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The moderating effect of the board independence on the association between ESG reporting and financial distress

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Abstract

This research reveals the influence of ESG reporting on financial distress. Moreover, the study examines the moderating influence of board independence between ESG reporting and the financial distress of the Saudi Arabian Exchange. The study used a database of 432 observations from non-financial corporations on the Saudi stock exchange from 2018 to 2023, employing fixed effect models to estimate the study findings. The study results indicate that ESG reporting enhances financial distress. Companies that have ESG reporting are associated with higher financial distress. Furthermore, the results reveal that board independence moderates the nexus between ESG reporting and financial distress. The study's originality resides in exploring the moderating role of board independence on the association between ESG reporting and financial distress, utilizing a sample from Saudi companies. This research offers companies, policymakers, and stakeholders practical insights to mitigate financial distress. The study encourages companies to adopt ESG reporting, thereby enhancing their financial performance.

Keywords: Board independence, corporate governance, ESG reporting, environmental performance, financial distress.

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1. Introduction

Financial distress is when a company has difficulty meeting its financial obligations, such as paying debts or operating expenses [1]. According to Citterio and King [2], financial distress occurs when there is insufficient liquidity or regular cash flows to cover obligations. Financial distress is represented by poor financial management, increased debt burden on the company, decreased sales, and increased operating costs [3]. Companies' Financial distress affects the company's market value due to the decrease in cash flows [4]. Moreover, the increase in outstanding debts and the company's inability to pay them are considered indicator of the company's financial distress [5]. According to Almubarak et al. [6], financial distress can be addressed by restructuring debts, increasing capital, good management of cash flows, and selling non-performing assets.

Financial distress refers to a company's ability to generate profits from its core or non-core operations over a given period of time. Financial distress is an important indicator for assessing a company's financial performance and its ability to sustain and grow in the market [7, 8]. Financial distress is a strategic approach that aims to achieve economic success while adhering to environmentally and socially responsible practices [9]. Recently, a focus on financial distress has become an integral part of successful company strategies. Companies that embrace financial distress seek to achieve a balance between financial growth, environmental conservation, and providing added value to society [10, 11]. Companies that adopt this approach not only achieve financial gains but also gain a positive reputation in the market and enhance their ability to compete [12, 13]. Financial distress provides them with the opportunity to build long-term relationships with customers, employees, and investors, which supports continuity and growth in an ever-changing business environment [14].

Environmental, social, and governance (ESG) reporting is an important aspect of modern accounting and management practices [15]. This reporting reflects how companies are committed to balancing their environmental, social, and governance goals [16]. ESG reporting provides transparent and reliable information about the activities and policies implemented by the company to support environmental, social, and governance issues that affect stakeholders [17]. ESG reporting is a strategic tool for companies to improve their reputation and achieve a competitive advantage [7, 18]. With the increasing interest of the international community in sustainability, it becomes necessary for companies to adopt transparent reporting practices that reflect their commitment to achieving sustainable development and societal well-being [19]. ESG reporting activities include environmental sustainability initiatives, charitable activities, and engaging in ethical business practices [20, 21]. ESG reporting initiatives can help reduce labor costs, and ESG reporting initiatives have a positive impact on society [22].

On the other hand, board independence, as one of the mechanisms of corporate governance, plays a main role in improving financial distress [23-25]. The impact of board independence on financial distress is an important topic in corporate governance. This impact revolves around how board members' independence is used to make strategic decisions that lead to achieving long-term sustainability goals [26]. In general, board independence contributes to enhancing financial distress by supporting informed financial decisions directed toward achieving a balance between economic growth and social and environmental responsibility.

The research gap identified through the existing literature, which is not cited in studying and analyzing financial distress, ESG reporting, and board independence [11, 27-29]. Still introduces unexplored rules in the Saudi context. This study is important and different from previous studies in many aspects. First, it focuses on non-financial Saudi companies, whereas the previous literature focused on developed countries. Second, financial distress studies remain significant and have become a source of concern for regulators and policymakers [30, 31]. As a result, it is necessary to investigate how ESG reporting affects financial distress for investor protection. Therefore, this study provides an extension of previous studies in an attempt to deepen the literature and reduce discrepancies. Finally, this research differs from previous literature in that it depends on the financial statements of non-financial Saudi companies. It is contended that in developing countries that have different cultural, regulatory, and institutional contexts, it can be expected to differ from that found in developed countries [32, 33].

The study's purpose is to identify the effects of ESG reporting on financial distress in Saudi Arabia. The analysis is based on 432 observations spanning the years 2018 to 2023. The findings reveal that ESG reporting has a positive influence on financial distress. The results also concluded that board independence moderates the relationship between ESG reporting and financial distress. The current study aims to contribute to the following aspects: First of all, the study aims to enrich the literature on financial distress, ESG reporting, and board independence. Thus, advancing the relevant literature in these fields. Second, the research is significant because the important influence of board independence in company monitoring deserves in-depth research on the various factors that relate to ESG reporting to financial distress. Finally, the study provides companies, shareholders, investors, and other stakeholders with practical contributions.

2. Theoretical Background

The study develops hypotheses that contribute to comprehending the nexus between financial distress, ESG reporting, and board independence. This study derives its variables and hypotheses from stakeholder theory and legitimacy theory. These theories emphasize the importance of ESG reporting by the corporation's management to enhance financial distress in the long term [34, 35]. Numerous studies have used these theories to understand the effects of ESG reporting and explain the factors affecting financial distress [36, 37]. In addition, many studies have adopted these theories to explain the effects of board independence as one of the corporate governance mechanisms [21, 38]. Stakeholder theory is one of the most vital theories for studying financial distress due to the impact of performance on the interests of shareholders. According to the stakeholder theory, ESG reporting initiatives help enhance a business's reputation.

On the other hand, the legitimacy theory in business institutions is related to the principles and rules that govern the actions and orientations of institutions in the commercial and economic fields [39]. When the concepts of legitimacy theory and financial distress come together, companies can create a system based on achieving economic growth in a way that respects the environment and society Solikhah et al. [36] investing in sectors that preserve the environment and contribute to social development Zyznarska-Dworczak [39] and achieving economic and social justice in commercial and financial transactions [35]. By focusing on social and economic justice and promoting investment, institutions can achieve long-term sustainability [17, 39]. Legitimacy theory seeks to achieve a balance between economic growth and ethics, leading to the formation of a sustainable business environment.

According to stakeholder theory and legitimacy theory, when board members are diverse, they can make financial decisions that balance profits with sustainable investments [40]. Board independence helps predict the financial risks associated with sustainability projects and assess their potential impact on financial distress [41]. Board independence can enhance transparency in sustainability reporting, ensuring that financial statements related to sustainable practices are accurate and clear, which increases investor and shareholder confidence [42]. Board independence can identify the most financially viable, sustainable investment opportunities, which helps integrate sustainability goals with profitability [43]. Board independence contributes to better communication with investors regarding the company's sustainable direction, which increases trust and provides greater support for environmental and social initiatives [41].

3. Literature Review and Hypotheses Development

3.1. The Impact of ESG Reporting on Financial Distress

According to stakeholder theory, improving ESG reporting has the effect of protecting shareholders' interests and improving the company's long-term sustainability [9]. Therefore, actions taken by a company's management offer investors signals about the management's vision of the company's future [44]. Previous studies argue that efficient ESG reporting enhances financial distress, and thus, there is a positive association between ESG reporting and financial distress [31, 32, 45]. Furthermore, managers use ESG reporting to boost profitability and impact future cash flow [29]. The managers make decisions based on their managerial discretion and private information, which might improve financial distress [10]. Conversely, Khan et al. [46] determined that ESG reporting negatively impacts the accuracy of forecasts by financial analysts on the stock exchanges. Therefore, there is a negative nexus between ESG reporting and financial distress because managers only use their discretion to maximize their utility, resulting in the misalignment of incentives between managers and shareholders and financial distress deterioration [13].

Companies that implement ESG criteria are more attractive to investors looking for sustainable investments [47]. Adherence to environmental and social criteria can reduce costs in the long run, such as reducing energy consumption or reducing legal risks [48]. According to Cesarone et al. [49], disclosing sustainable practices can improve a company's reputation and increase investor and customer confidence, leading to increased profitability. Furthermore, improving governance practices helps reduce financial and regulatory risks, which positively impacts profitability [50]. Investing in and disclosing ESG practices can improve profitability in the long run. To achieve this effect, companies must strike a balance between adhering to sustainability practices and achieving their financial goals [51]. Numerous studies have emphasized a positive association between ESG reporting and financial distress, especially in markets where investors are concerned about sustainability [52-54]. However, this relationship may vary based on factors such as industry sector, company size, and economic and regulatory environment.

Recently, there has been a growing body of empirical literature on ESG reporting in developing countries. For example, Wentzel et al. [32] provide evidence that companies can improve share value growth by adopting ESG reporting. Several studies, Mardini [31]; Yu, et al. [44]; Dhingra [45], and Wu and Jin [55] have concluded that ESG reporting has a positive influence on financial distress. The studies by Saygili et al. [56] implicitly indicate the adverse effect of ESG reporting on financial distress. Wentzel et al. [32] investigated the association between ESG reporting through environmental responsibility, social responsibility, and economic responsibility and financial distress in emerging markets. Their findings indicated that while ESG reporting positively influences financial distress, this effect is not statistically significant. According to the previous discussions, the next hypothesis was formulated:

$H_{1:}$ ESG reporting has a positive and significant influence on financial distress.

$H_{1a:}$ Environmental reporting has a positive and significant influence on financial distress.

$H_{1b:}$ Social reporting has a positive and significant influence on financial distress.

$H_{1c:}$ Governance reporting has a positive and significant influence on financial distress.

3.2. The Relationship between Board Independence, ESG Reporting, and Financial Distress

The Board of Directors can be a vital element in supporting companies to adopt objective ESG reporting and enhance financial distress [28, 57]. The characteristics of the Board of Directors reflect the Board's ability to supervise, monitor, and provide resources in light of the increasing interest in financial distress [58]. When the board of directors has knowledge and experience in ESG reporting, it can provide advice and guidance on the company's strategies and thus enhance financial distress [59-61]. Board independence is one of the governance mechanisms that limit managers' ability to manipulate financial distress assessments by reducing information asymmetry, thereby enhancing financial distress [62]. The board independence can lead to improving decision-making and enhancing the firm's profitability [19, 63]. Companies can consider board independence as a necessary factor to improve their performance [64]. By consulting with managers with financial expertise, the board can obtain the information necessary to make effective decisions in improving financial distress [65]. Therefore, boards must be prepared to support companies in adopting ESG reporting and working toward improved financial distress [66, 67].

Numerous pieces of literature support the board independence [57, 60, 68-71]. According to Elmashtawy et al. [72], the board's monitoring functions depend on various aspects, including board independence. Previous studies have also explored how board independence can enhance a company's strategy [73]. Board independence can also effectively reduce corporate risks and minimize the impact of crises on companies [24]. Similarly, Obeitoh et al. [74] indicated that board independence on the board improves financial distress because directors are more competent than others. According to Kouaib et al. [75], the board's independence enhances the board's ability to effectively monitor. Githaiga and Kosgei [41] highlighted the substantial positive impact of board independence on financial distress. As a result, some indicators show the positive effects of board independence on enhancing financial distress due to its tangible impact in ensuring reasonable assurance about the quality of the financial report, on which different stakeholders rely when making investment decisions associated with the company. Hussain et al. [76] demonstrated that boards that have women exhibit higher levels of conservatism and improved financial distress.

The board characteristics affect ESG reporting through economic responsibility, social responsibility, and environmental responsibility, Ismail and Latiff [25]. Kim et al. [77] concluded that a board of directors that has women is likely to work to improve the company's financial distress. Furthermore, [78] indicated that board independence is positively associated with improving the firm's financial distress. Obeitoh et al. [74] revealed that there is a positive relationship between some board characteristics, such as size, meetings, gender diversity, and financial distress. Several previous research findings concluded a positive nexus between board independence and financial distress [25, 27, 28, 57-59, 78]. Similarly, several studies have indicated that board independence is favorably associated with ESG reporting. Empirical studies concluded that the nexus between ESG reporting and financial distress is affected by corporate governance mechanisms [64, 67, 69, 70]. Accordingly, it is supposed that there is a nexus between ESG reporting and financial distress, and this association is affected by board independence, as well as the importance of board independence because of its tangible impact in ensuring reasonable assurance about the quality of the financial report, on which different stakeholders rely when making investment decisions associated with the company. Based on the above justifications and the purpose of the study, it is suggested that board independence moderates the relationship between ESG reporting and financial distress. Drawing from the preceding discussion, the subsequent hypotheses are proposed:

$H_{2:}$ Board independence moderates the nexus between ESG reporting and financial distress.

$H_{2a:}$ Board independence moderates the nexus between environmental reporting and financial distress.

$H_{2b:}$ Board independence moderates the nexus between social reporting and financial distress.

$H_{2c:}$ Board independence moderates the nexus between governance reporting and financial distress.

4. Methodology

4.1. Data Collection and Sampling

The study population includes all Saudi companies registered in the stock market between 2018 and 2023. The initial sample consists of 193 companies distributed across 17 economic sectors in the Saudi Stock Market. The final sample was selected according to the following conditions: First, the banking sector, the financial services sector, and insurance companies were excluded because of their nature specific to financial reporting. Secondly, companies whose financial statements were prepared in a foreign currency other than the Saudi Riyal. Third, companies' financial reports must be available regularly and contain sufficient data to measure the study variables. Fourth, companies' financial reports must be issued on December 31 to meet consistency in the fiscal year. Finally, companies must have been listed on the Saudi exchange from 2018 to 2023. After applying the previous conditions, the final sample for the study consists of 72 non-financial companies listed on the Saudi Stock Exchange and 432 observations, distributed to 17 sectors over the 2018–2023 period. Table 1 presents a summary of the selection process for the sample.

Table 1.
The sample of the study.

No.	Sectors	Initial sample	Final sample	Observations	
				No.	%
1	Energy	7	3	18	4.1%
2	Basic resources	45	13	78	18.1%
3	Capital goods	14	7	42	9.7%
4	Business and professional services	6	2	12	2.8%
5	Transport	7	3	18	4.1%
6	Long-term goods	6	1	6	1.4%
7	Consumer services	12	5	30	6.9%
8	Retailing of luxury goods	8	3	18	4.1%
9	Retailing of consumer goods	8	2	12	2.8%
10	Food production	17	8	48	11.2%
11	Health care and medicines	13	6	36	8.4%
12	Telecommunications	4	1	6	1.4%
13	Real estate management and development	13	6	36	8.3%
14	Applications and technology services	5	2	12	2.8%
15	Media & Entertainment	4	1	6	1.4%
16	Public utilities	6	2	12	2.8%
17	Real estate traded funds	18	7	42	9.7%
Total		193	72	432	100%

Furthermore, the study utilized secondary data, especially the financial statements, board of directors' reports, and supplementary clarifications of the sample companies. The study also sourced data from the companies' financial reports, which are published on the websites of the Saudi Capital Market Authority, the Tadawul website (http://www.tadawal.com), and the Argaam website (www.argaam.com). This study uses data panel regression by ordinary least squares with fixed effects.

The study employs fixed-effects ordinary least squares panel data regression models to examine the nexus between ESG reporting, board independence, and financial distress in Saudi non-financial companies. There is a set of assumptions related to the panel data analysis according to its type, and the statistical methods that test these assumptions vary. The choice between the pooled and fixed models is made using the F-test. To identify whether the model is pooled or random, the Breusch and Pagan-Lagrange multiplier tests are used. In addition, the Hausman analysis was used to assess the suitability of the panel data for the random effects model or the fixed effects model [80]. This study performed these three tests to determine the appropriate panel data model. Accordingly, the fixed effects model was used. Regression diagnostics were performed before each model was tested in the study to ensure that multiple regression assumptions were met and to avoid erroneous results. Normality, outliers, multicollinearity, heteroscedasticity, linearity, and autocorrelation are the most important regression assumptions in the study.

4.2. Variables of the Study

According to several studies Binesh et al. [1]; Song et al. [3]; Liwa et al. [4]; Suprabha et al. [5] and Almubarak et al. [6] financial distress can be measured using a set of financial indicators and ratios reflecting the company's financial ability to meet its obligations. The study's dependent variable is the financial distress (FD) of the sample companies, gauged through the return on assets (ROA) ratio, which is measured by the ratio of net income divided by the total assets. The study's independent variables express ESG reporting, encompassing environmental reporting (ENVD), social reporting (SOCD), and governance reporting (GOVD). Furthermore, the board independence (BIND) is the moderating variable of the interaction between ESG reporting and financial distress. In addition, the study includes three control variables, which include board gender diversity (BGDIV), firm size (FSIZE), and leverage (LEV). Table 2 summarizes the definition and measurement of dependent, moderating, independent, and control variables, along with evidence from prior studies that used the same measures.

Table 2.
Variable measurements.

Variable	Symbol	Measurement	Source
Dependent Variable			
Financial distress	FD	Measured by the net income to total assets ratio (ROA).	Binesh, et al. [1]; Citterio and King [2]; Song, et al. [3] and Liwa, et al. [4]
Independent Variables			
Environmental reporting	ENVD	An index of 31 indicators related to environmental issues.	Abdi, et al. [7]; Chouaibi [8] and Elmghaamez, et al. [16]
Social reporting	SOCD	An index of 36 indicators related to social issues.	Khan [15] and Kengkathran [17]
Governance reporting	GOVD	An index of 13 indicators related to governance issues.	Alvarez-Perez and Fuentes [9] and Alfalih [33]
ESG reporting	ESGD	Integrating the index of environmental, social, and governance aspects.	Carnini Pulino, et al. [11]; Giannopoulos, et al. [18]; Inamdar [29] and Yoo and Managi [79]
Moderating variable			
Board independence	BIND	The proportion of independent directors to total board members.	Boukattaya, et al. [24]; Setiani [63] and Elmashtawy, et al. [72]
Control Variables			
Board gender diversity	BGDIV	The presence of women on the board ratio	Manita, et al. [27]; Kampoowale, et al. [28] and Elmashtawy, et al. [72]
Firm size	FSIZE	The total assets logarithm.	Zhao, et al. [13]; Makhija, et al. [59] and Ouni, et al. [60]
Leverage	LEV	The total liabilities divided by the total assets ratio.	Bhatia and Marwaha [65]; Salsabilla and Kusumawardani [73] and Elmashtawy [80]

4.3. Econometric Tools

The study developed four models to measure the impact of ESG reporting on financial distress and the moderating role of board independence on the association between ESG reporting and financial distress. The study's models can be formulated as regression models, as follows:

4.3.1. The Direct Effect Models are Outlined Below

The direct effect models assess the effect of ESG reporting on financial distress in Saudi non-financial companies. The study formulated two models, and these models answer hypothesis 1.

$$FD_{it} = \alpha + .\beta_1 ENVD_{it} + \beta_2 SOCD_{it} + \beta_3 GOVD_{it} + \beta_4 BIND_{it} + \beta_5 GDIV_{it} + \beta_6 FSIZE_{it} + \beta_7 LEV_{it} + \varepsilon_{it} \quad (1)$$

$$FD_{it} = \alpha + .\beta_1 ESGD_{it} + \beta_2 BIND_{it} + \beta_3 GDIV_{it} + \beta_4 FSIZE_{it} + \beta_5 LEV_{it} + \varepsilon_{it} \quad (2)$$

4.3.2. The Models of Moderating Role are as Follows

The moderator effect models are to examine the moderating influence of board independence on the association between ESG reporting and financial distress in Saudi non-financial companies. The study formulated two models, and these models answer hypothesis 2.

$$FD_{it} = \alpha +. \beta_1 BIND_{it} + \beta_2 ENVD_{it} + \beta_3 ENVD * BIND_{it} + \beta_4 SOCD_{it} + \beta_5 SOCD * BIND_{it} + \beta_6 GOVD_{it} + \beta_7 GOVD * BIND_{it} + \beta_8 BGDIV_{it} + \beta_9 FSIZE_{it} + \beta_{10} LEV_{it} + \varepsilon_{it} \quad (3)$$

$$FD_{it} = \alpha +. \beta_1 ESGD_{it} + \beta_2 BIND_{it} + \beta_3 ESGD * BIND_{it} + \beta_4 BGDIV_{it} + \beta_5 FSIZE_{it} + \beta_6 LEV_{it} + \varepsilon_{it} \quad (4)$$

5. Results and Discussions

5.1. Descriptive Statistics

Table 3 shows a summary of the descriptive analysis for the independent, dependent, moderating, and control variables used in the study. The research examines the adherence of variables to the normal distribution through the application of the Kolmogorov-Smirnov and Shapiro-Wilk tests. Findings suggest that the variables conform to the normal distribution, as evidenced by significance values exceeding 0.05 [81]. Table 3 reveals that the mean of financial distress is 0.81 with a standard deviation of 1.03. The mean of governance reporting is 8.42, and the minimum and maximum levels are 0.00 and 91.32, respectively. The mean social reporting was around 13%, with a standard deviation of 17.64. The mean of environmental reporting is 7.21, and the minimum and maximum levels are 0.00 and 82.16, respectively. Moreover, the mean ESG reporting was around 14%, with a standard deviation of 26.27. The mean board independence is 14.03, and the standard deviation is 34.31. Concerning the control variables, the average board gender diversity is 15.51, and the standard deviation is 25.51, indicating that 16% of the sampled board members are women. The average firm size is 21.02 with a standard deviation of 2.07. The average leverage is 0.62, and the standard deviation is 1.65.

Table 3.
Descriptive Statistics.

Variables	Observations	Mean	Minimum	Maximum	Standard Deviation
FD	432	0.81	-1.57	3.34	1.03
GOVD	432	8.42	0.00	92.31	7.75
SOCD	432	12.93	0.00	93.12	17.64
ENVD	432	7.21	0.00	81.17	8.14
ESGD	432	13.78	0.00	91.32	26.27
BIND	432	14.03	0.00	83.75	34.31
BGDIV	432	15.51	0.00	97.62	25.51
FSIZE	432	21.02	13.32	20.39	2.07
LEV	432	0.62	0.00	13.26	1.65

5.2. Correlation Analysis

It is clear from the results of the correlation analysis that all values of the correlation coefficients within the matrix amounted to less than 0.80. This result indicates that the results of the correlation analysis between the study variables are free from multicollinearity [82]. The correlation analysis also concludes that there are significant correlations among independent, dependent, moderating, and control variables. The highest correlation between financial distress and ESG reporting is 0.52, suggesting that a higher level of ESG reporting is associated with a higher financial distress. The correlation between firm size and financial distress is also significant (with a correlation coefficient of 0.50), suggesting that larger companies have a higher financial distress. Furthermore, the variance inflation factor (VIF) test findings reveal a very low VIF for each variable (less than 1.30) and a large tolerance (at least 0.77), which indicates that there are no multicollinearity problems in the research variables in the correlation analysis [83].

5.3. Direct Effect Model's Analysis

Table 4 displays the regression findings of the direct influence analysis. The results in models 1 and 2 are allocated to the direct effect regression models of the effect of ESG reporting on financial distress. The findings in Model 1 concluded a significant positive and negative effect of governance reporting, social reporting, and environmental reporting on financial distress at a significant level of 5%, 1%, and 1%, respectively. Furthermore, the findings in Model 2 concluded a positive and significant impact of ESG reporting on financial distress at a significant level of 1% (7.18). This finding indicates that companies exhibiting elevated ESG reporting demonstrate a greater degree of financial distress, and these companies can increase their performance through a high level of ESG reporting. This finding is supported by the stakeholder theory and legitimacy theory. Therefore, H1 is supported.

Table 4.
Direct effect models.

Variables	**Model 1**	**Model 2**
_cons	0.03*** (0.00)	-0.06** (0.01)
GOVD	-3.23** (0.02)	
SOCD	3.53*** (0.01)	
ENVD	-0.37*** (0.00)	
ESGD		7.18*** (0.00)
BIND	0.37*** (0.01)	0.18*** (0.00)
BGDIV	0.02*** (0.00)	2.02** (0.01)
FSIZE	0.37** (0.01)	0.27** (0.02)
LEV	-0.04*** (0.01)	-0.04** (0.00)
R^2	0.44	0.41
Adjusted R^2	0.40	0.39
F-statistic	6.15	11.51
Prob (F-test)	0.00	0.00
Durbin-Watson test	1.07	2.01

Note: *, **, and *** are the significance levels at 0.1, 0.05, and 0.01, respectively.

The results also indicate that the board diversity affects the financial distress across the conducted models at a significant level of 1% and 5%, respectively. This finding is consistent with the findings of the studies Boukattaya et al. [24], Romano, et al. [57], and Setiani [63]. Moreover, board independence serves as a safeguarding mechanism, mitigating a company's risk exposure while enhancing its overall financial distress. Furthermore, the results concluded that the firm size has a positive effect on financial distress across the conducted models. These results mean that as the size of the company increases, its level of financial distress enhances. The findings also concluded that the board independence positively affects the financial distress according to models 1 and 2 at a 1% significance level. This result means that the presence of independent members on the board is important to enhance the financial distress. In addition, there is an inverse effect of leverage on the financial distress, as the values of financial distress are -0.05 and -0.03, respectively. This result reflects the negative impact of the increase in debt and financial insolvency on financial distress. Adjusted R^2 values range between 39% and 40%, exhibiting that the research variables are approximately 45% of the financial distress. The models evaluated additionally demonstrated that the D-W result values showed that variables do not have autocorrelation issues.

5.4. Moderating Analysis

Models 3 and 4 in Table 5 present the analysis of board independence as a moderating variable on the nexus between ESG reporting and financial distress. The findings of the moderating effect indicate that board independence strengthens the association between ESG reporting and financial distress. These results indicate that companies can enhance their financial distress by paying attention to the reporting of ESG to meet the needs of various stakeholders, in addition to paying attention to the independence of the Board of Directors members, as it has a positive impact on enhancing financial distress. These results are consistent with the results of studies by Kampoowale et al. [28] and Wasiuzzaman and Subramaniam [67]. Hence, H2 is supported. Noteworthy is that the board independence has strengthened the nexus between ESG reporting (environmental reporting, social reporting, and governance reporting) and financial distress across the conducted models (Model 3 and Model 4), which was obtained when the board independence was added to the models. This indicates the critical role of board independence, as the board independence has stronger incentives to influence operational decisions through management monitoring, resulting in higher financial distress.

Table 5.
Moderating effect models.

Variables	Model 3	Model 4
_cons	1.00** (0.00)	1.02*** (0.01)
BIND	1.63* (0.01)	2.47** (0.02)
GOVD	-0.34** (0.02)	
GOVD*BIND	-3.56*** (0.01)	
SOCD	7.35* (0.04)	
SOCD*BIND	1.28*** (0.01)	
ENVD	-0.46** (0.01)	
ENVD*BIND	0.42*** (0.01)	
ESGD		5.21*** (0.01)
ESGD*BIND		1.01*** (0.01)
BGDIV	1.56** (0.02)	2.19** (0.01)
FSIZE	2.04*** (0.01)	2.24*** (0.00)
LEV	-0.03*** (0.02)	-0.01*** (0.01)
R^2	0.44	0.47
Adjusted R^2	0.41	0.44
F-statistic	20.11	17.25
Prob (F-test)	0.00	0.00
Durbin-Watson test	1.63	1.51

Note: *, **, and *** are the significance levels at 0.1, 0.05, and 0.01, respectively.

It is clear from the regression analysis findings of the direct effect and the moderating effect that the values of adjusted R^2 reached 0.39 and 0.40 for the direct effect regression models and 0.41 and 0.44 for the moderating effect regression models. This indicates the positive effect of inserting the interaction between the ESG reporting (environmental reporting, social reporting, and governance reporting) and board independence variables in the moderating model. Additionally, it signifies the precision of the models and the autonomy of the factors influencing financial distress. Moreover, the outcomes demonstrated that the significance levels were 0.00 across the regression analysis models. The results of the moderating effect analysis can be supported by stakeholder theory and legitimacy theory. According to stakeholder theory, having women board members leads to working to meet the needs of different stakeholders, which has a long-term impact on enhancing the company's financial performance. Furthermore, legitimacy theory suggests that ESG reporting increases transparency between the company and internal and external users, which enhances its financial performance in the long term, in light of the presence of women on the board.

5.5. Endogeneity Analysis

Additional analyses are carried out to evaluate the robustness of the study's findings, and it is revealed that earlier results are robust with alternative measurements of the variables. Endogeneity analysis findings indicate similarity in the effect of independent variables and their interactions with board independence on financial distress. The coefficients' S-D are relatively steady, indicating that the predicted parameters vary consistently. The findings reveal that the significance level test yielded a value of 0.0001 for the variable representing the interaction between board independence and ESG reporting (environmental reporting, social reporting, and governance reporting), which is below the significance level of 0.05. This indicates a substantial influence of the board independence introduction on the association between ESG reporting and financial distress. Furthermore, the significance levels of the control variables, namely board independence, firm size, and leverage, are below 0.05, suggesting a significant relationship with financial distress. The models' explanatory power varies from 33% to 37%, demonstrating that including the board independence improves the nexus between ESG reporting and financial distress. Moreover, the coefficient of the regression models exhibits positive significance, as the significance levels fall below the significance threshold of 0.05.

6. Conclusion

The study examined the effect of ESG reporting on financial distress and the moderating role of board independence on the association between ESG reporting and financial distress. This research is attributed to a balanced database of 432 firm-year observations of Saudi non-financials spanning from 2018 to 2023. The results indicated that ESG reporting had a significant and positive influence on financial distress. It implies that Saudi companies have to concentrate on adopting more ESG reporting to improve financial performance. Moreover, the study found that board independence moderates the nexus between ESG reporting and financial distress. The results also concluded that board independence has a vital influence in enhancing financial distress. Furthermore, the results confirm the positive influence of introducing board independence as a moderator variable in the relationship models. Additional analyses were performed to investigate the robustness and endogeneity of the study inferences, and it was discovered that previous inferences are robust with different measurements.

This study makes the following distinct contributions to the existing literature: First, for a theoretical contribution, the study adds to the current research on financial distress, ESG reporting, and board independence, especially in Saudi Arabia. The study is the first to investigate the moderating role of board independence in the association between ESG reporting and financial distress. Second, the study offers various implications for regulators, companies, and stakeholders. The study indicates that board independence, as one of the corporate governance mechanisms, can bolster financial distress within non-financial companies listed on the Saudi Stock Exchange. Consequently, regulators have the opportunity to advocate for board independence as a means to enhance financial distress and incentivize its adoption among companies. Additionally, regulatory bodies can formulate guidelines and regulations that promote board independence integration to bolster financial distress. Finally, stakeholders can focus on the board's independence for more ESG reporting to enhance financial distress.

The study is subject to several limitations. Firstly, the analysis spanned six years and focused solely on non-financial firms within a single country, thereby restricting the generalizability of the conclusions and limiting control over all variables influencing the outcomes. Second, the measures used to assess financial distress and ESG reporting in the study might not encompass all dimensions of financial distress, given its multifaceted nature. There remains potential for future investigations to explore financial distress using alternative financial distress metrics. Subsequent research endeavors could also delve into comparing various corporate governance mechanisms and their respective effects on financial distress. Furthermore, future research could investigate the study variables encompassing both non-financial and financial companies. In conclusion, forthcoming research could endeavor to replicate the models developed in this study across diverse countries and extend the comparison over an extended timeframe to enable a more comprehensive analysis.

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