

## Article

# Impact of Human and Social Board Capital on the Level of Sustainability Reporting: Evidence from Saudi Arabia

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**Abstract:** The Board of directors serves as the primary mechanism for corporate governance, prompting numerous researchers to investigate the influence of its characteristics on the extent of sustainability reporting across various regions worldwide. Hence, this study aimed to examine the impact of human and social board capital, namely, a board of directors' multiple directorships and level of financial expertise, on the level of sustainability disclosure (SRL) reported by non-financial Saudi companies during the period from 2018 to 2022. To achieve these objectives, 654 firm-year observations belonging to 140 non-financial companies in Saudi Arabia were used. An SRL index was constructed using the following four aspects of sustainability: governance, economic, social, and environmental aspects. At the same time, the most common measurements for independent variables, as found in the literature, were utilized. An OLS regression analysis was performed as the main test of our two hypotheses, and the concluded results demonstrated that both the board of directors' multiple directorships and its level of financial expertise have significant positive impacts on the SRL. These findings are the first of their kind in the context of Saudi Arabia and can help market regulators, policymakers, and decision-makers in their attempt to achieve the goals of the country's sustainability initiatives and Vision 2030.

**Keywords:** sustainability reporting; multiple directorship; board expertise; Saudi Arabia; non-financial companies



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## 1. Introduction

The concept of corporate sustainability has become critically important for the business community over the past two decades. Rosati and Faria [1] defined corporate sustainability as the integration of minimum financial profitability, environmental protection, and social responsibility into a company's main activities. Indeed, sustainability has become an important parameter for different stakeholders, by means of which they evaluate the performance of different firms, which puts pressure on organizations to adhere to its principles [2]. Consequently, sustainable development has become an important issue for companies, especially publicly listed ones [3]. To stress its importance, stakeholders have started requesting sustainability reporting from companies, through which these companies provide information regarding the social and environmental impacts of their operations as well as their performance toward sustainable development [4]. Furthermore, the importance of sustainability reporting has increased over the past decade, as companies view it as an influential outlet to communicate their short- and long-term strategies to their stakeholders [5]—hence, the unprecedented increase in this type of disclosure [6]. At the same time, sustainability reporting can help investors and stakeholders in evaluating firms' overall performance [7].

Due to its increased importance, stakeholders have started to focus on the quality and quantity of sustainability information and have demanded that companies adhere to the reporting standards, which has highlighted the role of a board of directors (BOD) in monitoring management compliance with applicable regulations and reporting standards [8].

This has motivated a number of researchers to examine the correlation between different BOD characteristics and companies' sustainability reporting practices [9]. Nevertheless, the majority of these studies has focused on developed countries as well as some countries from Southeast Asia [5,10–14].

In the context of Saudi Arabia, only a handful of studies have attempted to investigate the determinants of sustainability reporting, such as those by [15–17]. Yet, these studies did not incorporate all four aspects of sustainability when assessing sustainability reporting, and the samples used in these studies were all from previous years, ranging from 2010 to 2019. Hence, due to the lack of studies examining the correlation between board characteristics and sustainability reporting in non-financial Saudi companies, this research aims to investigate the impact of a board of directors' multiple directorships and level of financial expertise on the level of sustainability reporting of these companies. Our study is groundbreaking in this country as it uncovers the determinants of the four aspects of sustainability reporting, which no previous study has attempted to reveal. Moreover, due to the current economic and regulatory climate in Saudi Arabia, this study can be considered a necessity. First, Saudi Arabia's Vision 2030 emphasizes the protection of the environment through the adoption of different programs to help the country ensure sustained growth for future generations [18]. In addition, as a result of Saudi Arabia's rapid economic growth, the Saudi Arabian General Investment Authority has placed greater emphasis on ensuring that firms report their environmental, social, and governance (ESG) performance in a transparent manner [19]. Lastly, in 2018, the Saudi Stock Exchange established sustainability reporting requirements as a useful resource for listed companies to help them navigate ESG requirements, which begs the question of assessing the level of this new type of reporting.

Consequently, in order to conduct our study, an initial sample of 654 firm-year observations were utilized in our analysis. This sample represents 140 non-financial companies, over a 5-year period from 2018 to 2022. After gathering the data, an OLS regression analysis as well as additional analyses involving an alternative definition of SRL and using fixed effect and random effect regressions were conducted. Accordingly, the results of the conducted tests revealed that human and social board capital (i.e., multiple directorships and board's expertise) help these companies increase their level of SRL. These results imply that directors that have more experience and expertise apply more pressure on a firm's management to report a complete set of sustainability information. In addition, these findings are consistent with the agency, resource-dependency, and human capital theories. These findings contribute to the existing body of knowledge on sustainability reporting by being the first study to examine the influence of human and social board capital on the sustainability reporting practices of non-financial companies in Saudi Arabia from 2018 to 2022. In addition, this study makes a theoretical contribution by employing the agency, resource-dependency, and human capital theories in explaining the relationships between the variables. Moreover, the results in this paper have significant implications for regulators, policymakers, and investors seeking to attain sustainability.

The subsequent sections of this paper are structured in the following manner. Section 2 presents a comprehensive analysis of pertinent literature, along with the development of the hypotheses. Subsequently, Section 3 provides an elaborate exposition of the research design, the chosen sample, and the utilized measurements. This will be followed by the presentation of the empirical findings in Section 4. Section 5 of the paper will serve as a summary of the study's findings and conclusions, emphasizing its contributions and offering recommendations for future research.

## 2. Literature Review and Hypotheses Development

### 2.1. Prior Research on Sustainability Reporting

Assessing the factors that impact the level of sustainability reporting by listed companies has been the focus of numerous research studies across the globe. In these studies, several categories of factors that impact the level of sustainability reporting have been utilized. These categories are as follows: (1) corporate governance characteristics [7,12,20];

(2) firm characteristics [21]; and (3) ownership characteristics [5,22]. Furthermore, these studies have used different measures to quantify the level of sustainability reporting, as some studies have focused on sustainability reporting [5,6,8,10,12,14,20,22–24]; others have used corporate social responsibility (CSR) reporting [25–27], and others have focused on ESG reporting [7,21,28,29] as a measure of sustainability reporting. Therefore, this review specifically concentrate on the studies that have evaluated the influence of corporate governance characteristics, especially board characteristics, on the level of sustainability reporting will be the focus of this review.

The relationship between board characteristics and the extent of sustainability reporting has been the focus of the mainstream of research studies concerned with non-financial disclosure. The most common characteristic that has been examined is board size, followed by board independence, board diversity, and number of board meetings, and, finally, only a handful of studies have examined the impact of multiple directorships and board expertise, which demonstrates the importance of this study. Regarding the latter characteristic, Anazonwu et al. [8] found a noteworthy positive correlation between the presence of board members with multiple directorships and the level of sustainability reporting in Nigeria, while Ong & Djajadikerta [14] reached the same conclusion in Australia. Concerning the financial expertise of board members, Githaiga & Kosgei [6] analyzed the level of sustainability disclosure of 79 listed firms in East Africa and found a positive correlation between the number of directors with financial knowledge and the extent of sustainability reporting.

As mentioned above, the majority of studies that have assessed the influence of board characteristics on the level of SRL have focused on other board characteristics. For instance, Al-Shaer & Zaman [10] found that the size of the board has a positive and significant effect on the level of SRL for companies in the UK, while both board independence and number of board meeting had no significant impacts. In East Asia, Bae et al. [5] found that the board's size and the proportion of independent directors have positive effects on the level of SRL, and Hu & Loh [12] reached the same conclusion in Singapore, in addition to the number of board meetings which they found to have a significantly positive impact on the SRL. Moreover, Zaid et al. [24] found that both a board's size and its independence impact the level of sustainability disclosure positively in Palestine. On the other hand, Kumar et al. [20] did not find any impact of a board's size or its independence on the SRL in India, albeit the number of board meetings had a positive impact. Lastly, Wijayanti & Setiawan [23] found that the size and independence of the board had positive and significant effects on the sustainability disclosure of global Islamic banks.

In the context of Saudi Arabia, the studies conducted on the impact of board characteristics on the level of SRL did not reach a consensus on this impact due to the difference in the samples examined and the measures used for the dependent variable. For example, Issa [17] found that board size and board meetings had no significant effects on the extent of CSR disclosure of Saudi firms between 2012 and 2014, while board independence had a significantly negative impact. Al-Duais et al. [15] found that board size and independence had no significant impacts, while board meetings had a significantly negative impact on the level of CSR disclosure of Saudi companies between 2010 and 2019, while Ebaid [30] found positive impacts of board independence and board size over the period from 2014 to 2019. On the other hand, Alotaibi & Hussainey [31] discovered that board size had a positive and significant impact on CSR over the two-year period from 2013 to 2014. Furthermore, Maswadi & Amran [26] found that the financial expertise of the board of directors had no significant impact on the level of CSR reporting of 114 firms in Saudi Arabia. Lastly, Bamahros et al. [16] concluded that the board's size and independence had significantly positive impacts on the level of ESG reporting of Saudi firms between 2010 and 2019, while the number of board meetings had a significantly negative impact.

Nevertheless, as demonstrated above, none of the studies conducted on firms from Saudi Arabia examined the impact on sustainability reporting, and none used a sample beyond the year 2019. Furthermore, none of the above studies examined the impacts of multiple directorships of board members. Therefore, this study aims to address this

deficiency by investigating the influence of human and social board capital on sustainability reporting, specifically focusing on the areas of governance, economic, social, and environmental aspects. In addition, as made evident by the previous studies, there is no consensus on the impacts of a board's characteristics due to differences in the samples used; therefore, our study will fill a gap, since the sample used (from 2018 to 2022) has never been utilized before in the literature concerning the impact of a board's characteristics on sustainability reporting for non-financial Saudi firms.

## 2.2. Hypotheses Development

The most dominant theory used to explain the relationship between corporate governance and firms' performance is the agency theory [17]. According to the agency theory, there is a misalignment of interests between managers and investors in companies [32]. Managers may not consistently act in the best interest of investors [33]. Therefore, according to agency theory, strong the mechanisms of directing a company will encourage managers to provide more information in order to minimise agency costs [34]. Thus, the agency theory advocates for strong monitoring mechanisms in order to safeguard shareholders' interests and ensure the quality of firms' disclosure [35]. At the same time, the resource-dependence theory argues that companies with better resources have a better performance [36], and one of these resources is their BOD. Lastly, the human capital theory views humans as a main resource that is critical for the production activities of any company. Accordingly, in this study, the above three theories will be used as the primary theoretical framework for formulating the research hypotheses regarding the relationships between BOD characteristics and the level of SRL in Saudi non-financial companies.

### 2.2.1. Association between Multiple Directorships and Sustainability Reporting

The term multiple directorships refers to the number of board directors who hold multiple directorships relative to the board's size. As the BOD is the main corporate governance mechanism that helps one monitor the quality and quantity of a firm's disclosure [29], having multiple directorships will equip BOD members with valuable strategic resources, such as knowledge, skills, and experience. This, in turn, enhances their ability to effectively carry out their monitoring responsibilities [37]. This is in line with the resource-dependence theory, as multiple directorships will enhance a firm's resources and, in return, its disclosure performance. Moreover, according to the agency theory, knowledgeable directors will require more disclosure of both financial and non-financial data from company management in order to minimise the agency problem between managers and stakeholders. Furthermore, as humans are the main productive resource of any company, serving on more than one board will provide board members with valuable knowledge and education that will help them improve their performance [38]. Multiple directorships make the director a significant source of experience and information for a firm. Multiple directorships provide skills for thorough monitoring of management actions, enhancing CSR disclosure [39,40]. Applying this notion to the context of our study, it can be argued that serving on multiple boards will enhance the boards' overall performance, which will be reflected in more non-financial disclosures, specifically, sustainability disclosure. This notion is supported by the findings of Anazonwu et al. [8]; hence, the following can be hypothesized:

**H<sub>1</sub>:** *There is a positive significant relationship between multiple directorships and sustainability reporting.*

### 2.2.2. Association between Directors' Expertise and Sustainability Reporting

In this study, directors' expertise refers to the proportion of financial experts' directors with respect to a board's size. Directors who possess a financial background possess a heightened comprehension of the significance of social and environmental matters. Consequently, they are more likely to promote the firm's involvement in sustainability reporting [41]. This aligns with both the resource-dependence and human capital theories, as directors who possess financial expertise will improve the quality of resources held by the firms. Furthermore, having financial experts on a board will help it monitor the

quality and quantity of the firm's disclosures to reduce agency problems. Applying these notions to our study's context, it can be argued that having financial experts on a BOD will enhance the monitoring and controlling performances of boards and increase the level of sustainability reporting [6]. Previous studies demonstrate that directors' expertise is positively associated with CSR and sustainability disclosure [42,43]. Accordingly, based on this theoretical framework, the following is hypothesized:

**H<sub>2</sub>:** *There is a positive significant relationship between directors' expertise and sustainability reporting.*

### 3. Research Design and Measurements

#### 3.1. Sample Selection and Data

In this study, a sample of 654 firm-year observations from 140 non-financial companies listed in Saudi Arabia's stock exchange over the five-year period from 2018 to 2022 was used. As shown in Table 1, the initial sample comprised 708 observations; nevertheless, 53 observations were excluded from the sample as these companies did not publish annual reports that would have enabled us to collect non-financial data, and one observation was discarded as it was an outlier to the sample. Moreover, this sample excluded data from financial firms, as these companies have special regulations and disclosure practices [44].

**Table 1.** Sample selection.

Initial Sample	708
Minus:	
Firm-year with unavailable corporate report	(53)
Outlier Variable	(1)
Final Sample	654

In addition, the sample contained both financial and non-financial data for these 140 companies. The financial data were collected from various electronic sources, including the Thomson Reuter EIKON database, Wall Street Journal, Argaam, and Yahoo Finance websites, while the non-financial data were collected manually from the corporate annual reports of these companies. The non-financial data were then analyzed using a content analysis technique, as it is a powerful tool for examining trends and patterns in documents and helps researchers analyze large volumes of data with relative ease [45], which make it most suitable to collect data from annual corporate reports [46].

#### 3.2. Variable Measurement

##### 3.2.1. Dependent Variable

The dependent variable in this research is the level of sustainability reporting for non-financial listed companies in Saudi Arabia. According to Loh, Thomas, & Wang [47] and Hu & Loh [12], sustainability reporting is the disclosure of non-financial information that includes four aspects—namely, governance, economic, social, and environmental aspects. Hence, sustainability reporting was measured using the sustainability reporting level index (SRL), which addresses the above-mentioned four disclosure aspects. In the SRL index, each item is binary-coded (having a value of 1 or 0); then, the total number of items that have actually been reported by a firm is divided by the maximum number of items reported, as demonstrated below:

$$SRL = \frac{\sum \text{Actual SRL items disclosed}}{\sum \text{Maximum SRL items}} \quad (1)$$

##### 3.2.2. Independent Variables

Two independent variables were utilized in this study to examine their impact on the SRL; these variables are the following: multiple directorships and directors' financial expertise. Regarding the former, the prior literature [8,14] measured multiple directorships

by the proportion of the total number of board of directors' members who hold multiple directorships with respect to the total number of directors on the board. With regard to directors' expertise, a measure representing the proportion of directors who are financial experts with respect to the total number of directors on the board was adopted [6,26].

### 3.2.3. Control Variables

Following previous studies, this study checked for a set of corporate governance variables—namely, board size, board independence, board meeting, audit committee size, and audit committee financial expertise [6,7,10,22,48]—as well as firm characteristics—namely: firm size, firm profitability, and leverage [5,12,22]. Table 2 presents the variables' measurement and their explanations.

**Table 2.** Measurements of variables.

Variable	Measurement
SRL	Company sustainability reporting level for governance, economic, social, and environmental aspects.
BMDir	The proportion of total number of board directors who hold multiple directorships to the board's size.
BExpDir	The proportion of financial experts' directors to the board's size.
BSize	Total number of board directors.
Bind	The proportion of independent directors to the board's size.
Bmeet	Total number of board meetings held in a year.
ACSize	Total number of audit committee members.
ACExp	The proportion of audit committee financial expert to the audit committee's size.
CSize	Natural logarithm of total assets.
CROA	Net income to total assets.
CLev	Total debt to total assets.

### 3.3. Empirical Model

The following regression model was designed for examining the hypotheses concerning the influence of a board's social and human capital on its sustainability reporting level:

$$SRL_{it} = \beta_0 + \beta_1 BMDir_{it} + \beta_2 BExpDir_{it} + \beta_3 BSize_{it} + \beta_4 Bind_{it} + \beta_5 Bmeet_{it} + \beta_6 ACSize_{it} + \beta_7 ACExp_{it} + \beta_8 CSize_{it} + \beta_9 CROA_{it} + \beta_{10} CLev_{it} + Industry_{it} + Year_{it} + \epsilon_{it} \quad (2)$$

## 4. Results

### 4.1. Descriptive Statistics

The descriptive statistics for the variables included in the regression model are presented in Table 3. As shown in the table, the mean and standard deviation (SD) values for the SRL are 0.754 and 0.206, respectively, which demonstrates the high level of sustainability reporting for non-financial companies in Saudi Arabia (75.4%), on average, when compared to other studies conducted in Saudi Arabia [15,16,30,31]. Moreover, the SD for the SRL of our sample is relatively low, which indicates the consistency in the level of sustainability reporting within the sample utilized in this study. At the same time, the mean and SD values of board directors who hold multiple directorships are 0.741 and 0.247, respectively, which indicates that a high percentage of the board members in our sample companies hold multiple directorships. As for the second independent variable, the proportion of financial experts who are also directors is relatively low, as only 38.6% of board members, on average, are considered financial experts. With regard to the control variables, the average board size in our sample was 7.992, which is less than those of previous studies in the context of Saudi Arabia; similarly, the boards of directors in our sample tended to meet less frequently than what was reported in previous studies [15,16]. As for the number of independent directors and the audit committee's size, their average values are in line with what was previously reported in the literature [16,31]. With regard to the firm characteristics, the average size of the firms in our sample was 9.309, and the SD was 0.759. Lastly, the companies in our sample have a relatively high leverage (50.6%), while the profitability was low (average

ROA was 2.3%), and some companies in our sample reported net losses, as the minimum value of the ROA was  $-601\%$ .

**Table 3.** Descriptive statistics.

Dependent Variable	N	Mean	S.D	Min	Max
SRL	654	0.754	0.206	0.25	1
Independent variables					
BMDir	654	0.741	0.247	0	1
BExpDir	654	0.386	0.201	0	0.909
Control variables					
BSize	654	7.992	1.574	3	11
Bind	654	0.487	0.146	0.09	1
Bmeet	654	5.476	2.389	1	25
ACSize	654	3.476	0.697	2	5
ACExp	654	0.727	0.251	0	1
CSize	654	9.309	0.759	7.380	12.367
CROA	654	0.023	0.256	$-6.013$	0.462
CLev	654	0.506	0.647	0.005	10

#### 4.2. Correlation Analysis

Table 4 shows the Pearson correlation matrix between the different variables used in our model, over the five-year period, together with their significance levels. Based on the below table, it can be deduced that multiple directorship, board of directors' expertise, board size, number of board meetings, audit committee's size, firm size, and firm profitability all have positive and significant correlations with the SRL at a 1% significance level; on the other hand, board independence and audit committee's expertise have negative and significant correlations with the SRL at a 1% significance level, while only a firm's leverage showed no significant correlation with the SRL. The results of the independent variables are consistent with what was previously reported in the literature, as Anazonwu et al. [8] found that multiple directorships positively influence the level of sustainability reporting in Nigeria, and Githaiga & Kosgei [49] deduced that board expertise positively impacts the level of sustainability reporting of companies in East Africa.

Regarding the control variables, results from previous studies in the literature are in line with our results regarding board size [10,24,49,50], audit committee's size [7,22], firm size [26,29,31,51], and firm profitability [17,29]. As for the number of board meetings, although our results are in line with some previous studies in the literature [12,14], they contradict those studies that were conducted in Saudi Arabia [16,17,31] maybe due to the fact that these studies examined the impact of this variable on CSR reporting rather than sustainability reporting, over a previous time period. Lastly, previous studies in the literature did not reach a consensus regarding the impact of the proportion of independent directors on the SRL, as some found that this impact is positive [30]; others found it to be a negative impact [17], while others found no significant impact [16].

Although the correlation matrix does not show any threat to multicollinearity, as the maximum correlation of 0.554 between any two independent variables in our study is below the maximum threshold of 0.8 or 0.9 [52], a variance inflation factor (VIF) analysis was conducted to ensure the reliability of our regression model. Table 5 presents the results of the VIF analysis, which shows that the highest VIF is 2.22, which is, once more, less than the threshold of 10 at which multicollinearity becomes a serious problem [53] and less than the recommended value of 5 [54].

**Table 4.** Pearson correlation matrix.

	SRL	BMDir	BExpDir	BSize	Bind	Bmeet	ACSize	ACExp	CSize	CROA	CLev
SRL	1										
BMDir	0.478 ***	1									
BExpDir	0.293 ***	0.232 ***	1								
BSize	0.311 ***	0.290 ***	0.278 ***	1							
Bind	−0.107 ***	−0.132 ***	0.016	−0.139 ***	1						
Bmeet	0.149 ***	0.182 ***	0.029	0.101 ***	−0.031	1					
ACSize	0.277 ***	0.191 ***	0.243 ***	0.398 ***	−0.072 *	0.150 ***	1				
ACExp	−0.194 ***	0.121 ***	0.492 ***	0.246 ***	0.045	−0.016	0.174 ***	1			
CSize	0.529 ***	0.554 ***	0.255 ***	0.512 ***	−0.270 ***	0.165 ***	0.447 ***	0.169 ***	1		
CROA	0.217 ***	0.062	−0.019	0.073 *	−0.058	−0.021	−0.010	0.061	0.093 **	1	
CLev	−0.046	0.003	0.007	−0.007	0.193 ***	−0.032	−0.036	−0.008	−0.099 ***	−0.023	1

Note: \*, \*\*, and \*\*\* denote significance at 10%, 5%, and 1%, respectively.

**Table 5.** Variance inflation factors.

Variable	VIF	1/VIF
CSize	2.22	0.449
BMDir	1.51	0.663
BSize	1.49	0.672
BExpDir	1.43	0.697
ACSize	1.37	0.728
ACExp	1.36	0.735
CROA	1.16	0.864
Bind	1.14	0.875
Bmeet	1.06	0.941
CLev	1.05	0.951
Mean VIF	1.38	

#### 4.3. Regression Models

In order to test our hypotheses and handle the bias of the omitted variables, an OLS regression analysis was used as the main test in this study, as shown in Table 6, which is a method which is extensively used in the literature [15,55,56]. As seen from the table, the R-squared value is 0.396; hence, our model can explain 39.6% of the variations in the SRL. Accordingly, to test our hypotheses, the SRL was regressed onto the independent variables in an iterative manner, and the coefficients are shown in Table 6. As hypothesized, both multiple directorships and board expertise have significant and positive impacts on the SRL at the 1% significance level. These findings confirm the argument that directors with more experience and expertise will ensure that non-financial information is adequately disclosed by their company to reduce agency problems and, at the same time, execute this with more quality and effectiveness, which are findings in line with the agency theory and both the resource-dependence and human capital theories, respectively. In addition, the former result is consistent with the findings of previous studies, such as Razek [40], Ali et al. [39], and Anazonwu et al. [8]. In terms of the association between a board's financial expertise and SRL, our findings are consistent with those of Umukoro et al. [43] and Githaiga & Kosgei [6], who performed their research on firms in East Africa and Nigeria, respectively. On the other hand, our findings contradict those of studies conducted in the Gulf region [29] and in Saudi Arabia [26]. The reasons behind such contradiction may be attributed to the fact that both studies used different measures for the SRL than the one used in this study and that their samples comprised reporting years prior to the timeframe used in this study.

**Table 6.** Regression results.

Variables	Expected Sign	Dependent Variable (SRL)
BMDir	+	0.1847 *** 5.63
BExpDir	+	0.1037 *** 2.69
BSize	+	0.0034 0.67
Bind	+	0.0192 0.35
Bmeet	+	0.0038 1.34
ACSize	+	0.0198 * 1.79
ACExp	+	0.0361 1.11
CSize	+	0.0858 *** 6.51
CROA	+	0.0851 1.19
CLev	−	−0.0040 −0.41
Constant		0.0939 1.41
Industry Effect		Yes
Years Effect		Yes
No. of Obs		654
R-squared		39.6%

Note: \* and \*\*\* denote significance at 10% and 1%, respectively.

#### 4.4. Robust Analysis

To recheck the results obtained from our main test, a robustness test was conducted, in which an alternative measure of the dependent variable (SRL2) was applied for the regression model. SRL2 is calculated as the logarithm of the total number of sustainability aspects reported by a company. A similar measure was used in previous studies such as Zaid's [24] and Bamahros et al.'s [16] in Palestine and Saudi Arabia, respectively, who used the logarithm of the index to capture the level of sustainability reporting.

Table 7 shows the regression results for the alternative measure of sustainability reporting. The results obtained from Table 7 confirm those obtained from our main test, as both multiple directorships and board expertise have positive and significant impacts on the SRL, with a similar R-squared value of 39%. Hence, the main conclusion from this research study remains unchanged even when applying the alternate measure for the SRL, which means that both our hypotheses are supported.

Lastly, we performed additional tests using both fixed effect and random effect analyses of the study's primary model to test the robustness of the OLS analysis. Fixed effects regression is a powerful method of assessing causal inference and can provide unbiased estimates [57]. This test was utilized in previous studies in the literature, such as in the works of Anazonwu et al. [8] and Orazalin & Baydauletov [37]. Concerning the random effect test, this test was previously adopted by Ebaid [30] and Githaiga & Kosgei [6]. Similar to the alternate measure of SRL, these additional tests obtained from Table 8 concurred with the conclusions deduced from our main analysis and confirmed both of our hypotheses, as both multiple directorships and board expertise have positive and significant impacts on the SRL, albeit at lower values of R-squared.

**Table 7.** Regression results (SRL2).

Variables	Expected Sign	Dependent Variable (SRL2)
BMDir	+	0.1294 *** 5.90
BExpDir	+	0.0628 ** 2.58
BSize	+	0.0012 0.35
Bind	+	0.0085 0.23
Bmeet	+	0.0031 * 1.67
ACSize	+	0.0136 * 1.94
ACExp	+	0.0402 * 1.73
CSize	+	0.0548 *** 6.62
CROA	+	0.0131 * 1.92
CLev	−	−0.0037 −0.37
Constant		0.0217 0.46
Industry Effect		Yes
Years Effect		Yes
No. of Obs		654
R-squared		39%

Note: \*, \*\*, and \*\*\* denote significance at 10%, 5%, and 1%, respectively.

**Table 8.** Regression analysis results (fixed effect and random effect).

Variables	Expected Sign	Fixed Effect	Random Effect
		Dependent Variable (SRL)	Dependent Variable (SRL)
BMDir	+	0.1597 *** 3.40	0.1685 *** 4.29
BExpDir	+	0.1371 ** 2.30	0.1409 *** 2.92
BSize	+	0.0074 0.80	0.0069 0.96
Bind	+	0.0188 0.45	0.0143 0.36
Bmeet	+	−0.0011 −0.39	−0.0002 −0.09
ACSize	+	−0.0106 −0.57	−0.0040 −0.24
ACExp	+	0.0062 0.15	0.0115 0.33
CSize	+	0.0636 * 1.88	0.0879 *** 4.59
CROA	+	−0.0253 −0.38	−0.0145 −0.23
CLev	−	0.0061 0.84	0.0068 1.08
Constant		0.3096 * 1.95	0.1844 * 1.75
Industry Effect		No	Yes
Years Effect		Yes	Yes
No. of Obs		654	654
R-squared		22.8%	22.6%

Note: \*, \*\*, and \*\*\* denote significance at 10%, 5%, and 1%, respectively.

## 5. Conclusions

This research study examined the influence of human and social board capital on the extent of sustainability reporting by non-financial companies listed in Saudi Arabia from 2018 to 2022. In this study, a sustainability index for governance, economic, social, and environmental aspects reported by the companies observed was utilized. Content analysis of the companies' annual reports was used to calculate the sustainability index, while an additional measure of the logarithm of the total number of sustainability aspects disclosed by the firms was used to check the robustness of our original model. Furthermore, in addition to the OLS regression utilized in our main test, fixed effect and random effect tests were also used. Using a sample of 654 observations representing 140 non-financial companies over our study's 5-year period, the OLS analysis as well as the robustness tests revealed that both multiple directorships and board expertise help these companies increase their level of SRL. The results imply that directors with more experience and expertise exert greater pressure on the firm's management to report a comprehensive set of sustainability information. This finding supports both of our hypotheses and aligns with the agency, resource-dependency, and human capital theories.

This study contributes to the existing literature on sustainability reporting by examining the influence of board characteristics on the sustainability reporting practices of non-financial firms in Saudi Arabia. To the best of our knowledge, this is the first study to investigate this relationship over the period from 2018 to 2022. This study presents the latest findings on how corporate governance attributes of non-financial firms in Saudi Arabia affect the SRL. Furthermore, this study makes a theoretical contribution by explaining the relationships between the variables using the agency, resource-dependency, and human capital theories. Based on the foregoing, this study will help to shed more light on the determinants of the SRL for non-financial Saudi firms, allowing investors to make more informed decisions about investing in these firms and their compliance with various sustainability aspects. Nonetheless, as with all research studies, this study does have certain limitations that provide potential avenues for future research. This study specifically examined the influence of having multiple directorships and the financial expertise of board members on the SRL; yet, as demonstrated in the literature, there are some other corporate governance characteristics that can have an impact on the SRL as well. Furthermore, despite the fact that the ownership structures of Saudi firms are quite unique, this study did not examine the impact of any of the ownership factors on the SRL, nor did it examine their moderating effects on the correlation between board characteristics and SRL; therefore, future research examining these relationships will help researchers provide a complete picture of the determinants of the SRL for Saudi non-financial companies. Finally, this study examined the SRL of non-financial companies only; thus, to completely assess the level of SRL reporting by the listed companies in Saudi Arabia, future studies on financial firms will be beneficial.

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