governance mechanisms: agent-side and control-side mechanisms. On one hand, agent-side mechanisms focus on providing executives with incentives such as share ownership, to help align the interests of agents and principals. On the other hand, the monitor-side mechanisms mainly focus on the board of directors as the main internal monitor to mitigate agency problems. The board performs this function by appointing or dismissing executive managers, determining their salaries, and following up on their activities, which contributes to preventing them from committing financial fraud.

In light of this important monitoring role of the board of directors, several studies have attempted to identify the types of boards that are effective in deterring financial statement fraud. These studies examined this issue from the perspective of board characteristics that increase the effectiveness of its monitoring role such as board independence [17, 75], Uwugbe et al. [87]; [7, 20, 26, 70, 88], board size [7, 11, 16, 70], board gender diversity [43, 50, 52, 56, 90], Cumming et al., [25]), Board age [93], board expertise [35], board meetings [33], Kjærland et al., [46]; [78], board rewards [88].

This study examines the effect of board characteristics (namely, independence, size, meeting frequency, and gender diversity) on the likelihood of fraud in financial statements in Saudi Arabia. This study contributes to the literature for several reasons. First, corporate governance

in the Saudi context has distinct characteristics that differ from other countries. On one hand, the literature has documented three models of corporate governance as follows: (1) The Anglo-Saxon Model, (2) The Continental-European Model, and (3) The Japanese Model [5, 86]. The Saudi governance regulation adopts the Anglo-Saxon model of corporate governance. The Anglo-Saxon model is designed to suit contexts characterized by financing through equity, dispersed ownership, active markets for corporate control, and flexible labor markets. In other words, the Anglo-Saxon model is designed for contexts characterized by an efficient capital market, sound legal structure, and strong shareholders activation [65]. On the contrary, the Saudi context is characterized by centralized ownership structures dominated by government or family ownership, low institutional and foreign ownership, weak shareholder activism, weak enforcement of corporate regulations, the weak market for capital, managerial labor, and corporate control [9, 10, 14]. The lack of institutional factors for applying the Anglo-Saxon model in the Saudi context raises doubts about the effectiveness of Saudi governance regulation. On the other hand, the Saudi governance regulation adopts a voluntary approach to "compliance or explanation." The regulation requires all listed companies to report their adherence and compliance with this regulation or justify non-compliance with the regulation or some of its articles. This voluntary nature results in different levels of corporate compliance with governance regulation across Saudi companies. In light of these characteristics, the effectiveness of corporate governance mechanisms in the Saudi context is a questionable issue.

Second, in the Saudi stock exchange as one of the emerging markets, the financial statements are the main and almost the only source of information on which stakeholders rely in making their economic decisions in light of the lack of development of financial media and financial analysis profession. As fraud in financial statements reduces the credibility of these statements, it becomes necessary to examine the factors that help prevent this fraud. Third, Saudi Arabia is one of the Arab countries located in the Middle East. Based on Transparency International's 2020 Corruption Perceptions Index (CPI), all Middle Eastern and North African (MENA) countries scored below the world median, which suggests serious fraud and corruption problems exist in this region. Fourth, understanding the factors that prevent fraud in financial statements is not only important to Saudi Arabia, but to the global economy as a whole. Due to globalization and the free flow of capital across countries, the impact of financial statement fraud that occurs in one country can easily spread to other countries around the world.

The rest of the study was organized as follows: The second section presents previous studies and the development of research hypotheses. The third section presents the methodology of the study. The fourth section presents the results of the study. The fifth section discusses the results, while the sixth section presents the conclusion, limitations, and suggestions.

Literature review and hypothesis development

Financial statement fraud

Financial statements must display the actual financial condition and financial performance of the company. However, the reality indicates that there are still many financial statements that do not show the actual financial position or performance of the company (Md Nasir and Hashim [60]). There are several definitions of the term "fraud." Fraud is a general term that refers to an individual's use of all his/her abilities to gain unfair competitive advantages [51]. ISA 240 (*The Auditor's Responsibilities Relating to Fraud in an Audit of Financial Statements*) defines fraud as an intentional act performed by one or several managing individuals, upon persons responsible for governance, employees, or third parties, involving the use of deceit to obtain an unfair or illegal advantage (IFAC [38]). According to the Association of the Certified Fraud Examiners, financial statement fraud is the intentional, misstatement (or omission) of material facts or other types of data that when considered with other publicly available information would make the user of the information change or alter his/her judgment (ACFE [19]). SAS 99 (*Consideration of Fraud in a Financial Statement Audit*) distinguishes between fraud and error from the perspective of the intent of the person who commits it. Fraud is an intentional act, while error is an unintentional act.

Financial statement fraud includes several forms, including intentional falsification or manipulation of financial records and documents supporting business transactions, intentional omission of some events, transactions, accounts, or other important information that must be presented in the financial statements, intentional false application of accounting standards and policies when measuring events and transactions and deliberately omit some important information that must be disclosed under accounting standards [8, 91]. In this context, research has illustrated how investors can find themselves impacted by such behavior, with incorrect decision-making around investment decisions being a major issue [69].

Although both the concept of "earning management" and the concept of "fraud" involve providing false information to users, they differ in terms of earnings management is an exploitation of the flexibility of accounting

standards, that is, it takes place within the framework of accounting standards, while fraud involves violating accounting standards [72]. From the above, it can be deduced that financial statement fraud involves an intentional misstatement or misclassification of items in the financial statements in order to influence the decision-making of users. It is perpetrated by those in top management positions such as the Chief Executive Officers (CEOs) and Chief Financial Officers (CFOs) who have access and control over the financial records of a company.

Board of directors and financial statement fraud

The board of directors, as the highest management body in the company, bears the responsibility of exercising leadership, supervision, and control to achieve the company's continuity and prosperity. Alzoubi and Selamat [11] argue that board members are responsible for setting organizational goals and strategies that are aligned with the interests of shareholders. In the context of financial information, they are responsible for the transparency and reliability of the financial statements. This is consistent with the argument suggested by Fama and Jensen [30] in that the board of directors possesses ultimate decision-making power because they have the highest level of control over the company. Executives may have some incentive to manipulate the financial statements because the information contained in these statements reflects their managerial ability and thus can directly affect their wealth [95]. However, board members are responsible for monitoring executives' decisions and preventing financial statement fraud and thus reducing agency problems [35, 61]. Previous studies have argued that the effectiveness of the role of the board of directors as a governance mechanism can be affected by some of the characteristics of this board. This study examines the effect of four of these characteristics, namely board independence, the board size, board meeting frequency, and gender diversity.

Board independence and financial statement fraud

Since he is not involved in the day-to-day operations, it is expected that the independent director is not subject to any pressure from any organizational level within the company. Therefore, he is more likely to act independently and act in the best interests of the shareholders. Byrd and Hickman [23] suggest that the objectivity of independent board members contributes to improving the board's performance and thus making better use of the company's resources. Beasley [20] and Deshow et al. (1996) argue that as the number of non-executive members of the board of directors increases, their oversight becomes more effective, which reduces the scope for managerial opportunism and improves the

company performance. Several empirical studies have documented the positive impact of board independence on the quality of financial reporting (Alves, [12]; Lippolis and Grimaldi, [54]; Obigbemi et al., [64]; [67], Klein [47]).

Concerning the relationship between board independence and the likelihood of fraud in financial statements, empirical studies have provided evidence that board independence improves its oversight role over the company's activities, which reduces fraud (e.g., [17, 75], Uwuigbe et al. [87]; [7, 49, 70, 88]). Consistent with the results of these studies, the first hypothesis of the study can be formulated in the form of the null hypothesis as follows:

H01 There is no significant relationship between board independence and the likelihood of fraud in the financial statements.

Board size and financial statement fraud

Board size is an important dimension of the board structure (Noor and Fadzil, [63]) and can be used as a proxy for the efficiency of the board of directors (Jia and Zhang, [42]). With regard to the impact of board size on the likelihood of fraud in the financial statements, the studies have reached mixed results. On one hand, some studies have argued that the smaller the size of the board, the more effective its monitoring role, and thus the lower the likelihood of fraud in the financial statements. The large size may result in difficulties in the organization, communication, and coordination between board members, which negatively affects the effectiveness of its role in oversight [11, 16, 75], Abbot et al., [1]; [40, 53].

On the other hand, some studies found a positive relationship between the board size and its monitoring role. Small board size can increase the burdens and responsibilities on the members, which negatively affects their monitoring role [33], Pucheta-Martínez and Gallego-Álvarez, [66]; Singh et al., [83]; [7]. Finally, some studies have found that there is no significant relationship between the board size and the effectiveness of its monitoring role (Tran et al., 2020,[70]). In light of this contradiction in the results of previous studies, the second hypothesis of the study can be formulated in the form of the null hypothesis as follows:

H02 There is no significant relationship between board size and the likelihood of fraud in the financial statements.

Board meetings and financial statement fraud

Board meeting frequency is considered one of the essential corporate governance characteristics. The number of board meetings is an indication of the effort exerted by this board and then an indication of the board's effectiveness in monitoring management (Chen et al., 24). The literature related to meetings frequency and fraud in the financial statements has come to contradictory results. Some studies have provided empirical evidence that fraud in the financial statements is positively associated with the number of board meetings (Obigbemi et al., [64]), while other studies provided evidence that fraud in the financial statements is negatively associated with the number of board meetings (Ahmed et al., [6]; Istianingsih, [39]; Abbad et al., [3]; Gulzar and Zongjun, [34], Xie et al., 92).

On the other hand, some studies indicate that there is no significant relationship between the number of board meetings and fraud in the financial statements [33], Kjærland et al., [46]; Ebrahim, [27]). In light of this contradiction in the results of previous studies, the third hypothesis of the study can be formulated in the form of the null hypothesis as follows:

H03 There is no significant relationship between board meeting frequency and the likelihood of fraud in the financial statements.

Board diversity and financial statement fraud

In general, women are more sensitive to interpersonal relationships, more cooperative, and less likely to take risks than men [28]. Several studies have shown that the representation of women on the board of directors leads to an increase in the quality of financial reporting. Ho et al. [37] suggest that female corporate leaders are generally more conservative in financial reporting. When women are responsible for monitoring financial reporting policies, they are more sensitive to potential lawsuits and default risks than men [31]. Lara et al. [50] find that having independent female directors is associated with reduced earnings management practices. About the relationship between the representation of women on the board of directors and financial statement fraud, several studies have documented the existence of a significant impact of this representation in reducing fraud in the financial statements. For example, Adhikari et al. [4] and Wang et al. [90] confirm that women are more committed to ethical practices than men in corporate

leadership positions. Accordingly, women are less likely to be involved in crime and litigations than men. Maulidi [59] provides considerable evidence to suggest that companies with female CFOs are negatively associated with accounting fraud. Beu et al. [22] find that female leaders are more trustworthy and more compliant with regulations and rules when they make financial decisions. Kim et al. [45] find that the Securities and Exchanges Commission (SEC) violations are less likely when the board has more women. Faccio et al. [29] find that companies run by female Chief Executive Officer (CEO) have lower earnings violations. The results of Liao et al. [52] and Hanousek et al. (2019) document that companies run by a female CEO are reluctant to engage in corruption. In the same vein, Kamarudin et al. [43] and Madah Marzuki et al. [56] find a negative relationship between the percentage of female directors and the likelihood of fraud. In light of the results of previous studies, the fourth hypothesis of the study can be formulated in the form of the null hypothesis as follows:

H04 There is no significant relationship between board gender diversity and the likelihood of fraud in the financial statements.

Research method

Sample and data

The study population includes all companies listed on the Saudi Stock Exchange (Tadawul) for a period of 6 years (2014–2019). The study uses data extracted from the published financial statements of Saudi companies. Data collection was stopped at 2019 due to the occurrence of the COVID- 2019 pandemic, which moved to Saudi Arabia at the beginning of March 2020. As a result of this pandemic, the authorities in Saudi Arabia made a general closure of the economy as a precautionary procedure, which affected the economic activity of all Saudi companies. This issue may have a significant impact on some items of the financial statements. To avoid the impact of this pandemic on the results of the study, the time series of data was stopped at 2019.

By the end of 2019, the number of companies listed in the Saudi market reached 173 companies distributed over 20 sectors. In the first step for selecting the sample, the 45 financial companies (i.e., banks and insurance companies) were excluded. Banks and insurance companies have been excluded because these companies have a special way of preparing financial statements, and the nature of revenues and expenses in these companies is different from other

Table 1 Distribution of the sample across sectors

Sector	Number of companies	Percentage (%)
Basic industries	25	37.3
Telecommunications	4	5.9
Food production	12	17.9
Transportation	5	7.5
Real estate development	6	8.9
Capital goods	7	10.5
Retail trade	3	4.5
Healthcare	2	3
Pharmaceutical	1	1.5
Applications and technology Services	1	1.5
Media and entertainment	1	1.5
Total	67	100

non-financial companies. In the second step, 61 other companies were excluded from the study population for various reasons, such as some companies were listed in the stock market after the year 2014, and then their published financial statements on the Saudi Stock Exchange website do not cover the entire study period. Also, some companies were merged into other companies during the study period, and then no longer had their own published financial statements. In addition, some companies whose registration in the financial market was canceled during the study period. After these two steps, the remaining 67 non-financial companies represent the sample for this study. Table 1 shows the distribution of the study sample among sectors.

Variables measurement

Likelihood of financial statement fraud: The likelihood of financial statement fraud is measured by using the modified model of Beneish’s [21] M-score which was used by several studies in emerging markets (e.g., [44, 51, 55, 76, 77, 81], Rostami and Rezaei [75]; [70]). The model that was developed by Beneish [21] is optimized to estimate the probability of manipulation in financial statements. A company will be given a score of "1" if it has red flags indicating the likelihood of preparing fraudulent financial statements and "0" if otherwise. The modified Beneish model used in this study is:

$$\begin{aligned}
 M - \text{score} = & 0.002 + 0.665 (\text{TATA}) \\
 & + 0.257 (\text{LVGI}) + 0.024 (\text{SGAI}) \\
 & - 0.641 (\text{DEPI}) + 0.19 (\text{SGI}) + 0.004 (\text{AQI}) \\
 & - 0.032 (\text{GMI}) + 0.061 (\text{DSRI})
 \end{aligned}$$

where TATA: Total Accruals to Total Assets Index

TATA = $\frac{(\text{Operating Profit}_t - \text{Operating Cash Flow}_t)}{\text{Total Assets}_t}$ calculated by dividing the number of independent board members by the total number of board members.

LVGI: Financial leverage index

$$\text{LVGI} = \frac{(\text{Long Term Debt}_t + \text{Current Liabilities}_t) / \text{Total Assets}_t}{(\text{Long Term Debt}_{t-1} + \text{Current Liabilities}_{t-1}) / \text{Total Assets}_{t-1}}$$

SGAI: Sales, General, and Administrative Expenses Index

$$\text{SGAI} = \frac{\text{Sales, General and Administrative Expenses}_t / \text{Sales}_t}{\text{Sales, General, and Administrative Expenses}_{t-1} / \text{Sales}_{t-1}}$$

DEPI: Depreciation Expenses Index

$$\text{DEPI} = \frac{\text{Depreciation}_{t-1} / \text{Property, Plant \& Equipment}_{t-1}}{\text{Depreciation}_t / \text{Property, Plant \& equipment}_t}$$

SGI: Sales Growth Index

$$\text{SGI} = \frac{\text{Sales}_t}{\text{Sales}_{t-1}}$$

AQI: Asset Quality Index

$$\text{AQI} = \frac{1 - (\text{Current Assets}_t + \text{Property, Plant \& Equipment}_t) / \text{Total Assets}_t}{1 - (\text{Current Assets}_{t-1} + \text{Property, Plant \& Equipment}_{t-1}) / \text{Total Assets}_{t-1}}$$

GMI: Gross margin index

$$\text{GMI} = \frac{(\text{Sales}_{t-1} - \text{Cost of Goods Sold}_{t-1}) / \text{Sales}_{t-1}}{(\text{Sales}_t - \text{Cost of Goods Sold}_t) / \text{Sales}_t}$$

DSRI: The sales index in receivable accounts

$$\text{DSRI} = \frac{(\text{Accounts Receivable}_t / \text{Sales}_t)}{(\text{Accounts Receivable}_{t-1} / \text{sales}_{t-1})}$$

According to this modified model, if companies have an M-score of less than or equal to 0.5, their financial statements are not likely to have been fraudulent, and then those companies are classified as having no fraudulent financial statements. As for companies that have an M-score of more than 0.5, their financial statements are likely to have been subjected to fraud, and therefore those companies are classified as having fraudulent financial statements.

Board independence

Board independence (INDE) was measured by the percentage of independent board members, which was

Board size

Since the size of the board can vary depending on the size of the company, board size (BSIZE) was measured by the ratio of the number of board members to the natural log of total assets.

Board meetings

Board meetings (MEET) were measured by the logarithm of the annual number of board meetings.

Board diversity

Board diversity (DIVE) was measured by the percentage of female board members, which was calculated by dividing the number of female board members by the total number of board members.

Control variables

In addition to the independent variables, the study also used three control variables that may be related to financial statement fraud. These three control variables are company size, leverage, and profitability. Large companies are the focus of attention of investors, financial analysts, media, and the public. The larger the company, the greater the incentive it has to disclose more information and avoid fraud to reduce the political costs that it may incur because of its size [57]. Company size (CSIZE) was measured by the natural log of the sum of the company's assets. That is Size = Ln (total assets). A company's profitability can affect the likelihood that management will commit fraud because the costs of committing fraud tend to be lower for poorly performing companies than for well-performing companies [58]. Profitability (PROF) was measured by return on assets. That is

Table 2 Descriptive statistic for the likelihood of fraud

	Min	Max	Mean	Std
Likelihood of Fraud in financial statements	0.10	0.76	0.38	0.127

Table 3 Descriptive statistics for independent and control variables

	Min	Max	Mean	Std
INDE	0	1	0.86	0.214
BSIZE	5	11	6.45	0.351
MEET	4	9	6.23	0.096
DIVE	0	0.10	0.04	0.032
CSIZE	2.357	8.654	5.874	0.637
PROF	0.121	0.668	0.331	0.632
LEVE	0.231	0.689	0.423	0.732

profitability=ROA. Highly leveraged companies are more likely to be unable to meet their debt obligations promptly. This may be a motive for the management to fraud in the financial statements to mitigate the possibility of bankruptcy [89]. Leverage (LEVE) was measured by the ratio of total debt to total assets. That is, Leverage=TD/ TA. Accordingly, the model used in this study can be formulated as follows:

$$\text{FRAUD} = \beta_0 + \beta_1 \text{INDE} + \beta_2 \text{BSIZE} + \beta_3 \text{DIVE} + \beta_4 \text{CSIZE} + \beta_5 \text{PROF} + \beta_6 \text{LEVE} + \varepsilon$$

Analysis and results

Descriptive statistics

Table 2 presents the descriptive statistics of the dependent variable, which is the likelihood of fraud in the financial statements, while Table 3 presents the descriptive statistics of the six independent variables.

As can be seen from Tables 2 and 3, the mean value of the likelihood of fraud in the financial statements is 0.38, which is less than 0.5. This result indicates that the financial statements of the sample companies, in general, are not subject to fraud, and therefore the financial statements of these companies can be classified as non-fraudulent financial statements. It is also noted the high level of independence of the board of directors, where the mean value of the ratio of independent members to the total number of board members was 0.86. On the contrary, the low level of women’s representation on the board of directors is observed in the sample companies, where the mean value of the ratio of women members to the total number of members was 0.04. It is also noted

that the number of board members in the sample companies ranges from 5 to 11, with a mean value of 6.45. The number of board meetings ranges between 4 and 9, with a mean value of 6.23.

Correlation analysis

Table 4 presents the correlation analysis for the study variables. As shown in Table 4, financial statement fraud is positively and significantly correlated with board size and leverage at the level of significance of $P \leq 0.05$. On the other hand, financial statement fraud is negatively and significantly related to board independence, company size, and company profitability. As for board meetings and gender diversity, there is a negative association with financial statement fraud, but this association is not significant at the level of significance $P \leq 0.05$.

Regression analysis

Before running the regression models, the study performed some diagnostic tests. The multicollinearity among regressors has been tested using the Variance Inflation Factor (VIF). As shown in Table 4, all independent variables show a VIF value smaller than 10 which means that there is no multicollinearity at a significant level of $P \leq 0.05$. The study concluded that the data are free from the problem of heteroscedasticity by performing Breusch–Pagan/Cook–Weisberg. Also, the Wooldridge test shows that there is no autocorrelation problem. The study performs three panel data techniques, namely: the pooled ordinary least squares model (OLS), the fixed-effect model (FE), and the random-effect model (RE).

To assess which of the three models is the most appropriate estimation technique for the data, the study performs Breusch–Pagan Lagrange multiplier (LM) test. The result of this test indicates that both the fixed-effect model and random-effect model are more appropriate than pooled ordinary least squares model. To determine which of the fixed-effect model and the random-effect model is the most suitable model for data analysis, the study performs Hausman test. The result of this test concludes that the fixed-effect model is more suitable for analyzing the study data than the random-effect model. Table 5 presents the results of the regression analysis. As shown in Table 5, the coefficient for the first independent variable "Board independence" is -5.97 , which indicates the existence of a negative relationship between the board independence and the likelihood of fraud in the financial statements, and this coefficient is significant at the level of significance $P \leq 0.05$. This result leads to the rejection of the first null hypothesis that assumes that there is no significant relationship between board independence and the likelihood of fraud in the financial

Table 4 Correlation analysis

	FRAUD	INDE	BSIZE	MEET	DIVE	CSIZE	PROF	LEVE	VIF
FRAUD	1.00								
INDE	- 0.171*	1.00							1.86
BSIZE	0.127*	0.016	1.00						2.02
MEET	- 0.097	0.086	0.096	1.00					1.97
DIVE	- 0.089	0.107	0.014	0.069	1.00				1.23
CSIZE	- 0.098*	0.211**	0.219*	0.091	0.024	1.00			1.45
PROF	-0.087*	0.114**	0.134	0.074	0.091***	0.216**	1.00		1.98
LEVE	0.102*	- 0.169**	0.139	0.068	0.078	0.286**	0.139	1.00	1.69

* Represents significant at $P \leq 0.05$

** Represents significant at $P \leq 0.10$

Table 5 Regressions results

Variable	Pooled OLS model			Fixed-effect model			Random-effect model		
	Coefficient	t-Statistic	Sig	Coefficient	t-Statistic	Sig	Coefficient	t-Statistic	Sig
INDE	- 4.63	- 5.68	0.000*	- 5.97	- 7.89	0.000*	- 5.09	- 6.08	0.000*
BSIZE	3.68	6.31	0.001*	4.29	5.97	0.000*	3.99	4.99	0.000*
MEET	- 4.67	- 3.68	0.224	- 6.96	- 4.63	0.374	- 7.91	- 3.68	0.217
DIVE	- 7.89	- 5.67	0.190	- 8.11	- 6.58	0.227	- 6.67	- 6.07	0.189
CSIZE	- 5.32	- 3.09	0.000*	- 6.67	- 4.97	0.000*	- 5.78	- 3.94	0.000*
PROF	- 3.24	- 4.61	0.000*	- 4.43	- 6.83	0.000*	- 4.09	- 5.74	0.000*
LEVE	3.97	3.64	0.000*	5.39	4.76	0.000*	4.64	4.07	0.000*
Observations	402			Observations	402		Observations	402	
Companies	67			Companies	67		Companies	67	
R-squared	0.1971			R-squared	0.3217		R-squared	0.2617	
F-statistic	9.89*			F-statistic	17.04*		F-statistic	13.98*	

* Represents significant at $P \leq 0.05$

statements. This result is consistent with the results of previous studies, which confirmed that the greater the independence of the board, the more effective its monitoring role, and thus the lower the likelihood of fraud in financial statements (e.g., [17, 75], Uwuigbe et al. [87]; [7, 20, 26, 70, 88]).

About the second independent variable "Board size," the coefficient of this is 4.29, which indicates the existence of a positive relationship between the board size and the likelihood of fraud in the financial statements, and this coefficient is significant at the level of significance $P \leq 0.05$. This result leads to the rejection of the second null hypothesis that assumes that there is no significant relationship between board size and the likelihood of fraud in the financial statements. This result is consistent with the results of previous studies, which confirmed that the greater the number of members of the board, the greater the difficulties of communication and coordination between them, which negatively affects the effectiveness of the monitoring role of the board, and thus

increases the likelihood of fraud in the financial statements (e.g., [7, 11, 16]).

As for the third independent variable "meetings frequency" and the fourth independent variable "Board diversity," Table 5 shows that the coefficients of these variables are - 3.96 and - 2.11, respectively, which indicates that the likelihood of fraud in the financial statements is negatively correlated with each of the numbers of board meetings and the presence of women in the board. However, the coefficients of these variables are not significant at the significance level of $P \leq 0.05$, which leads to the acceptance of the third and fourth null hypotheses, which state that there is no significant relationship between meetings frequency, board diversity, and the likelihood of fraud in the financial statements. This result contradicts the results of previous studies, which confirmed the existence of a significant effect on the representation of women on the board and the likelihood of fraud in the financial statements (e.g., [43, 50, 52, 56, 90], Cumming

et al. [16]). This result can be attributed to the poor representation of women on companies' boards of directors in Saudi Arabia before 2016. Before 2016, Saudi Arabia has been a very conservative society with regard to allowing women to work even though Saudi women have a great deal of educational qualification and ability to assume leadership responsibility. Accordingly, women were not allowed to hold senior positions, whether in the government sector or the private sector. In 2016, Saudi Arabia adopted a comprehensive economic vision called Saudi [48] (KSA, [48]). This vision included fundamental transformations in the Saudi culture, foremost of which is the recognition of the role of women as a basic partner in society and taking important steps aimed at empowering women and giving them the highest appropriate role, whether in the government sector or the private sector. The results of empowering women in Saudi Arabia began to be achieved gradually after 2016, where the percentage of women's representation began to increase in all fields, including membership of boards of directors. With regard to the control variables, it is evident from Table 5 that the results of the study are consistent concerning these variables with the results of previous studies (e.g., [17, 70, 75]), which indicated a negative relationship for each of the company's size and profitability with the likelihood of fraud in financial statements and a positive relationship between financial leverage and the likelihood of fraud in financial statements.

Discussion

The above results indicate the effectiveness of corporate governance mechanisms, especially the independence of the board of directors, in reducing the likelihood of fraud in the financial statements of Saudi companies. This result is consistent with the results of previous studies, which confirmed that the greater the independence of the board, the more effective its monitoring role, and thus the lower the likelihood of fraud in financial statements (e.g., [17, 75], Uwuigbe et al. [87]; [7, 20, 26, 70, 88]). The results also indicate that there is a positive relationship between the size of the board and the likelihood of fraud in the financial statements. This result is consistent with the results of previous studies, which confirmed that the greater the number of members of the board, the greater the difficulties of communication and coordination between them, which negatively affects the effectiveness of the monitoring role of the board, and thus increases the likelihood of fraud in the financial statements (e.g., [7, 11, 16]).

As for the meeting frequency, the results show that there is a negative, but not significant, relationship with the likelihood of fraud in the financial statements. This means that the frequency of board meetings does not

seem to have a direct impact on fraud in the financial statements. This result contradicts the results of several previous studies, which confirmed that the increase in the number of board meetings has a significant effect on reducing fraud in the financial statements (Ahmed et al., [6]; Istianingsih, [39]; Abbadi et al., [3]; Gulzar and Zongjun, [34], Xie et al., [92]). However, the results of the current study follow the line of several studies that document the absence of a significant impact of the number of meetings on the fraud in the financial statements (Kjærland et al., [46]; Ebrahim, [27]).

Regarding the board gender diversity, the results of the study indicate that there is a negative, but a not significant, relationship for this variable with the likelihood of fraud in the financial statements. In fact, this result contradicts the results of previous studies, which confirmed the existence of a significant effect of the representation of women on the board and the likelihood of fraud in the financial statements (e.g., [43, 50, 52, 56, 90], Cumming et al. [25]). This result can be attributed to the poor representation of women on companies' boards of directors in Saudi Arabia before 2016. Before 2016, Saudi Arabia has been a very conservative society about allowing women to work despite the fact that Saudi women have a great deal of educational qualifications and the ability to assume leadership responsibility. Accordingly, women were not allowed to hold senior positions, whether in the government sector or the private sector. In 2016, Saudi Arabia adopted a comprehensive economic vision called "Saudi [48]." This vision included fundamental transformations in the Saudi culture, foremost of which is the recognition of the role of women as a basic partner in society and taking important steps aimed at empowering women and giving them the highest appropriate role, whether in the government sector or the private sector. The results of empowering women in Saudi Arabia began to be achieved gradually after 2016, where the percentage of women's representation began to increase in all fields, including membership of boards of directors.

With regard to the control variables, the results of the study are consistent with respect to these variables with the results of previous studies (e.g., [17, 70, 75]), which indicated a negative relationship for each of the company's size and profitability with the likelihood of fraud in financial statements and a positive relationship between financial leverage and the likelihood of fraud in financial statements. This study contributes to the literature on financial statement fraud by examining financial statement fraud in Saudi Arabia, a context that has not been examined before. The results of the study can provide indications for those responsible for corporate governance in Saudi Arabia to take more effective actions to strengthen corporate governance mechanisms in relation

to the board of directors. The study also provides indications regarding the role of women's representation on the board. Despite the insignificance of the relationship between fraud in financial statements and the representation of women as a result of the weak representation of women at present, the results indicate that the representation of women on the board is negatively associated with fraud in the financial statements. This result provides indications of the success of the Saudi [48], which is based on empowering women and increasing their role in all activities, including economic activities.

Conclusion

Financial statements are the main communication tool between the company's management and stakeholders. Therefore, the credibility and integrity of the information contained in these statements have a fundamental impact on the decisions of stakeholders. Recently, interest in fraudulent financial statements has increased as a result of some financial scandals that have resulted in substantial losses for stakeholders and led to a loss of stakeholders' confidence in the accounting profession. This study examined the relationship between the board of directors as a mechanism for corporate governance and the likelihood of fraudulent financial statements in the Saudi stock exchange as one of the emerging markets. Based on a sample of 67 companies listed on the Saudi stock exchange during the period 2014–2019, the study concluded that the likelihood of fraud in the financial statements is negatively related to the board independence, as well as positively related to board size.

The study also concluded that there is no significant relationship between fraud in financial statements and the representation of women on the board and board meeting frequency. This study contributes to the research stream that examines the impact of corporate governance mechanisms on fraud in financial statements, especially in developing countries. However, this study has some limitations. First, the study examined only four characteristics of the board. Future studies can examine a wider range of characteristics such as duality, age, financial experience, international experience, share ownership, and other characteristics. Second, the study relied on only one model to estimate the likelihood of fraud in financial statements, which is Beneish [21]'s model. Future studies may use other models to estimate the likelihood of fraud in financial statements. Third, the sample size is small in light of the small number of companies listed on Saudi Stock Exchange during the study period. Fourth, the study used only three control variables. There may be other controlling variables that have an impact on

this relationship such as the age of the company, growth of the company, capital intensity.

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Declarations

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