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Does board diversity influence corporate SDG disclosure in an emerging economy?

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Purpose: This research investigates the impact of board of director diversity on a company's disclosure of Sustainable Development Goals (SDGs). The term board diversity encompasses a range of characteristics, including but not limited to nationality, gender, age, tenure, educational level and financial expertise.

Design/methodology/approach: A sample was drawn from the non-financial sector of Indonesian listed companies over the period 2021–2023, and included only those companies that had issued sustainability reports in accordance with the Global Reporting Initiative (GRI) standards. The hypothesis was tested using ordinary least squares with fixed effects and robust standard errors.

Findings/results: The results indicate that overall board diversity significantly impacts the disclosure of SDGs. Further analysis demonstrates that diversity in terms of age, educational level and financial expertise enhances this disclosure. In contrast, diversity in terms of nationality, gender and tenure does not have the same impact. The results are coherent when the SDGs are categorised according to their respective pillars.

Practical implications: This research provides insights for companies to prioritise diversity in age, education and financial expertise when selecting board members. This strategy can enhance SDG disclosure transparency and strengthen the company's reputation with investors and stakeholders.

Originality/value: The literature on the relationship between board diversity and corporate SDG disclosure is limited. This study contributes by highlighting the importance of prioritising diversity in age, education and financial expertise when selecting board members.

Keywords: top management team; board diversity; board heterogeneous; non-financial disclosure; sustainable development goals; sustainability reporting.

Introduction

Sustainable development has become a paramount global priority, with the United Nations' (UN) Sustainable Development Goals (SDGs) serving as a comprehensive framework to address pressing social, economic and environmental challenges. The 2023 UN SDG report reveals that many goals remain unmet, underscoring the urgency of engaging multiple stakeholders to address this issue (United Nations, 2023). Organisations have dedicated substantial attention to balancing economic growth, social well-being and environmental protection in line with this agenda by integrating it into their business strategy and operations. Top management, as strategic policymakers of companies, greatly influences companies' involvement in sustainability issues (Yang et al., 2024). Within this context, the role of board diversity in supporting SDGs has become an area of growing interest, particularly in developing countries where the challenges of sustainable development are more acute (Barkat et al., 2024; Lawati & Alshabibi, 2023; Sekarlangit & Wardhani, 2021).

Board diversity, referring to the heterogeneity of board members in terms of their demographic characteristics, expertise and backgrounds, has been recognised as a critical factor in enhancing corporate governance and decision-making (Lawati & Alshabibi, 2023; Zhang et al., 2024). Diverse boards are better equipped to understand and respond to the diverse needs of stakeholders, including local communities, as they can bring a broader range of perspectives and expertise to the table. Research suggests that board diversity can improve a company's financial performance when engaging with either the whole set of SDGs or a subset of the most frequently cited goals (Kusumastati et al., 2022). By incorporating SDGs into corporate disclosures, companies can enhance the quality and legitimacy of their non-financial reporting, serving as a

qualitative indicator of their commitment to the SDGs (Haywood & Boihang, 2021; Mohy-ud-Din, 2023). Such acts can lead to improved stakeholder trust, enhanced brand reputation and better alignment with societal expectations, all of which contribute to a company's long-term sustainability and competitive advantage.

This study investigates the relationship between board diversity and corporate SDG disclosure in the context of developing economies. Despite the growing importance of sustainability in corporate governance, empirical research examining how various dimensions of board diversity influence SDG disclosure remains relatively scarce (Denhere, 2024; Mazumder, 2024; Weerasinghe et al., 2023). This study aims to address this gap by contributing to the emerging literature on the governance drivers of corporate alignment with SDGs.

Literature review

The relationship between board diversity and a firm's commitment to SDGs can be understood through the lens of Upper Echelon Theory. This theory posits that an organisation's top-level executives' demographic characteristics, values and experiences significantly influence its strategic direction and actions. A diverse board, composed of individuals from various backgrounds, genders, ages and areas of expertise, brings a broader range of perspectives and experiences to strategic decision-making (Hambrick & Mason, 1984). This diversity of thought can lead to a more nuanced understanding of the complex social, environmental and economic dimensions of sustainability, fostering a more significant commitment to incorporating SDGs into the company's strategy (Mio et al., 2020).

Furthermore, a heterogeneous board is more likely to challenge assumptions, leading to more creative problem-solving and innovative approaches to sustainability. This diversity also enhances stakeholder engagement, because a board that reflects the demographics of its stakeholders is better equipped to understand and respond to their diverse needs and expectations regarding sustainability. Ultimately, Upper Echelon Theory suggests that a diverse board, with its broader range of experiences and values, is more likely to recognise the importance of SDGs, integrate them into strategic decision-makings and drive the organisation towards a more sustainable future. Companies often use the SDGs as a framework for their corporate social responsibility (CSR) initiatives. By aligning their actions with specific SDGs, companies can contribute to broader global goals while demonstrating their commitment to sustainability (Mio et al., 2020). Hence, SDG disclosures have become an essential medium for companies to communicate the seriousness and significance of their contributions towards sustainable development (Sekarlangit & Wardhani, 2021). Although no mandatory regulation requires companies to disclose their progress on the SDGs, this voluntary disclosure is crucial for companies to build the reputation and trust of their stakeholders. However, it is vital to be vigilant about the possibility of companies making symbolic, superficial SDG disclosures without being backed by a genuine, sustained commitment and concrete actions towards achieving these global sustainability goals. Companies should strive to align their SDG-related disclosures with tangible efforts and measurable progress on the ground to maintain transparency and credibility with their stakeholders.

The extant literature provides empirical support for the link between board diversity and CSR (Chams & García-Blandón, 2019; Chen et al., 2019; Guerrero-Villegas et al., 2018; Hashmi et al., 2023; Khan et al., 2019; Mehedi et al., 2024; Nekhili et al., 2017). However, the specific relationship between board diversity and SDG disclosure is still limited, particularly in the context of developing countries. A study conducted by Sekarlangit and Wardhani (2021) found that the level of board attendance in meetings and commitment to CSR influenced SDG disclosure, while research conducted by Weerasinghe et al. (2023) found that top management diversity did not affect SDG disclosure. Other studies have focused only on limited aspects of board diversity (Denhere, 2024; Zampone et al., 2024), on specific elements of SDGs (Taglialatela et al., 2023) or on a specific industry (Mazumder, 2024). In the context of developing countries, where the need for sustainable development is particularly pressing, further investigation is warranted to understand how board diversity can support the integration of SDGs into corporate strategies and disclosures.

Hypothesis development

Board diversity, encompassing a range of characteristics such as gender, age, skills, experience and background, is expected to positively influence the level and quality of a company's SDG reporting. This view stems from the idea that a diverse board is better equipped to understand and respond to complex and multifaceted nature of sustainability challenges (Rao & Tilt, 2016).

A board with diverse perspectives can foster more innovative and comprehensive approaches to integrating sustainability into business strategy, identifying and managing risks and opportunities, and measuring and reporting on SDG-related performance. Because board decisions are the product of group deliberation, an overall diversity metric may be better in capturing the total impact of diversity on SDG-related matters. While research specifically linking overall board diversity to SDG reporting is still emerging, various studies have (Donkor et al., 2023; Khan et al., 2019) highlighted the positive influence of board diversity components such as gender and national diversity on CSR disclosure, while findings from Hashmi et al. (2023) highlight the impact of top management team green innovation. These findings suggest that a board representing a more comprehensive range of viewpoints is more likely to prioritise sustainability concerns and communicate transparently about their efforts:

H1: There is a positive relationship between overall board diversity and the level of SDG disclosure.

This study uses a comprehensive measure of board diversity, covering the dimensions of gender, age, nationality, tenure, education level and financial expertise of the board of directors. These measures were selected based on data availability and relevance to the context of developing countries, where sustainability issues and achieving SDGs are significant challenges (Naciti, 2019). By using a multidimensional measure of board diversity, this study can delve deeper into how the diverse composition of the board can influence a company's SDG-related disclosures.

Diversity in board nationality, characterised by the representation of directors from various countries and cultural backgrounds, is expected to positively influence the level and quality of a company's SDG reporting. This relationship is based on the premise that directors from diverse national backgrounds bring a more comprehensive range of perspectives on sustainability issues shaped by their respective countries' social, environmental and governance contexts (Khan et al., 2019). This breadth of understanding can lead to a more comprehensive and nuanced approach to integrating SDGs into corporate strategy, considering a broader spectrum of stakeholder interests and global sustainability challenges. This assertion is supported by research (Harjoto et al., 2019), which found a positive link between board nationality diversity and corporate social performance. Their findings suggest that boards with a global perspective, informed by directors' experiences from different countries, are more likely to prioritise and effectively address sustainability concerns, leading to more robust and transparent SDG reporting:

H2: There is a positive relationship between the diversity of board members' nationalities and the level of SDG disclosure.

Gender diversity on corporate boards is expected to impact a company's SDG reporting positively because having more women on boards brings diverse perspectives, experiences and leadership styles, enhancing a company's commitment to sustainability. Women often prioritise social and environmental issues, leading to greater emphasis on stakeholder engagement and a broader definition of corporate success beyond financial performance (Mensi-Klarbach, 2014; Saeed et al., 2022). This condition, in turn, can result in a more comprehensive and transparent approach to SDG reporting. While research linking board gender diversity and SDG reporting is still emerging, numerous studies have established a positive relationship between board gender diversity and CSR reporting. For example, Saeed et al. (2022), using emerging economies data, and Cicchiello et al. (2021), using Asian and African data, found that the proportion of women on top management teams is positively related to corporate environmental strategy and sustainability reporting. A similar positive relationship likely exists between board gender diversity and the comprehensiveness and quality of SDG reporting:

H3: There is a positive relationship between the diversity of board members' gender and the level of SDG disclosure.

Board age diversity, encompassing a mix of younger and older directors, is expected to positively influence the levels of corporate disclosure related to the SDGs. This relationship is rooted in the understanding that different generations often bring distinct perspectives and experiences. Having grown up in a more globally interconnected and environmentally conscious era, younger directors may be more attuned to the urgency of sustainability challenges and the importance of stakeholder engagement. Conversely, older directors can offer deeper insights into the company's history, industry dynamics and long-term sustainability challenges (Yamane & Kaneko, 2021). This complementary blend of age-based perspectives can lead to a more inclusive and holistic approach to integrating SDGs into the company's strategy and reporting, ensuring that the diverse interests of all stakeholders are taken into account. While direct research on this relationship is limited, studies such as Sekarlangit and Wardhani (2021) found that companies with younger boards of directors tend to be earlier adopters of SDG reporting, suggesting that age diversity within a board can contribute to a more proactive and comprehensive approach to sustainability reporting:

H4: There is a positive relationship between the diversity of board members' age and the level of SDG disclosure.

Board tenure diversity, characterised by a mix of directors with varying lengths of service on the board, is expected to positively influence the level and quality of a company's SDG reporting. This hypothesis is grounded in the idea that a balance between experienced and newer directors can foster a more dynamic and informed approach to sustainability. Directors with longer tenures bring valuable institutional knowledge, an understanding of industry trends and established stakeholder relationships. Conversely, newer directors can offer fresh perspectives, challenge existing assumptions and bring in contemporary knowledge of evolving sustainability standards and stakeholder expectations (Farooq et al., 2024). This blend of experience and new ideas can lead to more innovative and comprehensive SDG strategies, and transparent and insightful reporting. While research linking board tenure diversity to SDG reporting is limited, studies on board tenure diversity and CSR reporting, such as Chen et al. (2019), could offer valuable insights. This study found that firms' CSR performance is significantly higher in CEOs' early tenure than in their later tenure. It highlights the importance of board characteristics in driving sustainability-related disclosures and could suggest a similar positive relationship between board tenure diversity and the comprehensiveness of SDG reporting:

H5: There is a positive relationship between the diversity of board members' tenure and the level of SDG disclosure.

Educational diversity of board members, specifically regarding the level of academic degrees held, is expected to have a positive relationship with the comprehensiveness and quality of SDG reporting. A board comprising individuals with a mix of diploma, bachelor's, master's, and doctoral

degrees can foster a multi-layered understanding of sustainability challenges (Khan et al., 2019). Board members with higher-level degrees, such as master's or doctoral degrees, often possess specialised knowledge and research experience, allowing them to contribute insights into complex sustainability concepts and analytical methods for measuring SDG-related performance. Conversely, those with diplomas or bachelor's degrees, while potentially having less specialised knowledge, can offer valuable practical experience and understanding of operational-level sustainability challenges. This blend of academic perspectives can lead to a more holistic approach to integrating and reporting SDGs, ensuring corporate disclosures reflect both strategic vision and practical implementation. While direct research on this relationship is limited, studies such as Harjoto et al. (2019) highlight the importance of diverse 'board capital', encompassing experience, skills and knowledge, for enhancing sustainability reporting practices:

H6: There is a positive relationship between the diversity of board members' educational level and the level of SDG disclosure.

The diversity of financial expertise within a board, encompassing backgrounds in accounting, finance, risk management and economics, is expected to positively influence the level and quality of a company's SDG reporting. This relationship is grounded in the understanding that effectively integrating sustainability into business operations requires a nuanced grasp of its financial implications (Lawati & Alshabibi, 2023). Board members with diverse financial expertise can provide insights into measuring and managing the risks and opportunities associated with SDG-related investments, aligning sustainability goals with financial performance and accurately quantifying and communicating the impact of sustainability initiatives. Findings from Naheed et al. (2021) suggest that board financial expertise is positively associated with CSR disclosure level. These findings suggest that a board with diverse financial knowledge is better equipped to guide companies in developing robust sustainability strategies, effectively allocating resources, and transparently reporting on their SDG progress:

H7: There is a positive relationship between the diversity of board members' financial expertise diversity and the level of SDG disclosure.

Methodology

The data in this study come from non-financial companies listed on the Indonesia Stock Exchange (IDX) that published Global Reporting Initiative (GRI)-based sustainability reports during 2021–2023. The GRI-based disclosure will be the basis for calculating the SDG disclosure index. The financial industry was excluded from the sample because it is highly regulated, including Sustainability Report disclosure, which could impact the results with bias. Data on the characteristics of the board of directors were obtained from the company's annual reports. Financial data were obtained from the company's financial statements. Based on the sample selection process, the final sample consists of 713 company-year observations. The details are presented in panel A and panel B of Table 1.

According to Table 1 (see panel A) on average about one-third of all public companies have published GRI-based sustainability reports. Panel B presents the sample distribution based on the industry classification published by the IDX. The data show that companies in the consumer non-cyclical sector dominate the disclosure of sustainability reports.

The SDG disclosure variable in this study is constructed using disclosure items in GRI-based sustainability reports. This study uses the standard benchmark from GRI that presents the linkage between the items in GRI-based sustainability disclosures and the targets in the SDGs (GRI, 2022a). This study does not use the SDG disclosures directly presented by the company in its sustainability report to reduce a self and subjective claim of such goals. Appendix 1 presents the relationship matrix between the GRI and SDG disclosures items. This matrix forms the basis for calculating the SDG index by comparing the number of items the company has disclosed with the number of items that should have been disclosed (199 items).

Board diversity is measured based on the board of directors' characteristics that can indicate diversity, namely nationality, gender, age, tenure, educational level and financial expertise. National diversity refers to the composition of the board of directors from Indonesia and foreign countries. Gender focuses on gender diversity in the board of director's male and female positions. Age classifies the age groups of

TABLE 1: Sample selection criteria.

Panels	2021	2022	2023	Total
Panel A				
Description				
Listed companies	766	825	903	2494
Companies that do not publish GRI-based sustainability reports	-506	-546	-611	-1663
Companies that publish GRI-based sustainability reports	260	279	292	831
Companies in the financial industry	-39	-40	-38	-117
Companies in the non-financial industry	221	239	254	714
Data not available	0	-1	0	-1
Final observation	221	238	254	713
Panel B				
Industry				
Energy	29	31	38	98
Basic material	34	37	41	112
Industrials	17	17	19	53
Consumer non-cyclicals	43	49	49	141
Consumer cyclicals	25	23	24	72
Healthcare	12	15	15	42
Properties and real estate	22	23	24	69
Technology	4	5	6	15
Infrastructures	29	32	31	92
Transportation and logistic	6	6	7	19
Total	**221**	**238**	**254**	**713**

GRI, Global Reporting Initiative.

the board of directors into several groups, namely age ≤ 35, 35–45, 46–55, 56–65 and over 65 years (Kusumastati et al., 2022). Tenure is divided into categories with a range of every 5 years, namely ≤ 5, 6–10, 11–15, 16–20, 21–25 and > 5 years. Educational level is divided into five parts: Doctorate, Master, Bachelor, Diploma and High School, or not completing their formal education. Financial expertise categorises directors with work experience or education in economics, finance and accounting as directors with expertise in the financial field and vice versa (Naheed et al., 2021).

Each diversity index is calculated using Blau's diversity index (Maji & Saha, 2021; Weerasinghe et al., 2023). The overall board diversity is the sum of all diversity indexes of nationality, gender, age, tenure, educational level and financial expertise. A higher diversity index score indicates a more diverse board composition. The control variables in this study include financial measures such as profitability, leverage and firm growth, as well as non-financial measures such as the number of board directors and the ownership status of the firm, where a value of 1 is assigned if the firm is state-owned and 0 if it is not. Listed state-owned firms carry out the state's duty to contribute to the success of the SDG agenda.

This study uses Ordinary Least Squares (OLS) regression with robust standard errors to eliminate bias in the OLS model (Hoechle, 2007; Petersen, 2009). In addition, this study employs two fixed effects, namely year and industry sector. The research model to test the hypotheses is as follows (see Equation 1 and Equation 2):

Hypothesis 1

$$SDGDis_{it} = \beta_1 BRDDIV_{it} + \beta_2 FrmOwr_{it} + \beta_3 BrdSize_{it} + \beta_4 FrmSize_{it} + \beta_5 FrmLev_{it} + \beta_6 FrmPrf_{it} + \beta_7 FrmGrw_{it} + \varepsilon_{it} \quad \text{[Eqn 1]}$$

Hypotheses 2–7

$$SDGDis_{it} = \beta_1 NatDiv_{it} + \beta_2 GdrDiv_{it} + \beta_3 AgeDiv_{it} + \beta_4 TnrDiv_{it} + \beta_5 EduDiv_{it} + \beta_6 ExpDiv_{it} + \beta_7 FrmOwr_{it} + \beta_8 BrdSize_{it} + \beta_9 FrmSize_{it} + \beta_{10} FrmLev_{it} + \beta_{11} FrmPrf_{it} + \beta_{12} FrmGrw_{it} + \varepsilon_{it} \quad \text{[Eqn 2]}$$

Ethical considerations

This article followed all ethical standards for research without direct contact with human or animal subjects.

Results

Table 2 presents the descriptive statistics of the observed data. All financial variables in the study have been winsorised (1% and 99%) to reduce the impact of extreme values that may make the regression equation spurious (Abdul et al., 2020; Kusumastati et al., 2022). Based on Table 2, it can be seen that the company's SDG disclosure is still moderate, while the level of diversity of the board of directors is at a low level, with age diversity as the highest diversity component and national diversity as the lowest diversity component.

The results of univariate analysis using Pearson correlation as presented in Table 3 show that board diversity is positively correlated with SDG disclosure, which presents initial support for the influence of board diversity on disclosure. The correlation values between variables show low values, with the highest value being the correlation between tenure diversity and national diversity at 0.663, which falls into the moderate category; therefore, it can be concluded that there is no multicollinearity issue.

The results of testing the first hypothesis are presented in Table 4. Based on the results presented in Table 4, the BRDDiv variable has a positive coefficient and influences SDGDis. This indicates that board diversity affects the company's level of SDG disclosure. The higher the level of board diversity, the more SDG disclosures the company will make. Therefore, hypothesis 1 can be accepted. The test results for each type of diversity show that the EduDiv, AgeDiv, and ExpDiv variables influence SDG disclosure. This means that diversity on the board regarding educational level, age diversity and financial expertise diversity can affect SDG disclosure. The more diverse the educational levels, age groups and financial expertise of the board of directors, the more SDG disclosures the company will make. Meanwhile, the NatDiv, GdrDiv, and TnrDiv variables do not affect the company's SDG disclosure. Therefore, diversity in nationality, gender and tenure does not impact SDG disclosure. The control variables show that BrdSize, FrmOwr and FrmPrf positively influence SDG disclosure. This means that the size of the board of directors, government ownership and the company's profitability level will affect the extent of the company's SDG disclosure. The control variables in this study found that board size, state-owned public companies and profitability are variables that influence the company's disclosure of SDGs.

TABLE 2: Statistic descriptive.

Variables	Mean	Median	SD	Minimum	Maximum
SDGDis	0.446	0.427	0.216	0.020	0.990
BRDDiv	2.185	2.212	0.652	0.000	3.598
NatDiv	0.125	0.000	0.187	0.000	0.500
GdrDiv	0.196	0.198	0.201	0.000	0.500
AgeDiv	0.712	0.750	0.150	0.000	0.923
TnrDiv	0.276	0.278	0.291	0.000	0.875
EduDiv	0.490	0.560	0.268	0.000	0.917
ExpDiv	0.385	0.444	0.151	0.000	0.500
BrdSize	4.913	5.000	2.163	2.000	15.000
FrmOwr	0.094	0.000	0.292	0.000	1.000
FrmSize	20.581	21.719	3.753	9.428	26.823
FrmLev	0.503	0.474	0.316	0.040	2.058
FrmPrf	0.043	0.039	0.092	-0.321	0.310
FrmGrw	0.200	0.109	0.498	-0.657	3.029

SD, standard deviation; SDGDis, SDG Disclosure; BRDDiv, Board Diversity; NatDiv, Nationality Diversity; GdrDiv, Gender Diversity; AgeDiv, Age Diversity; TnrDiv, Tenure Diversity; EduDiv, Education Level Diversity; ExpDiv, Financial Expertise Diversity; BrdSize, Board Size; FrmOwr, Firm Ownership; FrmSize, Firm Size; FrmLev, Firm Leverage; FrmPrf, Firm Profitability; FrmGrw, Firm Growth.

TABLE 3: Pearson correlation.

Variables	SDGDis	BRDDiv	NatDiv	GdrDiv	AgeDiv	TnrDiv	EduDiv	ExpDiv	BrdSize	FrmOwr	FrmSize	FrmLev	FrmPrf	FrmGrw
SDGDis	1.000	-	-	-	-	-	-	-	-	-	-	-	-	-
BRDDiv	0.190***	1.000	-	-	-	-	-	-	-	-	-	-	-	-
NatDiv	0.148***	0.559***	1.000	-	-	-	-	-	-	-	-	-	-	-
GdrDiv	-0.016	0.361***	-0.032	1.000	-	-	-	-	-	-	-	-	-	-
AgeDiv	0.262***	0.494***	0.221***	0.021	1.000	-	-	-	-	-	-	-	-	-
TnrDiv	0.022	0.569***	0.064*	-0.017	0.163***	1.000	-	-	-	-	-	-	-	-
EduDiv	0.143***	0.663***	0.428***	0.117***	0.171***	0.122***	1.000	-	-	-	-	-	-	-
ExpDiv	0.102***	0.379***	0.118***	0.073*	0.223***	0.094**	-0.006	1.000	-	-	-	-	-	-
BrdSize	0.275***	0.464***	0.310***	0.046	0.637***	0.193***	0.228***	0.148***	1.000	-	-	-	-	-
FrmOwr	0.110***	-0.295***	-0.216***	-0.003	0.190***	-0.292***	-0.336***	-0.029	0.135***	1.000	-	-	-	-
FrmSize	-0.002	0.046	-0.079**	0.095**	0.170***	0.068*	-0.095**	0.040	0.158***	0.160***	1.000	-	-	-
FrmLev	-0.069*	-0.058	0.075**	-0.048	0.014	-0.102***	-0.073*	0.032	0.036	0.189***	-0.079**	1.000	-	-
FrmPrf	0.173***	0.099***	0.068*	-0.009	0.116***	0.103***	0.008	0.030	0.085**	-0.103***	0.027	-0.440***	1.000	-
FrmGrw	-0.065*	0.003	0.006	-0.002	-0.065*	-0.041	0.072*	0.021	-0.033	-0.084**	-0.028	0.016	0.111***	1.000

SDGDis, SDG Disclosure; BRDDiv, Board Diversity; NatDiv, Nationality Diversity; GdrDiv, Gender Diversity; AgeDiv, Age Diversity; TnrDiv, Tenure Diversity; EduDiv, Education Level Diversity; ExpDiv, Financial Expertise Diversity; BrdSize, Board Size; FrmOwr, Firm Ownership; FrmSize, Firm Size; FrmLev, Firm Leverage; FrmPrf, Firm Profitability; FrmGrw, Firm Growth.

t, statistics in parentheses.

*, $p < 0.1$; **, $p < 0.05$; ***, $p < 0.01$.

TABLE 4: OLS Regression – hypotheses testing.

Variables	(1)	(2)
	SDGDis	SDGDis
BRDDiv	0.047*** (3.334)	-
NatDiv	-	0.053 (1.236)
GdrDiv	-	-0.036 (-0.987)
AgeDiv	-	0.132* (1.905)
TnrDiv	-	-0.021 (-0.774)
EduDiv	-	0.111*** (3.340)
ExpDiv	-	0.092* (1.944)
FrmOwr	0.091*** (2.829)	0.087*** (2.594)
BrdSize	0.020*** (5.029)	0.016*** (3.537)
FrmSize	0.000 (0.165)	0.001 (0.603)
FrmLev	-0.005 (-0.187)	-0.006 (-0.239)
FrmPrf	0.205** (2.195)	0.212** (2.278)
FrmGrw	-0.008 (-0.513)	-0.011 (-0.731)
_cons	0.228*** (4.543)	0.154*** (2.678)
Year FE	Yes	Yes
Industry FE	Yes	Yes
F	17.056***	14.599***
R^2	0.264	0.283
N	713	713

SDGDis, SDG Disclosure; BRDDiv, Board Diversity; NatDiv, Nationality Diversity; GdrDiv, Gender Diversity; AgeDiv, Age Diversity; TnrDiv, Tenure Diversity; EduDiv, Education Level Diversity; ExpDiv, Financial Expertise Diversity; BrdSize, Board Size; FrmOwr, Firm Ownership; FrmSize, Firm Size; FrmLev, Firm Leverage; FrmPrf, Firm Profitability; FrmGrw, Firm Growth; OLS, Ordinary Least Squares.

t, statistics in parentheses.

*, $p < 0.1$; **, $p < 0.05$; ***, $p < 0.01$.

This study conducts further analysis by examining the effect of board diversity and its components on the disclosure of the SDG pillars. This analysis aims to see the extent of the impact of board diversity on the disclosure of the SDG pillars. Sustainable Development Goals are classified into four pillars, namely economic (SDG 7, SDG 8, SDG 9, SDG 10, SDG 17), social (SDG 1, SDG 2, SDG 3, SDG 4, SDG 5), environmental (SDG 6, SDG 11, SDG 12, SDG 13, SDG 14, SDG 15), and law and governance (SDG 16) (Safitri et al., 2021). Additional analysis aims to see whether board diversity also impacts the company's SDG disclosure in these four pillar areas. The test results are presented using the overall board diversity variable in Table 5.

The tests of the relationship between board diversity and SDG pillars using the components of board diversity are presented in Table 6. The research results show that the BRDDiv variable provides consistent disclosure results for each SDG pillars. The contribution of each diversity component also shows consistent results that the EduDiv, AgeDiv and ExpDiv variables affect disclosure in each SDG pillars.

Discussion

The research findings revealed that the diversity of the board of directors had a positive and significant impact on the company's disclosure of its adherence to the SDG. These results were consistent across the overall disclosure of the company's progress on the SDGs and the disclosure of each pillar or goal within the SDGs. These findings suggest that having a diverse range of perspectives and backgrounds represented on the board can encourage and facilitate the company's more comprehensive and transparent reporting on its SDG-related activities, achievements and areas for improvement. When breaking down the components of board diversity, this study found that the variables of age diversity, educational level diversity and financial expertise diversity had a positive effect on SDG disclosure. In contrast, the variables of tenure diversity, nationality diversity, and gender diversity did not affect SDG disclosure.

Board age diversity likely contributes to increased SDG disclosure because it brings a mix of perspectives on long-term sustainability challenges, similar with the result from Ismail and Ali (2024). Younger board members, having grown up with increasing awareness of climate change, social justice issues and the UN' SDGs, often bring a heightened sensitivity to these concerns. They can push for more significant consideration of long-term environmental and social risks and opportunities, which are central to the SDGs. Conversely, older board members offer valuable experience and historical context, helping to ground SDG strategies in practical realities and long-term vision.

TABLE 5: OLS Regression – Board Diversity to SDG pillars.

Variables	(1)	(2)	(3)	(4)
	EcoDis	SosDis	EnvDis	LnGGDis
BRDDiv	0.033*** (2.619)	0.055*** (3.640)	0.057*** (3.142)	0.038*** (3.221)
FrmOwr	0.086*** (2.905)	0.114*** (3.346)	0.098** (2.434)	0.045 (1.529)
BrdSize	0.017*** (4.381)	0.018*** (3.954)	0.027*** (5.512)	0.015***' (3.946)
FrmSize	-0.000 (-0.219)	0.001 (0.325)	0.001 (0.261)	0.001 (0.313)
FrmLev	0.009 (0.372)	-0.016 (-0.535)	-0.009 (-0.277)	-0.007 (-0.268)
FrmPrf	0.184** (2.016)	0.172 (1.613)	0.246** (2.141)	0.198** (2.401)
FrmGrw	-0.017 (-1.177)	-0.003 (-0.206)	-0.005 (-0.260)	-0.001 (-0.047)
_cons	0.318*** (6.750)	0.208*** (3.864)	0.180*** (2.829)	0.179*** (4.132)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
F	11.260***	13.644***	18.246***	16.508***
R^2	0.199	0.237	0.266	0.262
N	713	713	713	713

BRDDiv, Board Diversity; FrmOwr, Firm Ownership; BrdSize, Board Size; FrmSize, Firm Size; FrmLev, Firm Leverage; FrmPrf, Firm Profitability; FrmGrw, Firm Growth; OLS, Ordinary Least Squares.
t, statistics in parentheses.
*, $p < 0.1$; **, $p < 0.05$; ***, $p < 0.01$.

TABLE 6: OLS Regression – Board diversity component to SDG pillars.

Variables	(1)	(2)	(3)	(4)
	EcoDis	SosDis	EnvDis	LnGGDis
NatDiv	0.030 (0.741)	0.089* (1.917)	0.068 (1.204)	0.010 (0.276)
GdrDiv	-0.017 (-0.510)	-0.001 (-0.023)	-0.078* (-1.724)	-0.014 (-0.421)
AgeDiv	0.122** (1.987)	0.135* (1.836)	0.151* (1.712)	0.100* (1.660)
TnrDiv	-0.032 (-1.278)	-0.022 (-0.762)	-0.000 (-0.008)	-0.050** (-2.106)
EduDiv	0.082*** (2.670)	0.104*** (2.917)	0.134*** (3.197)	0.123*** (4.397)
ExpDiv	0.074* (1.646)	0.087* (1.701)	0.109* (1.818)	0.096** (2.336)
FrmOwr	0.075** (2.428)	0.107*** (2.972)	0.103** (2.458)	0.035 (1.201)
BrdSize	0.013*** (3.037)	0.014*** (2.695)	0.021*** (3.948)	0.012*** (2.865)
FrmSize	0.000 (0.157)	0.002 (0.754)	0.002 (0.643)	0.002 (0.877)
FrmLev	0.008 (0.364)	-0.019 (-0.660)	-0.011 (-0.355)	-0.004 (-0.143)
FrmPrf	0.189** (2.067)	0.173 (1.620)	0.250** (2.204)	0.223*** (2.721)
FrmGrw	-0.020 (-1.366)	-0.007 (-0.393)	-0.008 (-0.431)	-0.006 (-0.459)
_cons	0.248*** (4.608)	0.145** (2.324)	0.100 (1.390)	0.097** (1.973)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
F	9.990***	11.916***	15.249***	15.703***
R^2	0.216	0.253	0.284	0.290
N	713	713	713	713

NatDiv, Nationality Diversity; GdrDiv, Gender Diversity; AgeDiv, Age Diversity; TnrDiv, Tenure Diversity; EduDiv, Education Level Diversity; ExpDiv, Financial Expertise Diversity; BrdSize, Board Size; FrmOwr, Firm Ownership; FrmSize, Firm Size; FrmLev, Firm Leverage; FrmPrf, Firm Profitability; FrmGrw, Firm Growth; OLS, Ordinary Least Squares.
t, statistics in parentheses.
*, $p < 0.1$; **, $p < 0.05$; ***, $p < 0.01$.

This blend of diverse perspectives, combining the fresh insights of younger members with the wisdom and experience of older members, can lead to more robust and comprehensive SDG disclosures that address the complex, interconnected challenges outlined in the SDGs.

A board of directors with diverse academic qualifications, from diplomas to doctoral degrees, is better positioned to grasp the multifaceted nature of the SDGs and can translate that understanding into enhanced disclosure practices. This diversity in academic attainment brings a broader spectrum of knowledge and analytical skills. For instance, individuals with vocational diplomas might offer practical insights into industry-specific sustainability challenges. At the same time, those with bachelor's or master's degrees could contribute expertise in areas such as environmental management or social impact assessment. Furthermore, board members with doctoral degrees often possess specialised research skills and a deep understanding of complex systems. This enables them to contribute to more robust data analysis and strategic planning related to SDG targets. This blend of academic perspectives allows for a more comprehensive and nuanced approach to identifying, assessing and reporting a company's SDG-related risks, opportunities and impacts.

Board members with diverse financial expertise are crucial for ensuring that SDG initiatives are ethically sound and financially viable, leading to more transparent and credible disclosures. Their financial insight and guidance can help quantify the financial implications of SDG-related risks and opportunities, integrate sustainability considerations into the core of business strategies and robustly demonstrate the strategic and

financial business case for SDG-aligned investments. This in-depth financial perspective and expertise bolster the credibility of SDG disclosures, assuring stakeholders that sustainability is not merely a box to be ticked but a fundamental and integrated element of the company's long-term value creation strategy.

While the research suggests that gender diversity alone might not directly translate to increased SDG disclosure, it is crucial to acknowledge this finding within the context of existing board compositions. The data reveal a persistently low average for gender diversity, indicating that the proportion of women on boards remains limited. This suggests that the lack of a direct correlation between gender diversity and SDG disclosure could stem from the fact that women's perspectives are still not adequately represented in boardrooms to effect significant change in sustainability reporting. The focus should remain on achieving meaningful gender balance on boards and, crucially, fostering an inclusive boardroom culture where diverse perspectives, including those of women, are actively encouraged, valued and integrated into decision-making processes. This inclusive environment is more likely to lead to a holistic approach to sustainability and, consequently, more comprehensive SDG disclosures.

The lack of a direct link between nationality diversity and SDG disclosure is notable, particularly given the findings that show a low score for national diversity on boards. This suggests that most boards predominantly comprise Indonesian citizens, potentially limiting the range of perspectives on global sustainability challenges. While representation from different countries is essential, this finding highlights that a genuine commitment to the SDGs requires more than just ticking the box of nationality diversity. It necessitates a board culture that values diverse perspectives on global sustainability challenges, actively seeks out and integrates insights from different regions and fosters cross-cultural understanding to overcome the potential limitations of a nationally homogenous board. Rather than simply aiming for representation from various countries, this nuanced approach is more likely to result in meaningful and impactful SDG disclosures.

The finding that tenure diversity on corporate boards does not directly correlate with SDG disclosure suggests that simply having a mix of directors with varying lengths of board service is not enough to drive meaningful sustainability reporting. While the experience and institutional knowledge of long-tenured directors can be valuable, a board that is overly entrenched in the status quo may lack the fresh perspectives and innovative mindset needed to embrace the transformative changes inherent in the SDGs. Instead, boards should focus on cultivating a culture that values the wisdom and insights gained through long experience and actively encourages and empowers newer directors to challenge the existing practices and bring bold, forward-thinking ideas to the table. This dynamic interplay between seasoned directors and those with newer perspectives allows for a more critical, holistic assessment of a company's sustainability performance and a greater willingness to explore and implement innovative approaches to addressing the complex, interrelated social, environmental and governance challenges reflected in the SDGs. Ultimately, this balanced board culture is more likely to result in SDG disclosures that are truly substantive, forward-looking and aligned with the transformative vision of the global sustainability agenda.

Conclusion

This study examines the relationship between the overall and partial diversity of the board of directors and SDG disclosure. The research findings show that board diversity positively affects SDG disclosure. The tests on each component of the board of directors found that age diversity, educational level diversity and financial expertise diversity affect SDG disclosure. In contrast, gender, tenure and nationality diversity do not affect SDG disclosure. Based on the results of this study, it can be concluded that the diversity within the board of directors can be a driver of the company's SDG disclosure.

The limitation of this research lies in the focus on companies that assess SDG using GRI-based indicators, resulting in limited observations. Future research can develop other, more comprehensive measurement bases to reach companies whose sustainability reports are not GRI-based. This research was conducted in Indonesia, which adheres to the two-tier system, thus the use of the board of commissioners' variables, both in terms of characteristics and diversity, is also interesting to be studied further to see the role of the board of commissioners as a supervisor of the board of directors in the relationship between the board of directors diversity and SDG disclosure.

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Competing interests

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Authors' contributions

E.B.S. conceptualised the study and contributed to various aspects of the research including methodology, formal analysis, investigation, writing – original draft, data

collection and validation, writing – review and editing, and supervision. M.A.E.M. was involved in data collection, writing – review and editing, supervision and resources. A.S. contributed to project administration, data collection and supervision

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Data availability

The data supporting the findings of this study are available from the corresponding author, E.B.S., upon reasonable request.

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Appendix starts on the next page →

Appendix 1

TABLE 1-A1: Sustainable development goal disclosure matrix.

SDGs	Disclosure topics by using GRI''s codification	Total
SDG 1	202-1, 203-2, 207-1, 207-2, 207-3, 207-4, 413-2	7
SDG 2	411-1, 413-2	2
SDG 3	203-2, 305-1, 305-2, 305-3, 305-6, 305-7, 306-1, 306-2, 306-3, 306-4, 306-5, 401-2, 403-6, 403-9, 403-10	15
SDG 4	404-1	1
SDG 5	2.9, 2.10, 202-1, 203-1, 401-1, 401-2, 401-3, 404-1, 404-3, 405-1, 405-2, 406-1, 408-1, 409-1, 414-1, 414-2	16
SDG 6	303-1, 303-2, 303-3, 303-4, 303-5, 304-1, 304-2, 304-3, 304-4, 306-1, 306-2, 306-3, 306-5	13
SDG 7	302-1, 302-2, 302-3, 302-4, 302-5	5
SDG 8	2.7, 2.8, 2.30, 201-1, 202-1, 202-2, 203-2, 204-1, 301-1, 301-2, 301-3, 302-1, 302-2, 302-3, 302-4, 302-5, 306-2, 401-1, 401-2, 401-3, 402-1, 403-1, 403-2, 403-3, 403-4, 403-5, 403-7, 403-8, 403-9, 403-10, 404-1, 404-2, 404-3, 405-1, 405-2, 406-1, 407-1, 408-1, 409-1, 414-1, 414-2	41
SDG 9	201-1, 203-1	2
SDG 10	2.7, 207-1, 207-2, 207-3, 207-4, 401-1, 404-1, 404-3, 405-2	9
SDG 11	203-1, 306-1, 306-2, 306-3, 306-4, 306-5	6
SDG 12	301-1, 301-2, 301-3, 302-1, 302-2, 302-3, 302-4, 302-5, 303-1, 305-1, 305-2, 305-3, 305-6, 305-7, 306-1, 306-2, 306-3, 306-4, 306-5, 417-1	20
SDG 13	201-2, 302-1, 302-2, 302-3, 302-4, 302-5, 305-1, 305-2, 305-3, 305-4, 305-5	11
SDG 14	304-1, 304-2, 304-3, 304-4, 305-1, 305-2, 305-3, 305-4, 305-5, 305-7	10
SDG 15	304-1, 304-2, 304-3, 304-4, 305-1, 305-2, 305-3, 305-4, 305-5, 305-7, 306-3, 306-5	12
SDG 16	2.9, 2.10, 2.11, 2.12, 2.15, 2.23, 2.26, 205-1, 205-2, 205-3, 206-1, 307-1, 403-4, 403-9, 403-10, 408-1, 410-1, 414-1, 414-2, 415-1, 416-2, 417-2, 417-3, 418-1, 419-1	25
SDG 17	207-1, 207-2, 207-3, 207-4	4
Total		**199**

Source: GRI. (2022b). *Linking the SDGs and the GRI standards GRI supports the sustainable development goals* (Issue May). Retrieved from https://www.globalreporting.org/public-policy/sustainable-development/integrating-sdgs-into-sustainability-reporting/#:~:text=Linking%20the%20SDGs%20and%20the,%20Oil%20and%20Gas%20Sector%202021

SDG, sustainable development goals; GRI, global reporting initiative.