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## CORPORATE GOVERNANCE DIVERSITY AND ENVIRONMENTAL PERFORMANCE DISCLOSURE IN SUSTAINABILITY REPORTING OF INDUSTRIAL COMPANIES

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**Introduction.** As sustainability goals have become central to the global agenda, society and government institutions have become increasingly aware of and concerned about environmental challenges. Therefore, regulatory authorities have urged companies to be transparent and accountable for their environmental performance. In this context, increasing the number of women on corporate boards has become a central driver of the design and development of corporate sustainability initiatives.

**Aim and tasks.** This study examines the impact of corporate board structure and female representation on environmental disclosure, as reported in the activity, sustainability, and integrated reports of 40 manufacturing companies listed on the Borsa Istanbul in 2023.

**Results.** This study examines the impact of gender diversity, particularly female inclusion in audit committees and the number of female board members, on the level of environmental disclosure in sustainability compliance reports. Multiple regression analysis was employed to evaluate the influence of independent variables on environmental compliance. The study of 40 manufacturing companies listed on the Istanbul Stock Exchange in 2023 found that, on average, these companies had a high level of environmental compliance (mean = 39, range = 6–48), with 58% of the companies having a score of 40 or higher. Regression analysis ( $R^2 = 0.207$ ;  $p = 0.037$ ) showed that board gender diversity ( $\beta = 2.931$ ;  $p = 0.006$ ) had a significant positive effect on environmental disclosure, whereas the number of women on the board and presence in audit committees had no such effect. Content analysis indicates a high degree of compliance in the manufacturing sector. The results indicate that companies with female board members have more tendencies to provide high levels of environmental disclosure.

**Conclusions.** This study demonstrates that board diversity has a positive impact on companies' environmental performance and reporting practices. However, the number of women on boards and female representation on the audit committee were not statistically significant in relation to the level of compliance with environmental disclosure. Further research is needed to understand how board diversity influences environmental management in various industries and countries.

**Keywords:** Sustainability Reporting, Integrated Reporting, Environmental Disclosure, Compliance Level, Women on Board.

## **1. Introduction.**

In recent years, the global importance of sustainability has increased significantly, and companies have become more transparent about their environmental and social impacts. Technological advancements, economic crises, and heightened environmental and social awareness among citizens have sparked investor interest and prompted regulatory authorities to develop new policies. As such, entities have found it necessary to adopt non-financial reporting, pushing businesses to increase their responsibilities and transparency.

Consequently, companies tend to report their environmental, social, and governance (ESG) practices and strategies in addition to their financial performance. They accomplish this through various reports, some of which are mandated by law and others are voluntary. In this context, the structure of corporate boards has become a crucial factor in how companies address environmental and sustainability issues, as well as the level of transparency they maintain.

During the initial phase of non-financial reporting, businesses primarily in Western Europe and the United States aimed to achieve accountability goals by publishing social disclosures and accounting information (Epstein, Flamholtz, & McDonough, 1976). Later, environmental issues that emerged in the late 1980s and the early 1990s, under pressure from civil society organisations, led governments and companies to be accountable for issues such as carbon emissions and climate change (Kolk, 2005). Thus, companies have begun to publish environmental reports. In the 1990s, corporate social responsibility was widely recognised as a significant issue by several companies. The foundation for business strategy and sustainability practices has been established. The transition from corporate social responsibility reporting to sustainability reporting occurred, and sustainability reporting became a crucial practice due to its focus on companies' economic, social, and environmental performance, as well as its contribution to achieving their long-term financial goals (Camilleri, 2022).

Sustainability reports publicly disclose a business's environmental, social, and governance (ESG) practices and performance.

Integrated reports have helped individuals in making decisions regarding a company's value on several dimensions, including financial, governance, social, and environmental grounds. Sustainability reports are made available to a broader audience by explaining a company's economic, environmental, and social corporate impacts. Integrated reports, on the other hand, reveal firms' value creation abilities on short-, medium-, and long-term bases (POA, 2023).

From a regulatory perspective, the Turkish Public Oversight Accounting and Auditing Standards Authority (POA) and Capital Markets Board (CMB) can be considered when investigating Turkey's sustainability reporting practices. The POA aligned national reporting standards with the International Sustainability Reporting Standards (ISRS) issued by the International Sustainability Standards Board (ISSB), allowing conformity with international standards. Firms are required to comply with the "Sustainability Principles Compliance Framework", which outlines environmental, social, and governance (ESG) performance disclosure requirements for preparing reports in accordance with the CMB. The Sustainability Principles Compliance Report of the CMB differs from the ISRS in its greater focus on Environmental, Social, and Governance (ESG) performance. In comparison, the TSRS complied with by the POA places more importance on the international framework, is customised to meet the needs of investors, and considers the financial implications.

Some studies in the non-financial literature based on legitimacy theory highlight strong evidence that companies use social and environmental disclosures to enhance their legitimacy (Deegan, 2002; Mousa & Hassan, 2015). Additionally, several other studies have found that companies with low environmental performance tend to exhibit better disclosure practices (Cho & Patten, 2007; Mahmood, 2017). There is considerable literature on board structures, which are a fundamental component of corporate governance (Saidon & Ghani, 2020; Abdelqader et al., 2022). Empirical evidence indicates that diversity within corporate boards is primarily examined in terms of age, ethnicity, gender, and education (Carter et al., 2003; Miller & Triana, 2009).

Gender has been explicitly addressed in numerous studies and the influence of women's presence on financial performance and corporate governance has been examined (Adams & Ferreira, 2009; Ararat et al., 2010; Campbell & Vera, 2008; Low et al., 2015; Bennouri et al., 2018). Several studies have shown that female representation has a positive influence on financial performance and corporate governance (Crowther & Seifi, 2020). For instance, Bennouri et al. (2018) state that female directors have a positive impact on a firm's environmental and social performance. Wasiuzzaman and Wan Mohammad (2020) analysed the effect of board diversity on environmental disclosure. They observed a positive relationship between them.

Rjiba and Thavaharan (2022) and Garcia-Sanchez et al. (2024) have suggested that boards with female members place greater importance on environmental risks. Barrosa et al. (2024) stated that an increasing number of women on boards encourage firms to take sustainability-related actions, such as carbon emission controls and environmental reporting. Female board representation serves as a link between corporate governance and environmental sustainability. Companies should prioritise women's involvement on boards to achieve long-term objectives, manage strategic processes effectively, mitigate environmental risks, and enhance reporting quality (Dang et al., 2023; Almaqtari et al., 2024).

The contribution of this study to the literature is to highlight the relationship between environmental disclosure compliance and diverse board composition in sustainability reports, aiming to raise awareness of the importance of increased women's representation in management. Content analysis was applied to the sections on environmental principles in sustainability compliance reports. Unlike previous studies, this study applied content analysis to the environmental dimensions of the reports. Compliance levels were scored using the developed scale. Multiple regression analysis was then employed to test the effects of board gender diversity (BGDV), the number of women on the board (NW), and the presence of women on audit committees on environmental compliance.

The findings suggest that companies demonstrate a high level of environmental compliance and that board gender diversity has a significant impact on compliance levels.

The overall structure of the study includes Section 1, which is an introductory section. Section 2 examines the theoretical dimensions of this study. Section 3 outlines the methodology used in this study. Section 4 presents the primary outcomes of the analysis. Section 5 presents a discussion of the research implications. The final section draws upon the research to provide conclusions and outline future research directions.

## **2. Literature Review.**

### **2.1. Gender Diversity in Corporate Governance**

Corporate governance emerged as a key concept and practice of management adopted by scholars, business communities, governments, and international institutions in the 1990s, prompted in various ways by international financial crises, scandals in management in businesses and institutions, initiatives in privatisation, growth in international market capital flows, and globalisation tendencies (Akyuz, 2009).

Corporate governance is broadly defined as the implementation of all elements necessary for the effective management of an institution within a specific plan, order, and management approach. It is a narrower form of management, where the ability of a business to attract monetary and social capital, work effectively, maintain social values, and manage relations among the administration of an institution or firm, owners, and stakeholders is controlled (World Bank, 2010). The OECD defined corporate governance as "a set of relationships between a company's management, its board of directors, its shareholders, and other stakeholders" (OECD, 2004). Corporate governance began to gain prominence in the 18th and 19th centuries, when the Industrial Revolution and an atmosphere of free competition began to emerge. It became a focus of academic attention, when companies began to confront vulnerabilities in the composition of their management, production, and economic activities.

Studies on this concept continued under various names from the crisis until the 1980s, when the concept began to be referred to as “corporate governance”. It began to appear in the 1990s, and with the corporate scandals of the 2000s, it became an indispensable concept in the literature (Ayanoğlu & Türedi, 2022).

Over time, capital markets have prompted many countries to revise their corporate governance structures in accordance with the OECD and World Bank guidelines. Numerous studies have been conducted on this subject because the board of directors is the most important corporate governance mechanism. A collaborative study conducted by the Boston Consulting Group and the Corporate Governance Association examined corporate governance practices in Türkiye and the key factors influencing their development and implementation. This suggests that strategic decision-making, monitoring the implementation of decisions, and executive responsibility are the primary functions of boards of directors in Turkish companies.

The increasing importance of boards of directors, the main constituents of the corporate governance structure, has led to an increase in the number of studies investigating board composition. Boards have been studied for their diversity, encompassing factors such as ethnicity, age, education, and gender (Carter et al., 2003; Erhardt et al., 2003; Miller & Triana, 2009). Internationalisation and the proportion of independent directors have also been added by some studies as more dimensions (Ararat et al., 2015). Gender and female representation on boards have been of special interest, particularly in terms of their impact on the financial performance of firms and corporate governance, of the above dimensions of diversity (Campbell & Vera, 2008; Adams & Ferreira, 2009; Ararat et al., 2010; Low et al., 2015; Bennouri et al., 2018).

Furthermore, some studies suggest that female representation on boards positively impacts firms’ financial performance and creates value by increasing investor confidence (Carter et al., 2010; Terjesen et al., 2016). However, the study also suggests that women’s representation at the management level may not directly impact financial performance.

However, rather than the successful implementation of fundamental corporate governance principles (Adams & Ferreira, 2009; Post et al., 2015). Overall, the literature suggests that female representation on company boards plays a crucial role in shaping strategic decisions related to the financial performance of firms and in the control and monitoring mechanisms of corporate governance. Global comparative studies from around the world have also been published in the literature, highlighting the differences between countries. For instance, the Women on Boards Survey, conducted by the credit ratings agency GMI Ratings (2013), and the Global Board Diversity Analysis reports, commissioned by the search firm Egon Zehnder, have been used. The results indicate that the proportion of female board members is above 20% in Scandinavian nations and the United Kingdom. In comparison, this proportion remains between 10% and 20% in Turkey and other countries.

Additionally, the proportion of female board members is close to 10% in most countries. These findings support the fact that there are few female board members (GMI Ratings, 2013; Egon Zehnder, 2016). Desvaux et al. (2017) found that publicly traded European companies with more female directors had an average company value 17% higher than those with fewer female directors.

Moreover, such businesses had nearly double the operating profit. Although an increasing number of studies have demonstrated the link between female leadership and higher firm performance, female managers have not reached a sufficient level (Crowther & Seifi, 2020). To compensate for this, the European Union has implemented policies and legislative interventions to achieve gender diversity in higher-ranking positions. Such initiatives involve strategic frameworks to promote gender diversity on corporate boards in the public and non-public sectors. Recent studies support these findings. For example, Deloitte (2023) found that organisations with inclusive boards are more likely to meet environmental and social governance targets.

## **2.2. Board Gender Diversity and Corporate Environmental Disclosure.**

Several studies have explored the relationship between corporate governance mechanisms and disclosure practices (Adams, 2002; Amran et al., 2014). Haniffa and Cooke (2002) examined voluntary disclosures in terms of governance, culture, and firm-specific aspects in the annual reports of companies listed on the Kuala Lumpur Stock Exchange. Similarly, Kılıç et al. (2015) studied the Turkish banking industry and found that board composition, including the presence of female and independent directors and higher free-float ratios, is significantly linked to the level of corporate social responsibility reporting (Abdelqader et al., 2022). The structure of the board of directors plays a significant role in companies' disclosure practices, transparency, and accountability mechanisms. Following this governance-disclosure relationship, a growing body of literature links board gender diversity with sustainability-oriented disclosure practices.

Women on boards can help stakeholders understand and envision the future by offering diverse ethical perspectives and considerations (Lu & Herremans, 2019). As more women participate in decision-making, companies tend to adopt more responsible environmental practices (Ally et al., 2024). Moreover, this enhances corporate transparency and accountability, particularly in areas such as environmental reporting, carbon management, and the transition to clean energy (Fernandez-Torres et al., 2025).

From a stakeholder perspective, women's participation on boards can improve board effectiveness (Aly et al., 2024; Wasiuzzaman & Wan Mohammad, 2020). Observations in the literature show that women are sensitive to sustainability and environmental concerns. Firms that prioritise corporate social responsibility and ethical values address environmental issues in their reports, thereby evaluating environmental risks. Haque (2017) emphasised that diversity in board's results in a reduction in carbon footprint. Liao et al. (2015) found a significant and positive association between board gender diversity and the extent of carbon disclosure by UK companies.

Post et al. (2015) noted that board structures with three or more female members tend to give greater weight to environmental issues. In the comparative Australian survey, Hollindale et al. (2019) found that greater female board representation is associated with more informative carbon emission disclosures. Lu and Herremans (2019) conducted an industry study and found that companies with a higher proportion of women on their boards in industries with significant environmental impacts achieve better results in addressing environmental issues.

Muhammad and Migliori (2023) analysed the impact of female representation on boards and sustainability committees on environmental performance. Crowther and Seifi (2020) concluded that companies with female board members and sustainability committees have superior environmental performance. Almaqtari et al. (2024) investigated the correlation between financial performance and environmental sustainability. Additionally, they included the moderating effect of board gender diversity on these variables in the analysis (Abdelqader et al., 2022; Issa & Zaid, 2021).

Zharfpeykan (2025) examined the relationship between gender diversity on New Zealand companies' boards and their ESG performance and found that boards with a higher proportion of women tend to provide more comprehensive environmental, social and governance (ESG) disclosures.

Trireksani et al. (2024) demonstrated that gender equality at the national level amplifies this effect, whereas Rjiba & Thavaharan (2022) indicated that boards with a significant female representation mitigate carbon emissions. García-Sánchez et al. (2024) investigated that female directors had a positive impact on energy transition disclosures, while Barroso et al. (2024) determined that regulations on gender quotas reduce carbon emissions. Their findings showed that the companies with higher women representation on the board disclose more detailed and higher-quality environmental disclosures. These findings suggest that boards with gender diversity pay more attention to sustainability issues and are more responsive to stakeholder demands.

Modiba and Ngwakwe (2017) found a positive correlation between the number of women on a board and firms' energy and social disclosures. Zampone et al. (2024) stated that board gender diversity positively impacts the disclosure of the United Nations Sustainable Development Goals. Fernández-Torres et al. (2025) highlighted that female board members tend to give more weight to environmental responsibility, promote ethical issues, and foster greater awareness of long-term sustainability. Wang et al. (2023) found that having more women in leadership roles at the international level was associated with improved environmental performance. Moreno-Ureba et al. (2022) stated that female directors encourage new ideas about the environment.

Several studies have examined the impact of gender diversity on audit committees, revealing a significant effect on governance and reporting quality due to the presence of female members. Accordingly, Bravo and Alvarado (2018) found a positive correlation between the quality of voluntary ESG reporting practices and the representation of women on audit committees. Gull et al. (2023) also emphasised that the awareness of female members' stakeholders and ethics-focused approaches increases the transparency and reliability of sustainability reporting. The literature has long established that audit committees play a central role in monitoring and protecting shareholders (Fama & Jensen, 1983). Including female members in audit committees enhances monitoring and reporting mechanisms. This finding supports the overall effectiveness of governance (Srinidhi et al., 2011; Bravo & Alvarado, 2018).

Ma et al. (2024) examined the relationship between gender diversity and environmental, social, and governance (ESG) disclosure in Chinese public companies, focusing on the role of audit committees in regulatory oversight. The study's findings suggest that audit committees play a role in regulating this dynamic relationship. In a study of a UK sample, Al-Shaer and Zaman (2021) found that audit committees with a high level of gender diversity and expertise improved the accuracy and quality of environmental reporting.

These studies demonstrate that including women in audit teams is a legal requirement for diversity and a crucial means of enhancing governance by promoting ethical standards and increasing transparency.

This study has several characteristics that distinguish it from other similar studies. First, while studies typically examine disclosures or reports encompassing ESG indices, this study focus on the environmental dimension of principal compliance in sustainability reports, explicitly considering the board composition. Furthermore, this study allows for sector-specific assessments by focusing on manufacturing companies. Empirical evidence provides a consistent basis for hypothesising that gender-diverse boards positively influence firms' environmental disclosure practices. From a corporate governance perspective, female directors contribute to enhanced monitoring, stakeholder orientation, and ethical leadership, resulting in more comprehensive environmental disclosures.

Focusing on the body of literature that emphasises the contribution of boards of directors to corporate governance, and the role of board female diversity in sustainability reporting and disclosure of information on ESG issues, the following hypotheses were developed to guide the analysis:

H1: A relationship exists between the level of environmental compliance and board gender diversity.

H2: There is a relationship between the environmental compliance level and the number of women on the board.

H3: There is a relationship between the environmental compliance level and the presence of female members in the audit committee.

### **3. Methodology.**

This study investigates the effect of gender-diverse boards of directors on the extent of environmental policy disclosure in sustainability compliance reports. The key distinguishing factor of this study is its investigation of the impact of female board representation on environmental policy disclosure in sustainability-compliance reports.

The independent variables include board characteristics, such as gender representation and the degree of women's participation on corporate boards of directors in the audit committee. The level of environmental disclosure is identified as a dependent variable in sustainability compliance reports. Content analysis was used to predict the dependent variable. Multiple regression analysis was employed to investigate the relationships between the independent and dependent variables. Forty actively manufacturing companies traded on the Borsa Istanbul in 2023 were selected as the sample.

Environmental disclosures and data on carbon emissions contained in the companies' disclosure reports were analysed. Data on the dependent variable were collected from companies' sustainability compliance reports using a scoring system and content analysis. Data for the independent variables were gathered from the firms' annual and integrated activity reports.

### **3.1. Research Method for Compliance Level.**

Content analysis was used to assess the level of compliance with the Environmental Principles' paragraphs in the reports. A scaling system was established to assess the level of compliance and calculate an entity-level company score. Content analysis has been commonly used to assess the presence of specific disclosure items (Krippendorff, 2004; Krippendorff, 2018) and has been significantly applied in corporate social responsibility and environmental reporting research (Haniffa & Cook, 2005; Daub, 2007; Skouloudis et al., 2009; Rouf, 2011; Kılıç & Kuzey, 2018). Content analysis enables researchers to derive contextual meanings from textual data, an aspect that is frequently overlooked by automated techniques (Krippendorff, 2018). A content analysis coded by a human can interpret deeper context-specific meanings contained in narratives (Weber, 1990).

Turkish firms prepare their sustainability reports based on the "Sustainability Principles Compliance Framework" of the Capital Markets Board (CMB), which provides general guidelines for ESG performance.

Their compliance reports have four main sections: General Principles (10 items), Environmental Principles (25 items), Social Principles (15 items), and Corporate Governance Principles (2 items) (CMB). Highlighting the Environmental Principles section, this study examines how firms confront environmental issues within the regulatory scheme.

An assessment tool was created based on the "sustainability principles compliance framework" that BIST companies are required to publish. Companies prepare their Sustainability Principles Compliance Reports based on this framework, published by the Capital Markets Board (CMB), and include a "Company Compliance Status". These compliance statuses consist of four categories: "Yes", "Partially", "No", and "Not Applicable". Each principle in the report is marked with an "X" in one of these four categories (Appendix A).

For example, if the company fully disclosed principle/item "B19" in the main environmental principles section, it marked "Yes"; if it disclosed only limited or incomplete information, it marked "Partially"; if it did not disclose the relevant criterion, it marked "No"; and if it was not relevant to the item, it marked "X" in the "Not Applicable" column (Appendix A). The scoring tool developed in the current study is also based on the points assigned to these categories in companies' published sustainability principle compliance reports. Content analysis was conducted using this scoring tool, which included no additional comments. In the companies' sustainability principles compliance reports, each environmental criterion received 2 points if its "X" was in the "yes" column, 1 point if it was in the "partially" column, and 0 points if it was in the "no" or "irrelevant" columns. Therefore, the coding did not require any comments. The coding rules were clarified to enhance reliability, and the results were verified multiple times. Previous studies have developed and used similar scoring tools and evaluations (Daub, 2007; Skouloudis et al., 2009). Table 1 presents the scoring tool used to assess each company's level of compliance and to compute the total environmental compliance score.

**Table 1. Example of a Scoring System for Company Compliance Status.**

A Company Compliance Status					
B. Environmental Principles (B1-B25)	Yes	Partial	No	Not Applicable	Scores 2 point for Yes 1 point for Partial 0 point for No and Not Applicable)
B1	X				2
B2		X			1
B3			X		0
B4				X	0
Total score for example items (B1-B4)					3

Source: created by the authors.

### 3.2. Research Model

This study examines the impact of board gender structure and women’s participation in management on the audit committee on the extent of companies’ environmental disclosure. Multiple regression analysis was employed to test the proposed research hypotheses (H1, H2, and H3).

Multiple regression (MR) is a statistical method used to analyse data from independent or predictor variables to explain changes in the dependent or outcome variables (Pedhazur, 1997; Kraha et al., 2012). This study provides an integrated framework to simultaneously analyse the effect of governance-related (independent) variables on environmental disclosure levels (dependent variable).

The research model is specified as:

$$EDL = \beta_0 + \beta_1 BGDV + \beta_2 ACW + \beta_3 NW + \varepsilon \quad (1)$$

where,  $\beta_0, \beta_1, \beta_2, \beta_3$  are the model parameters, and  $\varepsilon$  is a random error.

As previously stated, the independent variables (BGDV, NW, and ACW) of the study were determined based on theoretical and empirical studies on corporate governance (Modiba & Ngwakwe, 2017; Zampone et al., 2024).

Studies indicate that gender diversity on various boards supports audit quality and ethical decision-making processes. Therefore, the research model includes variables that may affect the environmental practices of manufacturing firms with intense environmental impacts (Anazonwu et al., 2018; Jizi, 2017).

**Table 2. Variable Definitions and Data Collection.**

Variable		Specification	Data source
Environmental disclosure level (EDL)	Dependent Variable	Total scores obtained by content analysis	Sustainability compliance report of the company
Board gender diversity (BGDV)	Independent Variable	If there is a female member, 1, otherwise 0	Integrated activity reports, annual activity reports, sustainability reports
Number of women on the board (NW)	Independent Variable	Number of women board members of firm	Integrated activity reports, annual activity reports, sustainability reports
Existence of women on the audit committee (ACW)	Independent Variable	If there is a female member, 1, otherwise 0	Integrated activity reports, annual activity reports, sustainability reports

Source: created by the authors.

#### 4. Results.

The research sample consisted of 40 manufacturing companies listed on the Borsa Istanbul in 2023. Manufacturing companies that disclosed information on carbon emissions and related environmental disclosures were included in the analyses. Data were collected from the integrated activity, annual activity, sustainability, and sustainability compliance reports of the companies. The descriptive statistics for the environmental compliance are shown in Table 3.

**Table 3. Descriptive Statistics for Environmental Compliance Level.**

Average	39,075
Standard Error	1,285215486
Median	40
Mode	36
Range	42
Minimum	6
Maximum	48

The summary statistics for the independent variables are presented in Table 4, and the regression analysis results are presented in Table 5. The mean compliance level was 39. The maximum compliance level was 48, and the minimum was 6. In other words, one company received a very low score of 6, whereas the scores of the remaining companies ranged from 22 to 48. In summary, of the 40 companies whose reports were examined, 23 received scores above 40, 14 received scores between 30 and 40, and the remaining three received scores of 22, 27, and 28, respectively.

These results indicate a high level of compliance with environmental principles in the reports of manufacturing companies.

**Table 4. Summary Statistics for Independent Variables.**

Statistic	Value
Average number of women on board	1.65
Median number of women on board	1.5
Proportion at least one woman on board	85%
Proportion of women on audit committee	50%
Proportion with gender diversity	85%
Number of companies without women on board	6

Table 4 presents the descriptive statistics for the independent variables for the sample. The average number of women on the company's board of directors is 1.65, with a median of 1.5. Approximately 85% of companies have at least one female board member, and 50% have female members on their audit committees. Overall, 85% of the companies have gender diversity on their boards, while six companies have no female board members.

The regression analysis investigates the relationship between the Environmental Disclosure Level (EDL), which serves as the dependent variable, and three key independent variables: the presence of women on the audit committee (ACW), board gender diversity (BGDV), and the number of women serving on the board of directors (NW).

**Table 5. Regression Analysis Results.**

Parameters	Model	
R	0.455	
R2	0.207	
N	40	
ANOVA Sig.	0.037	
ANOVA F	3.137	
Coefficients	t	Sig.
Constant	7.774	0.000
BGDV	2.931	0.006
NW	-1.513	0.139
ACW	0.230	0.819

The ANOVA table tested the statistical significance of the overall model and showed that the model was significant. In other words, the independent variables in the model have a significant effect on the dependent variable, EDL. The model explains 20.7% of the variation in the environmental disclosure. Although the R-squared value of this model was not very high, it was significant, revealing the role of the variables in the model. BGDV has a significant positive effect, indicating the importance of gender diversity on boards. NW and ACW are insignificant, indicating no enhancement of environmental disclosures by a single female member of a company or a single female member of an audit committee.

This suggests that board gender diversity has a significant impact on environmental compliance. For instance, Cicchiello et al. (2021) found a positive correlation between gender diversity and firm transparency. Zampone et al. (2024) emphasised how board gender diversity contributes to more powerful Sustainable Development Goals reporting.

More recently, Xu et al. (2025) explained that diverse boards tend to disclose more transparent information regarding corporate environmental responsibility. The results confirm the findings of previous studies, which indicate that boards with female members are more transparent in their management of carbon emissions and environmental reporting (Barroso et al., 2024; Wang et al., 2023).

At the board-management level, boards with higher female representation are more likely to publicly disclose their environmental practices. This goes beyond merely complying with requirements or embracing social responsibility; it reflects higher-quality reporting practices pursued to establish stakeholder confidence and achieve greater compliance with regulatory demands and market expectations. The positive and significant  $\beta$  coefficient for BGDV explicitly indicates that higher board gender diversity benefits environmental disclosure, suggesting that board management initiatives to broaden female representation on boards can significantly increase compliance and transparency.

No statistically significant relationship was observed between the remaining independent variables, which are AUDTW, NW, and EDL. Bravo and Alvarado (2018) found that gender diversity in audit committees has a positive impact on the comprehensiveness and validity of ESG performance. However, the findings of the current study do not indicate the impact of female audit committee members on environmental disclosures.

The finding regarding NW counters the positive findings of Hollindale et al. (2019), who determined that boards considering female representation provide more qualified greenhouse gas emissions disclosures (Issa & Zaid, 2021). Substantive diversity leads to improved disclosure practices compared to symbolic representation at the board level. Overall, the findings support H1 and reject H2 and H3. Consequently, the strong and positive relationship between board gender diversity and environmental compliance measures suggests that companies seeking improvements in ESG reporting, particularly in their environmental performance, should give greater weight to diversity in their board structure and at the managerial level.

However, the presence of women on the audit committee and the number of women on the board did not significantly affect disclosure. It is essential to note the distinct aspects of the independent variables, Board Gender Diversity (BGDV) and Number of Women (NW). BGDV represents the board's gender diversity, specified as one if there is at least one female member and zero otherwise. However, NW indicates the number of female board members in the firm. Therefore, the BGDV is a more accurate measure of how inclusive and gender balanced a group is, and it can influence how decisions are made.

In contrast, the NW may not extensively represent diversity when women participate. This conceptual distinction explains the rationale behind one variable producing significant outcome while the other fails to do so. The results indicate that the extent of compliance with environmental corporate disclosures increases with the representation of women on boards.

## 5. Discussion

The results of this study demonstrate a positive correlation between environmental responsibility and board diversity in sustainability reports. However, no significant correlation was observed between audit committee diversity and the number of women on it. Manufacturing companies that prioritise board diversity are more likely to report on sustainability issues and their environmental performance, particularly their carbon emissions. This finding is consistent with the findings of a previous study (Liao et al., 2015), which found a positive correlation between board gender composition and carbon emissions reporting. According to Anazonwu et al. (2018) and Jizz (2017), companies that prioritise board gender diversity tend to adhere to sustainability principles and integrate these aspects into their reporting practices.

This study also contributes to the literature on corporate governance and sustainability. According to agency theory, gender-diverse boards improve monitoring mechanisms, have fewer managerial interests, and tend to be more transparent in their reporting processes (Aly et al., 2024; Al-Janadi, 2025). Within the stakeholder theory framework, female directors are more likely to submit comprehensive reports that align with the interests of stakeholders who care about environmental issues (Aly et al., 2024).

Companies with high female representation are more likely to disclose environmental performance information to gain public support and maintain legitimacy (Ali et al., 2024).

This study offers valuable guidance for corporate executives on harnessing the positive impact of gender diversity on board environmental compliance to foster stakeholder trust. This serves as a strategic governance mechanism that enhances transparency and accountability. Therefore, executives should pay greater attention to women's participation and integrate this element into their HR policies. Furthermore, training programs should consider the contribution of female executives to sustainability auditing.

At the policy level, these findings underscore the need for regulations that promote or require gender diversity on corporate boards.

Regulators, such as the Capital Markets Board (CMB), could strengthen prevailing governance codes by establishing minimum requirements for diversity or disclosure guidelines, thereby encouraging corporate entities to instil inclusiveness into their governance frameworks. Investors may also view female board representation as a key factor in promoting stronger environmental responsibility and, therefore, consider gender diversity in their investment decisions.

The primary contribution of this study lies in its focus on the environmental policy section of sustainability compliance reports, which distinguishes it from prior studies. In general, most prior studies focus on all dimensions of sustainability disclosures, whereas this study concentrates specifically on the environmental dimension.

A significant limitation of this study is the relatively small sample size and the fact that it was developed using data obtained over a year. Future studies should address these limitations by incorporating a broader range of analyses and a larger, more diverse sample.

## 6. Conclusions.

This study examines the effect of female representation on corporate environmental disclosure. To achieve this goal, the firms' sustainability compliance reports were analysed using content analysis. Compliance reports are essential tools for demonstrating sustainability strategies and addressing climate change issues in manufacturing companies. With the increasing complexity of regulatory frameworks, these reports have become essential for demonstrating corporate environmental accountability and compliance. This research focused primarily on environmental disclosures, a mandatory component of sustainability compliance reporting practices. The extent of these disclosures was reviewed, and an individual disclosure score was assigned to each company.

Regression analysis was employed to investigate the relationship between environmental disclosure levels and the number of female directors on the board, female representation on the audit committee, and gender diversity on the board. The sample consisted of 40 manufacturing companies listed on Borsa Istanbul (BIST). The data related to disclosure was obtained from company websites and public platforms. The environmental disclosure score, which was determined as the dependent variable, was computed using content analysis. The independent variables were: the number of women on the board of directors, the presence of female audit committee members, and the level of gender diversity on the board. The findings from the regression analysis indicated a positive and significant effect of board gender diversity on the extent of environmental disclosures. However, the number of women on boards and their presence on audit committees were not significant predictors.

This study provides informative content on the level of firms' compliance, as revealed in the environmental principles section of their sustainability compliance reports, and the determinants of this compliance level. This study examined the level of firms' disclosure of the Environmental Principles element in their Sustainability Principles Compliance Report, transparently and compliantly, by subjecting it to content analysis that included details of their environmental performance. The impact of female board representation on these disclosures was identified as the main problem in this study. This study justifies the use of inclusive leadership to achieve positive environmental outcomes. Although further studies are needed to examine the finer aspects of these relationships, this study strongly supports the role of diverse perspectives in ecological administration.

Therefore, research evidence on the impact of women's representation and board composition on environmental disclosures will bring the issue to the forefront and protect the role of women in managerial decision-making.

A significant positive correlation exists between board heterogeneity and environmental reporting practices. This finding suggests that boards that accept gender diversity as an essential factor are more likely to promote effective monitoring, ethical awareness, and stakeholder sensitivity in environmental reporting. This finding aligns with the prior studies, which suggest that diversity enhances the quality of decision-making (Fernández-Torres et al., 2025; Lu & Herremans, 2019). The number of women (NW) and the presence of women in the audit committee (ACW) may indicate symbolic diversity, which can limit its impact. The findings underscore that the quality and depth of gender participation, rather than mere existence, are essential for enhancing environmental disclosures.

This study contributes to the sustainability and corporate governance literature by providing evidence from an emerging market environment. The practical contribution of this study is to reveal the importance of diversity, showing that it is not merely a social or symbolic goal for managers and regulators. It is a governance vehicle that enhances environmental accountability and transparency.

Future research can extend these findings by employing different industries, cross-national studies, and additional firm-level and governance variables, such as profitability, ownership, and sustainability committees. Extending the analysis to other areas of ESG disclosure and employing more advanced approaches, such as panel data methods or machine learning models, would enrich the understanding of corporate transparency and the effect of governance diversity.

Appendix A

Table A1. Abstract.

Aksa Acrylic Chemical Industries Inc. Sustainability Compliance Report Publish Date: 17.02.2025 20:13:00 Disclosure Type:DG Year:2024 Period:1						
Company Compliance Status						
	Yes	Partial	No	Not Applicable	Explanation	Report Information on Publicly Disclosed Information (Page number, menu name on the website)
<b>Sustainability Compliance Report</b> <b>B. ENVIRONMENTAL PRINCIPLES</b>						
B1. The policies and practices, action plans, environmental management systems (known by the ISO 14001 standard) and programs have been disclosed.	X					It is explained in the "Quality and Product Safety" and "Natural Resource Management" sections of the 2023 Integrated Annual Report. It will explained in the "Our Integrated Business Model and Sustainability Strategy" and "We Are Responsible To Our Planet" sections of the 2024 Integrated Annual Report.
B2. The environmental reports prepared to provide information on environmental management have been disclosed to the public which is including the scope, reporting period, reporting date and limitations about the reporting conditions.	X					It is explained in the "Scope of the Our Report" section of the 2023 Integrated Annual Report. It will explained in the "Scope of the Our Report" section of the 2024 Integrated Annual Report.
B4. The environmental targets within the scope of performance incentive systems which included in the rewarding criteria have been disclosed to the public on the basis of stakeholders (such as members of the Board of Directors, managers and employees).	X				At the beginning of each year, our employees set individual targets in line with the Company's goals and strategies. Projects and actions that address the sustainability infrastructure are included in the individual targets of the relevant departments, including senior management.	It is explained in the "Talent and Performance Management" section of the 2023 Integrated Annual Report. It will explained in the "Being an Employee at Aksa" section of the 2024 Integrated Annual Report.
B5. How the prioritised environmental issues have been integrated into business objectives and strategies has been disclosed.	X				The Company will prepared an Integrated Annual Report for 2024 and defined its integrated business model and strategy in this process. Together with the value creation model, it integrates environmental and sustainability issues into its business results.	It is explained in the "Value Focused Sustainability Approach and Integrated Business Model" section of the 2023 Integrated Annual Report. It will explained in the "Our Integrated Business Model and Sustainability Strategy" section of the 2024 Integrated Annual Report.

Source: adapted from the Aksa Acrylic Chemical Industries Inc. (2025).

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