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# The association between CEO characteristics and privileges and the extent of firms' sustainability disclosure: The role of board independence

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**A B S T R A C T**

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The literature argues that the quality of a firm's financial reporting is reflected in the extent of its sustainability disclosure (SD). This study therefore examines the link between CEO characteristics (i.e., age, financial experience, duality leadership structure) and privileges (i.e., compensation and ownership) and the extent of SD. It also examines whether board independence has a vital impact on this association. A panel data set of 329 firm-year observations of firms listed on the Amman stock Exchange (ASE) between 2022 and 2023 is investigated. While the results show that a CEO's age and compensation positively and significantly affect the magnitude of a firm's SD, the CEO's financial experience, duality and ownership do not have a significant link to SD. Moreover, when board independence moderates the association between CEO characteristics and privileges and the extent of SD, the only variable that has a positive and significant effect on the extent of sustainability information is the CEO's age. The findings are expected to be beneficial to firms' decision makers regarding the selection of CEOs, as well as in deciding their compensation schemes. It also adds new evidence to the current debate in the literature on this issue, especially from a developing capital market like Jordan.

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## 1. Introduction

Faced with a unique worldwide business environment caused by the negative consequences of several catastrophic events – starting with the financial failures of high-profile firms in 2002, and continuing with the global financial crisis in 2007, the Arab spring in 2011, the Covid-19 pandemic in 2020 and, finally, the war in Ukraine in 2022 – firms' investors and other stakeholders have been paying extra attention to the quality of firms' financial reporting, as such quality is the most likely guarantee of the continuity of a firm and its ability to maintain long-term profitability. One of the well-established factors in the literature that may reflect high-quality financial reporting is having a good level of Sustainability Disclosure (SD). The Amman Stock Exchange (ASE) defines SD as "the practice of managing companies' impact on the economic, social and environmental issues for the purpose of identifying risks and opportunities that increasingly impact the success of companies through driving performance gains and increasing competitiveness" (ASE, 2023). SD comprises three dimensions: social, environmental and governance disclosure. Indeed, several firms are working hard (i.e., through adopting labour rights and maintaining proper work conditions) to be classified as socially connected to send a positive message about their strategies, policies and working environment (Hardiningsih et al., 2020). Environmental disclosure refers to a firm's efforts to avoid the negative consequences of their operations and activities on the surrounding environment by disclosing information regarding water, energy, effluents and waste, biodiversity, and environmental grievance mechanisms (ASE, 2023; Al-Shaer et al., 2023). In terms of governance disclosure, firms are interested in disclosing information regarding board structure, board independence, and the style of their leadership structure, which in turn may reflect the quality of governance system that firms adopt. Notwithstanding that firms are seeking to have a good degree of SD, there are several factors that may affect such disclosure, mainly a firm's CEO. Indeed, the prior research provides evidence that CEOs' characteristics (i.e., age, financial experience, duality leadership structure) and privileges (i.e., compensation and ownership) affect several attributes of firms, such as financial performance, earnings management and, for the purposes of the current study, SD (Qi et al., 2018; Qwasmeh

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& Azzam, 2020). This is due to the power and superiority of information that most CEOs have about their firms and, most importantly, such information is most likely not available to other stakeholders, mainly shareholders; this problem is known as information asymmetry. The literature argues that, through the board of directors, firms must be vigilant in hiring a CEO by selecting the appropriate person. However, the board can perform this duty better when a high percentage of its members are independent. This study contributes to the literature by providing new evidence on the association between CEO characteristics and SD from a new context, given that the generalizability of findings between developed and developing countries is limited due to several factors. It also helps in presenting the potentially crucial role of board independence in enhancing the level of firms' SD. The results of this study are expected to provide firms' decisions makers with important information about how the compensation and privileges of CEOs may have a vital role in sending a good message about firms by disclosing all relevant information about their social, environmental and governance practices. Furthermore, this study uses the most recent data, especially in the aftermath of the Covid-19, which in turn contributes to the literature regarding the influence of CEO characteristics and privileges over the extent of firms' SD.

## 2. Literature Review and Hypotheses Development

### *2.1 CEO Characteristics and Sustainability Disclosure*

The ability of firms' CEOs to affect the extent of SD has important implications for investors and other stakeholders when making informed decisions that enhance a sustainable and responsible business environment. Indeed, Zimon, Arianpoor and Salehi (2022, p.6) argue that "CEOs play a critical role in disclosure decisions, and CEOs' mental models, culture, and history are fundamental for transparency". Therefore, previous studies from several different contexts have examined the link between CEO characteristics (i.e., tenure, education, age and duality leadership structure) and firms' SD and reported mixed conclusions. For example, Romano et al. (2020) analyse the impact of CEO duality on environmental, social and governance disclosure across a sample of Italian firms. They find an inverse impact of CEO duality on the ability of firms to disclose sustainability information. In the same vein, Oware and Awunyo-Vitor (2021), using 800 firm-year observations, report that firms with a duality leadership structure are more likely to have low levels of environmental disclosure. More interestingly, they find that this low level of SD is more pronounced when CEOs are older. The same result is also reported by Lee (2023) using data from 13 Asia Pacific markets.

Sannino et al. (2020) investigate several CEO characteristics (i.e., tenure, age, education, gender and experience) and SD using data from 100 financial technologies firms. They find that CEOs' age and tenure play a vital role in improving the sustainability of a business model, especially in leading firms. Qawasmeh and Azzam (2020) show that older CEOs are less likely to alter earnings to meet several earnings benchmarks, indicating that older CEOs are interested in disclosing all relevant information regarding firms' practices and activities, which in turn leads to an increase in the quality of financial reporting. Moreover, Al-Shaer, Albitar and Liu (2022) use a composite index of environmental disclosure from a sample of firms from 2011 to 2019 and report a positive and highly significant association between CEO age and environmental disclosure. Specifically, they posit that "the older the CEO, the more likely s/he is to engage in projects that have a positive effect on environmental performance" (Al-Shaer et al., 2022, p. 1039). On the other hand, Mukherjee and Sen (2022) examine a panel data set of 138 firms from 2011 to 2018, and find that CEO age negatively affects the magnitude of SD. They recommend firms to be more vigilant when hiring a CEO by taking several factors into consideration, especially their roles and responsibilities. Consistent with this view, Mnif and Kchaou (2023) find an insignificant relationship between CEO age and the readability of SD reports. Another stream of research examines the association between CEOs' financial experience and the magnitude of SD. For example, Shahab et al. (2019) analyse over 16,000 observations of Chinese listed firms from 2010 to 2017 and find that CEOs' financial experience is one of the most important factors that lead to an increased level of firms' SD, especially pertaining to environmental issues. Of equal importance, they find that this association is minimised when young CEOs are leading these firms, most likely due to the upper echelon's theoretical perspective. Depending on a longitudinal dataset of 500 firms, Hrazdil, Mahmoudian and Nazari (2021) find a positive and highly significant link between CEO experience and social and environmental dimensions, especially in firms with higher environmental impact, while Wang, Qiu and Luo (2022) report the positive impact of CEO experience on firms' green innovation. They find that this impact is more pronounced in state-owned firms compared to privately owned firms. This is because state-owned firms are subject to more scrutiny, as well as having a good corporate governance structure. A similar conclusion is also reported by several researchers in different contexts, such as Wang et al. (2023) and Abdul Latif et al. (2023). Based on the previous discussion, the current study develops the following hypotheses:

**$H_1$:** *There is a positive association between CEO age and SD.*

**$H_2$:** *There is a positive association between CEO experience and SD.*

**$H_3$:** *There is a negative association between CEO duality and SD.*

### *2.2 CEO Privileges and Sustainability Disclosure*

CEOs' compensation and ownership have been examined extensively in prior research and indeed previous studies link them with several attributes of firms, like financial performance (Banerjee, Zattoni & Saiyed 2022; Omotola 2023), earnings management (Qawasmeh & Azzam 2020; Farouk & Ahmed 2023), corporate governance (Lee, Park & Chung 2022; Assenso-

Okofo, Jahangir Ali & Ahmed 2021), but little has been done regarding SD, especially in developing contexts. For example, Al-Shaer and Zaman (2019), using a sample from UK firms, find a positive association between CEO compensation and sustainability reporting assurance. They recommend firms to pay more attention to the behaviour of top management when assessing the achievement of sustainability targets. In the same context, Adu, Flynn and Grey (2022) corroborate the findings of Al-Shaer and Zaman (2019) and report a highly significant link between CEO pay and sustainable business practices. Depending on more than 1,990 firm-year observations of listed firms at STOXX Europe 600, Velte (2023) finds a strong positive association between executive compensation and the extent of biodiversity disclosure. Bhaskar et al. (2023) find that the total compensation paid to CEOs is positively and significantly linked with SD. However, they find that this association is more pronounced in cases of variable compensation compared with fixed compensation. In terms of CEOs' ownership, the prior research provides mixed results with regard to its impact on the magnitude of sustainability information disclosed by listed firms. For example, Zimon, Arianpoor and Salehi (2022) examine the relationship between non-financial SD and CEOs' characteristics from 2013 to 2020, using 178 listed firms at Tehran Stock Exchange. They show that CEO compensation plays a critical role in enhancing the quality of non-financial SD, which in turn leads to an improvement in the reputation of firms. On the other hand, Amornkitvikai et al. (2022) analyse the association between e-commerce SD and the percentage of shares owned by firms' CEOs and find a negative association between them. Additionally, Velte (2022) reports that the impact of CEO ownership on the quality of SD is weak, using 672 firm-year observations form Europe and South African firms from 2014 to 2019. Therefore, the current study develops the following hypotheses regarding the association between CEO privileges and SD:

**H$_4$:** *There is a positive association between CEO compensation and SD.*

**H$_5$:** *There is a positive association between CEO ownership and SD.*

*2.3 The Moderating Role of Board Independence on Sustainability Disclosure*

Board independence is considered one of the most important monitoring mechanisms that firms adopt to minimise the problem of conflicts of interest between principals and agents (i.e., CEOs) and ensure that CEOs act in the best interests of the firm's stakeholders. Indeed, Azzam (2020, p.160) states that "The financial failure of prominent firms has resulted in unprecedented attention in the majority of CG codes worldwide about the role of independent directors in monitoring managers. An AT perspective asserts that what is important in controlling managers and detecting their mismanagement is not the board per se, but rather its independence from the firm's managers". Therefore, prior research has examined the association between board independence and SD in different business environments. For example, Naciti (2019) analyses the published data of more than 360 firms from 46 countries and finds that board diversity is positively linked with SD performance. More interestingly, the study finds that this link is most often observed in firms with non-duality leadership structure. Shahbaz et al. (2020) investigate the potential relationship between several board attributes (i.e., board independence and gender diversity) and SD in a sample from the global energy sector from 2011 to 2018. They report that independent directors play a vital role in boosting the magnitude of firms' SD. Based on Italian data, Tibiletti et al. (2020) show that board independence positively and significantly improves firms' social responsibility. They recommend involving the stakeholders in firms' operations, as well as avoiding CEO duality due to the undesirable impact of this duality on the quality of social disclosure. Using data from approximately 440 firms from 20 developing capital markets, Disli, Yilmaz and Mohamed (2022) find that the positive impact of board independence is more pronounced with governance and environmental disclosure compared with social disclosure. They advise policy makers to impose a high-quality governance structure in order to benefit sustainability. Most recently, Githaiga and Kosgei (2023) have investigated a sample of firms listed on the East African capital markets from 2011 to 2020. They find that while board size negatively affects SD, board independence is found to improve the extent of firms' SD. Similar findings positively and significantly are also reported by Anyigbah et al. (2023) and Agarwala, Pareek and Sahu (2023). To summarise, the literature argues that more independent directors serving on firms' boards are most likely linked with an increased level of earnings quality, better financial performance, high quality governance systems and, more importantly for the current study, a high level of SD. Thus, this study develops the following hypotheses regarding the moderating impact of board independence on the relationships between CEO characteristics (i.e., age, financial experience, duality leadership structure) and privileges (i.e., compensation and ownership) and the extent of SD:

**H$_6$:** *Board independence moderates the positive association between CEO age and SD.*
**H$_7$:** *Board independence moderates the positive association between CEO experience and SD.*
**H$_8$:** *Board independence moderates the negative association between CEO duality and SD.*
**H$_9$:** *Board independence moderates the positive association between CEO compensation and SD.*
**H$_{10}$:** *Board independence moderates the positive association between CEO ownership and SD.*

## 3. Methodology

This study includes all the listed firms in ASE from 2022 to 2023. The reason behind selecting this period is to avoid the consequences of the Covid-19 pandemic, which started in 2020, the effects of which were minimised by approximately the end of 2021. All the necessary data were collected from firms' annual reports, which are available on the website of the Jordan Securities Commission. Firms listed on the ASE yield (342) firm-year observations. Due to the missing financial and non-

financial data, 5 and 8 observations are excluded, respectively. The final sample, therefore, includes 329 firm-year observations.

**Table 1**
Sample selection criteria

| Description | Observations |
|---|---|
| Total Observations | 342 |
| Less: Missing Financial Data | (5) |
| Less: Missing Non-Financial Data | (8) |
| Final Sample | 329 |

*SD*, which is the dependent variable, is measured by an index that comprises three aspects: environmental (i.e., 7 variables), social (i.e., 13 variables), and governance disclosures (i.e., 8 variables). This study includes the following independent variables: *CEO age* ($CEO.AGE$) is the age of a CEO at the end of the year. *CEO experience* ($CEO.EXP$) is measured using a dummy variable, which takes the value of one if the CEO has experience in preparing or auditing financial statements, and zero otherwise. *CEO duality leadership structure* ($CEO.DUA$) is measured using a dummy variable, which takes the value of one if the CEO served as the chair of the board, and zero otherwise. *CEO compensation* ($CEO.COM$) is measured by total cash compensation paid to a firm's CEO. *CEO ownership* ($CEO.OWN$) is measured by the ratio of shares owned by the CEO. *Board independence* ($BOARD.IND$) is measured by the ratio of independent directors sitting on the board. The current study controls for some variables that are most likely to have an impact on the extent of SD. The variables are: *Firm size* ($SIZE$), which is measured by total assets at the beginning of the year. *Leverage* ($LEV$) is the ratio of total debts to total equity. *Market listed status* (MLS) is a dummy variable that takes the value of one if the firm's shares are traded in the first market, and zero otherwise. *Book to market ratio* (BM), which is measured by the ratio of book value of equity to the market value of equity. After selecting the variables of this study, $H_1$ to $H_5$ are tested using Eq. (1) as follows:

$$SD_{it} = \beta_0 + \beta_1 CEO.AGE_{it} + \beta_2 CEO.EXP_{it} + \beta_3 CEO.DUA_{it} + \beta_4 CEO.COM_{it} + \beta_5 CEO.OWN_{it} + \beta_6 SIZE_{it} + \beta_7 LEV_{it} + \beta_8 \text{MLS} + \beta_9 \text{BM} + \varepsilon_{it} \quad (1)$$

$H_6$ to $H_{10}$ are tested using Eq. (2) as follows:

$$SD_{it} = \beta_0 + \beta_1 CEO.AGE_{it} + \beta_2 CEO.AGE_{it} * BOARD.IND + \beta_3 CEO.EXP_{it} + \beta_4 CEO.EXP_{it} * BOARD.IND + \beta_5 CEO.DUA_{it} + \beta_6 CEO.DUA_{it} * \text{BOARD.IND} + \beta_7 CEO.COM_{it} + \beta_8 CEO.COM_{it} * BOARD.IND + \beta_9 CEO.OWN_{it} + \beta_{10} CEO.OWN_{it} * BOARD.IND + \beta_{11} SIZE_{it} + \beta_{12} LEV_{it} + \beta_{13} \text{MLS} + \beta_{14} \text{BM} + \varepsilon_{it} \quad (2)$$

## 4. Results and Discussions

Table 2 shows that the mean value of *SD* is approximately 38%, which is consistent with the previously reported results of Azzam *et al.* (2020) in the same context with a mean of 35%. Jordanian firms have a relatively low mean of *CEO.AGE* and *CEO.EXP*, especially when compared with other financial markets in developed countries, like the US and the UK. Despite the fact that all-corporate governance regulations in Jordan recommend avoiding CEO duality, the results show that on average 18.7% of the firms listed on the ASE have a dual leadership structure. The mean value recorded for *CEO.COM* is 0.117 $US million, with only 4.1% percentage of ownership. Such a low level of CEO ownership is not surprising given that most of the previous studies of the Jordanian capital market report a similar conclusion, such as those conducted by Bsoul et al. (2022) and Qawasmeh and Azzam (2020). While 49.2% of firms' directors are independent, Table 2 shows that the minimum percentage in some firms is zero. Hence, these firms do not comply with the governance regulations in Jordan, which state that at least one third of firms' directors should be independent. In terms of control variables, the size of firms listed on the ASE is relatively small, with a mean of 109.2 $US million. This is especially true when compared with firms' size in developed capital markets. The means of *LEV* and *BM* are 47.3% and 66.8%, respectively. Finally, Table 2 reports that while 41.7% of firms are listed in the first market, the remaining firms (i.e., 58.3%) are listed in the second market.

**Table 2**
Descriptive statistics

| *VARIABLES* | *MIN* | *MAX* | *MEAN* | *MEDIAN* | *OBSERVATIONS* |
|---|---|---|---|---|---|
| *SD* | 0.083 | 0.912 | 0.376 | 0.271 | 329 |
| *CEO.AGE* | 31.00 | 83.00 | 53.41 | 11.25 | 329 |
| *CEO.EXP* | 0.000 | 1.000 | 0.415 | 0.331 | 329 |
| *CEO.DUA* | 0.000 | 1.000 | 0.187 | 0.094 | 329 |
| *CEO.COM (MILLION $US)* | 0.022 | 0.587 | 0.117 | 0.057 | 329 |
| *CEO.OWN* | 0.000 | 0.624 | 0.041 | 0.019 | 329 |
| *BOARD.IND* | 0.000 | 1.000 | 0.492 | 0.412 | 329 |
| *SIZE (MILLION $US)* | 0.081 | 1,322 | 109.2 | 41.28 | 329 |
| *LEV* | 0.000 | 2.114 | 0.473 | 0.197 | 329 |
| *MLS* | 0.000 | 1.000 | 0.417 | 0.0000 | 329 |
| *BM* | 0.098 | 1.514 | 0.668 | 0.432 | 329 |

Before running a regression analysis, some assumptions must be checked. The first one is no multicollinearity among the study's variables. Multicollinearity occurs when "some or all of the explanatory variables are highly correlated with one

another" (Koop, 2013, p.99). Therefore, the Spearman test is used here to check this assumption. The results reported in Table 3 show that the highest correlation observed is 56.8% between *CEO.COM* and *CEO.AGE*. Indeed, such an association is not surprising, because CEOs are expected to receive more compensation in their later years of serving in firms compared with the early years. Thus, multicollinearity is not a concern here. However, the current study finds that the data are not normally distributed (i.e., using the degree of skewness and kurtosis), and that they suffer from heteroskedasticity (i.e., using the Breusch-Pagan test). In this case, prior research such as Hill et al. (2018) and Gujarati and Porter (2010) recommend using the fixed effect model with robust standard errors to avoid this problem.

**Table 3**
Spearman Correlation Matrix

| | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|---|
| CEO.AGE | (1) | 1.000 | | | | | | | | |
| CEO.EXP | (2) | 0.183* | 1.000 | | | | | | | |
| CEO.DUA | (3) | 0.228 | 0.274 | 1.000 | | | | | | |
| CEO.COM | (4) | 0.568* | 0.127* | 0.328 | 1.000 | | | | | |
| CEO.OWN | (5) | -0.036 | -0.364 | 0.095 | 0.318 | 1.000 | | | | |
| SIZE | (6) | 0.074 | 0.418 | 0.173 | 0.457 | -0.084 | 1.000 | | | |
| LEV | (7) | -0.225 | 0.047 | 0.029* | 0.179 | -0.218 | -0.233* | 1.000 | | |
| MLS | (8) | 0.032* | 0.229* | -0.114 | 0.098* | 0.041 | 0.392 | 0.057 | 1.000 | |
| BM | (9) | 0.321 | 0.041 | 0.036* | 0.161 | -0.124 | 0.119 | 0.102 | 0.142* | 1.000 |

(*) indicates significance at 1 percent in two-tailed test.

Table 4 reports the findings of the link between CEO characteristics and privileges and the extent of *SD*. Consistent with the proposition mentioned earlier, there is a positive and significant association (P>0.05) between CEO age *(CEO.AGE)* and sustainability information disclosed by the ASE's listed firms. This implies that CEOs in their later years of serving have the incentive to disclose more information about firms' environmental, social and governance practices, which in turn leads to positive consequences for the financial performance. This result is consistent with the argument in the previous studies – such as those conducted by Qawasmeh and Azzam (2020), Ali and Zhang (2015) and Axelson and Bond (2009) – that older CEOs are less likely to manage earnings and thus represent the real financial position of listed firms. In other words, older CEOs do not have the opportunistic behaviour that focuses on maximising their benefits and compensations on the interest of firms' benefits. To summarise, relatively older CEOs are more motivated to disclose all the relevant information pertaining to firms' operations, including sustainability information. Based on the current results, $H_1$ is supported. Inconsistent with the current study's propositions, an insignificant link is found between CEO experience *(CEO.EXP)* and CEO duality *(CEO.DUA)* and the magnitude of sustainability information disclosed by the ASE's listed firms. This result indicates that financial experience as well as the duality leadership structure do not play a pivotal role in enhancing the extent of firms' *SD*. Moreover, firms where the positions of CEO and board chair are held by one person are less likely to focus on *SD* issues and, most importantly, they may try to maximise their own benefits. Indeed, several corporate governance codes in different business environments, like the Sarbanes–Oxley Act in the US and the Cadbury Code in the UK, recommend separating the two roles. Of equal importance, previous studies such as those conducted by Alves (2023), Almashhadani and Almashhadani (2022) and Azzam (2020) provide empirical evidence that firms with CEO duality have a low level of governance quality, internal control and earnings quality.

**Table 4**
Regression results of the association between CEO characteristics and privileges and SD

| SD | Coef. | T-Value |
|---|---|---|
| CEO.AGE | 0.114 | 2.18* |
| CEO.EXP | 0.047 | 0.89 |
| CEO.DUA | 0.019 | 1.29 |
| CEO.COM | 0.193 | 3.17** |
| CEO.OWN | -0.272 | -0.74 |
| SIZE | 5.328 | 2.91** |
| LEV | -0.082 | -0.57 |
| MLS | 2.208 | 4.12** |
| BM | -0.381 | -1.04 |
| Cons. | 0.629 | 0.92 |
| No. of obs =329 | | |
| Adj.$R^2$ = 28.3% | | |

(*) and (**) indicate significance at 5 and 1 percent, respectively, in two-tailed test.

Based on the findings reported in Table 4, $H_2$ and $H_3$ are rejected. CEO compensation *(CEO.COM)* is positively and significantly linked (P>0.01) with *SD*, suggesting that firms' where CEOs are receiving more privileges are more motivated to improve *SD*. This is especially true given that CEOs in such firms may believe that the high levels of *SD* will lead to enhanced financial performance, which in turn leads to maximising their financial compensations, specifically in cases where CEO compensation is tied to financial performance. This result is consistent with the results reported by Alfawareh et al. (2023) and Bhuyan et al. (2022). Hence, $H_4$ is accepted. Notwithstanding that the current study proposes a positive association

between CEO ownership *(CEO.OWN)* and *SD*, Table 4 shows an insignificant negative association between them. This result is in line with the findings of the previous studies in different contexts, like those conducted by Mnif and Kchaou (2023), Amornkitvikai et al. (2022) and Zimon et al. (2022). One plausible explanation for this result is that CEOs in Jordanian listed firms hold a low percentage of shares; thus, they are less interested in disclosing more sustainability information in annual reports, which could lead to improved earnings for the firm as well as earnings per share. Of equal importance, Table 2 shows that CEO ownership represents approximately 4% of firms' ownership structure. Therefore, CEO ownership does not have an impact on the magnitude of *SD*, hence $H_5$ is rejected.

**Table 5**
Regressions results of the moderating role of board independence on the association between CEO characteristics and privileges and SD

| *Variables* | *Model 1* | *Model 2* | *Model 3* | *Model 4* | *Model 5* |
|---|---|---|---|---|---|
| Intercept | 0.417<br>(1.11) | 0.541<br>(1.28) | 0.531<br>(0.92) | 0.324<br>(1.22) | 0.638<br>(0.84) |
| CEO.AGE | 0.213<br>(2.09) * | 0.117<br>(3.09) ** | 0.258<br>(2.88) ** | 0.097<br>(2.14) * | 0.198<br>(2.25) * |
| CEO.EXP | 0.087<br>(0.62) | 0.147<br>(0.88) | 0.091<br>(0.45) | 0.182<br>(0.72) | 0.051<br>(0.43) |
| CEO.DUA | 0.087<br>(1.18) | 0.118<br>(1.52) | 0.065<br>(1.41) | 0.054<br>(1.07) | 0.136<br>(1.33) |
| CEO.COM | 0.217<br>(3.41) ** | 0.183<br>(2.29) * | 0.249<br>(3.11) ** | 0.174<br>(2.11) * | 0.276<br>(2.04) * |
| CEO.OWN | -0.281<br>(-1.18) | -0.178<br>(-1.21) | -0.331<br>(-0.97) | -0.224<br>(-1.29) | -0.417<br>(-0.81) |
| CEO.AGE *BOARD.IND | 0.128<br>(2.28) * | | | | |
| CEO.EXP *BOARD.IND | | 0.048<br>(0.71) | | | |
| CEO.DUA *BOARD.IND | | | 0.072<br>(0.41) | | |
| CEO.COM *BOARD.IND | | | | 0.119<br>(1.45) | |
| CEO.OWN *BOARD.IND | | | | | -0.182<br>-(0.69) |
| SIZE | 4.171<br>(4.11) ** | 5.221<br>(4.19) ** | 5.147<br>(6.88) ** | 3.877<br>(2.91) ** | 4.395<br>(3.24) ** |
| LEV | -0.147<br>(-1.18) | -0.084<br>(-0.84) | -0.183<br>(-0.91) | -0.074<br>(-0.82) | -0.221<br>(-0.88) |
| MLS | 3.217<br>(2.87) ** | 2.317<br>(3.47) ** | 2.981<br>(2.87) ** | 3.189<br>(3.91) ** | 2.287<br>(3.04) ** |
| BM | -0.421<br>(-1.12) | -0.369<br>(-1.20) | -0.338<br>(-0.95) | -0.247<br>(-1.17) | -0.228<br>(-0.84) |
| No. of observations | 329 | 329 | 329 | 329 | 329 |
| Adjusted $R^2$ | 31.8% | 29.1% | 33.8% | 26.4% | 30.8% |

(*) and (**) indicate significance at 5 and 1 percent, respectively, in two-tailed test.

In terms of the control variables, *(SIZE)* is significantly linked with *SD*, implying that, compared to small firms, large firms are more interested in the disclosure of sustainability information. This is because large firms are working hard to send good signals to their investors, especially foreigners, that they care about the environment, social and governance issues. While *(LEV)* and *(BM)* are insignificantly associated with *SD*, *(MLS)* is positively and significantly associated (P>0.01) with *SD*, suggesting that firms listed on the first market have more incentive to disclose sustainability information compared to the firms listed on the second market. This is since the first market in Jordan is intended for profitable and large firms, thus such firms are motivated to increase the level as well as the quality of SD because these firms are under the scrutiny of several parties, like current and potential investors. Table 5 provides the results of the moderating role of board independence on the association between CEO characteristics (i.e., age, financial experience, duality leadership structure) and privileges (i.e., compensation and ownership) and the extent of *SD*. The results of the associations between *(CEO.AGE), (CEO.EXP), (CEO.DUA), (CEO.COM)* and *(CEO.OWN)* and the magnitude of *SD* remain unchanged from the previously reported results in Table 4. However, regarding the moderating role of board independence, the results show a positive and significant association (P>0.05) between *(CEO.AGE*BOARD.IND)* and sustainability information disclosed by the ASE's listed firms. This result corroborates the argument in the literature – such as the research conducted by Hu et al. (2023), Jaidi et al. (2022) and Azzam (2020) – that board independence plays a critical role in enhancing several attributes of listed firms, like financial performance, internal control, governance quality, earnings quality and, for the current study, the level of *SD*. Hence, the high level of board independence along with older CEOs serving in firms are more likely motivating firms to disclose more information regarding sustainability issues (i.e., environmental, social and governance practices). Thus, $H_6$ is accepted. The moderating role of board independence on the other CEO characteristics and privileges – namely *(CEO.EXP), (CEO.DUA), (CEO.COM)* and *(CEO.OWN)* – is found to be insignificantly linked with *SD* levels. Therefore, $H_7$, $H_8$, $H_9$ and $H_{10}$ are rejected. In terms of control variables, the results remain unchanged from those previously reported in Table 4.

## 5. Conclusion

SD – including social, environmental and governance dimensions – has received more attention from shareholders, researchers, regulators and practitioners, especially after the financial collapse of high-profile firms from 2000 onwards. This is especially true given that the sustainability information disclosed by listed firms in their annual reports is considered one of the pivotal factors that may provide solid evidence pertaining to firms' financial reporting quality as well as their long-term continuity. Of equal importance, the literature argues that CEOs most likely play a critical role in the extent of firms' SD. Therefore, this study examines the link between CEO characteristics (i.e., age, financial experience, duality leadership structure) and privileges (i.e., compensation and ownership) and the extent of SD, using 329 firm-year observations from the ASE between 2022 and 2023. Furthermore, it examines whether board independence has a vital impact on this association.

The results show that CEOs' age and compensation are the only variables that positively and significantly affect the magnitude of firms' SD. CEOs' financial experience, duality leadership structure and ownership do not have a significant link with SD. Moreover, when the board independence moderates the association between CEO characteristics and privileges and the extent of SD, the only variable that has a positive and significant impact on SD is CEO age, thus board independence does not affect CEO compensation. This suggests that the existence of independent directors on firms' boards is not able to affect SD in all scenarios. The results of this study are beneficial to firms' decision makers (i.e., boards of directors) in terms of their CEO selection process and the determination of their compensation schemes. It also contributes to the ongoing debate in the literature on this issue, especially from a developing country context like Jordan, given that the generalizability of findings between developed and developing markets is limited due to the differences in their business and legal environments.

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