
BOARD CHARACTERISTICS AND SUSTAINABILITY REPORTING: A STUDY OF LISTED MINING FIRMS IN INDONESIA



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Abstract

This study aims to examine the influence of board characteristics on sustainability reporting. The research uses a population of mining companies listed on the Indonesia Stock Exchange (IDX) during the period of 2021–2023. A quantitative approach is employed, using content analysis as the research method. Hypothesis testing is conducted using robust standard errors and multiple linear regression with the Year Fixed Effect Model in STATA 17 software. The results of the study indicate that gender diversity has no effect on sustainability reporting. However, the independence of the board of commissioners and the size of the board of directors have a positive and significant effect on sustainability reporting. A limitation of this study is the relatively small sample size, as it focuses solely on mining companies listed on the IDX. Future research is recommended to broaden the scope of companies under study (not limited to the mining sector) and to consider including other board characteristic variables.

Keywords: Board Characteristic, Legitimacy Theory, Sustainability Reporting

INTRODUCTION

There has been growing interest among business and academic circles in the disclosure of non-financial information, namely sustainability (Kumar et al., 2021; Hasan et al., 2022; Alta'any et al., 2023; Benameur et al., 2023; Githaiga & Kosgei, 2023). The KPMG (2022) survey notes that 96% of G25 companies currently publish a separate sustainability report. With the increasing global push for sustainable development, sustainability reporting disclosure has been receiving more attention from companies, regulators, professional bodies, and researchers (Githaiga & Kosgei, 2023).

According to the Global Reporting Initiative, GRI (2021) in Githaiga & Kosgei (2023), sustainability reporting is defined as “the practice of an organization publicly reporting its economic, environmental, and/or social impacts, as well as its contributions both positive and negative towards sustainable development goals.” Similarly, the World Business Council for Sustainable Development defines sustainability reporting as “a public report by companies to provide internal and external stakeholders with an overview of the company’s position and activities in economic, environmental, and social dimensions” (Nelson and Grayson, 2017 in Githaiga & Kosgei (2023)). Therefore, a sustainability report disclosed by a company can serve as a means to communicate accurate and credible information to all stakeholders about the company’s environmental and social activities, regardless of their economic impact; provide an overview of the company’s values, principles, and governance systems; and demonstrate the company’s commitment to sustainable development (Boiral et al., 2019; Alta'any et al., 2023; Githaiga & Kosgei, 2023).

In Indonesia, this topic has attracted increasing interest since the Financial Services Authority (OJK) issued Regulation No. 51/POJK.03/2017 on “The Implementation of Sustainable Finance for Financial Institutions, Issuers, and Public Companies,” which requires public companies to prepare a sustainability report as part of communication and accountability efforts to increase awareness and commitment to sustainability principles, as well as to support low-carbon economic growth (Adhariani & Du Toit, 2020). The mining industry is one of the sectors highly sensitive to sustainability issues due to its potentially significant environmental, social, and economic impacts. Under POJK (Otoritas Jasa Keuangan, 2017), mining companies fall under the category of issuers required to prepare sustainability reports starting from the 2021 fiscal year (Noor et al., 2024).

The mining sector in Indonesia plays a crucial role in the national economy, with abundant natural resources such as coal, gold, copper, and nickel. This sector is a vital source of the country’s main commodities; however, as noted by Putri & Gischa (2021), it has long been associated with harmful environmental impacts such as deforestation, ecosystem damage, and water pollution. One example is the environmental damage caused by illegal tin mining in Bangka Belitung, estimated to have caused environmental losses of up to IDR 271 trillion (unairnews, 2024). Furthermore, numerous social conflicts have arisen due to inequitable distribution of benefits and land rights disputes, such as in Wawonii Island, further damaging the sector’s image (Utami Argawati, 2023). These phenomena drive companies to face challenges in demonstrating their commitment to sustainable development.

To enhance sustainability in this sector, mining companies in Indonesia must transparently report the social and environmental impacts of their operations. One factor that can influence sustainability and related disclosures is internal corporate governance. In fact,

the board of directors as the internal governance body of a company is essential for the effective functioning of all types of businesses (Rathnayaka Mudiyansele, 2018). The implementation of effective governance is a key factor in long-term business success (Buallay & Al-Ajmi, 2019). In analyzing the influence of internal corporate governance on sustainability reporting, this study considers board characteristics, which include gender diversity on the board of directors, independence of the board of commissioners, and board size. The selection of these variables is consistent with contemporary governance literature (Noor et al., 2024; Chai & Suparman, 2022; Nugraha, 2024; Euginia & Triwacananingrum, 2022; Githaiga & Kosgei, 2023; Erin et al., 2022; Kumar et al., 2022; Saepudin et al., 2021; Thun & Zülch, 2023; Agyemang et al., 2020).

Previous studies by Erin et al. (2022) and Githaiga & Kosgei (2023) found that gender diversity on the board of directors positively influences sustainability reporting. However, research by M. Shamil et al. (2014) found a negative relationship between female board members and sustainability reporting, and no significant effect of board gender diversity on sustainability reports (Euginia & Triwacananingrum, 2022; Kumari et al., 2022). Prior studies also found that a higher proportion of independent directors on the board enhances corporate governance mechanisms and board effectiveness (Githaiga & Kosgei, 2023; Kumari et al., 2022). Nevertheless, there is an opposing view suggesting that board independence negatively correlates with sustainability report quality (Erin et al., 2022; Jamil et al., 2021; Kumar et al., 2022; Saepudin et al., 2021). In a two-tier system, there are two boards: the board of directors and the board of commissioners as the supervisory (Putra, 2023). Since Indonesia follows a civil law system, this study uses board of commissioners' independence as an independent variable (Noor et al., 2024). Regarding the influence of board size on sustainability reporting, studies by Erin et al., 2022; Kılıç & Kuzey, 2019; and Thun & Zülch, 2023 suggest that board size has a significant positive effect on sustainability report quality. In contrast, research by Elaigwu et al., (2024) and Githaiga & Kosgei, (2023) found a significant negative effect of board size. Other studies, such as (Kumar et al., 2022), found no significant impact of board size on sustainability report quality.

Based on these inconsistencies in previous research, a research gap emerges, motivating further study on the influence of board characteristics (board size, board of commissioners' independence, and board gender diversity) on sustainability reporting. This study is conducted in Indonesia, specifically on mining companies listed on the Indonesia Stock Exchange. Considering that Indonesia is one of the countries with high biodiversity (Gunawan et al., 2022) and that biodiversity continues to be degraded by development activities related to natural resource industries mining included (Maskun et al., 2021) the findings of this research are expected to provide relevant contributions to managerial practices in Indonesia, particularly regarding sustainability reporting initiatives, which have grown significantly in recent years

REVIEW OF LITERATURE

Legitimacy Theory

According to legitimacy theory (Dowling & Pfeffer, 1975), sustainability reporting is carried out by companies with the aim of obtaining legitimacy from external stakeholders by demonstrating the company's compliance with social norms and expectations. This theory assumes that there is an implicit contract between the company and society. By reporting

economic, social, and environmental issues, companies show that they have fulfilled their responsibilities under this contract and ensure that their activities align with societal values. This can help companies avoid or reduce the risk of future regulations that might limit their strategic choices. Sustainability reports can become a differentiating factor in a competitive industry as well as build investor trust, strengthen public confidence, and increase employee loyalty (Dewi & Maulana, 2022). Management believes that legitimacy not only increases the opportunity to attract economic resources and reduce threats from external pressures, but is also useful for securing social and political support (Masud et al., 2018a). By building a positive reputation in the eyes of stakeholders, companies can continue to maintain their survival (Berman et al., 1999).

Sustainability Reporting

Sustainability reports are used as a tool to support the long-term continuity and growth of a company (Erasmus et al., 2023). Sustainability reporting assists companies in planning, preparing, reporting, and disclosing information about their commitment, implementation, measurement, and accountability in managing economic, social, environmental, and corporate governance issues to both internal and external stakeholders in order to realize their vision and goals (Dewi & Maulana, 2022; Githaiga & Kosgei, 2023).

Disclosure of a sustainability report provides external benefits such as improving the company's image an important intangible resource for building competitive advantage (Erasmus et al., 2023) and enables the company to develop and maintain positive relationships with stakeholders (Lourenço et al., 2012). In the long run, sustainability reports can contribute to minimizing the cost of conflicts with stakeholders and help establish stable and positive relationships (Laskar & Gopal Maji, 2018).

Gender Diversity on the Board of Directors

Gender diversity on the board of directors has been considered an important concept that improves board effectiveness in good governance and has attracted attention from both academics and companies (Erin et al., 2022). Previous studies (Erin et al., 2022; Githaiga & Kosgei, 2023; Noor et al., 2024) on board characteristics and sustainability report quality found a significant positive effect of gender diversity on sustainability reporting.

Gender diversity enhances balanced decision-making because women's perspectives differ from men's (Bakar et al., 2019). Women are known to be effective in making decisions that can enhance corporate sustainability strategies, thereby increasing sustainability reporting (Al-Shaer & Zaman, 2016; Bakar et al., 2019). Furthermore, female directors tend to be more generous on community issues and more stakeholder-oriented as they pay attention to employees, the environment, and communities, and have a different leadership style (Gray et al., 2014; Al-Shaer & Zaman, 2016). With a better understanding of company complexities, gender diversity can ensure the integrity of sustainability reporting, which in turn increases legitimacy in the eyes of society, as supported by legitimacy theory.

Some other studies found a significant negative effect (M. Shamil et al., 2014). Muttakin et al. (2015), from a cultural perspective, argued that the role of female directors could be limited in developing countries, creating the perception that female board membership is merely tokenism. There are also findings that gender diversity on the board has no effect on sustainability reporting (Kumar et al. (2022) or on its quality (Noor et al., 2024).

Al-Shaer & Zaman (2016) found that board diversity improves sustainability reporting in the UK. This is consistent with other studies Harjoto et al. (2015) in the US, Ibrahim & Hanefah (2016) in Jordan, and Nahar Abdullah & Ku Ismail (2013) in Malaysia which all reported a significant positive relationship between board gender diversity and sustainability reporting. In Indonesia's mining sector, researchers found a positive effect of board gender diversity on sustainability disclosure (Setiawan et al., 2018).

H1: Gender diversity on the board of directors has a positive effect on sustainability reporting.

Board of Commissioners' Independence

An independent commissioner is a board member who has no direct relationship with the company or shareholders. The greater the proportion of independent commissioners, the more objective the board can be and the better they can protect the interests of all stakeholders. This happens because a larger number of independent commissioners can put more pressure on management to improve disclosure quality and encourage greater sustainability reporting (H. Putri et al., 2025).

Previous studies found a significant positive effect between board independence and the quality of sustainability reporting (Githaiga & Kosgei, 2023). Independent boards tend to satisfy various stakeholders by providing quality information, aligning with legitimacy theory as it shows legitimacy to stakeholders (Erin et al., 2022).

However, some studies found a significant negative effect (Madona, 2020; Ekaputri & Eriandani, 2022; Idawati & Hanifah, 2022; Kumar et al., 2022). Others found no significant effect (Saepudin et al., 2021; Jamil et al., 2021 Erin et al., 2022; Kumari et al., 2022). Kumar et al. (2022) argued that independent boards may place less priority on sustainability performance and disclosure, fulfilling only corporate governance duties without enhancing sustainability performance. Saepudin et al. (2021) also found no significant effect between the proportion of independent commissioners and sustainability reporting quality, a result supported by Winarsih & Solikhah (2015) in Indonesia's natural resource industry.

Despite mixed findings, this study adopts the positive relationship argument, as it aligns with theory and is supported by more empirical evidence.

H2: Board of commissioners' independence has a positive effect on sustainability reporting.

Board Size

The board of directors is a group of individuals appointed by shareholders to manage the company, make strategic decisions, and achieve long-term objectives. Board size refers to the number of directors serving in a company. Larger boards tend to have greater diversity in experience, financial expertise, and problem-solving capabilities (Githaiga & Kosgei, 2023). This can enhance the company's reputation, aligning with legitimacy theory.

Some studies found a significant positive effect between board size and sustainability reporting quality (Erin et al., 2022 ; Thun & Zülch, 2023). Masud et al. (2018) found that board size has a positive relationship with environmental sustainability reporting. Beji et al. (2021) found similar results, where larger board sizes were positively associated with all areas of corporate social responsibility. Kumar Garg (2008) argued that CEOs can more easily influence larger boards compared to smaller ones.

Githaiga & Kosgei (2023) concluded that large and diverse boards may include individuals with extensive knowledge of environmental and social issues, influencing the company to engage in CSR activities and disclose them.

On the other hand, some studies found a significant negative effect (Elaigwu et al., 2024; Githaiga & Kosgei, 2023). Kumar et al. (2022), in a study of environmentally sensitive industries in India, found no significant effect on sustainability disclosure. In contrast, in Indonesia’s mining industry, a positive effect was found, as larger boards could provide more varied input (Winarsih & Solikhah, 2015).

H3: Board size has a positive effect on sustainability reporting quality.

Based on the hypothesis development, Figure 1 presents the research framework.

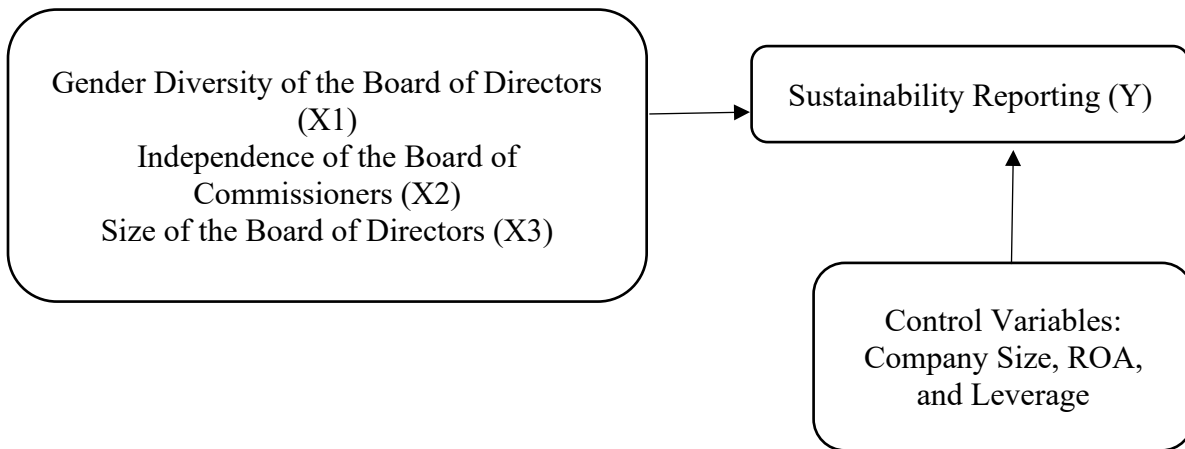


Figure 1.
Research Framework

RESEARCH METHOD

This study is a quantitative research. The population in this study consists of companies engaged in the mining industry that are listed on the Indonesia Stock Exchange (IDX) in 2021–2023. The type of data used in this study is secondary data in the form of annual reports and sustainability reports. Data sources were obtained from the official IDX website (www.idx.co.id) and the respective companies’ websites. The sampling method used in this study is purposive sampling, applying several criteria as follows:

Table 1.
Sample Selection Criteria

No	Information	Total		
		2021	2022	2023
1	Mining companies listed on the Indonesia Stock Exchange	92	92	92
2	Mining companies whose annual reports were not available	(15)	(9)	(2)
3	Mining companies that have annual reports	77	83	90
4	Mining companies that did not publish sustainability reporting	(10)	(5)	(3)

5	Total observations	232
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Source: Indonesia Stock Exchange, individual company reports (2024)

The variables used are sustainability reporting as the dependent variable; gender diversity of the board of directors, independence of the board of commissioners, and board size as the independent variables; and firm size, ROA, and leverage as the control variables. The operational definitions of the variables are as follows:

Table 2.
Variable Measurements

Variables	Measurement
Dependent:	Total GRI indicators disclosed by the company divided by the total overall GRI indicators
- Sustainability Report (SR)	
Independent	Proportion of female board members compared to the total number of board members
- Board Gender Diversity (BGEN)	
- Board Independence (BIND)	Proportion of independent commissioners compared to the total number of commissioners
- Board Size (BSIZE)	Natural logarithm of the total number of board members
Control:	Natural logarithm of total assets
- Firm Size (FS)	
- Financial Performance (ROA)	Ratio of net income after tax to total assets
- Leverage (LEV)	Ratio of total liabilities to total assets

Source: Processed secondary data (2025)

The data analysis techniques in this study include descriptive data analysis, robust standard error testing, and multiple linear regression with the following regression equation:

$$SR = \beta_0 + \beta_1 GEN + \beta_2 IND + \beta_3 BSIZE + \beta_4 FS + \beta_5 ROA + \beta_6 LEV + \varepsilon$$

Notes:

- β_0 : Constant
- $\beta_1 GEN$: Gender Diversity of the Board of Directors
- $\beta_2 IND$: Independence of the Board of Commissioners
- $\beta_3 BSIZE$: Size of the Board of Directors
- $\beta_4 FS$: Company Size
- $\beta_5 ROA$: Financial Performance
- $\beta_6 LEV$: Leverage
- e : error term

RESULTS AND DISCUSSION

Descriptive Statistics

Table 3.
Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
SR	232	.25	.298	0	.944
BGEN	232	.12	.172	0	.667

BIND	232	.43	.12	0	1
BSIZE	232	1.323	.413	.693	2.708
FS	232	28.706	.3.246	0	32.756
ROA	232	.062	.277	-3.5	.603
LEV	232	.494	.366	0	3.044

Source: Stata 17 (2025)

Based on Table 3, the average value of the Sustainability Report (SR) is 0.25, indicating that the level of sustainability reporting using the GRI 2016 standards remains relatively low. It can be concluded that only about 25% of the companies in the sample reported sustainability reports using the GRI 2016 standards. The standard deviation of this variable is 0.298, which is relatively low.

The minimum SR value is 0, obtained from companies that made no disclosures based on the GRI 2016 standards in their sustainability reports for the 2021–2023 period, such as PT Central Omega Resources Tbk (DKFT), PT Ifishdeco Tbk (IFSH), PT Apexindo Pratama Duta Tbk (APEX), PT Samindo Resources Tbk (MYOH), PT Perdana Karya Perkasa Tbk (PKPK), PT Baramulti Suksessarana Tbk (BSSR), PT Resource Alam Indonesia Tbk (KKGI), PT Mitabara Adiperdana Tbk (MBAP), PT Sumber Energi Andalan Tbk (ITMA), PT Eksploitasi Energi Indonesia Tbk (CNKO), PT Dwi Guna Laksana Tbk (DWGL), PT Sumber Global Energy Tbk (SGER), PT Transcoal Pacific Tbk (TCPI), PT Trans Power Marine Tbk (TPMA), PT Sillo Maritime Perdana Tbk (SHIP), PT Pelayaran Tamarin Samudra Tbk (TAMU), PT Soechi Lines Tbk (SOCHI), PT Rukun Raharja Tbk (RAJA), PT Logindo Samudramakmur Tbk (LEAD), PT Ratu Prabu Energi Tbk (ARTI), and PT Citatah Tbk (CTTH). This may be due to the fact that the Financial Services Authority (OJK) does not explicitly mandate the use of the GRI standards.

The maximum SR value is 0.944, recorded by PT Indika Energi Tbk (INDY) and PT Vale Indonesia Tbk (INCO) in 2023. This is because the sustainability reports of INDY and INCO disclosed almost all the GRI 2016 standards. Additionally, INCO achieved the “Gold” rank in the Asia Sustainability Reporting Rating (ASRRAT) in 2023.

The gender diversity variable (BGEN) has an average value of 0.12, meaning that, on average, companies in the sample had female directors accounting for 12% of the total board of directors. Findings by Wahid (2019) in the United States showed a similar result of 9%. This indicates that male directors hold a relatively larger proportion of board positions in the mining sector compared to females. The standard deviation of this variable is 0.172, which is not far from previous findings (Githaiga & Kosgei, 2023). The relatively large standard deviation is because the value is above the mean. The minimum BGEN value is 0 in 141 observations out of 232 total observations, indicating that some companies from 2021 to 2023 did not appoint any female directors as part of their boards. The maximum BGEN value is 0.667 (66.7%), recorded by PT Delta Dunia Makmur (DOID) in 2021, PT Mitrabahera Segara Sejati (MBSS) in 2022 and 2023, and PT Alfa Energi Investama (FIRE) in 2023. The low number of female directors is partly influenced by the absence of OJK regulations in Indonesia setting a minimum quota for female representation on public company boards.

The board independence variable (BIND) has an average value of 0.434, indicating that 43.4% of board commissioners in each company are independent commissioners. Previous findings showed similar results of 47.1% (Erin et al., 2022). The standard deviation of this variable is 0.113, which is relatively small and not far from previous findings of 0.096

(Noor et al., 2024). The minimum BIND value is 0.25, recorded in PT Sigma Energi Compressindo Tbk (SICO) in 2023, PT AKR Corporindo Tbk (AKRA) in 2023, PT Super Energy Tbk (SURE) in 2022, and PT Indo Tambang Megah Tbk (ITMG) in 2021, and 0.29 in 2022. Based on Financial Services Authority Regulation No. 33/PJOK.04/2014, every public company must have at least 30% independent commissioners if the board has more than two members. This indicates that some companies still do not meet the requirements. The maximum BIND value is 1, recorded by PT Astrindo Nusantara Infrastruktur Tbk (SICO) in 2023, where the initial number of independent commissioners was 2 out of 3 total commissioners, becoming 2 independent commissioners out of 2 total commissioners.

The board size variable (BSIZE) has an average value of 1.323, meaning that, on average, companies in the sample have boards with 3–4 members. This result is not far from previous findings by (Setiawan et al., 2018), who studied the mining industry and found an average of 4.74. The standard deviation of this variable is 0.413, equivalent to 1.51, which can be considered relatively small and close to previous findings of 1.60 (Setiawan et al., 2018). This indicates that the data are not widely dispersed from the mean. The minimum BSIZE value is 0.693, equivalent to 2 directors, recorded by PT Perdana Karya Perkasa Tbk (PKPK), PT Batulicin Nusantara Maritim Tbk (BESS), PT Dwi Guna Laksana Tbk (DWGL), PT Dana Brata Luhur Tbk (TEBE), PT Ulima Nitra Tbk (UNIQ), PT GTS Internasional Tbk (GTSI), PT Pelayaran Tamarin Samudra Tbk (TAMU), PT Indah Perkasa Sentosa Tbk (INPS) during 2021–2023; PT Golden Eagle Energy Tbk (SMMT) and PT Ratu Prabu Energi Tbk (ARTI) in 2022 and 2023; and PT Delta Dunia Makmur Tbk (DOID), PT Mandiri Herindo Adiperkasa Tbk (MAHA), PT Atlantis Subsea Indonesia Tbk (ATLA), PT Humpuss Maritim Internasional Tbk (HUMI), PT Sunindo Pratama Tbk (SUNI), and PT Capitalinc Investment Tbk (MTFN) in 2023. Based on Financial Services Authority Regulation No. 33/PJOK.04/2014 concerning Boards of Directors and Commissioners of Issuers or Public Companies, every public company must have at least 2 directors, so it can be concluded that all companies in the sample complied with this regulation. The maximum BSIZE value is 2.708, equivalent to 15 directors, recorded by PT Bumi Resources Tbk (BUMI) in 2023. In the previous year, BUMI had 10 directors and stated in its annual report that changes in composition were made based on considerations of effectiveness and productivity of the company’s performance.

Paired Correlation Test

Table 4.
Paired Correlation

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) SR	1.000						
(2) BGEN	0.031	1.000					
(3) BIND	0.111	-0.022	1.000				
(4) BSIZE	0.440*	-0.037	-0.026	1.000			
(5) FS	0.440*	0.050	0.050	0.443*	1.000		
(6) ROA	0.130	0.058	-0.030	0.198*	0.223*	1.000	
(7) Leverage	-0.101	-0.130	0.104	-0.083	0.061	-	1.000
						0.203*	

* shows significance at $p < .01$

Source: Stata 17 (2025)

Based on Table 4, it shows that board size and firm size have a positive correlation with sustainability reporting. This means that the larger the board size and company size, the greater the likelihood they will report sustainability. This may occur because larger companies have more resources and greater pressure to implement sustainability practices.

Hypothesis Test Results

Table 5.
Robust Standard Errors

SR	Coef.	St.Err.	t-value	p-value	[95% Conf Interval]	Sig
BGEN	.021	.089	0.24	.812	-.154 .196	
BIND	.284	.158	1.80	.074	-.028 .596	*
BSIZE	.214	.05	4.31	.0	.116 .312	**
FS	.03	.013	2.26	.019	.005 .056	
ROA	-.009	.042	-0.21	.813	-.092 .074	
LEV	-.078	.027	-2.86	.005	-.132 -.024	***
2021b	0	
2022	.052	.038	1.37	.173	-.023 .128	
2023	.117	.039	3.01	.003	.04 .194	***
Constant	-1.053	.322	-3.27	.001	-1.687 -.419	***
Mean dependent var		0.250	SD dependent var		0.298	
R-squared		0.316	Number of obs		232	
F-test		14.514	Prob > F		0.000	
Akaike crit. (AIC)		26.656	Bayesian crit. (BIC)		57.020	

*** $p < .01$, ** $p < .05$, * $p < .1$

Source: Stata 17 (2025)

Based on Table 5, the F-test value is 14.514 with a probability of 0.000, indicating that the model is feasible. The coefficient of determination is 0.316, meaning the independent variables (gender diversity, board independence, and board size) and control variables (firm size, financial performance, and leverage) influence sustainability reporting by 31.6%, while 68.4% is influenced by other variables not included in the model.

Hypothesis 1: Gender diversity of the board of directors has a positive effect on sustainability reporting

The gender diversity of the board of directors has a regression coefficient of 0.021 with a p-value of 0.812. This indicates that gender diversity has a positive but not significant effect on sustainability reporting. From a cultural perspective, the role of women on boards in developing countries may be limited, creating a perception that female board membership is merely symbolic or formal (Muttakin et al., 2015), which is not consistent with legitimacy theory. This finding aligns with research by (Nugraha, 2024), which showed that gender diversity in the board has no effect on sustainability report disclosure and stated that corporate governance in Indonesian companies is dominated by men, making the influence of female directors on decision-making very limited, including decisions related to environmental and social disclosure practices. This is also supported by Noor et al. (2024), who found an insignificant relationship between gender diversity and reporting quality. This can be explained by existing gender gaps, assumptions that women have lower education and work experience than men, views that some jobs are unsuitable for women, and stigmas that

women are less productive than male workers (Nuraeni & Lilin Suryono, 2021). This is also reflected in the absence of OJK regulations mandating a minimum number of women on public company boards in Indonesia, indicating that gender diversity is not yet a primary focus of corporate policy. Additionally, the study showed that 141 out of 232 observations had no female directors as part of the board, indicating that most Indonesian mining companies between 2016 and 2021 did not appoint female directors.

Hypothesis 2: Board independence positively affects sustainability reporting (accepted, positive significant, $p < 0.1$)

Board independence has a coefficient value of 0.284 with a p-value of 0.074, indicating a positive and significant effect on sustainability reporting at a 10% significance level. This finding aligns with Masud et al. (2018a), who stated that board independence is positively related to environmental sustainability disclosure and is consistent with legitimacy theory, which emphasizes that more independent directors positively impact society and organizations by encouraging greater disclosure of environmental strategies, policies, and actions. Furthermore, this finding aligns with (Ong & Djajadikerta, 2018), who found a positive and significant relationship between independent boards and total sustainability disclosure (economic, social, and environmental), supported by statements that a higher proportion of independent directors can support stronger governance and more comprehensive sustainability reporting.

Hypothesis 3: Board size positively affects sustainability reporting (accepted, positive significant, $p < 0.05$)

Board size has a coefficient value of 0.214 with a p-value of 0.000, showing a positive and significant effect on sustainability reporting at the 5% significance level. This finding is consistent with disampaikan (Euginia & Triwacananingrum, 2022), who stated that board size positively and significantly influences sustainability report disclosure. It also aligns with Erin et al. (2022), who found a strong positive relationship between board size and quality of sustainability reporting, proving that larger boards contribute to higher quality reporting and tend to influence management to disclose relevant sustainability information. Rathnayaka Mudiyansele (2018) also showed that larger board sizes have a positive and significant influence on sustainability disclosure.

Control Variables Test Results:

Firm size (FS) has a regression coefficient of 0.03 with a p-value of 0.019 (< 0.05), indicating that firm size has a positive and statistically significant effect on sustainability reporting. It can be concluded that the larger the company size, the higher the tendency to prepare and disclose sustainability reports.

Financial performance (ROA) has a regression coefficient of -0.009 with a p-value of 0.813, meaning financial performance has no significant effect. ROA has a negative but statistically insignificant effect on sustainability reporting. It can be concluded that financial performance (ROA) does not significantly influence the company's tendency to prepare sustainability reports.

Leverage (LEV) has a coefficient of -0.078 with a p-value of 0.005, indicating a negative and statistically significant effect on sustainability reporting at the 1% significance level (***). Therefore, it can be concluded that the higher the company's leverage, the lower the tendency to disclose sustainability reports.

CONCLUSION

This study analyzes the effect of board characteristics on sustainability reporting among mining sector companies listed on the Indonesia Stock Exchange (IDX). The study uses a population of 92 companies listed on the IDX for the 2021–2023 period, resulting in 276 observations. After elimination, the total sample used in this study consisted of 232 observations. The findings indicate that gender diversity has a positive but statistically insignificant effect on sustainability reporting. This suggests that the presence of female directors may be part of the company's effort to demonstrate inclusivity values; however, such presence has not been proven to significantly affect performance or disclosure. On the other hand, board independence and board size have a significant and positive impact on sustainability reporting. This shows that a larger proportion of independent directors and commissioners can support stronger governance and are more likely to disclose relevant information regarding sustainability reporting.

This study has several limitations. First, GRI scores were not readily available from websites, requiring manual data collection and processing, which may introduce subjectivity. The authors have made efforts to minimize subjectivity by coordinating within the research team to align perceptions and ensure the study adhered to the guidelines and explanations provided in the GRI 2016 standards. Moreover, the total scores obtained were solely based on the number of disclosed items and did not reflect the depth of disclosure on specific topics. Second, this study only examines board characteristics limited to gender diversity, board independence, and board size. Third, it focuses solely on mining sector companies listed on the IDX within a relatively short period (2021–2023).

Based on these limitations, future research could develop additional, more specific criteria in cases where certain GRI points may lead to differing interpretations, thereby making the research more standardized. Future studies could also expand the research variables, such as the frequency of board meetings, board capital, and CEO duality. Additionally, future research could investigate how company-specific factors such as ownership structure influence sustainability reporting, as well as broaden the scope of the research to compare sustainability reporting practices across regions, between private and public companies, with the aim of determining the impact of board characteristics on sustainability reporting across different geographic areas and corporate entities. Furthermore, future studies are recommended to use a longer time frame to provide a more comprehensive and accurate picture of sustainability reporting practices. Such results are expected to be more representative and enhance the validity of the findings.

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