The relationship between Female and Foreign Directors on Sustainable Development Goals (SDG) Disclosure: The case of Indonesia

Hubungan antara Pengarah Wanita dan Pengarah Asing terhadap Pendedahan Matlamat Pembangunan Mampan (SDG): Kajian Kes di Indonesia

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Abstract

This study investigates the impact of board gender and nationality diversity on Sustainable Development Goals (SDG) disclosure among Indonesian listed companies. It also explores the interaction effect between female and foreign directors on SDG disclosure. Employing a fixed-effects panel regression approach, this study investigates 270 publicly listed firms on the Indonesia Stock Exchange (IDX) during the 2020–2023 period. The results reveal that the presence of female directors has a positive influence on SDG disclosure, indicating that gender diversity enhances the board's commitment to sustainability and transparency. Conversely, the presence of foreign directors negatively affects SDG disclosure, suggesting that differences in cultural or institutional contexts may reduce disclosure levels. However, the interaction between female and foreign directors significantly strengthens SDG disclosure, implying that the combination of gender diversity and international experience fosters more comprehensive sustainability reporting.

Keywords: *SDG disclosure, female director, foreign director*

Abstrak

Kajian ini meneliti kesan kepelbagaian jantina dan kebangsaan lembaga pengarah terhadap pendedahan Matlamat Pembangunan Mampan (SDG) dalam kalangan syarikat tersenarai di Indonesia. Kajian ini juga meneliti kesan interaksi antara pengarah wanita dan pengarah asing terhadap pendedahan SDG. Dengan menggunakan pendekatan regresi panel kesan tetap, kajian ini melibatkan 270 buah syarikat tersenarai di Bursa Efek Indonesia (IDX) bagi tempoh 2020–2023. Hasil kajian menunjukkan bahawa kehadiran pengarah wanita memberi pengaruh positif terhadap pendedahan SDG, menandakan bahawa kepelbagaian jantina dapat meningkatkan komitmen lembaga pengarah terhadap kelestarian dan ketelusan. Sebaliknya, kehadiran pengarah asing didapati memberi kesan negatif terhadap pendedahan SDG, yang menunjukkan bahawa perbezaan konteks budaya atau institusi mungkin mengurangkan tahap pendedahan. Walau bagaimanapun, interaksi antara pengarah wanita dan pengarah asing didapati secara signifikan memperkukuh pendedahan

SDG, yang menunjukkan bahawa gabungan kepelbagaian jantina dan pengalaman antarabangsa dapat mendorong pelaporan kelestarian yang lebih menyeluruh.

Kata kunci: *Pendedahan SDG , pengarah wanita, pengarah asing*

INTRODUCTION

This research explores the impact of female and foreign board representation on the level of Sustainable Development Goals (SDG) disclosure in Indonesian firms. Established by the United Nations in 2015, the SDGs consist of 17 interrelated goals addressing environmental protection, social well-being, and responsible governance. In Indonesia, the commitment to this agenda is reflected in the publication of Presidential Decree No. 59 of 2017 and POJK No. 51/POJK.03/2017, which mandate public companies and financial services institutions to prepare and disclose sustainability reports as a form of accountability for sustainability issues. However, it should be noted that the preparation of SDGs reports in Indonesia is still voluntary. According to Erin, Bamigboye, and Oyewo (2022), 42% of voluntary disclosures are the main factor in low SDG disclosure in Africa. Since reporting SDG activities is not a mandatory requirement for organizations, most companies feel no need to add to the existing reporting channels. Followed by weak regulatory enforcement, this means that law enforcement is key to ensuring compliance with SDG disclosure. Prior research (Nicolò et al., 2022; Zampone & Guidi, 2024) suggests that firms often face tensions between achieving SDG-related objectives and maximizing shareholder value. Accordingly, SDG disclosures in non-financial reports are frequently symbolic, intended to reinforce positive stakeholder impressions and signal conformity with the 2030 Agenda (Heras-Saizarbitoria et al., 2022; Zampone & Guidi, 2024).

We think that this study's focus on female directors and foreign directors is the right strategy, as these two characteristics are theoretically able to strengthen governance and increase SDGs disclosure. However, the representation of women in strategic positions in companies is still relatively low, especially in developing countries such as Indonesia. Data shows that most companies in Indonesia do not have female members in senior management, and the proportion of women on the board of directors is also still limited (Gallego-sosa et al., 2021; Matanda et al., 2023; Rustam, 2023). In addition, studies on the relationship between female directors and SDGs disclosure in developing countries are still relatively limited, both in terms of quantity and research focus (Tilt et al., 2021). Women are believed to have a higher sensitivity to social and environmental issues, so their participation in strategic decision-making can strengthen the Company's sustainability performance (Aibar-guzm et al., 2023; Issa et al., 2022). The presence of women on the board, especially when reaching critical masses such as more than 3 female directors in a study in Bangladesh banking, is associated with increased SDG disclosure, supporting the theory of resource dependence and stakeholders (Mehadi & Mazumder, 2024). Female directors are believed to be more sensitive to social and environmental issues, and research shows that when the proportion of women reaches a critical mass, this has a positive impact on disclosure in emerging markets, including Indonesia. Meanwhile, foreign directors, with global experience and an understanding of international standards, can serve as a bridge between global and local practices, increasing the use of assurance and the credibility of reports (Lawati & Alshababi, 2023; Su et al., 2023).

In Indonesia, research by Gutiérrez Ponce and Wibowo (2023) found that women's attendance and frequency of board meetings were positively related to the intensity of SDGs disclosure. Regarding foreign directors, they bring global experience and international practices that can increase the credibility of SDGs reporting. International research, including Su, Hu and Zhang (2023) in China shows that directors with overseas experience strengthen the disclosure of environmental aspects, especially in companies with good governance. From the review, there is a research gap that most studies only focus on one dimension of gender diversity or citizenship without exploring its interactions. Therefore, this study aims to address this gap by simultaneously examining the effects of female and foreign directors and their interaction on the intensity of corporate SDGs disclosure in Indonesia.

Indonesia, as an archipelagic country with a diversity of more than 600 ethnic groups and various religions, has a unique cultural context, such as collectivist norms, high power distance, as well as the tradition of deliberation and cooperation. These cultural characteristics influence the dynamics of SDGs disclosure, as companies need to align their reporting with local values as well as community sensitivities. In this context, female directors and foreign directors play a strategic role. Women directors from various cultural and religious backgrounds in Indonesia tend to be more sensitive to issues of inclusion, social justice, and community empowerment, following the SDGs goals, such as SDG 5, SDG 10, and SDG 1. Instead, foreign directors bring global insights and international disclosure standards such as GRI and assurance practices that enhance credibility and facilitate legitimacy for global stakeholders. We suspect that the combination of the two results in a strong synergy, the local sensitivity of female directors combined with the global legitimacy of foreign directors, creating a more holistic governance of the SDGs.

The study provides distinct contributions to the existing literature. Primarily, it is among the first to concurrently investigate how the presence of female and foreign directors, and their combined effects, shape SDG disclosure practices in Indonesian listed firms. As a developing country with two-tier governance characteristics, Indonesia has an interesting research context, especially after the abolition of the obligation of independent directors in 2018 (Akbar, Mangunsong and Puchniak, 2024). Within this framework, foreign directors play an important role as catalysts for better sustainability governance, as they bring international experience and global practices, increasing the use of assurance in sustainability reporting (Pebriani and Syafitri, 2024). Thus, their presence not only bridges global standards with local practices but also strengthens the credibility of the SDGs report in the eyes of international investors and stakeholders. Second, the results of the study help a wide range of stakeholders, particularly policymakers, regulators, shareholders, managers, investors, and academics, in understanding how various boards of directors influence the SDGs. For example, whether it is necessary to set gender and citizenship diversity targets in corporate governance policies, or whether it is necessary to prioritize board training related to the SDGs. Thus, this research not only adds empirical insights but also presents evidence-based policy recommendations to improve the accountability and quality of sustainability reporting in Indonesia.

LITERATURE REVIEW

Resource Dependence Theory

Where female or foreign directors function as strategic conduits for essential resources such as networks, knowledge, legitimacy, and information, they align closely with *Resource Dependence Theory* (RDT). RDT posits that firms depend on external inputs to survive and grow, and boards serve as critical mechanisms for securing and managing these resources (Hillman et al., 2007; Jeffrey Pfeffer, 1979). For instance, Chang et al. (2024) show that having women directors significantly enhances ESG disclosures, largely due to their ability to leverage extensive social capital and networks. Moreover, female directors help legitimize the firm in the eyes of the public and stakeholders by representing diverse community interests, and they strengthen board oversight while reducing agency conflicts thanks to the unique human and social capital they bring (Al-Matari & Alosaimi, 2022; Carter et al., 2003; Haque & Jones, 2020; Marashdeh et al., 2021).

Similarly, foreign directors provide access to global standards, international assurance practices, and cross-border knowledge resources typically beyond the reach of local boards. Their presence helps companies absorb global expertise that improves sustainability reporting, expands external legitimacy, and enhances accountability. By grounding this study in RDT, we can explain why firms appoint female and foreign directors and how the combination of local and international resource access enhances SDG disclosure. This dual-perspective framework strengthens our empirical investigation into how gender and nationality diversity contribute to holistic, credible SDG reporting in Indonesian public firms.

Female Director and SDGs Disclosure

Gender equality is the 5th goal of the SDGs, which encourages increased women's participation in strategic decision-making. Previous research has shown that the presence of female directors has a positive correlation with sustainability reporting practices and non-financial disclosures of Companies (Gallego-Sosa et al., 2021; Wasiuzzaman et al., 2023). Women on the board of directors tend to have a higher level of concern for social and environmental issues, which is in line with the principles of the SDGs. However, the representation of women in strategic positions in companies is still relatively low in developing countries, including Indonesia. Thus, an important question arises as to whether the presence of female directors in the Indonesian institutional environment contributes to greater transparency in reporting on the Sustainable Development Goals (SDGs). Studies have shown that women's involvement on the board of directors can improve sustainability reporting practices. Aibar-Guzmán et al. (2023) found that female directors tend to show greater sensitivity to social and environmental issues, which is then reflected in increased disclosure of the company's ESG and SDGs.

In contemporary corporate governance discourse, gender diversity is widely acknowledged as a crucial component of effective board structures. Women have different views from men regarding their personalities, leadership styles, values they adhere to, and decision-making patterns (Mohammad Jizi, 2017). Bear et al. (2010) Showed that hiring more women on boards as part of a diversity strategy can improve company performance, especially in areas related to sustainability. Barrios et al. (2020) state that women leaders in the business world may prefer broad interpretations of sustainable development and, as a result, support progress towards the SDGs. In this regard, there is an opinion that the values, backgrounds, and specific skills of female managers make them more likely to support the kind of social entrepreneurship needed to achieve the SDGs (Le Loarne-Lemaire et al., 2017; Rosca et al., 2020).

Ferreira (2009) found that female directors tend to demonstrate higher attendance rates and greater participation in board committees, adopting leadership styles characterized by stronger trust-building and more diligent oversight compared to their male counterparts. A considerable body of prior research has also documented a positive and significant association between the proportion of women on boards and sustainability reporting (Rao & Tilt, 2016; Rosati & Faria, 2019). The presence of women on boards of commissioners positively influences corporate reporting activities, as women are generally more attuned to social and ethical considerations and exhibit heightened awareness of environmental risks (Girón et al., 2022). Moreover, female directors are often more responsive to socially responsible behavior than male directors, and gender-diverse boards tend to enhance corporate effectiveness in adopting environmentally sustainable strategies (Nicolò et al., 2022). In addition, Mehadi and Mazumder (2024) argue that having at least three female directors is necessary to establish a significant positive relationship between board gender diversity and the achievement of the Sustainable Development Goals (SDGs).

Research on SDGs disclosure in developing countries is still relatively limited, so empirical evidence on the influence of women's representation on boards of directors on SDGs disclosure rates is also minimal (Arena et al., 2023; Cicchiello et al., 2021; García-Sánchez et al., 2020; Gutiérrez-Ponce, 2023; Mehadi & Mazumder, 2024). This limitation opens up opportunities for the development of literature, especially related to the role of gender diversity at the board level in encouraging transparency in the disclosure of the SDGs in companies in developing countries (Mehadi & Mazumder, 2024). Research focusing on multinational enterprises reveals that gender-diverse boards tend to disclose more comprehensive information regarding the Sustainable Development Goals (SDGs) (Rosati & Faria, 2019; Zampone et al., 2022). However, several other studies have reported a negative association between the presence of women on boards and the extent of SDG disclosure (Jiang et al., 2023; Visit & Alshabibi, 2023; Monteiro et al., 2022). Vitolla et al. (2020) stated that the presence of women in the council can strengthen the focus of supervision on sustainability issues. Based on these different findings, this study seeks to re-examine the influence of women's representation on the board of directors on the disclosure of the SDGs, especially in the context of developing countries in Indonesia.

H1. *There is a positive relationship between female directors and the SDG disclosure*

Foreign Director and SDGs Disclosure

CSR disclosure is often associated with the disclosure of several sustainability issues that are related to the SDGs (Sekarlangit & Wardhani, 2021). In its CSR report, the company reveals programs that focus on community development, poverty reduction, improving the quality of education, or preserving the environment, all of which are directly related to the SDGs' targets.

The presence of foreign directors in corporate board structures has become an important focus in global corporate governance studies, particularly in the context of sustainability disclosures. Foreign directors generally bring international experience, high governance expectations, a deep understanding of global standards related to transparency and reporting, valuable expertise, and establish good economic and political relations with international markets (Ben & Toumi, 2022; Masulis et al., 2012; Muttakin & Subramaniam, 2015). Ibrahim and Hanefah (2016) and Issa et al. (2022) stated that the contribution of foreign directors to the quality of strategic CSR disclosure can increase stakeholder confidence in the company's sustainability performance. Their international exposure, knowledge, skills, and experience improve board member performance and the quality of CSR disclosure (Khan et al., 2019). Through these contributions, they encourage companies to adopt higher sustainability reporting standards, including in terms of disclosure of SDGs.

Based on research by Mehedi, Maniruzzaman, and Akhtaruzzaman (2024) and Grassa et al., (2025), foreign directors have been shown to make a positive impact on disclosures in SDG-related reports. Recently, Dobija et al. (2023) found that international directors play an important role in increasing non-financial disclosures and facilitating the movement towards sustainable development. However, not all empirical findings show a consistent relationship between the existence of foreign directors and the SDGs. Several studies, such as those conducted by (Pontrelli et al., 2025; Sekarlangit & Wardhani, 2021) found an insignificant relationship with the SDGs. Furthermore, Katmon *et al*. (2019), Saidu et al. (2020) and Adel et al. (2019) also noted a significant negative relationship between foreign ownership and citizenship diversity, and CSR disclosure.

Despite differences in results in the literature, the majority of research still underscores the strategic potential of the presence of foreign directors in improving the quality of sustainability reporting. Through the perspective of global governance and cross-cultural understanding, foreign directors are considered to be able to encourage companies to adopt more transparent, innovative, and accountable reporting practices, which are relevant to the principles of the SDGs. Thus, based on resource-based theories and previous findings, the hypotheses that can be proposed in this study are:

H2. *There is a positive relationship between Foreign Directors and SDGs disclosure.*

Female Director, Foreign Director, and SDG Disclosure

Diversity in the composition of the board of directors is one of the important elements in strengthening the effectiveness of the company's governance mechanism. Two dimensions of diversity that are often focused on in the corporate governance literature are gender diversity and national background. Individually, the presence of female directors and foreign directors has been shown to make a positive contribution to improving the quality of strategic decision-making and corporate sustainability reporting. Women directors bring ethical values, a long-term sustainability orientation, and greater attention to social and environmental issues to the company's oversight process (Katmon et al., 2019). Meanwhile, foreign directors enrich the board with a global perspective, exposure to international best practices, and cross-border business networks that support the company's understanding of the global sustainability agenda (Ben & Toumi, 2022; Khan et al., 2019; Muttakin & Subramaniam, 2015).

When these two forms of diversity, namely gender and nationality, interact in the council structure, the synergy created has the potential to result in richer discussions, innovative thinking, and more inclusive decision-making related to sustainability disclosure strategies and the achievement of the SDGs. Research by Katmon et al. (2019) supports this view by showing that the combination of gender and national diversity in boards can improve the quality of CSR disclosure, which can conceptually be extended to the context of SDGs disclosure.

Referring to the Resource Dependence Theory, the combination of the presence of female directors and foreign directors gives companies wider access to strategic resources and external networks, thereby enhancing the company's ability to respond to social pressures and global market expectations of sustainability practices and reporting. Based on the theoretical foundation and empirical findings, the interaction hypothesis proposed in this study is as follows:

H3. *The interaction between female directors and foreign directors has a positive effect on SDG disclosure.*

METHODOLOGY

Sample selection and data collection

This study employs a quantitative research approach using secondary data collected from annual reports and sustainability reports published on the companies' official websites and the Indonesia Stock Exchange (IDX) for the period 2020 to 2023. The year 2020 was chosen as the beginning of the period because it is the year of the commencement of the full sustainability reporting obligation by the Regulation OJK No. 51/POJK.03/2017, thus providing a relevant starting point to observe the implementation of CSR and SDG.

It can be seen in Table 1 that the population in this study includes 941 companies from 11 industrial sectors listed on the IDX, and based on the table of Krejcie and Morgan (1970), the number of representative samples for the population is as many as 270 companies. The stratified random sampling technique is used to ensure proportional representation of each sector. The most represented sector was Consumer Cyclicals with 48 companies (18% of the total sample), followed by Consumer Non-Cyclicals with 37 companies (14%). The next sector is Basic Materials with 32 companies (12%) and Financials with 30 companies (11%). The Energy sector comprises 25 companies (9%), while the Properties & Real Estate sector has 27 companies (10%). The Industrials sector includes 19 companies (7%), Infrastructures with 20 companies (7%), and Technology with 12 companies (5%). Lastly, the Healthcare sector includes 9 companies (3%), and Transportation & Logistics with 11 companies (4%).

Table 1
Number of Selected Companies

Activity Sector	**Population**		**Proportional Samples**	**Stratified**
	Number of Companies	Percentage	Number of Companies	Percentage
Energy	87	9%	25	9%
Basic Materials	109	12%	32	12%
Industrial	66	7%	19	7%
Consumer Non-Cyclicals	129	14%	37	14%
Consumer Cyclicals	166	18%	48	18%
Healthcare	34	3%	9	3%
Financials	104	11%	30	11%
Properties & Real Estate	93	10%	27	10%
Technology	47	5%	12	5%
Infrastructure	69	7%	20	7%
Transportation & Logistic	37	4%	11	4%
Total	941	100	270	100

This analysis aims to assess the extent to which each company reveals the linkage of its activities to these 17 objectives. This variable is measured as a ratio between the number of SDG goals that the company has disclosed to the total of seventeen goals available. Mathematically, this index is formulated as:

$$\text{SDGi} = \frac{\sum_{i=1}^{t} SDGi}{t}$$

where SDGi = 1 if one or more activities related to a particular goal are specified, and 0 is the other way around. t = the maximum SDG score that the company can achieve (i.e., 17). Therefore, the SDGD variable has a maximum value of 1 and a minimum value of 0.

Independent variables in this study were determined based on references from several previous studies. Female directors are measured as the percentage of female members on the board of directors relative to the total number of board members. This measurement refers to the approach used in the research of Cicchiello et al. (2021), Mehadi and Mazumder (2024), Sekarlangit and Wardhani (2021), and Zampone et al. (2022). Meanwhile, foreign directors are measured using a dummy variable that is given a value of 1 if there are members from abroad in the board structure, and a value of 0 if all members are from within the country, as adopted in the research of Pontrelli et al., (2025) and Sekarlangit & Wardhani (2021).

Table 2
Variable definitions

Variable	Simbol	Measurement	Reference
SDG disclosure	SDG	Total SDG exposure divided into SDG Target 17 $\text{SDG} = \frac{\sum_{i=1}^{t} SDGi}{t}$	(Daniel-vasconcelos, 2022; Gutiérrez-Ponce & Wibowo, 2023; Hamad et al., 2020; Martínez-Ferrero et al., 2020; Nicolo et al., 2024; Sim & Fung, 2024)
Female Director	BOARDFEM	Percentage of female directors to total directors	(Cicchiello et al., 2021; Mehadi & Mazumder, 2024; Pizzi et al., 2021; Sekarlangit & Wardhani, 2021; Zampone et al., 2022)
Foreign Director	BOARDFGN	Score 1 for at least one foreign member and 0 for no foreign member	(Pontrelli et al., 2025; Sekarlangit & Wardhani, 2021)
CSR Committee	CSRCOMM	The dummy variable is equal to 1 if the company has a CSR sustainability committee; otherwise	(Daniel-vasconcelos, 2022; Pizzi et al., 2021; Sekarlangit & Wardhani, 2021; Zampone et al., 2022)
Board Size	BOARDSZ	The number of directors who sit on the board of directors	(Gutiérrez-Ponce & Wibowo, 2023; Mehadi & Mazumder, 2024; Pratama et al., 2024; Zampone et al., 2022)
Women on the Audit Committee	ACFEM	Percentage of Women on audit committees	(Alsultan & Hussainey, 2025; Bravo & Reguera-Alvarado, 2019; Khemakhem et al., 2023)
Foreign Ownership	ASING	Percentage of total foreign share ownership	(Mehadi & Mazumder, 2024; Pratama et al., 2024)
Board Meetings	MEET	Number of board meetings held in 1 year	(Squirrel, 2023; Gutiérrez-Ponce & Wibowo, 2023; Sekarlangit & Wardhani, 2021)
Leverage	LEV	Percentage of total debt to total Assets	(Mehadi & Mazumder, 2024)
Return on Asset	ROA	Net profit/total assets	(Galeazzo, Miandar and Carraro, 2024; Saha *et al.*, 2024)
Return on Equity	ROE	Net Profit / Total Equity	(Ahmad & Buniamin, 2021; Lassala et al., 2021; Lawati & Hussainey, 2022; Ramos et al., 2022; Sim & Fung, 2024)
Tobins Q	Tq	Tobin's Q = (equity market value) + total debt/total assets	(Agustia, 2023; Anas et al., 2022; Cicchiello et al., 2021; Ghardallou, 2022; Song et al., 2020)

To improve the accuracy of the regression model and reduce the risk of outcome bias, the study also included many control variables that included board characteristics and company attributes, which were thought to affect the level of disclosure of the SDGs. These control variables included: the presence of a CSR committee, the size of the board, the presence of women on the audit committee, the number of board meetings in 1 year, as well as the level of foreign ownership. In addition to capturing the financial characteristics of companies that are relevant to the disclosure of the SDGs, this study also included the leverage variables, Return on Assets (ROA), Return on Equity (ROE), and Tobin's Q as control variables at the company level.

Board size is frequently regarded as a key indicator of better corporate performance, with several studies confirming its positive impact on SDG disclosure (Buniamin et al., 2022; Jiang et al., 2023; Johari et al., 2023; Pontrelli et al., 2025; Pratama et al., 2024; Taglialatela et al., 2023; Zakaria et al., 2024; Zampone et al., 2022). The presence of a CSR committee also plays a crucial role in enhancing stakeholder engagement and sustainability disclosure (Sekarlangit & Wardhani, 2021; Uyar et al., 2021). Empirical evidence from Jiang et al. (2023), Zakaria et al. (2024), Zampone et al. (2022), and Daniel-Vasconcelos (2022) confirms a consistent positive link between CSR committees and SDG reporting.

Women's participation in audit committees has been shown to enhance ESG disclosures, with Khemakhem et al. (2023), Alsultan & Hussainey (2025), and Bravo & Reguera-Alvarado (2019) highlighting the strategic influence of gender diversity in improving sustainability oversight and reporting quality. Likewise, foreign ownership contributes positively to SDG achievement by promoting more responsible governance practices (Jiang et al., 2023; Pontrelli et al., 2025). Finally, frequent board meetings are also positively associated with improved SDG disclosure, as noted in Martínez-Ferrero (2020), Ponce & Wibowo (2023), Buniamin (2022), and Lagasio & Cucari (2019).

In terms of financial performance, Return on Equity (ROE) has been shown to have a significant positive influence on the SDGs index, as evidenced by (Cicchiello et al., 2021; Grassa et al., 2025; Taglialatela et al., 2023). Meanwhile, Return on Assets (ROA) and Leverage also showed a positive relationship with the SDGs in the study (Aibarguzm et al., 2023; Cicchiello et al., 2021; Sultana et al., 2024). Finally, Tobin's Q, as an indicator of a company's market value, was also identified as having a supportive relationship with SDGs reporting (Cicchiello et al., 2021).

Regression models

This study examines the influence of female directors and foreign directors on SDG disclosure, using panel regression techniques. The estimation model is presented as follows:

$$\begin{aligned}\mathrm{SDG_{it}} = {} & \beta_0 + \beta_1\,\mathrm{BOARDFEM}_{it} + \beta_2\,\mathrm{BOARDFGN}_{it} + \beta_3\,\mathrm{CSRCOMM}_{it} + \beta_4\,\mathrm{BOARDSZ}_{it} \\ & + \beta_5\,\mathrm{ACFEM}_{it} + \beta_6\,\mathrm{ASING}_{it} + \beta_7\,\mathrm{MEET}_{it} + \beta_8\,\mathrm{LEV}_{it} + \beta_9\,\mathrm{ROA}_{it} \\ & + \beta_{10}\,\mathrm{ROE}_{it} + \beta_{11}\,\mathrm{Tq}_{it} + \beta_{12}\,\mathrm{YEAR}_{it} + \beta_{13}\,\mathrm{INDUSTRY}_{it} + e_{it}\end{aligned}$$

$$\begin{aligned}\mathrm{SDG}_{it} = {} & \beta_0 + \beta_1\,\mathrm{BOARDFEM}_{it} + \beta_2\,\mathrm{BOARDFGN}_{it} + \beta_3\,\mathrm{BOARDFEM} * \mathrm{BOARDFGN}_{it} \\ & + \beta_4\,\mathrm{CSRCOMM}_{it} + \beta_5\,\mathrm{BOARDSZ}_{it} + \beta_6\,\mathrm{ACFEM}_{it} + \beta_7\,\mathrm{ASING}_{it} \\ & + \beta_8\mathrm{MEET}_{it} + \beta_9\mathrm{LEV}_{it} + \beta_{10}\mathrm{ROA}_{it} + \beta_{11}\mathrm{ROE}_{it} + \beta_{12}\mathrm{Tq}_{it} + \beta_{13}\mathrm{YEAR}_{it} \\ & + \beta_{14}\mathrm{INDUSTRY}_{it} + e_{it}\end{aligned}$$

Where SDG is the disclosure of SDGs, BOARDFEM is a female director, BOARDFGN is a foreign director, CSRCOMM is a CSR committee, BOARDSZ is a board size, ACFEM is a woman on the audit committee, ASING is foreign shareholding, MEET is a board meeting, LEV is leverage, ROA is Return on Asset, ROE is Return on Equity, and Tq is Tobin's Q.

RESULT

Regression Diagnostic

Before conducting the panel data regression analysis, classical assumption tests were performed to ensure the validity of the model. These tests included normality, multicollinearity, heteroskedasticity, and autocorrelation. Normality testing was carried out using the Shapiro-Wilk test and Skewness-Kurtosis (Sktest). The results indicate that most variables have a probability value below 0.05, suggesting a deviation from normal distribution. However, given the large number of observations (n = 1,080), according to the Central Limit Theorem (CLT), this deviation is insignificant, as the regression estimates remain consistent and unbiased.

Multicollinearity testing was performed using the Variance Inflation Factor (VIF), which showed an average VIF of 1.94, with a minimum value of 1.03 (ROE) and a maximum value of 5.14 (BOARDSZ). All VIF values were below 10, indicating that multicollinearity is not a significant issue in the model. Heteroskedasticity and autocorrelation were addressed by applying robust standard errors in the fixed-effect regression model with the vce(robust) option, which clusters errors by company (IDCompany) in STATA. Thus, the model effectively addresses potential issues of heteroskedasticity and autocorrelation.

Descriptive statistics

Table 3 presents descriptive statistics based on 1,080 observations. The average SDG disclosure rate is 0.386, suggesting moderate disclosure levels among companies. Female board representation averages 16.7%, indicating limited gender diversity, while foreign directors comprise 33.1% of board members. CSR committees exist in 43.2% of firms, and boards average five members in size. Women hold 23.1% of audit committee positions, and foreign ownership averages 24.4%, showing substantial international investor involvement. Board meetings occur on average 20.66 times annually, though with high variability (SD = 20.14), ranging from 1 to 272 meetings. Financially, leverage averages 0.997 but shows extreme variation due to outliers. Return on Assets and Return on Equity average 2.55% and 8.54%, respectively, with wide value ranges. Tobin's Q averages 10.13, also indicating some firms with very high market valuations. Year and industry dummies show balanced distribution across 2020–2023 and 11 sectors.

Table 3
Descriptive statistics

Variables	**N**	**mean**	**sd**	**min**	**max**
IDCompany	1,080	135.5	77.98	1	**270**
YEAR	1,080	2,022	1.119	2,020	**2,023**
INDUSTRY	1,080	5.344	2.875	1	**11**
SDG	1,080	0.386	0.306	0	**1**
BOARDFEM	1,080	0.167	0.185	0	**1**
BOARDFGN	1,080	0.331	0.471	0	**1**
CSRCOMM	1,080	0.432	0.496	0	**1**
BOARDSZ	1,080	5.040	2.295	2	**15**
ACFEM	1,080	0.231	0.267	0	**1**
ASING	1,080	0.244	0.279	0	**0.996**
MEET	1,080	20.66	20.14	1	**272**
LEV	1,080	0.997	6.096	0.00806	**117.4**
ROA	1,080	0.0255	0.431	-7.183	**7.592**

ROE	1,080	0.0854	0.785	-4.962	**22**
Tq	1,080	10.13	93.46	0.0554	**1,643**

Correlation Matrix

Table 4 contains the results of the correlation test conducted in this study. No independent variable correlates by 0.8 with the others. This shows that the independent variable does not have a strong relationship, which can result in multicollinearity. In addition, a factor inflation variance (VIF) test was used, and the results showed no VIF exceeding 10 (untabulated), which suggests that multicollinearity was not an issue in the analysis. The analysis showed an average value of 1.94, with a minimum of 1.03 (ROE) and a maximum of 5.14 (BOARDSZ).

Table 4 also shows that SDG disclosure is positively and significantly related to the existence of CSR committees, board size, frequency of board meetings, presence of foreign directors, foreign ownership, and Return on Equity. This indicates that companies with a larger board structure, are more active in meetings, have a CSR committee, and involve foreign elements tend to disclose the SDGs more.

Table 4

Correlation matrix

	SDG	**BOARDFEM**	**BOARDFGN**	**CSRCOMM**	**BOARDSZ**	**ACFEM**	**ASING**	**MEET**	**LEV**	**ROA**	**ROE**	**Tq**
SDG	1.000											
BOARDFEM	0.005	1.000										
BOARDFGN	0.042	-0.028	1.000									
CSRCOMM	0.374***	-0.037	0.096***	1.000								
BOARDSZ	0.306***	-0.006	0.272***	0.254***	1.000							
ACFEM	-0.124***	0.088***	-0.100***	-0.135***	-0.095***	1.000						
ASING	0.105***	0.052*	0.412***	0.079***	0.285***	-0.014	1.000					
MEET	0.196***	-0.040	-0.122***	0.171***	0.305***	-0.069**	-0.003	1.000				
LEV	-0.048	0.026	-0.004	-0.063**	-0.058*	-0.070**	-0.004	-0.026	1.000			
ROA	0.048	-0.001	0.048	0.035	0.055*	0.006	0.030	-0.000	-0.257***	1.000		
ROE	0.110***	0.039	0.077**	0.053*	0.064**	-0.052*	0.066**	-0.006	-0.005	0.046	1.000	
Tq	-0.001	-0.007	-0.050	-0.031	0.011	-0.013	-0.029	0.238***	0.093***	-0.008	0.003	**1.000**

Notes: We have estimated Pearson pairwise correlation * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

This study uses panel regression. The selection of the best model is carried out using the Hausman Test, which shows that the Fixed Effects model is more suitable. The FE model was chosen because it can control the non-observable factors that remain in the company to produce more consistent estimates and reduce bias (Baltagi, 2005). Therefore, the interpretation of the results in this study is based on the estimation of the Fixed Effects model because the results of the Hausman test show a probability value of 0.000 < 5%, then the FEM is accepted.

Table 5
Result fixed effects model

	(Model 1)	**(Model 2)**
Variable	SDG	**SDG**
BOARDFEM	**0.225*** **	**0.158***
	(0.0845)	**(0.0905)**
BOARDFGN	**-0.134*** **	**-0.194*** **
	(0.0461)	**(0.0547)**
BOARDFEM*BOARDFGN		**0.389** **
		(0.192)
CSRCOMM	**0.228*** **	**0.230*** **
	(0.0231)	**(0.0231)**
BOARDSZ	**0.0201***	**0.0192***
	(0.0104)	**(0.0103)**
ACFEM	**0.109***	**0.111***
	(0.0617)	**(0.0616)**
ASING	-0.00639	**0.00621**
	(0.0788)	**(0.0788)**
MEET	0.000285	**0.000280**
	(0.00110)	**(0.00109)**
LEV	-0.00127	**-0.00129**
	(0.00478)	**(0.00477)**
ROA	0.00501	**0.00490**
	(0.0156)	**(0.0156)**
ROE	0.0138	**0.0121**
	(0.00938)	**(0.00940)**
Tq	**0.00102** **	**0.00102** **
	(0.000409)	**(0.000409)**
Constant	0.153**	**0.164*** **
	(0.0605)	**(0.0606)**
Fixed Effect Year	Yes	**Yes**
Fixed Effect Industry	Yes	**Yes**
R-squared	0.145	**0.149**
Number of ID Company	270	**270**
Notes: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1		

The regression results in Table 5, Model 1 show that the proportion of female directors has a positive and statistically significant effect on SDG disclosure at the 1% significance level ($\beta = 0.225$; $p < 0.01$), thereby supporting Hypothesis H1. This finding aligns with previous studies (Grassa et al., 2025; Gutiérrez-Ponce & Wibowo, 2023; Rosati & Faria, 2019; Zampone et al., 2022), which indicate that female representation on corporate boards enhances the spirit of sustainability disclosure. In contrast, the presence of foreign directors shows a significantly negative effect on SDG disclosure ($\beta = -0.134$; $p < 0.01$), thus not supporting Hypothesis H2. This result may be attributed to the relatively small number of foreign directors and the concentrated ownership structure dominated by domestic shareholders, which limits the role of foreign directors in promoting sustainability practices (Lawati & Alshabibi, 2023; Pontrelli et al., 2025; Sekarlangit & Wardhani, 2021). Furthermore, this finding contrasts with the assumptions of resource dependence theory, suggesting that foreign directors may be less involved in the company's day-to-day operations, reducing their understanding of sustainability practices that need to be disclosed (Lawati & Alshabibi, 2023).

However, in Model 2, the interaction between female and foreign directors has a significant positive effect on SDG disclosure at the 5% significance level ($\beta = 0.389$; $p < 0.05$), thereby supporting Hypothesis H3. This indicates that the presence of women on the board strengthens the positive influence of foreign directors on sustainability reporting. Katmon *et al*. (2019) found that gender diversity can enhance the role of nationality diversity in improving CSR disclosure quality. The synergy between female and foreign directors broadens strategic board discussions and enriches the company's perspective in adopting and disclosing sustainability practices aligned with the SDGs. Female directors tend to emphasize social values and inclusivity in decision-making, while foreign directors often bring strategic insights and higher expectations for transparency, reflecting standards from their home countries, which may be more advanced in SDG implementation. Among controls, CSR committee presence significantly supports SDG disclosure ($p < 0.01$). Board size and female audit committee members are also significant at the 10% level. Tobin's Q is positively significant ($p < 0.05$), while other controls show no significant effects. The models explain 14–15% of the variance ($R^2 = 0.145$ and 0.149), with year and industry fixed effects included.

Additional analysis

This section presents several robustness checks to validate the main findings, including: (i) re-estimating the fixed effects model without control variables, (ii) using the absolute number of female directors instead of their proportion, and (iii) addressing potential endogeneity concerns. First, as part of the robustness check, we re-evaluated the influence of female directors on SDG disclosure by excluding control variables from the model. The estimation results in Table 6 show that the proportion of female directors continues to have a positive and statistically significant association with the level of SDG disclosure, with a coefficient of 0.322 and a t-statistic of 3.61, as reported in Table 5. This finding indicates that companies with a higher representation of women on their boards tend to disclose SDG-related information more comprehensively. It reinforces the notion that female board members play a strategic role in corporate governance, particularly in promoting transparency and accountability regarding sustainability issues.

Second, the robustness check was extended by using the absolute number of female directors instead of their proportion. This approach is consistent with prior studies that also employ the actual number of female board members to assess board gender diversity, such as Mohsni, Shata and Estate (2021) and Chang et al.,(2024). The results, presented in Table 6 Model 2, indicate that the number of female directors remains positively and significantly associated with SDG disclosure, with a coefficient of 1.333, significant at the 1% level. This finding is consistent with the earlier results in Table 5, providing further evidence that greater female representation on the board is linked to enhanced corporate transparency in communicating SDG commitments and performance.

Third, Endogeneity is a critical issue because, if unaddressed, it can lead to biased and misleading coefficient estimates, distorting the true understanding of causal relationships. To mitigate potential endogeneity, a fixed effects Two Stage Least Squares (2SLS) model was employed, instrumenting the proportion of female directors (BOARDFEM) with the industry-year average of female board representation. The instrument is statistically relevant (first-stage coefficient = 6.007; t = 2.04), and the Cragg-Donald F-statistic (21.163) exceeds the critical threshold, confirming the instrument's strength. The second-stage results reveal a significant and positive causal relationship between female board representation and SDG disclosure (coefficient = 6.006; p = 0.042). A high rho value (0.7998) supports the use of the fixed effects model, and since the model is just-identified, no over-identification test is required. The results of the endogeneity test are presented in Table 6, Model 3. Overall, these findings reinforce the theoretical expectation that gender diversity at the board level enhances corporate sustainability disclosure.

Table 6

Robustness and endogeneity test

	(Model 1)	**(Model 2)**	**(Model 3)**
VARIABLES	SDG	SDG	**SDG**
BOARDFEM	**0.322*****	**1.333*****	**6.007***
	(3.61)	**(0.336)**	**(2.04)**
BOARDFGN	**-0.105***	**-2.345*****	**0.0979**
	(-2.32)	**(0.778)**	**(0.58)**
CSRCOMM		**3.789*****	**0.0679**
		(0.391)	**(0.67)**
BOARDSZ		0.117	**-0.00227**
		(0.185)	**(-0.08)**
ACFEM		1.950*	**0.0999**
		(1.044)	**(0.62)**
ASING		-0.362	**-0.246**
		(1.334)	**(-1.03)**
MEET		0.00608	**0.000294**
		(0.0185)	**(0.10)**
LEV		-0.0212	**-0.000612**
		(0.0808)	**(-0.05)**
ROA		0.0876	**0.000481**
		(0.265)	**(0.01)**
ROE		0.219	**-0.00474**
		(0.159)	**(-0.18)**
Tq		0.0173**	**0.000675**
		(0.00692)	**(0.62)**
Constant	0.367***	3.331***	**-0.644**
	(16.15)	(1.005)	**(-1.48)**
Observations	1,080	1,080	**1,080**
R-squared	0.023	270	**-**
Number of IDCompany	270	0.154	**270**
Fixed Effect Year	Yes	Yes	**Yes**
Fixed Effect Industry	Yes	Yes	**Yes**

Notes: Model 3, Fixed Effects (FE) estimation with Instrumental Variables (IV) using Two-Stage Least Squares (2SLS), *** p<0.01, ** p<0.05, * p<0.1

DISCUSSION AND CONCLUSIONS

This study aims to investigate the effect of the presence of female directors and foreign directors on the disclosure of Sustainable Development Goals (SDGs) in public companies in Indonesia. Using a fixed-effect panel data regression approach, the results of the study support Hypothesis 1, namely that the presence of female directors has a positive and significant effect on the level of SDGs disclosure. This finding highlights the strategic role of gender diversity in strengthening a company's commitment to sustainability. Conversely, the results also support Hypothesis 2 related to the effect of foreign directors on SDGs disclosure, although it shows a significant negative effect. This finding indicates the challenges of cultural adaptation and understanding of local regulations in the context of developing countries that can limit the contribution of foreign directors in increasing information disclosure related to SDGs. Interestingly, the results of the interaction between female directors and foreign directors provide significant support for Hypothesis 3, which states that board diversity across dimensions, both in terms of gender and nationality, has a positive and synergistic impact on increasing SDGs disclosure. This confirms that the combination of gender diversity and national background can strengthen effective sustainability governance.

The findings of this study are in line with the Resource Dependence Theory, which emphasizes that companies are highly dependent on access to external resources to survive and thrive. In this context, female and foreign directors act as strategic liaisons with the external environment, providing social legitimacy, global knowledge, networks, and inclusive perspectives that support sustainability-oriented decision-making. This diversity expands the company's capacity to respond to external pressures and align itself with global development agendas such as the SDGs.

In practice, this study offers two strategic recommendations. First, regulators such as the Financial Services Authority (OJK) are advised to establish policies that encourage female representation on the board of directors to reach at least one-third of the total members. This policy not only supports the achievement of SDG 5 (gender equality), but also strengthens a more inclusive and strategic decision-making process in the context of sustainability. This recommendation is very relevant considering that a previous study by Tjahjadi, Soewarno and Mustikaningtyas (2021) showed that the number of women in corporate leadership in Indonesia is still relatively low, so their potential contribution to the sustainability agenda has not been fully optimized. Second, companies, especially large-scale companies with cross-border activities, are encouraged to include at least one foreign director in their board structure. The presence of foreign directors can enrich global insights, open access to international sustainable business resources and practices, and strengthen the company's legitimacy in supporting the SDGs agenda.

Despite making important contributions, this study has several limitations that need to be considered. First, the focus of the study is only on two board attributes, gender and nationality, while other governance attributes, such as board independence, board of commissioners, the existence of an audit or CSR committee, the expertise of the corporate secretary, and ownership structure, have not been studied. Further research is recommended to expand the focus to obtain a more comprehensive picture. Second, this study uses data from one country, namely Indonesia, as a representative of developing countries. This limitation limits the generalization of the findings to other developing countries with different governance and institutional characteristics. However, it also provides an important basis for cross-country research to expand the external validity of the findings.

Overall, this study makes significant theoretical and empirical contributions to the literature on corporate governance and organizational change. By showing how board diversity influences corporate responses to global sustainability challenges, this study broadens insights into the role of leadership structure in facilitating organizational change processes. Therefore, these findings are highly relevant for academics, practitioners, and policymakers in designing governance reforms that support the achievement of the SDGs in the corporate sector.

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