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RESEARCH ARTICLE

Charting a Sustainable Path: The Nexus of Board Attributes and CEO Characteristics in Shaping Sustainability Reporting

Radziah Mahmud[1], Nor Khadijah Mohd Azhari[2], Nor Farizal Mohammed[3], Sylvia Veronica Siregar[4]

[1]*Faculty of Accountancy, Universiti Teknologi MARA Selangor, Puncak Alam, Selangor, Malaysia*
[2]*Department of Business and Management, Universiti Teknologi MARA Penang, Permatang Pauh Campus, Penang, Malaysia.*
[3]Faculty of Accountancy, Universiti Teknologi MARA, Malaysia
[4]Department of Accounting, Faculty of Economics, Universitas Indonesia, Depok, Indonesia

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***Corresponding Author:**

ABSTRACT

The integration of sustainability practices become imperative and companies have shifted towards corporate responsibility, emphasising sustainability reporting as a strategic approach for organisations to demonstrate commitment to environmental, social, and governance considerations. Regulatory initiatives further highlight the importance of sustainability reporting in fostering transparency and accountability. However studies on sustainability reporting in Malaysian business environment are underexplored. Drawing on stakeholder theory and upper echelons theory, this study examines the impact of board attributes on sustainability reporting in Malaysian listed companies, with a focus on the moderating role of CEO characteristics. Based on data from 206 listed companies in Malaysia for the period from 2021 to 2022, multiple regression models have been constructed and analysed using Python Pandas Programming tools. This study reveals that board tenure and board size significantly impact sustainability reporting, while some board attributes and CEO characteristics show no direct impact on sustainability reporting. Notably, the association between board attributes, measured by board tenure, and sustainability reporting appears to be moderated by CEO characteristics. Apart from addressing a critical gap in the literature concerning the relationships between board attributes, CEO characteristics, and sustainability reporting, this study provides practical insights for corporate leaders, regulators, and stakeholders in shaping sustainable business practices.

INTRODUCTION

In the dynamic environment of evolving corporate governance, the integration of sustainability practices has become an imperative for companies globally. Sustainability reporting practice may enhance transparency and accountability by providing a holistic view of a company's environment, social and governance (ESG) policies (Indriawati, Nurlis & Dhewi, 2022; Sheikh Abu Bakar, Mohd Ghazali & Ahmad, 2019), mitigate information asymmetry on sustainability activities (Lopatta, Kaspereit, Tideman, & Rudolf, 2023), manage risks related to climate change, resource scarcity and other factors (Lai, Shad, & Ali Shah, 2021), engage stakeholders to meet their expectation and build trust (Indriawati et al., 2022; Yadav & Jain, 2023), and foster financial performance (Agostini, Costa & Korca, 2022).

The Malaysian economic environment has changed significantly, with stakeholders no longer focused merely on financial performance. Given the changing environment, more companies in Malaysia are emphasising on corporate responsibility, indicating their commitment through sustainability reporting (Elaigmu, Abdulmalik & Talab, 2021). This practice is seen as a strategic approach for organisations to demonstrate their enthusiasm to ESG considerations. Regulatory initiatives, such as the Bursa Malaysia Listing Requirements and the Malaysian Code on Corporate Governance (MCCG), prioritising the significance of sustainability reporting as a measure to foster transparency and accountability in the business sector (Sheikh Abu Bakar et. al., 2019). This shift signifies a growing recognition of the importance of sustainable reporting practices which aligns with the sustainabiltiy objectives outlined in the United Nation' Sustainable Developmet Goals (SDGs).

The relationship between board attributes and sustainability reporting has emerged as a crucial area of scholarly study, with an increasing recognition of the critical role boards play in navigating companies towards responsible and sustainable business practices (Ismail & Mohd Latiff, 2019). Yadav and Jain (2023) suggest that since the board of directors have responsibility to make decisions for the best interests of the stakeholders, they play a pivotal role in sustainability reporting. As part of their fiduciary duty, the board of directors undertakes the role of strategic supervision in overseeing good corporate governance practices that satisfy the anticipation of their stakeholders. Besides approving and supervising significant decisions, the board has the authority to appoint, dismiss, and provide incentives to the top management (Fama & Jensen, 2019).

It is argued that CEO characteristics may exert a significnat influence on the companies' strategies, stakeholder engagement and reporting strategies including sustainability reporting practices (Lopatta et al., 2022). The profound impact of CEO leadership in sustainabilty reporting should be recognised as the CEO acquires the essential characteristics and values to effectively motivate the companies to achieve their sustainability goals (Boone, Buyl, Declerck & Sajko, 2020).

Even though there is growing importance of sustainability reporting, a research gap exists in understanding the relationships between board attributes, CEO characteristics, and the sustainability reporting in Malaysian companies. While previous studies have investigated these variables in isolation (Buniamin, Jaffar, Ahmad & Johari, 2022; Sekarlangit & Wardani, 2021), there is a scarcity of empirical research that holistically investigates their relationship within the unique cultural, regulatory, and economic environment of Malaysia. Understanding the relationship of diverse perspectives and experiences within boards becomes essential for Malaysian companies to align their practices with the complex expectations of stakeholders in sustainability reporting. Furthermore, the scarcity of empirical evidence on how CEO characteristics moderate this relationship further aggravates the complexity of the problem, deterring the progress toward sustainable development objectives described in the SDGs.

To fill the identified gaps, we investigate the impact of board attributes on sustainability reporting and the moderating role of CEO characteristics in this relationship. From a theoretical perspective, this study uses the theoretical premise of stakeholder theory to explore the impact of board attributes on sustainability reporting and upper echelons theory for the moderating role of CEO characteristics in Malaysian listed companies from 2021 and 2022.

The study finds that board tenure and board size have a significant impact on sustainability reporting. Other board attributes and CEO characteristic do not impact the sustainability reporting. It is also found that the relationship between board attributes measured by board tenure and sustainability reporting is moderated by CEO characteristic. By examining these determinants, we seek to enhance our knowledge of the motivations for sustainability reporting practices and provide insights for companies, regulators, and other stakeholders to promote sustainable business initiatives in Malaysia.

2.0 LITERATURE REVIEW

2.1 Underlying Theories

Rubino, Tenuta, and Cambrea (2021) assert that reliance on one theory to explain the influence of board attributes and CEO characteristics on sustainability reporting may simplify the complex relationships involved. To provide a more holistic understanding, this study integrates stakeholder theory (Freeman, 2010; Al-Qudah & Houcine, 2023) and upper echelons theory (Hambrick & Mason, 1984; Saha, Kabir & Chowdhury, 2023). Stakeholder theory emphasizes stakeholders' demand and anticipation in decision-making processes to ensure long-term sustainability (Freeman, 2010; Wang, 2017). Meanwhile, upper echelons theory focuses on how CEO attributes impact companies' strategies, including sustainability reporting practices (Hambrick & Mason, 1984; Saha et al., 2023). By considering CEO characteristics alongside board attributes, this theory enhances the realisation on how leadership dynamics influence sustainability reporting practices.

2.1 Sustainability Reporting

Sustainability reporting is recognised worldwide as significant for effective corporate governance. Due to stakeholders' demand on ESG disclosure, companies are prompted to disclose sustainability initiatives (Indriawati et al., 2022). This report provides valuable insights on the company's sustainability strategy, performance, and risks, enhancing trust and fostering the company's reputation (Lai et al., 2021; Yadav & Jain, 2023).

Sustainability reporting is motivated by various factors such as consumer preferences, investor expectations, and regulatory frameworks like Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), the Task Force on Climate-related Financial Disclosures (TCFD). These regulations provide guiding principles and standards for sustainability reporting, aligning with societal pressures and regulatory requirements (Lai et al., 2021).

Sustainability reporting becomes important as a strategic mechanism for managing risks, encouraging creativity and innovation, attracting investment, and subsequently developing long-term value for shareholders (Agostini et al., 2022). Companies with effective integration of sustainability practices into thier business models are perceived to manage emerging challenges, confiscate opportunities, and develop flexibility in a challenging global business environment.

Sustainability reporting in Malaysia is governed by Bursa Malaysia Securities Berhad's regulations, particularly the Sustainability Reporting Guide. This framework assists companies in disseminating sustainability information, overseeing risks, and fulfilling stakeholder demands (Bursa Malaysia, 2022). Wong, Jalaludian and Phua (2019) emphasise on the mandatory incorporation of a sustainability statement in annual reports for all listed companies, featuring the growing importance of sustainability disclosure in corporate reports.

2.2 Board Attributes and Sustainability Reporting

Board attibutes are regarded as critical in enhancing sustainability reporting, facilitating effective monitoring, and implementating efficacious corporate governance mechanisms. Diverse backgrounds of board members contribute to varied perspectives in decision-making. Literature has asserted that gender diversity may favourably influence sustainability reporting (Singhania, Singh, Aggrawal & Rana, 2023). Companies with more female directors experience better board effectiveness and encourage the adoption of sustainability practices (Monteiro, Lemos & Rebeiro, 2022) Aligned with stakeholder theory, female members tend to foster sustainability practices and they are inclined to support the management in fulfilling the interests of various stakeholders (Balchandani, Kim, Berg, Hedrich, Rölkens, & Amed, 2021). Inconsisent with this view, Kwarteng, Appiah and Addai (2023) provide evidence that female directors have an insignificant influence on sustainability practices. Even though research on board gender and sustainability reporting yields mixed findings, it is hypothesised that:

H1: Board gender has a positive impact on sustainability reporting

Previous research provides evidence that specific board skills play a critical role in determining the companies' sustainability strategy and reporting. According to stakeholder theory, diverse educational backgrounds and skills among board members positively impact resource quality, enabling effective stakeholder engagement and enhancing sustainability across ESG performance (Anyigbah et al., 2023; Harjoto & Laksmana, 2018; Said Hj Zainuddin & Haron, 2009). Thus, we hypothesise that:

H2: Board specific skills have a positive impact on sustainability reporting

Stakeholder theory posits that independent directors have a crucial responsibility in promoting sustainability reporting practices. There is evidence that the presence of independent directors influences sustainability reporting positively (Kwarteng et al., 2023) as their independence, distinct proficiency, and commitment to stakeholder interests are valuable contributions to board discussions and decisions related to sustainability activities.. However, conflicting findings exist in cases where the effectiveness of independent directors in shaping sustainability reporting practices is questionable in companies with prevalent CEOs or entrenched management organisations (Buniamin et al., 2022). Hence, this study expects the following hypothesis:

H3: Board independence has a positive impact on sustainability reporting

Recent studies such as Livnat, Smith, Suslava, and Tarlie (2021) provide evidence that board tenure may influence the effectiveness of sustainability reporting practice. Prolonged board tenure can enhance sustainability performance through better monitoring and sharing of valuable insights (Bonini, Deng, Ferrari, John & Ross, 2022). However, the risk of complacency and reduced active learning among longer-tenure board members may reduce the sustainabilty reporting disclosure (Al-Jaifi, Al-Qadasi & Al-Rassas, 2023; Niu & Berberich, 2015). This argument is consistent with stakeholder theory that suggests board tenure may have both favourable and unfavourable impacts on sustainability reporting, subject to how it manipulates the directors' viewpoints and engagements with stakeholders. Consequently, we hypothesise that:

H4: Board tenure has a significant impact on sustainability reporting

Since the impact of board meeting frequency on sustainability reporting is relatively limited compared to other aspects of board attributes, this study seeks to shed light on how this CG component may influence sustainability disclosure. Consistent with stakeholder theory, more board meeting frequency may lead to better and more comprehensive reporting sustainability practices through effectively monitoring sustainability-related affairs (Sekarlangit & Wardani, 2021). Frequent board meetings may enhance diligence and the ability of the board members to address stakeholders' concerns and better influence companies' sustainable performance (Kwarteng et al., 2023). Thus, we propose that:

H5: Board meeting has a positive impact on sustainability reporting

Stakeholder theory also claims that board size may have an impact on sustainability reporting by influencing the effectiveness of boards in signifying stakeholders' needs, monitoring sustainability practices, and promoting accountability (Buniamin et al., 2022). A larger board may benefit the stakeholders in monitoring and restricting management opportunistic behaviours due to diverse ideas, knowledge and more representation of stakeholders (Berraies & Rejeb, 2019; Saidat et al., 2019). However, larger boards may suffer from inefficient decision-making and compromised monitoring resulting in impacting sustainability (Kwarteng et al., 2023). Following Buniamin et al. (2022), we suggests that:

H6: Board size hasa positive impact on sustainability reporting

Thus, board attributes generally play crucial roles in influencing sustainability reporting outcomes, with various perspectives and potential trade-offs in monitoring and controlling managerial opportunistic behaviours.

2.3 CEOs Characteristics and Sustainability Reporting

The general impact of CEOs characteristics on sustainability reporting is perceived to be beyond the mere disclosure of environmental and social measures. In line with upper echelon theory, CEOs who possess power with visionary leaders may enhance a corporate culture that value ESG considerations thereby has significant positive impact on sustainability reporting (Lopatta et al., 2022). Their focus on long term vision may inspire more investment in sustainable practices as CEO's decisions are influenced by their social values and preference (Boone et al., 2020). CEO's power may determine corporate culture and strategy, emphasising the pivotal position of leadership in inclusive sustainability reporting. After considering the arguments above, we hypothesise that:

H7: CEO characteristic has a positive impact on sustainability reporting

2.4 Moderation effect of CEO Characteristic on the Impact of Board Attributes on Sustainability Reporting

The moderation effect of CEO characteristic on the impact of board attributes on sustainability reporting emphasises on the significance of considering CEO characteristic in recognising the companies' sustainability initiatives. By understanding how CEO characteristic moderate the relationship between board attributes and sustainability reporting, companies can better stimulate their leadership resources to obtain favourable sustainability outcomes (Zhang, Sun & Liu, 2020). Chen, Lin and Yang (2020) suggest that the CEOs' environment awareness may strengthen the impact of board attributes on sustainability reporting. Thus, we propose that:

H8(a): CEO characteristic has moderated the impact of board gender on sustainability reporting

H8(b): CEO characteristic has moderated the impact of board specific skills on sustainability reporting

H8(c): CEO characteristic has moderated the impact of board independence on sustainability reporting

H8(d): CEO characteristic has moderated the impact of board tenure on sustainability reporting

H8(e): CEO characteristic has moderated the impact of board meeting on sustainability reporting

H8(f): CEO characteristic has moderated the impact of board size on sustainability reporting

3.0 RESEARCH DESIGN

To construct our sample, the necessary information was collected using secondary data obtained from Refinitiv Eikon, which is published by Thomson Reuters. Prior to analysing the data, this study excluded financial institutions and companies that had incomplete information, missing data, and outliers. The dataset consisted of 412 yearly observations spanning from 2021 to 2022, and it was derived from the financial and non-financial data of 206 publicly listed companies in Malaysia.

The variables used in this study and their measurements are summarised in Table 1.

Table 1: Variables and their Measurement

Variables	Acronym	Measurement	Source
DEPENDENT VARIABLE			
Sustainability reporting	SDG	SDG Score	Al-Qudah & Houcine (2023)
INDEPENDENT VARIABLES			
Board gender	Gender	% of female directors	Singhania et al. (2023)
Board specific skills	SpecSkill	% of directors having business related skills	Orazalin & Mahmood (2021)
Board independence	Board_Ind	% of independent board members	Alyibgah et al. (2023)
Board tenure	Tenure	Number of years' service	Hartojo & Laksmana (2018)
Board meeting	BMeeting	Number of meetings in a year	Alyibgah et al. (2023)
Board size	BSize	Number of board members	Alyibgah et al. (2023)
MODERATING VARIABLE			
CEO Duality	CEO_Dual	1 Yes, 0 No	Singhania et al. (2023)
CONTROL VARIABLES			
Firm size	Size	Natural log of total assets	Mohd Azhari, Mahmud & Shaharuddin (2022)
Liquidity	LIQ	Current ratio	Mohd Azhari et al. (2022)
Leverage	LEV	Debt equity ratio	Mohd Azhari, Mahmud & Yildiv (2023)
Sales growth	Growth	Changes in revenue/current year revenue	Mohd Azhari et al. (2022)
Profitability	Prof_ ROE	Return on Equity	Mohd Azhari et al. (2022)

To achieve the objectives of the study, the following regression equations have been constructed and analysed using Python Pandas Programming tools:

$$SDG_{it} = \beta_0 + \beta_1 Gender_{it} + \beta_2 SpecSkill_{it} + \beta_3 Board\_Ind_{it} + \beta_4 Tenure_{it} + \beta_5 BMeeting_{it} + \beta_6 BSize_{it} + B_7 CEO\_Dual_{it} + \beta_8 Size_{it} + \beta_9 LIQ_{it} + \beta_{10} LEV_{it} + \beta_{11} Growth_{it} + \beta_{12} Prof\_ROE_{it} + €_{it} \quad \text{....................}(1)$$

$$SDG_{it} = \beta_0 + \beta_1 Gender_{it} + \beta_2 SpecSkill_{it} + \beta_3 Board\_Ind_{it} + \beta_4 Tenure_{it} + \beta_5 BMeeting_{it} + \beta_6 BSize_{it} + B_7 CEO\_Dual_{it} + B_8 CEO\_Dual_{it} {*} MV_{it} + \beta_9 Size_{it} + \beta_{10} LIQ_{it} + \beta_{11} LEV_{it} + \beta_{12} Growth_{it} + \beta_{13} Prof\_ROE_{it} + €_{it} \quad \text{....................}(2)$$

4.0 ANALYSIS AND DISCUSSION

4.1 Descriptive Statistics

The descriptive statistics were obtained as depicted in Table 2. The mean of SDG Score (SDG) is 6 and the minimum and maximum score is 0 and 17 respectively. It indicates that few firms did not disclose the SDG Score information. The Board Meeting (BMeeting) shows great fluctuation with minimum of 4 times and maximum of 30 times per year. The Board size (BSize) fluctuates between 5 and 15 with a mean of 8. Board Independence (Board_Ind) has a mean of 51.27%, which shows that independent directors hold approximately 51.27% of the proportion on the board.

The proportion of female directors on the board (Gender) range between 0% and 66.67%, shows that few firms in our sample do not have any females on their board and some firms have more female representation on their board than male. Following the Budget 2022 pronouncement, Malaysian public listed companies must have one female director by 2023, clarifying the non-existence of female directors in some companies. The mean of firm size (Size), Liquidity (LIQ), Leverage (LEV), Sales Growth (Growth) and Profitability (Prof_ROE), are 21.58%, 2.44 times, -2.16%, 25.78% and 0.12%, respectively.

Table 2: Descriptive Analysis

	Minimum	**Maximum**	**Mean**	**Std. Deviation**	**VIF**
SDG	0.00	17.00	6.62	5.60	
Gender	0.00	66.67	22.21	12.55	1.07
SpecSkill	11.11	100.00	56.26	16.13	1.30
Board_Ind	22.22	88.89	51.27	11.36	1.12
Tenure	1.25	24.13	8.55	4.60	1.33
BMeeting	4.00	30.00	6.77	3.42	1.50
BSize	5.00	15.00	8.21	1.91	1.33
CEO_Dual	0.00	1.00	0.07	0.26	1.04
Size	18.09	26.05	21.58	1.55	1.87
LIQ	0.08	12.96	2.44	1.99	6.51
LEV	-484.44	125.63	-2.16	37.19	1.09
Growth	-83.37	3218.10	25.78	163.02	1.03
Prof_ROE	-0.72	1.88	0.12	0.24	1.11

4.2 Correlation

Table 3 shows the Pearson correlation analysis of all the variables. A statistically significant negatively correlation at the 5% level (-0.12) was found between SDG and SpecSkill. Similarly, SDG and Tenure (-0.22) have negative significant correlation at the 1% level. In addition, SDG and BMeeting (0.15) and SDG and BSize (0.13) have positive significant at the 5% and 1% level respectively. Based on the correlation analysis, the multicollinearity problem does not exist among the explanatory variables since every correlation is less than 0.80 (Shrestha, 2020).

Table 3: Correlation Analysis

	SDG	**Gender**	**SpecSkill**	**Board_ Ind**	**Tenure**	**BMeeting**	**BSize**	**CEO_Dual**
SDG	1.00							
Gender	0.061	1.00						
SpecSkill	-0.12**	-0.05	1.00					
Board_Ind	0.06	0.05	-0.20***	1.00				
Tenure	-0.22***	-0.06	0.34***	-0.14**	1.00			
BMeeting	0.15**	0.08	-0.32***	0.06	-0.38***	1.00		
BSize	0.13***	0.07	-0.11**	-0.10**	-0.03	0.10**	1.00	

CEO_Dual	-0.05	-0.02	0.09	0.06	-0.06	-0.05	0.02	1.00

*Note. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.*

Control variables are Size, LIQ, LEV, Growth and Prof_ROE

4.3 Multiple Regression

To investigate the impact of board attributes on sustainability reporting in Malaysia and to examine the moderating effect of CEO characteristic on the impact of board attributes on sustainability reporting in Malaysia, this study employed multiple regression models to demonstrate the precise associations.

Table 4: Multiple Regression Analysis

	MODEL 1		MODEL 2	
	Coefficients	**T -Test**	**Coefficients**	**T -Test**
(Constant)		-5.68		-5.83
Gender	0.03	0.68	0.04	0.98
SpecSkill	-0.01	-0.24	-0.01	-0.29
Board_Ind	0.03	0.77	0.03	0.73
Tenure	-0.17***	-3.41	-0.15***	-2.98
BMeeting	0.05	1.05	0.05	0.94
BSize	0.12**	2.54	0.12*	2.48
CEO_Dual	-0.05	-1.27	-0.01	-0.08
Size	0.35***	6.38	0.36***	6.46
LIQ	0.01	0.09	0.01	0.07
LEV	-0.06	-1.26	-0.06	-1.33
Growth	0.01	0.29	0.01	0.31
Prof_ROE	0.02	0.50	0.02	0.36
INT_CEOxGender			0.01	0.00
INT_CEOxSpecSkilL			-0.04	-0.87
INT_CEOxBoard_Ind			-0.03	-0.54
INT_CEOxTenure			0.06	1.04
INT_CEOxBMeeting			0.02	0.46
INT_CEOxBSize			-0.09*	-1.72
F	13.52		9.20	
R	0.52		0.53	
R-Squared	0.27		0.28	
Durbin-Watson			1.94	

Based on Table 4, the model of this study is deemed fit and statistically significant with the F-value of 13.52, whereby this value suggested that the model is statistically valid and the R-Squared within the model is 27.10% indicating that almost 27.1% of the variation in the dependent variable is explained by the variations in the independent variables.

Table 4 shows that there is an impact on board attributes under board tenure and board size components. Similar to Al-Jaifi et al. (2023), board tenure has a negative impact on sustainability reporting in Malaysia. This result indicates that longer board tenure can harm the companies as board members are losing their ability to objectively oversee management (Livnat et al., 2021). However, this result contradicts with Kwarteng et al. (2023) that found board tenure has a positive impact on sustainability reporting. The negative influence of board tenure on sustainability reporting, as per stakeholder theory, can be attributed to a gradual misalignment with the changing expectations of stakeholders, a potential resistance to adopting newer sustainability norms, and a diminished sensitivity to ESG matters over time. Addressing this challenge may involve strategies to ensure ongoing board renewal, fostering diversity of perspectives, and actively engaging with stakeholders to stay abreast of evolving sustainability priorities.

It is found that board size has a positively significant impact on sustainability reporting practices. This result is supported by Buniamin et al., (2022), Anyigbah et al., (2023) and Kwarteng et al., (2023). These results indicate that the companies efforts have fulfilled the demands of stakeholders in terms of sustainability disclosure. Consistent with stakeholder theory, bigger boards have several advantages, such as more diverse ideas, skills, knowledge, and stakeholder representation that will aid in monitoring and controlling management opportunistic behaviours (Berraies & Rejeb, 2019).

Finally, the firm size (Size) that is used as a control variable indicates a positive significance with SDG, indicating that an increase in firm size by 1% results in 0.35% increase in the sustainability reporting disclosure.

To test our second objective in this study, we run the regression analysis using INT_CEO as a moderator. We seek to examine the moderating effect of CEO characteristic on the impact of board attributes on sustainability reporting in Malaysia. The result shows that CEO characteristic or duality has a negative and significant impact on board size. Unlike Chen et al., (2020), this study suggests that CEO duality has weakened the impact of board attributes on sustainability reporting. Based on upper echelon theory, the weaken impact may be attributed to concentration of power, diminished board independence, and priority on short-term and immediate financial performance (Hambrick & Mason, 2016; Anyigbah et al., 2023).

5.0 CONCLUSION

This study aims to investigate the impact of board attributes on sustainability reporting and how CEO characteristic moderates this relationship. It is found that certain board attributes namely board tenure and board size have a significant impact on sustainability reporting practices. Further analysis shows that CEO characteristic has diminished the favourable influence of board size on sustainability reporting. The findings of this study contribute both theoretically and practically to sustainable business practices in the Malaysian corporate environment. Adopting stakeholder and upper echelons theories, it explores how companies, driven by board attributes and CEO characteristic, respond to stakeholder expectations. This study also seeks to provide practical insights for corporate leaders, regulators, and stakeholders in shaping strategies for sustainability reporting, enhancing corporate governance, and promoting responsible business behaviour. Since this study utilised secondary data from database, it may not capture the qualitative aspects of board attribute and CEO characteristic. Future research could employ a mixed-methods approach, incorporating qualitative data collection methods such as interviews, surveys, or content analysis. This would allow for a more comprehensive understanding of the qualitative aspects of board attributes and CEO characteristic, complementing the quantitative insights gained from the database. Future research should explore the impact of industry-specific characteristics on the relationships between board attributes, CEO characteristics, and sustainability reporting in the Malaysian corporate context.

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