

## DETERMINANTS OF CORPORATE SUSTAINABILITY DISCLOSURE: EVIDENCE FROM ESG BOARD

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### Abstract

Corporate sustainability disclosure (CSD) has become an important mechanism for improving transparency regarding corporate environmental and social responsibilities. This study examines the determinants of corporate sustainability disclosure by analyzing the roles of environmental commitment, circular economic initiatives, and firm size, as well as the moderating effect of financial risk. The study also compares sustainability disclosure practices between firms with Environmental, Social, and Governance (ESG) boards and those without. The sample consists of 185 firm-year observations from energy sector companies listed on the Indonesia Stock Exchange during 2020–2024. Panel data regression with moderated regression analysis was employed. The results indicate that environmental commitment affects sustainability disclosure differently depending on the presence of ESG boards. Meanwhile, circular economy initiatives and firm size positively influence sustainability disclosure regardless of governance structure. Financial risk strengthens environmental disclosure incentives but weakens the influence of firm size.

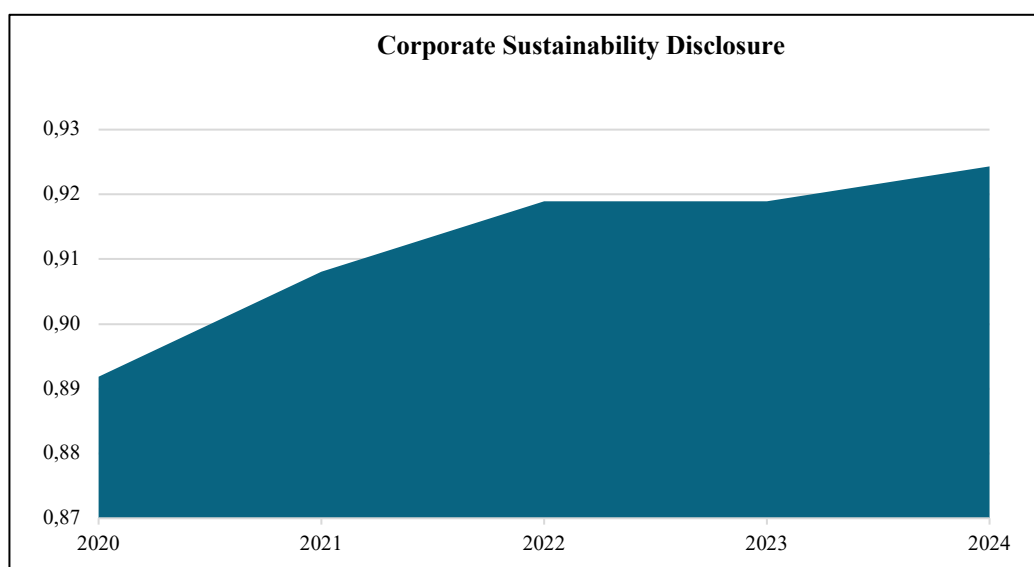
Keywords: Corporate Sustainability Disclosure, Environmental Commitment, Circular Economy Initiative, Financial Risk, ESG Board

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### 1. Introduction

Sustainability has become a major concern in global economic development as business activities increasingly generate environmental and social impacts beyond financial performance (Maiti, 2021; Senadheera et al., 2022). Rising concerns over climate change, environmental degradation, and resource scarcity have encouraged regulators, governments, and investors to demand greater corporate accountability regarding sustainability practices (Abdullahi et al., 2017; Ashraf & Nazir, 2023). Consequently, companies are increasingly integrating environmental, social, and governance (ESG) considerations into corporate strategies and reporting practices to address sustainability challenges and improve transparency (Diwan & Sreeraman, 2024; Gonçalves & Gaio, 2023a).

Corporate sustainability disclosure (CSD) has emerged as an important mechanism through which companies communicate sustainability initiatives and environmental responsibility to stakeholders (Khatri & Kjærland, 2023; Zhong & Wang, 2023). Through sustainability disclosure, firms provide information on environmental protection, social responsibility, and governance practices that reflect their commitment to sustainable development (Z. Li, 2023; Raghupathi et al., 2023). Empirical evidence from this study indicates that the average CSD score increased from 0,892 in 2020 to 0,924 in 2024 as shown at Figure 1, suggesting gradual improvement in sustainability transparency. Nevertheless, the modest increase indicates that sustainability disclosure may still be driven by regulatory pressure and legitimacy motives rather than substantial sustainability transformation (Gonçalves & Gaio, 2023a; Kumar et al., 2023).



**Figure 1. Corporate Sustainability Disclosure Energy Sector Company's**

One factor that may influence corporate sustainability disclosure is environmental commitment, which reflects the extent to which companies allocate resources to environmental protection activities (Murti, 2023; Ye & Dela, 2023). Environmental commitment can be observed through environmental costs incurred by firms to support pollution prevention, waste management, and environmental monitoring initiatives (Novriana & Fakhroni, 2022; Ye & Dela, 2023). Firms that invest more heavily in environmental initiatives are generally more likely to disclose sustainability information as a signal of environmental responsibility and accountability to stakeholders (Ashraf & Nazir, 2023; Murti, 2023). Prior studies also suggest that environmental investment may encourage companies to communicate their environmental performance more transparently to strengthen legitimacy and stakeholder trust (Alodat, Amosh, et al. 2024; Ashraf and Nazir 2023; Gonçalves and Gaio 2023b; KementerianPUPR et al. 2023; Zarzycka and Krasodomska 2026)

Another important factor influencing sustainability disclosure is the adoption of circular economic initiatives. The circular economy concept emphasizes sustainable resource utilization through recycling, reuse, and redesign of production systems to reduce environmental impacts (Diaz et al., 2021; Kristensen & Mosgaard, 2020). Firms implementing circular economic strategies often disclose these initiatives as part of sustainability reporting to demonstrate environmental innovation and responsible resource management (Pozzoli et al., 2023; Vitolla et al., 2023). Empirical evidence indicates that companies adopting circular economy practices tend to provide broader sustainability disclosures compared with firms that rely on conventional production models (Esposito et al., 2023; Opferkuch et al., 2022; Pozzoli et al., 2023; Sormin et al., 2026; Tiscini et al., 2022; Wulandari, 2026).

Firm characteristics may also influence sustainability disclosure practices. Firm size is frequently identified as an important determinant of corporate disclosure because larger firms face greater public scrutiny and stronger stakeholder pressure (Mahmood et al., 2025; Wulandari & Akbar, 2025; Zarzycka & Krasodomska, 2026). In addition, large firms possess greater financial and organizational resources that enable them to implement sustainability initiatives and reporting more effectively (Abdi et al., 2022;

Alodat, Amosh, et al., 2024b; Gonçalves & Gaio, 2023a; Kumar et al., 2023; Mahmood et al., 2025; Thi et al., 2023; Zarzycka & Krasodomska, 2026).

Financial conditions may also influence corporate sustainability disclosure decisions, particularly financial risk reflected through leverage levels (Bertelli et al., 2025; Ye & Dela, 2023). Firms with higher financial leverage often face greater monitoring from creditors and investors, which increases pressure to provide more transparent information regarding corporate activities (Ashraf & Nazir, 2023; Mahmood et al., 2025). In such situations, sustainability disclosure may function as a signaling mechanism to reduce information asymmetry and maintain stakeholder confidence (Gonçalves & Gaio, 2023a; Kumar et al., 2023).

Therefore, firms experiencing higher financial pressure tend to adjust their transparency strategies to mitigate perceived uncertainty and legitimacy concerns among stakeholders (Alodat, Amosh, et al., 2024b; Bertelli et al., 2025). Corporate governance mechanisms may also influence sustainability disclosure practices (Palea et al., 2024; Thi et al., 2023). In recent years, many firms have established ESG boards or sustainability committees to oversee sustainability strategies and environmental performance (Rosyidah & Ningsih, 2025; Yahaya, 2026). Prior studies show that governance structures and board characteristics significantly enhance ESG disclosure and sustainability transparency (Abdelkader et al., 2024; Zhu et al., 2026).

Despite growing attention to sustainability disclosure, several gaps remain in the literature. Prior studies often examine determinants such as environmental performance, governance mechanisms, or firm characteristics separately rather than within an integrated framework. Research simultaneously analyzing environmental commitment, circular economic initiatives, and firm size remains limited. Furthermore, the moderating role of financial risk and the influence of ESG boards on sustainability disclosure have received little attention. Therefore, this study investigates these relationships and compares firms based on ESG board presence.

## 2. Theoretical Background

Corporate sustainability disclosure reflects corporate transparency regarding environmental and social impacts. Several theoretical perspectives, including stakeholder, signaling, legitimacy, and SDGs frameworks, explain corporate motivations in sustainability reporting and disclosure practices. The theoretical perspectives are explained as follows.

### 2.1 Stakeholder Theory

Stakeholder theory explains that firms are accountable not only to shareholders but also to a broader range of stakeholders affected by corporate activities, including investors, regulators, communities, and environmental groups (Gutterman, 2023; Hörisch et al., 2020; Senadheera et al., 2022). Companies are therefore expected to respond to stakeholder demands for transparency by providing sustainability-related information in their disclosures (Kumar et al., 2023; T. Li et al., 2025; Paul et al., 2024; Raghupathi et al., 2023). Environmental commitment and circular economic initiatives represent corporate efforts to address environmental concerns raised by stakeholders, encouraging firms to communicate these initiatives through corporate sustainability disclosure (Pozzoli et al., 2023; Tiscini et al., 2022; Vitolla & Raimo, 2026). Larger firms face stronger stakeholder pressure and public scrutiny, which often leads to broader sustainability disclosure (Gonçalves & Gaio, 2023a; Mahmood et al., 2025; Zarzycka &

Krasodomska, 2026). Financial risk and ESG board oversight may further influence corporate transparency and strengthen sustainability disclosure practices (Alodat, Salleh, et al., 2024; Ashraf & Nazir, 2023; Haijie Huang et al., 2024; Zhu et al., 2026).

## 2.2 Signaling Theory

Signaling theory explains that companies voluntarily disclose information to reduce information asymmetry between managers and external stakeholders such as investors and regulators (Abdi et al., 2022; Nguyen, 2026; Spence, 1973). Through disclosure practices, firms provide signals regarding their quality, credibility, and long-term sustainability commitments (Paul et al., 2024; Raghupathi et al., 2023). Corporate sustainability disclosure can therefore serve as a signal that a firm actively implements responsible environmental and social practices. Environmental commitment and circular economy initiatives may signal proactive sustainability strategies, while larger firms tend to disclose more information to strengthen reputation and stakeholder confidence (Mahmood et al., 2025; Vitolla et al., 2023; Zarzycka & Krasodomska, 2026).

## 2.3 Legitimacy Theory

Legitimacy theory argues that organizations continuously seek to ensure that their operations are perceived as consistent with societal norms, values, and expectations in order to secure continued support from stakeholders and society (Kumar et al., 2023; Suchman, 1995; Zarzycka & Krasodomska, 2026). When a gap emerges between corporate activities and societal expectations, firms may increase disclosure to restore or maintain legitimacy (Abdi et al., 2022; Kumar et al., 2023; Wang et al., 2022). Corporate sustainability disclosure therefore becomes an important communication strategy through which firms demonstrate environmental responsibility and social accountability (Alodat, Salleh, et al., 2024; Gonçalves & Gaio, 2023a; Zhong & Wang, 2023). Companies implementing environmental initiatives and circular economy practices tend to expand sustainability disclosure to reinforce legitimacy and strengthen public trust in their sustainability commitments (Esposito et al., 2023; Mahmood et al., 2025; Pozzoli et al., 2023).

## 2.4 SDG's Theory

The Sustainable Development Goals (SDGs) framework emphasizes the integration of economic growth, environmental protection, and social well-being as key pillars of sustainable development (Mao et al., 2025; Senadheera et al., 2022; United Nations, 2015). The SDGs encourage companies to align their business strategies with global sustainability objectives such as responsible consumption, climate action, and sustainable production systems (Diaz et al., 2021; Lu & Sander, 2026; Zahid et al., 2024). In this context, corporate sustainability disclosure becomes an important mechanism through which firms communicate their contributions to achieving sustainable development targets (T. Li et al., 2025; Paul et al., 2024; Zhong & Wang, 2023). Firms implementing environmental commitment and circular economy initiatives are more likely to disclose sustainability information as evidence of their alignment with global sustainability agendas (García-Sánchez et al., 2022; Lepore et al., 2026; Vitolla et al., 2023).

Collectively, these theoretical perspectives provide a comprehensive foundation for understanding the determinants of corporate sustainability disclosure. Stakeholder demands, signaling incentives, legitimacy considerations, and global sustainability agendas may influence how companies communicate their environmental and social

responsibilities through sustainability reporting. Based on these theoretical arguments, this study further examines the relationships between environmental commitment, circular economic initiatives, firm size, financial risk, and corporate sustainability disclosure, as well as the role of ESG boards in shaping these disclosure practices

### **2.5 Environmental Commitment, Corporate Sustainability Disclosure, ESG Board**

Environmental commitment reflects the extent to which companies allocate resources and implement strategies aimed at addressing environmental issues and improving environmental performance within their operations (Lusiana et al., 2021; Murti, 2023). Companies demonstrating stronger environmental commitment tend to invest in environmental initiatives such as emission reduction programs, waste management systems, and environmental monitoring activities as part of their sustainability strategies (Novriana & Fakhroni, 2022; Ye & Dela, 2023). These environmental initiatives generate sustainability-related information that becomes relevant for stakeholders and corporate reporting practices (T. Li et al., 2025; Raghupathi et al., 2023). Consequently, firms tend to communicate these environmental activities through corporate sustainability disclosure to demonstrate transparency and accountability regarding environmental responsibility (Gonçalves & Gaio, 2023a; Paul et al., 2024). The presence of ESG boards may further influence this relationship because governance structures play an important role in overseeing sustainability strategies and ensuring that environmental initiatives are properly communicated through corporate disclosures (Haijie Huang et al., 2024; Thi et al., 2023). ESG boards also strengthen sustainability governance mechanisms and encourage companies to improve transparency in sustainability reporting practices (Abdelkader et al., 2024; Zhu et al., 2026)

Previous studies generally show that environmental commitment and environmental initiatives encourage firms to increase corporate sustainability disclosure practices (Agnes, 2023; Alodat, Salleh, et al., 2024; Ashraf & Nazir, 2023; Murti, 2023; Novriana & Fakhroni, 2022; Ye & Dela, 2023). However, several studies report inconsistent findings, suggesting that environmental initiatives do not always lead to broader sustainability disclosure due to differences in reporting incentives and governance structures (Czaja-Cieszyńska et al., 2021; Mahmood et al., 2025; Nugrahani et al., 2023; Zarzycka & Krasodomska, 2026). Based on this explanation, the hypothesis proposed is:

*H1: There is a variation in the influence of environmental commitment on corporate sustainability disclosure between companies that have ESG boards and those that do not.*

### **2.6 Circular Economy Initiative, Corporate Sustainability Disclosure, ESG Board**

Circular economy initiatives refer to corporate strategies that emphasize sustainable resource utilization through recycling, reuse, and waste reduction within production and operational processes (Diaz et al., 2021; Kristensen & Mosgaard, 2020). Companies implementing circular economy practices aim to improve resource efficiency while minimizing environmental impacts throughout the product life cycle (Abdelmeguid et al., 2022; Zahid et al., 2024). These initiatives generate information regarding environmental innovation, resource management, and sustainable production practices that can be communicated to stakeholders through corporate reporting (Opferkuch et al., 2022; Tiscini et al., 2022). Consequently, firms that adopt circular economy initiatives are more likely to disclose sustainability-related information to demonstrate environmental responsibility and sustainable business practices (Lepore et al., 2026; Vitolla et al., 2023). The presence of ESG boards may further influence this relationship because governance

structures play a significant role in overseeing sustainability strategies and promoting environmentally responsible business practices (Haijie Huang et al., 2024; Thi et al., 2023) ESG boards encourage companies to integrate circular economy initiatives into corporate strategies and to communicate these sustainability practices more transparently through sustainability reporting (Palea et al., 2024; Zhu et al., 2026).

Previous studies generally find that the adoption of circular economy practices is positively associated with sustainability disclosure practices (Esposito et al., 2023; Gunarathne et al., 2021; Leggerini et al., 2026; Opferkuch et al., 2022; Pozzoli et al., 2023; Tiscini et al., 2022). However, some studies report inconsistent findings, suggesting that circular economy initiatives do not always translate into broader disclosure due to differences in governance structures and reporting incentives (Bawa & Asongu, 2026; Esposito et al., 2023; García-Sánchez et al., 2022; Sulik-Górecka & Iskra, 2026) Based on this explanation, the hypothesis proposed is:

*H2: There is a variation in the influence of circular economy initiatives on corporate sustainability disclosure between companies that have ESG boards and those that do not.*

## **2.7 Firm Size, Corporate Sustainability Disclosure, ESG Board**

Firm size is often associated with the level of corporate visibility and the resources available to implement sustainability practices and reporting activities (Mahmood et al., 2025; Zarzycka & Krasodomska, 2026). Larger firms generally possess greater financial and organizational resources that enable them to implement environmental initiatives, sustainability strategies, and comprehensive disclosure practices (Gonçalves & Gaio, 2023a; Kumar et al., 2023; Wulandari & Akbar, 2025). In addition, large companies tend to face stronger scrutiny from regulators, investors, and the public, which encourages them to improve transparency through broader sustainability disclosure (Paul et al., 2024; Zhong & Wang, 2023). Consequently, firms with larger size are more likely to disclose sustainability-related information to maintain corporate legitimacy and stakeholder trust (Alodat, Amosh, et al., 2024b; Khatri & Kjærland, 2023).

The presence of ESG boards may further influence this relationship because governance structures play an important role in overseeing sustainability strategies and strengthening sustainability reporting practices (Haijie Huang et al., 2024; Thi et al., 2023). ESG boards encourage companies to adopt stronger governance mechanisms related to sustainability performance and disclosure practices (Abdelkader et al., 2024; Menicucci & Paolucci, 2026). Previous studies generally indicate that firm size positively influences sustainability disclosure because larger firms have greater incentives and resources to communicate sustainability practices to stakeholders (Abed et al., 2021; Digidowiseiso, 2023; Fadilah & Uzliawati, 2022; Islamiati & Suryandari, 2020; Yohana & Suhendah, 2023). However, several studies report inconsistent results, suggesting that firm size does not always determine the extent of sustainability disclosure due to differences in governance structures and reporting incentives (D'Costa et al., 2025; Fiana & Endri, 2025; Handayati et al., 2022). Based on this explanation, the hypothesis proposed is:

*H3: There is a variation in the influence of firm size on corporate sustainability disclosure between companies that have ESG boards and those that do not.*

## 2.8 Financial Risk, Corporate Sustainability Disclosure, ESG Board

Financial risk reflects the level of financial pressure faced by firms and is commonly measured through the debt-to-equity ratio (DER), which indicates the extent to which corporate activities are financed through debt relative to shareholders' equity (Bertelli et al., 2025; Mahmood et al., 2025; Ye & Dela, 2023). Firms with higher financial risk generally face stronger monitoring from creditors and investors because higher leverage increases concerns regarding financial stability, risk management, and long-term sustainability performance (Alodat, Amosh, et al., 2024b; Ashraf & Nazir, 2023; Paul et al., 2024). Under such conditions, companies often enhance transparency through corporate sustainability disclosure to reduce information asymmetry, signal responsible corporate behaviors, and maintain stakeholder confidence regarding sustainability strategies (Gonçalves & Gaio, 2023a; Kumar et al., 2023; Zhong & Wang, 2023). Financial risk can therefore shape how firms communicate environmental commitment, circular economy initiatives, and firm characteristics through sustainability disclosure because firms under financial pressure may strategically disclose sustainability information to maintain legitimacy and reassure stakeholders (Murti, 2023; Paulus & Tarmidi, 2025; Pozzoli et al., 2023; Vitolla et al., 2023)

The moderating role of financial risk may become more significant when firms simultaneously face financial pressure while investing in environmental initiatives or implementing circular economy strategies, particularly in companies with greater organizational resources such as larger firms (Leggerini et al., 2026; Novriana & Fakhroni, 2022; Ye & Dela, 2023). Corporate governance structures such as ESG boards may further influence how firms respond to financial risk because board oversight strengthens sustainability governance and encourages firms to maintain transparency in sustainability reporting practices (Haijie Huang et al., 2024; Palea et al., 2024; Thi et al., 2023). Prior studies generally find that financial conditions and leverage influence sustainability disclosure practices, indicating that firms facing higher financial pressure tend to adjust their disclosure strategies to maintain stakeholder trust (Ashraf & Nazir, 2023; Fadilah & Uzliawati, 2022; Gonçalves & Gaio, 2023a; Islamiati & Suryandari, 2020; Kumar et al., 2023; Mahmood et al., 2025; Paul et al., 2024; Yohana & Suhendah, 2023). However, several studies report inconsistent results, suggesting that financial risk does not always significantly influence sustainability disclosure because corporate governance structures, reporting incentives, and institutional environments may moderate this relationship (Alfara & Nugrahanti, 2025; Czaja-Cieszyńska et al., 2021; D'Costa et al., 2025; Handayati et al., 2022; Zarzycka & Krasodomska, 2026). Based on this explanation, the hypothesis proposed is:

*H4: There is a variation in the moderating role of financial risk on the relationship between environmental commitment and corporate sustainability disclosure between companies that have ESG boards and those that do not.*

*H5: There is a variation in the moderating role of financial risk in the relationship between environmental commitment and corporate sustainability disclosure between companies that have ESG boards and those that do not*

*H6: There is a variation in the moderating role of financial risk in the relationship between environmental commitment and corporate sustainability disclosure between companies that have ESG boards and those that do not*

### 3. Methods

This study employs a quantitative approach using secondary data from annual and sustainability reports through IDX ([www.idx.co.id](http://www.idx.co.id)) and company’s website. The sample was selected for 37 companies of energy sector companies who published their annual report during 2020–2024 and had conducted an initial public offering IPO since 2020, so 185 firm-year observations selected through purposive sampling. The analysis is conducted using three models. Model 1 examines the full sample of 185 observations. Model 2 focuses on firms with ESG boards (139 observations), while Model 3 analyzes firms without ESG boards (46 observations). The dependent variable is corporate sustainability disclosure (CSD), while the independent variables include environmental commitment (ENC), circular economy initiative (CEI), and firm size (SIZE). Financial risk (DER) is included as a moderate variable. The hypotheses are tested using panel data regression with moderated regression analysis (MRA) with E-Views 13. Table 1 shows the measurement variables in this research.

**Table 1. Operationalization Variable**

| Variable  | Indicator  |
|---|--|
| <b>Corporate Sustainability Disclosure (Y)</b>  |  |
| Disclosure of ESG information to enhance transparency and stakeholder accountability (Khatri & Kjærland, 2023; Lestari et al., 2025; Simamora & Kusharyanti, 2024)      | $CSD = ED + SD + GD + SR + GRI$                                      |
| <b>Environmental Cost (X1)</b>  |  |
| Corporate commitment to environmental protection through resource allocation and environmental management initiatives (Hapsoro & Adyaksana, 2020; Hidayat et al., 2022) | $EC = \frac{\text{Environmental Cost}}{\text{Net Profit After Tax}}$ |
| <b>Circular Economy Initiatives (X2)</b>  |  |
| Corporate circular economy practices emphasizing resource efficiency, reuse, recycling disclosure (Kristensen & Mosgaard, 2020; Vitolla et al., 2023)                   | $CEI = \frac{\text{Score CEI}}{\text{Total Scores}}$                 |
| <b>Firm Size (X3)</b>   |  |
| Reflects company scale by total assets (Fahmi, 2020; Wulandari & Akbar, 2025)   | $\text{Ln}(\text{Total Assets})$                                     |
| <b>Financial Risk (Z)</b>   |  |
| Financial risk reflected by debt proportion relative to equity (Bertelli et al., 2025; Ye & Dela, 2023)   | $DER = \frac{\text{Liabilities}}{\text{Equities}}$                   |

Source: Data processed by researcher, (2026).

### 4. Results and Discussion

The results test of this study will explain as follows:

**Table 2. Statistic Descriptive**

|     | Mean  | Med.  | Max.   | Min.   | SD    | Obs. |
|-----|-------|-------|--------|--------|-------|------|
| CSD | 0,912 | 1,000 | 1,000  | 0,600  | 0,126 | 185  |
| ENC | 1,324 | 0,387 | 29,686 | -8,561 | 3,614 | 185  |

|      | Mean   | Med.   | Max.   | Min.    | SD    | Obs. |
|------|--------|--------|--------|---------|-------|------|
| CEI  | 0,705  | 0,800  | 1,000  | 0,000   | 0,250 | 185  |
| SIZE | 30,516 | 30,070 | 40,998 | 25,222  | 2,915 | 185  |
| DER  | 1,329  | 0,865  | 24,849 | -14,392 | 2,601 | 185  |

Source: Data processed by EViews 13, (2026).

Table 2 presents descriptive statistics for 185 firm year observations. The mean value of Corporate Sustainability Disclosure (CSD) is 0,912, indicating a high level of sustainability transparency since disclosure scores above 0,70 are generally considered strong according to the GRI sustainability reporting framework (Global Reporting Initiative, 2021). The Environmental Cost (ENC) averages 1,324, with substantial variation, reflecting differences in firms' environmental investments and sustainability commitments (Murti, 2023; Ye & Dela, 2023). The Circular Economy Initiative (CEI) shows a mean of 0,705, indicating moderate to strong adoption of circular practices, as values above 0,50 suggest integration of circular strategies (Esposito et al., 2023; Kristensen & Mosgaard, 2020). The average SIZE of 30.516 indicates relatively large firms (Kumar et al., 2023; Wulandari & Akbar, 2025). Finally, the DER mean of 1,329 reflects moderate leverage within the typical 1–2 industry range (Brigham & Houston, 2022; Kieso et al., 2020). Before conducting the regression analysis, classical assumption tests were performed to ensure that the estimated model satisfies the basic requirements of the Panel Ordinary Least Squares (OLS) method as shown in Tabel 3.

**Table 3. Model Selection Test**

| Test         | p-value | Chosen Model |
|--------------|---------|--------------|
| Chow Test    | 0,000   | FEM          |
| Hausman Test | 0,238   | REM          |
| LM Test      | 0,000   | REM          |

Source: Data processed by EViews 13, (2026).

Model selection was conducted using Chow, Hausman, and Lagrange Multiplier tests. The Chow test ( $p = 0.000$ ) indicates that the Fixed Effects Model (FEM) is preferred over the pooled model. However, the Hausman test ( $p = 0.238$ ) suggests that the Random Effects Model (REM) is more appropriate than FEM. The LM test ( $p = 0.000$ ) confirms REM as the final model. Continued with classic assumptions test as shown at Table 4.

**Table 4. Classic Assumption Test**

| Multicollinearity                         | Centered VIF |
|---|--------------|
| C   |              |
| ENC                                       | 1,044        |
| CEI                                       | 1,032        |
| SIZE                                      | 1,002        |
| DER                                       | 1,014        |
| <b>Normality (Probability)</b>            | 0,068        |
| <b>Heteroscedasticity (Breusch-Pagan)</b> | 0,243        |

Source: Data processed by EViews 13, (2026).

VIF for each variable shows the value under 10, which means there is no multicollinearity. The normality test shows the probability value 0,068 higher than 0,05, which means that the data distribution is normal. The heteroscedasticity test shows Breusch-pagan value for 0,234, which means that the data regressed was homogeneous. Continuously with hypothesis test as shown at Table 5.

**Tabel 5. Hypothesis Test**

|                | Model 1 |          | Model 2 |          | Model 3 |          | Result    |
|----------------|---------|----------|---------|----------|---------|----------|-----------|
|                | Coef    | Sig      | Coef    | Sig      | Coef    | Sig      |           |
| ENC -> CSD     | 0,001   | 0,765    | -0,001  | 0,816    | 0,015   | 0,082*   | Supported |
| CEI -> CSD     | 0,255   | 0,000*** | 0,183   | 0,001*** | 0,112   | 0,021**  | Rejected  |
| FS -> CSD      | 0,012   | 0,000*** | 0,007   | 0,060*   | 0,077   | 0,000*** | Rejected  |
| DER*ENC -> CSD | 0,002   | 0,052*   | 0,002   | 0,022**  | -0,004  | 0,385    | Supported |
| DER*CEI -> CSD | 0,063   | 0,000*** | 0,108   | 0,005*** | 0,028   | 0,212    | Supported |
| DER*FS -> CSD  | -0,011  | 0,001*** | -0,006  | 0,097*   | 0,000   | 0,217    | Supported |
| Constanta      | 0,342   |          | 0,581   |          | -1,517  |          |           |
| F-Statistics   | 0,000   |          | 0,000   |          | 0,000   |          |           |
| R-Square       | 0,516   |          | 0,405   |          | 0,794   |          |           |
| N              | 185     |          | 139     |          | 46      |          |           |

Notes: \*p<0,10, \*\*p<0,05, \*\*\*p<0,01.

Model 1: All data processed.

Model 2: Data with ESG Board presences.

Model 3: Data without ESG Board presences.

Source: Data processed by researcher, (2026).

The F-statistic values in all models are significant with values 0,000 lower than 0,05, indicating that the independent variables jointly influence Corporate Sustainability Disclosure (CSD). The R-square values indicate the explanatory power of the models. Model 1 shows an R<sup>2</sup> of 0,516, meaning that 51,6% of the variation in CSD is explained by the variables in the model. Model 2 has an R<sup>2</sup> of 0,405, while Model 3 shows the highest explanatory power with an R<sup>2</sup> of 0,794.

#### 4.1 Environmental Commitment, Corporate Sustainability Disclosure, ESG Board

The first hypothesis test on Table 5 explains that there is a variation in the influence of environmental commitment on corporate sustainability disclosure between companies that have ESG boards and those that do not. The results show that in Model 1 environmental commitment does not have a significant effect on corporate sustainability disclosure with coefficient 0,001 and significant value 0,765. In Model 2, which represents companies that have ESG boards, environmental commitment also shows an insignificant relationship with corporate sustainability disclosure with coefficient -0,001 and significant value 0,816. However, in Model 3, which represents companies without ESG boards, environmental commitment shows a positive and marginally significant effect on corporate sustainability disclosure with coefficient 0,015 and significant value 0,082. These results indicate that the influence of environmental commitment differs between companies that have ESG boards and those that do not. So, hypothesis 1 is supported.

This finding suggests that environmental initiatives implemented by firms do not always lead to broader sustainability disclosure when governance structures such as ESG boards are present. Companies with ESG boards may integrate environmental initiatives into internal sustainability management processes where disclosure decisions are influenced by governance oversight and reporting strategies. In contrast, firms without ESG boards tend to disclose environmental initiatives more voluntarily to signal environmental responsibility and maintain stakeholder trust. In such cases, sustainability disclosure becomes a communication mechanism used by firms to demonstrate their commitment to environmental management and corporate accountability (Murti, 2023; Novriana & Fakhroni, 2022; Ye & Dela, 2023).

The findings of this study are consistent with previous studies which conclude that environmental initiatives and environmental commitment can encourage companies to disclose sustainability information as part of demonstrating environmental responsibility and improving transparency toward stakeholders (Murti, 2023; Novriana & Fakhroni, 2022; Ye & Dela, 2023; Zhong & Wang, 2023).

#### **4.2 Circular Economy Initiative, Corporate Sustainability Disclosure, ESG Board**

The second hypothesis test on Table 5 explains that there is a variation in the influence of circular economic initiatives on corporate sustainability disclosure between companies that have ESG boards and those that do not. The results show that circular economic initiatives have a positive and significant effect on corporate sustainability disclosure in Model 1 with coefficient 0,255 and sign. 0,000. In Model 2, which represents companies that have ESG boards, the relationship also shows a positive and significant effect with coefficient 0,183 and sign. 0,001. Similarly, in Model 3, which represents companies without ESG boards, circular economy initiatives remain positively significant with coefficient 0,112 and significant value 0,021. These results indicate that the influence of circular economic initiatives on sustainability disclosure does not differ between companies that have ESG boards and those that do not. Therefore, Hypothesis 2 is rejected.

This finding suggests that circular economy initiatives inherently produce sustainability-related information such as resource efficiency, recycling activities, and environmentally responsible production processes that tend to be disclosed regardless of governance structure. Firms implementing circular economy strategies generate measurable environmental outcomes that require transparency in sustainability reporting to demonstrate environmental innovation and strengthen stakeholder trust. Consequently, sustainability disclosure becomes an important communication mechanism for firms implementing circular economy strategies, making the presence of ESG boards less decisive in influencing disclosure behaviour (Diaz et al., 2021; Kristensen & Mosgaard, 2020; Pozzoli et al., 2023; Vitolla et al., 2023). The findings of this study are consistent with previous studies which conclude that circular economy initiatives encourage companies to improve sustainability disclosure practices as part of communicating environmental innovation and sustainable resource management (Gunarathne et al., 2021; Leggerini et al., 2026; Lepore et al., 2026; Lu & Sander, 2026; Pozzoli et al., 2023; Tiscini et al., 2022; Vitolla & Raimo, 2026).

#### **4.3 Firm Size, Corporate Sustainability Disclosure, ESG Board**

The third hypothesis test on Table 5 explains that there is a variation in the influence of firm size on corporate sustainability disclosure between companies that have ESG boards and those that do not. The results show that firm size has a positive and significant effect on corporate sustainability disclosure in Model 1 which shows coefficient 0,012 and sign. 0,000. In Model 2, which represents companies that have ESG boards, firm size also shows a positive and marginally significant relationship with coefficient 0,007 and sign 0,060. Meanwhile, in Model 3, which represents companies without ESG boards, firm size shows a positive and significant effect with coefficient 0,077 and sign. 0,000. These results indicate that the influence of firm size on sustainability disclosure does not differ between companies that have ESG boards and those that do not. Therefore, Hypothesis 3 is rejected.

This finding suggests that larger firms tend to disclose sustainability information more extensively regardless of governance structure because they possess greater financial resources and face higher public visibility. Larger companies are more exposed to stakeholder scrutiny and therefore tend to improve transparency in sustainability reporting to maintain legitimacy and corporate reputation (Kumar et al., 2023; Mahmood et al., 2025; Zarzycka & Krasodomska, 2026). Consistent with previous studies which conclude that firm size encourages companies to disclose sustainability information more extensively due to greater stakeholder pressure and corporate visibility (Abed et al., 2021; Fadilah & Uzliawati, 2022; Gonçalves & Gaio, 2023a; Yohana & Suhendah, 2023).

#### **4.4 Financial Risk, Corporate Sustainability Disclosure, ESG Board**

The fourth hypothesis test shows that there is a variation in the moderating role of financial risk on the relationship between environmental commitment and corporate sustainability disclosure between companies that have ESG boards and those that do not. The results show that in Model 1 the interaction between financial risk and environmental commitment has a positive and marginally significant effect on corporate sustainability disclosure with coefficient 0,002 and significant value 0,052. In Model 2, which represents companies that have ESG boards, the interaction between financial risk and environmental commitment shows a positive and significant relationship with corporate sustainability disclosure with coefficient 0,002 and significant value 0,022. However, in Model 3, which represents companies without ESG boards, the interaction between financial risk and environmental commitment does not show a significant effect on corporate sustainability disclosure with coefficient  $-0,004$  and significant value 0,385. So, hypothesis 4 is supported. These results indicate that financial risk strengthens the relationship between environmental commitment and sustainability disclosure mainly in companies with ESG boards presences. This finding suggests that firms facing higher financial pressure tend to increase transparency in sustainability reporting to maintain stakeholder confidence and reduce information asymmetry (Alodat, Salleh, et al., 2024; Ashraf & Nazir, 2023; Mahmood et al., 2025). Prior studies also show that financial conditions and leverage influence corporate sustainability disclosure as firms attempt to maintain legitimacy and stakeholder trust (Alodat, Salleh, et al., 2024; Ashraf & Nazir, 2023; Gonçalves & Gaio, 2023a; Mahmood et al., 2025; Paul et al., 2024).

The fifth hypothesis test shows that there is a variation in the moderating role of financial risk on the relationship between circular economy initiatives and corporate sustainability disclosure between companies that have ESG boards and those that do not. The results show that in Model 1 the interaction between financial risk and circular economy initiatives has a positive and significant effect on corporate sustainability disclosure with coefficient 0,063 and significant value 0,000. In Model 2, which represents companies that have ESG boards, the interaction between financial risk and circular economy initiatives also shows a positive and significant relationship with corporate sustainability disclosure with coefficient 0,108 and significant value 0,005. Meanwhile, in Model 3, which represents companies without ESG boards, the interaction between financial risk and circular economy initiatives does not show a significant effect on corporate sustainability disclosure with coefficient 0,028 and significant value 0,212. Therefore, hypothesis 5 is supported. These results indicate that financial risk strengthens the influence of circular economy initiatives on sustainability disclosure particularly in companies with ESG governance structures. This finding suggests that firms implementing circular economy strategies tend to disclose sustainability information

more extensively when facing financial pressure, as sustainability disclosure can signal responsible environmental management to investors and creditors (Leggerini et al., 2026; Pozzoli et al., 2023; Vitolla et al., 2023). Previous studies also explain that circular economy initiatives encourage firms to enhance sustainability disclosure as part of communicating environmental innovation and sustainable resource management (Gunarathne et al., 2021; Leggerini et al., 2026; Lu & Sander, 2026; Pozzoli et al., 2023; Tiscini et al., 2022; Vitolla & Raimo, 2026).

The sixth hypothesis test explains that there is a variation in the moderating role of financial risk on the relationship between firm size and corporate sustainability disclosure between companies that have ESG boards and those that do not. The results show that in Model 1 the interaction between financial risk and firm size has a negative and significant effect on corporate sustainability disclosure with coefficient  $-0,011$  and significant value  $0,001$ . In Model 2, which represents companies that have ESG boards, the interaction between financial risk and firm size shows a negative but marginally significant relationship with corporate sustainability disclosure with coefficient  $-0,006$  and significant value  $0,097$ . However, in Model 3, which represents companies without ESG boards, the interaction between financial risk and firm size does not show a significant effect on corporate sustainability disclosure with coefficient  $0,000$  and significant value  $0,217$ . So, the hypothesis 6 is supported. These results indicate that financial risk may weaken the influence of firm size on sustainability disclosure. This finding suggests that firms with higher leverage may prioritize financial stability and debt obligations rather than expanding sustainability reporting practices. Prior studies indicate that financial conditions and firm characteristics can influence sustainability disclosure decisions as firms adjust reporting strategies to maintain financial stability and stakeholder trust (Alodat, Salleh, et al., 2024; Ashraf & Nazir, 2023; Mahmood et al., 2025; Zarzycka & Krasodomska, 2026).

## 5. Conclusion

This study investigates the determinants of corporate sustainability disclosure by examining the roles of environmental commitment, circular economy initiatives, firm size, and financial risk, while also comparing firms based on the presence of ESG boards. The results indicate that environmental commitment influences sustainability disclosure differently between firms with ESG boards and those without, suggesting that governance structures may affect how environmental initiatives are communicated to stakeholders. In contrast, circular economy initiatives and firm size consistently influence corporate sustainability disclosure across firms regardless of ESG board presence, indicating that these factors inherently generate sustainability-related information that encourages firms to disclose sustainability practices.

Furthermore, financial risk plays an important moderating role in several relationships. The findings show that financial risk strengthens the influence of environmental commitment and circular economy initiatives on sustainability disclosure, particularly in firms with ESG boards. However, financial risk weakens the relationship between firm size and sustainability disclosure, suggesting that firms facing higher leverage may prioritize financial stability and debt obligations over expanding sustainability reporting practices.

From a theoretical perspective, this study contributes to the sustainability disclosure literature by integrating stakeholder, signalling, legitimacy, and SDGs perspectives in explaining how corporate environmental strategies, firm characteristics, and financial

conditions influence sustainability reporting. Practically, the findings highlight the importance of governance mechanisms such as ESG boards in enhancing sustainability transparency and managing sustainability communication under financial pressure.

This study is limited to energy sector companies and a specific observation period. Future research may expand the scope by including other sectors, longer observation periods, or additional governance and institutional variables to provide a more comprehensive understanding of corporate sustainability disclosure practices.

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