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Araştırma Makalesi (Research Article)

The Impact of Board Characteristics on Sustainability (ESG) Performance: The Case of Turkey*

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Abstract

This study was conducted by examining 325 firm-year observations from 62 firms listed on the Istanbul Stock Exchange (BIST) between 2014 and 2023. The research utilized environmental, social, and governance (ESG) scores and data on board characteristics to examine the effects of corporate governance structures on sustainability performance. The data was obtained from the LSEG Workspace (formerly Refinitiv Eikon) database, which is used globally as a financial analysis and data provider. The analysis examined the impact of board characteristics such as board size, gender diversity, expertise, and external affiliations on ESG performance using a fixed effects regression model with an unbalanced panel data structure. Empirical findings show that board gender diversity and expertise have a significant and positive impact on ESG performance. In contrast, board size was found to have a significant and negative impact on ESG performance. On the other hand, no statistically significant relationship was found between the variable representing the external affiliations of board members and ESG performance.
Keywords: Board Characteristics, ESG Performance, Corporate Governance, Gender Diversity.

JEL Codes: G34, Q56, J16.

Yönetim Kurulu Özelliklerinin Sürdürülebilirlik (ESG) Performansı Üzerindeki Etkisi: Türkiye Örneği

Abstract

Bu çalışma, 2014-2023 döneminde Borsa İstanbul'da (BIST) işlem gören 62 işletmeye ait 325 şirket-yılı gözlemini inceleyerek gerçekleştirilmiştir Araştırmada, kurumsal yönetim yapılarının sürdürülebilirlik performansı üzerindeki etkilerini incelemek amacıyla çevresel, sosyal ve yönetişim (ESG) puanları ile yönetim kurulu özelliklerine ilişkin veriler kullanılmıştır. Söz konusu veriler, finansal analiz ve veri sağlayıcısı olarak küresel ölçekte kullanılan LSEG Workspace (önceki adıyla Refinitiv Eikon) veri tabanından temin edilmiştir. Analiz kapsamında, yönetim kurulu özellikleri olan kurul büyüklüğü, cinsiyet çeşitliliği, uzmanlığı ve dış bağlantıların ESG performansı üzerindeki etkisi, dengesiz panel veri yapısına sahip sabit etkiler regresyon modeli ile incelenmiştir. Ampirik bulgular, yönetim kurulu cinsiyet çeşitliliği ile uzmanlığının ESG performansı üzerinde anlamlı ve pozitif etkiler sağladığını göstermektedir. Buna karşılık, yönetim kurulu büyüklüğünün ESG performansı üzerinde anlamlı ve negatif bir etkisi tespit edilmiştir. Diğer yandan, yönetim kurulu üyelerinin dış bağlantılarını temsil eden değişken ile ESG performansı arasında istatistiksel olarak anlamlı bir ilişki bulunmamıştır.

Anahtar Sözcükler: Yönetim Kurulu Özelliği, ESG Performansı, Kurumsal Yönetim, Cinsiyet Çeşitliliği.

JEL Kodları: G34, Q56, J16.

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1. INTRODUCTION

Today, businesses' success is evaluated not only by financial performance criteria but also by the extent to which they comply with sustainability principles (Cucari, Esposito De Falco, & Orlando, 2018: 250). Sustainability is defined through Environmental, Social, and Governance (ESG) criteria, which guide companies in shaping their long-term strategies. The environmental dimension encompasses policies related to carbon emissions, energy and water use, and waste management, with a focus on renewable energy and carbon footprint reduction. The social dimension reflects companies' responsibilities toward employees, communities, and stakeholders, focusing on employee rights, occupational safety, gender equality, and social contribution projects. The governance dimension involves adherence to ethical standards, transparency, anti-corruption measures, and an effective board and shareholder structure.

ESG performance has become an essential criterion for both financial analysts and investors in their decision-making processes (Eccles, Lee, & Stroehle, 2020: 575; Solomon & Solomon, 2006: 564). In this regard, numerous independent organizations evaluate this performance. Some of these institutions are world-renowned organisations such as LSEG Workspace (formerly Refinitiv Eikon), Bloomberg, MSCI Stats, and Sustainalytics. These organizations evaluate companies' environmental, social, and governance practices to create ESG scores, thus supporting investors in making informed decisions (Martiny, Taglialatela, Testa, and Iraldo, 2024: 9).

Since there is no universally accepted standard for ESG metrics, each data provider develops a unique methodology to measure ESG performance and determines the environmental, social, and governance factors it considers important according to this approach (Eccles, Lee, & Stroehle, 2020: 576). Due to differences in measurement methods, indicators, and weightings, assessments of the same firm's ESG performance can vary significantly between data providers.

The ESG score provided by Refinitiv (LSEG) is calculated using a standard weighting method, with the environmental dimension contributing 42.5%, the social dimension 32.5%, and the governance dimension 25% to the final score; these ratios are kept constant across all sectors (Martiny, Taglialatela, Testa, & Iraldo, 2024: 6). The ESG score is based on information obtained from publicly available sources such as firm websites, activity reports, civil society organization reports, media content, and stock exchange disclosures, and comprehensively analyzes the performance of companies across a total of 178 criteria.

In Turkey, the ESG approach is still developing, and sustainability reporting has been made mandatory for businesses that meet specific criteria. According to the framework determined by the Public Oversight Authority (POA), certain companies, including investment institutions, portfolio management companies, financial leasing and factoring companies, are required to produce sustainability reports. For this obligation to arise, at least two of the three criteria, namely, the total assets of the relevant entity exceeding TL 500 million, the annual net sales revenue exceeding TL 1 billion, or the number of employees exceeding 250 people, must be exceeded for two consecutive reporting periods (POA, 2025).

Banks have a different situation. Under Banking Law No. 5411, banks subject to the regulation and supervision of the Banking Regulation and Supervision Agency (BRSA) are directly obliged to report on sustainability, regardless of any thresholds. However, banks under the Savings Deposit Insurance Fund (SDIF) are exempted from this obligation.

The implementation of these obligations commenced in 2024, and sustainability activities for 2024 will be reported in 2025. However, companies outside the scope can also report voluntarily within the Turkish Sustainability Reporting Standards framework. Globally, legal regulations such as the European Union's Sustainable Finance Taxonomy and the sustainability reporting requirements of the U.S. Securities and Exchange Commission (SEC) are increasing the importance of ESG.

The board of directors plays a vital role in determining and implementing the firm's ESG strategies.

The Upper Echelons Theory emphasizes the impact of the board structure on firm performance, arguing that the demographic and cognitive characteristics of firm executives affect the decisions taken (Hambrick, 2015: 1). According to this theory, the size, gender diversity, skills, and affiliations of the board of directors can be a decisive factor in the firm's achievement of its sustainability goals.

According to agency theory, an effective oversight mechanism is necessary to reduce conflicts of interest between managers and shareholders (Jensen & Meckling, 1976). The size of the board of directors is seen as a critical factor in this regard. According to the resource dependency theory, board members are important resources that provide strategic knowledge, experience, and social capital for the firm (Pfeffer, 1973). Large boards of directors and an increase in the number of outside board members help companies control environmental uncertainties and reduce uncertainties in the strategy development and implementation process (Pearce & Zahra, 1992: 411). Another study found that an increase in board size leads to greater consideration of environmental concerns (Walls, Berrone, & Phan, 2012: 899). The positive effect of board size on environmental concerns suggests that it may also potentially contribute indirectly to ESG performance. In this context, studies in the literature have found a positive and significant relationship between ESG disclosures and board size (Suttipun, 2021: 399).

It is also noted that exceeding a certain level of board size may reduce effectiveness and lead to coordination difficulties and conflictual decision-making processes (Jensen, 1993: 865). Furthermore, in large boards, the “free rider” problem may cause members to be reluctant to share responsibility, thereby increasing inefficiencies (Treepongkaruna, Kyaw, & Jiraporn, 2024: 4220). In this context, an increase in board size has been associated with a higher likelihood of being sued in environmental lawsuits, indicating that large boards have limited effectiveness in preventing environmental risks and violations (Kassinis & Vafeas, 2002: 411).

Following board size, one of the most studied board characteristics in corporate governance research is board gender diversity (Dwekat, Seguí-Mas, Tormo-Carbó, & Carmona, 2020: 2882; Singh, Terjesen, & Vinnicombe, 2008: 49). Women's strong communication skills, good listening skills, diplomatic abilities, and collaborative approaches enable them to better assess environmental and development-related issues (Campanella, Serino, Crisci, & D’Ambra, 2021: 475). Therefore, the presence of women on the board of directors can support the strengthening of ESG performance.

Many academic studies have shown that the presence of women on the board of directors is associated with ESG performance (Arhinful, Mensah, & Owusu-Sarfo, 2024; Manita, Bruna, Dang, & Houanti, 2018); corporate social responsibility (CSR) (Bear, Rahman, & Post, 2010; Shaukat, Qiu, & Trojanowski, 2016), and human rights (Beji, Yousfi, Loukil, & Omri, 2021). The literature generally shows that the presence of female board members has a positive effect on ESG performance (Velte, 2016: 106). It is noted that this effect becomes more pronounced and meaningful when the number of women on the board reaches a critical mass (Yadav & Prashar, 2023).

The board of directors plays a crucial role in the processes of effective monitoring, evaluating management performance, and analyzing corporate strategies related to ESG factors, with the contributions of members who possess diverse skills and perspectives (Arhinful, Mensah, & Owusu-Sarfo, 2024: 40; Campanella, Serino, Crisci, & D’Ambra, 2021). The upper echelon theory proposed by Hambrick and Mason (1984) reveals that demographic and functional characteristics have significant effects on strategic decision-making processes. Finkelstein, Hambrick, and Cannella (2009) emphasize that functional experience broadens a manager's knowledge and that diverse functional experience enables more effective and informed decision-making in areas such as accounting, finance, marketing, and human resources.

The impact of board skills on ESG, CSR, and environmental practices is clearly evident in the literature. Board expertise and skill diversity reduce CSR concerns (Harjoto, Laksmana, & Lee,

2015: 642) and, as a result, contribute to improved ESG performance and strengthened environmental practices. This situation demonstrates that the presence of members with different knowledge and skills can be considered a strategic resource in achieving companies' sustainability goals.

The affiliations of board members can influence ESG performance not only through the firm's internal structure but also through relationships established with external stakeholders and industry actors. Related executives working in industrial companies may tend to downplay environmental responsibilities due to their profit-maximization-focused perspectives; in contrast, members with academic or political affiliations support environmental decisions aligned with social interests (Kassinis & Vafeas, 2002: 401). Related managers with past affiliations to the firm may be inclined to tolerate laxity in environmental practices, which can negatively impact the firm's overall ESG performance (Pearce & Zahra, 1992: 412). Furthermore, the presence of managers with extensive external affiliations may weaken board oversight, which can negatively affect environmental compliance and lead to a decline in ESG performance (Hoang, 2025: 1). In this context, the affiliations of board members emerge as an important external factor in determining ESG performance.

Within this framework, the study examines the effects of four corporate governance elements—board size, gender diversity, board member skills, and board member affiliations—on ESG performance in Turkey. Previous studies have primarily focused on the relationship between ESG performance and financial results. The motivation for this study stems from the fact that the relationship between board structure and ESG performance in Turkey has been examined only to a limited extent. Furthermore, the need to question the validity of findings obtained in developed countries in emerging economies with different corporate structures, cultural norms, and regulatory conditions also necessitates this study.

In this study, 325 firm-years of observations from 62 non-financial companies operating in Turkey between 2014 and 2023 were analyzed using the LSEG Workspace database, which has an unbalanced panel data structure. The findings indicate that steps to encourage the inclusion of skilled and competent women on boards of directors may increase ESG performance through gender diversity. On the other hand, the effect of board size on ESG performance was found to be negative, emphasizing the importance of creating qualified boards rather than quantitative ones. Furthermore, board members' external affiliations show a non-significant negative impact on ESG performance. This finding suggests that members affiliated with other companies or institutions may have limited contribution to the firm's management, control, and achievement of sustainability goals. In this study, the consideration of board member skills and affiliations, which have been addressed to a limited extent in the literature, strengthens the theoretical and practical contributions of the study. Furthermore, by presenting original evidence in the Turkish context, this study contributes to the understanding of ESG practices in developing countries and provides valuable insights for managers, investors, and policymakers.

2. CONCEPTUAL FRAMEWORK

Today's global economic, environmental, and social challenges demonstrate that companies' activities cannot be limited to financial results alone. The concept of socially responsible investment (SRI) emerged in the 1960s with the recognition of the environmental and social impacts of industrialization. It was one of the pioneering initiatives that increased investor awareness before the era of CSR practices. SRI is discussed as an approach that aims to guide investors' investment decisions by taking into account companies' environmental sustainability, ethical management, and social responsibility practices (Schueth, 2003: 189). In the 1970s and 1990s, CSR practices and reporting highlighted the need for companies to systematically measure and manage their social and environmental responsibilities (Carroll, 1999: 268). These processes

paved the way for the emergence of the ESG concept and its introduction by the United Nations in 2004 (Eccles, Lee, & Stroehle, 2020: 577). ESG provides a comprehensive framework that enables companies to holistically assess their environmental impacts, social relationships, and governance structure; regulations, stakeholder expectations, and social awareness are driving increased demand for the disclosure and enhancement of ESG performance.

Board characteristics are widely studied in the literature on ESG performance (Pearce & Zahra, 1992; Suttipun, 2021; Velte, 2016). Corporate governance theories allow for an explanation of the role of these characteristics in ESG strategies. Agency theory (Jensen & Meckling, 1976) emphasizes conflicts of interest between managers and shareholders and the need to manage these conflicts through corporate mechanisms, providing an explanatory framework for understanding conflicts between short-term costs and long-term benefits in the ESG context. Stakeholder theory (Freeman, 1984) argues that companies should consider not only the interests of shareholders but also those of employees, customers, suppliers, society, and the environment, providing a theoretical basis for boards of directors to consider stakeholder expectations in ESG strategies. The resource-based view (RBV) (Barney, Wright, & Ketchen, 2001: 625) suggests that the knowledge, skills, experience, and diversity possessed by board members indirectly contribute to enhancing companies' competitive strength and, at the same time, strengthening ESG performance. In this context, board size, gender diversity, members' skills/expertise, and affiliations can be considered corporate governance elements that play an important role in determining companies' ESG strategies and implementing sustainability goals.

ESG reporting is an essential tool that enables companies to present their sustainability practices transparently to their stakeholders. Investors, regulatory bodies, and other stakeholders globally consider ESG reports to assess companies' environmental, social, and governance performance (Arvidsson & Dumay, 2022: 1092).

There are many international standards in ESG reporting. The Global Reporting Initiative (GRI) is one of the most widely used frameworks in sustainability reporting. It enables companies to report their economic, environmental, and social performance in accordance with specific standards. The Carbon Disclosure Project (CDP) is an important initiative that assesses companies' performance on carbon emissions, water security, and deforestation. The International Integrated Reporting Council (IIRC) has developed a model that focuses on long-term value creation by encouraging the presentation of financial and non-financial information in a single report. Additionally, the Task Force on Climate-related Financial Disclosures (TCFD) ensures that companies report transparently on their management of climate change risks. At the same time, the Sustainability Accounting Standards Board (SASB) helps investors make informed decisions by developing sector-specific sustainability reporting standards.

In Europe, the European Sustainability Reporting Standards (ESRS) require companies to report their sustainability performance in line with European Union regulations. The International Sustainability Standards Board (ISSB) aims to establish a global standard for sustainability reporting. LSEG Workspace's ESG scores are based on a combination of internationally recognized standards (such as GRI, SASB, TCFD). This approach aims to provide investors and other stakeholders with transparent, comparable, and reliable ESG scores.

In Turkey, regulations on ESG reporting are gradually increasing. Within the scope of the Capital Markets Board (CMB) Sustainability Principles, companies listed on Borsa Istanbul must comply with the sustainability principles. One of the most essential regulations contributing to the development of sustainability reporting in Turkey is the Turkish Sustainability Reporting Standards (TSRS). TSRS consists of two main standards:

TSRS 1—General Principles: This document outlines the basic framework companies should consider when reporting on sustainability.

TSRS 2 - Climate-related Disclosures: Includes disclosures on how companies manage the risks

associated with climate change.

These standards comprise four main components: governance, strategy, risk management, metrics, and targets.

- Governance: Explains how governance mechanisms function in companies' sustainability decision-making processes.
- Strategy: Reveals how companies determine their long-term strategies in line with ESG targets.
- Risk Management: It covers information on how ESG-related risks are identified and managed.
- Metrics and Targets: These include indicators and targets that companies use to measure their sustainability performance.

Making sustainability reporting mandatory in Turkey will enable companies to present their ESG performance transparently, thereby increasing investor confidence.

3. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

There are many academic studies on the relationship between ESG performance/CSR and board characteristics:

Pearce & Zahra (1992), using data from 119 Fortune 500 industrial companies, they examined the effects of board structure (size and external member representation) on the future financial performance of these companies during the period from 1983 to 1989. The findings show positive correlations ranging from 0.19 to 0.29 between board size and ROA, ROE, EPS, and net profit margin, and that both affiliated and independent outside members are generally positively related to performance. Furthermore, larger boards and an increased number of external members on the board help companies manage environmental uncertainties and reduce uncertainties in the strategy development and implementation process.

Velte (2016) used a sample of 1,019 firm-year observations of German and Austrian companies listed on the Frankfurt and Vienna stock exchanges from 2010 to 2014. The research findings indicate that the ratio of female board members has a positive impact on companies' ESG performance.

Shaukat, Qiu, and Trojanowski (2016) examined the effect of board characteristics on corporate social responsibility (CSR) performance using 2,028 firm-years of observations from companies listed on the stock exchange in the United Kingdom between 2002 and 2010. The research findings show that as the level of board independence, gender diversity, and financial expertise on the audit committee increases, the board's orientation toward CSR strengthens. As a result of this increased orientation, companies with boards that are highly oriented toward CSR develop more comprehensive and voluntary corporate social responsibility strategies, thereby significantly improving their environmental and social performance.

Birindelli, Dell'Atti, Iannuzzi, and Savioli (2018) examined the impact of board characteristics on ESG score using data from 108 banks in Europe and the United States (U.S.) from 2011 to 2016. The study found a statistically significant and positive relationship between board gender diversity, board size, the professional experience and skills of board members, and the ESG score.

Husted and Sousa-Filho (2019) examined the relationship between board structure and ESG disclosures from 2011 to 2014, using a sample of 176 firms from Brazil, Mexico, Colombia, and Chile. The study shows that board size and independent directors positively affect ESG disclosures, but women on the board and CEO duality negatively affect these disclosures.

Dwekat, Seguí-Mas, Tormo-Carbó, and Carmona (2020), examined the effect of audit committee and board of directors characteristics on corporate social responsibility (CSR) disclosures over the period from 2016 to 2018, using a sample of the 69 largest European companies by market value. According to the study's findings, board gender diversity and audit committee independence have a positive effect on CSR disclosures.

Aksoy, Yilmaz, Tatoglu, and Basar (2020), examined the determinants of Corporate Social Performance (CSP) in non-financial Turkish firms and used a sample of 63 firms listed on the Borsa Istanbul Sustainability Index covering the period 2014–2018. The results of the logistic regression analysis indicate a positive relationship between CSP and board size and the proportion of independent members, but no significant relationship between CSP and board gender diversity.

Suttipun (2021), examined companies operating on the Stock Exchange of Thailand (SET) between 2015 and 2019 in terms of board composition and corporate characteristics. The findings of the study indicate that there is a positive and significant relationship between ESG disclosures and board size and the number of female board members.

Beji, Yousfi, Loukil, and Omri (2021), analyzed the relationship between board characteristics and global corporate social responsibility (CSR) by examining companies included in the SBF120 index, which covers the 120 largest companies traded on the French stock exchange, during the period 2003-2016. The findings reveal that large boards have a positive relationship with all areas of CSR performance. Furthermore, it was determined that gender diversity on the board of directors has a positive relationship with human rights and corporate governance dimensions.

Disli, Yilmaz, and Mohamed (2022) examined the effects of board characteristics on sustainability performance among 439 non-financial firms listed on stock exchanges in 20 developing countries during the period 2010–2019. The analysis results reveal that board size has a negative effect on sustainability performance, while there is a positive relationship between board gender diversity and sustainability performance.

Wasiuzzaman and Subramaniam (2023) examined the relationship between gender diversity and ESG disclosures using data from 2004 to 2016 for energy companies operating in 48 developed and developing countries. The analysis results show a statistically significant and positive relationship between board size, the proportion of women on the board, and ESG disclosures.

Bigelli, Mengoli, and Sandri (2023) analyzed the effect of board structure on the ESG score of 835 companies operating in the European Union between 2002 and 2020. In the study, board size was not found to have a significant relationship with ESG score. In contrast, gender diversity, proportion of independent directors, and firm size were positively related to ESG score.

Ünal, Temiz, and Özdemir (2024) found a significant and positive relationship between the gender and cultural diversity of the members in the management of the companies and sustainability performance by using the data of 436 companies from 35 countries between 2015 and 2020.

Abdelkader, Gao, and Elamer (2024) found that board gender diversity and size are negatively related to ESG performance in their study of 432 firm years of South African firms between 2015 and 2020. They also found that firm size is positively related to ESG performance.

Arhinful, Mensah, and Owusu-Sarfo (2024) examined the impact of board characteristics on the ESG performance of 32 automobile companies listed on the Tokyo Stock Exchange. The study found that board gender diversity and meetings do not significantly affect ESG performance. In contrast, board size, educational background, and dual roles of the CEO and independent board members have a statistically positive effect on ESG performance.

Hoang (2025), examined the relationship between board member affiliations and firm performance for 2,854 non-financial firms listed on the stock exchange in the United States during the period 2003-2023. The study's findings indicate that board member affiliations generally have a negative impact on firm performance. However, it was concluded that board member affiliations positively

affect performance in financially distressed companies.

In national studies, ESG performance is generally analyzed within a theoretical framework, and its relationship with variables such as financial performance, prudence, and the cost of debt is also examined.

Özkan, Tanç, and Taşdemir (2018), using the data of 35 companies in the BIST Sustainability Index for 2011-2016, found that corporate social responsibility disclosures positively affect profitability ratios.

Güngör Tanç (2019), BIST 100 companies, 2018, found no significant relationship between the publication of sustainability reports and firm value (P/E).

Düzer (2023), in his study examining the relationship between sustainability performance and prudence using the 2021 data of BIST 100 companies, did not find a significant relationship between ESG performance scores and conservatism.

Atasel and Güneysu (2023), using data from 66 companies in the BIST All Index for 2015-2021, found a significant and negative relationship between debt cost and ESG performance.

Karyağdı & Şit (2023), examined the impact of ESG performance on financial performance using the annual data of companies listed on the BIST Sustainability-25 Index for the 2018–2022 period. The analysis results reveal that the ESG performance of the companies examined has a positive effect on return on assets.

Aslan-Çetin, Öztürk, and Akarsu (2024), using the data of 26 companies in the BIST Sustainability Index for the years 2018-2022, found that the ESG score has a significant and positive effect on return on assets and return on equity, and a significant and negative impact on market/book value.

While academic literature has made important contributions to the role of board structure on ESG performance, findings in this area remain controversial. In particular, findings on the impact of governance variables such as board size and the proportion of female members on ESG performance vary (Husted & Sousa-Filho, 2019; Wasiuzzaman & Subramaniam, 2023). This suggests that the relationship may vary depending on contextual factors such as country conditions, regulatory environment, and sectoral dynamics.

A significant portion of empirical studies on ESG has focused on developed countries and primarily non-financial sectors. Research conducted in Turkey, a developing country, is limited in number and does not sufficiently focus on relatively less-studied aspects of board structure, such as specific skills and affiliations. This situation highlights the need for comprehensive and contextual analyses that evaluate board structure in a multidimensional manner.

The study investigates whether board characteristics significantly impact ESG performance. The research question developed four hypotheses.

Board Size: Board size is a factor that directly affects companies' decision-making processes and strategic orientations. By providing various perspectives, larger boards can comprehensively assess environmental, social, and governance (ESG) issues. However, larger boards can sometimes lead to slower coordination and decision-making processes, reducing the effectiveness of ESG initiatives. Studies on this issue have yielded mixed results. Suttipun (2021: 399), and Wasiuzzaman & Subramaniam (2023: 2156) find a positive relationship between board size and ESG performance, while Abdelkader, Gao, and Elamer (2024: 9), and Disli, Yilmaz, and Mohamed (2022: 929) find a negative relationship. Bigelli, Mengoli, and Sandri (2023: 22), and Pozzoli, Pagani, and Paolone (2022: 9) found no significant relationship between board size and ESG performance. The hypothesis developed based on the findings of the studies in the literature regarding the effects of board size on ESG performance is as follows:

H1: Board size (B_Size) has a negative impact on ESG performance.

Board Gender Diversity: Diversity of women on the board encourages a more transparent and ethical approach to financial reporting processes. Srinidhi, Gul, and Tsui (2011) reported that female directors tend to limit earnings management practices and provide high-quality financial information. Arun, Almahrog, and Aribi (2015) argue that women managers' tendency to provide high-quality financial information may increase the accuracy and reliability of ESG performance. There is no significant difference between female senior executives and profit management (Geçici, 2022: 124). It is thought that female executives may exhibit more sensitive and sustainability-oriented approaches, especially in environmental and social responsibility issues. In the literature, Birindelli, Dell'Atti, Iannuzzi, and Savioli (2018: 11) and Bear, Rahman, & Post (2010), Disli, Yilmaz, and Mohamed (2022: 929), Suttipun (2021: 399), and Velte (2016: 98) found a positive relationship between board gender diversity and ESG performance, while Arhinful, Mensah, and Owusu-Sarfo (2024: 397) found no significant relationship. The hypothesis developed based on the findings of the studies in the literature on the effects of board gender diversity on ESG performance is as follows:

H2: Board gender diversity (B_Gend) has a positive impact on ESG performance.

Board Specific Skill: Board members' expertise in finance, law, environmental sciences, or sustainability can support the effective implementation of ESG strategies. While members with technical knowledge can develop policies to improve ESG performance by strengthening the firm's sustainability reporting, a lack of expertise can weaken the board's ability to assess environmental and social risks accurately. Evidence in the literature shows that board members' expertise positively impacts companies' ESG performance (Arhinful, Mensah, & Owusu-Sarfo, 2024: 397; Harjoto, Laksmana, & Lee, 2015: 642; Shaukat, Qiu, & Trojanowski, 2016: 369). Expertise indicators based on LSEG Workspace data reveal whether directors have knowledge and experience in financial analysis, risk management, and sustainability strategies. Boards with high levels of expertise can adopt more transparent and sustainable business practices by better managing environmental and social risks (Birindelli, Dell'Atti, Iannuzzi, & Savioli, 2018: 11). The hypothesis developed based on the findings of the studies in the literature on the effects of board expertise on ESG performance is as follows:

H3: The specific skills of board members have a positive impact on ESG performance.

Board Member Affiliation: The external affiliations of board members can affect firms' environmental and social performance in different ways. Indeed, a study has shown that managers with a background in industrial companies or affiliations with such companies have a profit-oriented perspective that leads to environmental responsibilities being pushed into the background (Kassinis & Vafeas, 2002: 401). In contrast, it is stated that members appointed to the board of directors from outside the firm make positive contributions to decision-making processes by reducing environmental uncertainties. With their different experiences and expertise, these members can ensure that firms act more carefully on environmental issues (Pearce & Zahra, 1992: 411). Furthermore, it has been found that senior executives' external affiliations improve financial reporting quality and are associated with high audit quality (Bhandari, Mammadov, Shelton, & Thevenot, 2018: 27). Board members' affiliations with external stakeholders can strengthen sustainability performance by contributing to the adoption of best practices in ESG initiatives.

Members with strong affiliations can help the firm adopt best practices in sustainability, while overly affiliated executives may not be able to focus sufficiently on ESG initiatives due to conflicts of interest. Based on the findings of studies in the literature on the impact of board members' affiliations/relationships on ESG performance, the following hypothesis is developed:

H4: The affiliations of board members (B_Affi) have a positive impact on ESG performance.

The control variables used in the study were selected from variables commonly used in the literature and predicted to affect ESG performance, to control for the relationship between ESG

scores and board characteristics, and to analyze the effects of independent variables more accurately.

Firm Size: Large-scale firms may be more sensitive to ESG responsibilities due to their higher public visibility. Therefore, firm size has been included in the model as an essential factor that may affect ESG performance (Bigelli, Mengoli, & Sandri, 2023; Birindelli, Dell'Atti, Iannuzzi, & Savioli, 2018; Wasiuzzaman & Subramaniam, 2023).

Leverage Ratio (Lev): Businesses with high financial risk levels may limit their ESG investments or use such investments as a tool to enhance their reputation. In this regard, the leverage ratio has been used as a control variable that may affect the ESG score (Bigelli, Mengoli, & Sandri, 2023; Birindelli, Dell'Atti, Iannuzzi, & Savioli, 2018; Husted & Sousa-Filho, 2019; Wasiuzzaman & Subramaniam, 2023).

Return on Assets (ROA): Profitable companies can invest more in ESG activities thanks to their financial resources and thus demonstrate higher ESG performance. Therefore, the ROA variable, which represents the level of profitability, has been included in the model (Bigelli, Mengoli, & Sandri, 2023; Birindelli, Dell'Atti, Iannuzzi, & Savioli, 2018; Wasiuzzaman & Subramaniam, 2023).

4. METHODOLOGY OF THE RESEARCH

4.1. Subject and Purpose of the Study

This study aims to analyze the effects of board characteristics on the environmental, social, and governance (ESG) performance of non-financial publicly listed companies in Turkey. Using data from 2014 to 2023, the study examines the relationship between structural and demographic characteristics of the board of directors and the ESG performance of the sampled firms included in the LSEG Workspace database. In this context, the study aims to investigate how board composition affects corporate sustainability performance.

4.2. Population and Sample of the Study

The study focuses on non-financial listed firms in Turkey. Based on data obtained from the LSEG Workspace database, an initial sample of 131 firms was identified. Of these, 69 firms were excluded due to missing information on ESG performance and board-related variables. Financial institutions and companies with incomplete data were therefore not included in the study, which constitutes a limitation regarding sectoral coverage. Table 1 provides detailed information on the sample selection process and the scope of the study. As a result, the final dataset comprises 325 firm-year observations from 62 firms.

Table 1. Sample

	Total
Borsa Istanbul Non-Financial Firms (from LSEG Workspace)	131
Minus:	
Firms that do not have data on ESG score and/or board of directors variables	69
Final Sample	**62**

Source: (LSEG Workspace, 2025)

Table 2 presents the distribution of the sample firms across different industries. Among the 62 non-financial listed firms, the largest representation is observed in the Basic Materials sector, which accounts for 22.6 percent of the total sample, while the Consumer Goods sector also represents 22.6

percent. The Industrials and Utilities sectors follow with 14.5 percent each, and the Consumer Services sector constitutes 11.3 percent of the firms.

Table 2. Sectoral Composition of Non-Financial Firms

Industry Name	Number	%
Basic Materials	14	22,6
Consumer Goods	14	22,6
Industrials	9	14,5
Utilities	9	14,5
Consumer Services	7	11,3
Health care	3	4,8
Technology	3	4,8
Telecommunication Services	2	3,2
Oil & Gas	1	1,6
Total	**62**	**100,0**

The remaining sectors, including Health Care 4.8 percent, Technology 4.8 percent, Telecommunication Services 3.2 percent, and Oil & Gas 1.6 percent, account for a smaller portion of the sample. Overall, the dataset comprises 62 firms spanning nine industry sectors, providing a comprehensive representation of non-financial publicly listed companies in Turkey.

4.3. Definitions and Measurements of Variables

Board characteristics are considered an important indicator of corporate governance quality, and the literature frequently examines their possible relationship with ESG performance. Table 3 summarizes the variables used in this context and their equivalents in the literature. All data in the study were obtained from the LSEG Workspace database.

Table 3. Definitions of Variables and Literature

Variable	Definitions	Literature	Data Source
Dependent Variables			
ESG Score	Percentage of ESG score	(Abdelkader et al., 2024; Arhinful et al., 2024; Bigelli et al., 2023; Birindelli et al., 2018; Disli et al., 2022; Galbreath, 2013; Husted & Sousa-Filho, 2019; Velte, 2016; Wasiuzzaman & Subramaniam, 2023)	LSEG Workspace (formerly Refinitiv Eikon)
Independent Variables			
Board Size (B_Size)	Number of people on the board of directors	(Arhinful et al., 2024; Beji et al., 2021; Bigelli et al., 2023; Birindelli et al., 2018; Husted & Sousa-Filho, 2019; Kassinis & Vafeas, 2002; Pearce & Zahra, 1992; Pfeffer, 1973; Wasiuzzaman & Subramaniam, 2023)	LSEG Workspace
Gender Diversity on the Board of Directors (B_Gend)	Percentage of women on the board of directors	(Abdelkader et al., 2024; Arhinful et al., 2024; Bear et al., 2010; Bigelli et al., 2023; Birindelli et al., 2018; Disli et al., 2022; Dwekat et al., 2020; Husted & Sousa-Filho, 2019; Shaukat et al., 2016; Suttipun, 2021; Velte, 2016; Wasiuzzaman & Subramaniam, 2023)	LSEG Workspace
Board Specific Skill (B_Skill)	Percentage of skills and expertise of board members	(Arhinful et al., 2024; Birindelli et al., 2018; Harjoto et al., 2015; Shaukat et al., 2016)	LSEG Workspace
Board Member Affiliation (B_Affi)	Relations and connections of board members with other companies	(Bhandari et al., 2018; Hoang, 2025; Kassinis & Vafeas, 2002; Pearce & Zahra, 1992)	LSEG Workspace

Control Variables			
Firm Size (Firm_Size)	Natural logarithm of the firm's assets ($)	(Bigelli et al., 2023; Birindelli et al., 2018; Wasiuzzaman & Subramaniam, 2023) Wasiuzzaman, S., & Subramaniam, V. (2023)	LSEG Workspace
Leverage Ratio (LEV)	Total Liabilities /Total Assets	(Bigelli et al., 2023; Birindelli et al., 2018; Husted & Sousa-Filho, 2019; Wasiuzzaman & Subramaniam, 2023)	LSEG Workspace
Return on Assets Ratio (ROA)	Net Income/Total Assets	(Bigelli et al., 2023; Birindelli et al., 2018; Wasiuzzaman & Subramaniam, 2023)	LSEG Workspace

Source: (Created by the author)

The study examines the relationship between board characteristics and ESG performance using a multiple linear regression model and the Stata statistical program. In addition, a causality analysis was desired; however, this analysis could not be performed on the existing sample because it required complete and comprehensive data. This situation can be considered a limitation of the study.

4.4. Research Model and Hypotheses

The model includes ESG performance as the dependent variable and board size, gender diversity, level of expertise, and external connections as independent variables. In addition, firm size, leverage ratio, and return on assets are included in the model as control variables. The regression model is presented in Equation 1:

$$ESG\ Score_{i,t} = \beta_0 + \beta_1 B\_Size_{i,t} + \beta_2 B\_Gend_{i,t} + \beta_3 B\_Skill_{i,t} + \beta_4 B\_Affi_{i,t} + \beta_5 Firm\_Size_{i,t} + \beta_6 LEV_{i,t} + \beta_7 ROA_{i,t} + \varepsilon_{i,t} \quad (1)$$

The effects of the independent variables in Equation 1 on ESG performance are tested within the framework of the following hypotheses:

H1: Board size (B_Size) has a negative impact on ESG performance.

H2: Board gender diversity (B_Gend) has a positive impact on ESG performance

H3: The specific skills of board members have a positive impact on ESG performance

H4: The affiliations of board members (B_Affi) have a positive impact on ESG performance

The stated hypotheses aim to test the direction and significance of the effect of the board's structural and qualitative characteristics on companies' sustainability performance. The findings will provide empirical evidence on how corporate governance mechanisms shape ESG performance.

5. EMPIRICAL FINDINGS

Table 4 presents the sample size, mean, median, standard deviation, minimum, and maximum values for dependent, independent, and control variables. The mean for the ESG score was calculated as 59.71, the median was 65.5, the standard deviation was 22.17, the minimum was 1.54, and the maximum was 94.39. These values indicate significant differences in the companies' ESG performances. When the variables related to the board structure are examined in Table 4, the number of members on the board (B_Size) is 9.42 on average, with nine members in most companies, and the largest board of directors comprises 21 members. The rate of women on the board (B_Gend) is 14.58% on average and 12.50% on median. While there are no women members in some companies, the highest rate of women is 60%. The skill and expertise rate of board members (B_Skill) is 37.48% on average and 35.71% on median, and in some companies, it is observed that all members are experts. Regarding board members' connections with other companies (B_Affi), the mean is 0.97, the median is 0.76, the maximum is 3.64, and the standard deviation is 0.88.

Table 4. Descriptive Statistics

Variables	N	Average	Median	Std. Dev	Min.	Max.
ESG Score	325	59.71	65.5	22.17	1.54	94.39
B_Size	325	9.42	9	3.08	3	21
B_Gend (%)	325	14.58	12.50	12.44	0	60
B_Skill (%)	325	37.48	35.71	21.50	0	100
B_Affi	325	.97	.76	.88	0	3.64
Firm_Size (1.000 $)	325	1.570.000	513.000	3.100.000	2.502	35.700.000
LEV	325	.32	.29	.23	0.00	1.54
ROA	325	.06	.06	.10	-.73	.52

ESG performance represents the ESG score; B_Size represents the board size; B_Gend represents the gender diversity of the board; B_Skill represents the expertise and skills of board members; B_Affi represents the external affiliations of board members; Firm_Size represents the total assets of the firm; LEV represents the leverage ratio; and ROA represents the profitability ratio.

The firm size (Firm_Size) exhibits a wide distribution among the financial variables. The average is $1.57 billion, the median is $513 million, and the market value of the smallest firm is $2.5 million, while the largest firm is $35.7 billion. The leverage ratio (Lev) was calculated as an average of 0.32, and the highest leverage ratio was 1.54. It was determined that the use of debt remained at very low levels in some companies.

Finally, the return on assets ratio (ROA) was calculated as an average of 0.06, the median was 0.06, and the standard deviation was 0.10. The minimum value was -0.73, and the maximum value was 0.52, indicating significant differences in profitability among the companies. In general, it is observed that there is a wide distribution in terms of ESG scores, board structures, and financial indicators among the companies examined. This situation reflects the diversity that may arise from different management strategies, sectoral dynamics, and economic structures.

Table 5 shows the Pearson correlations of the variables in the ESG score model. According to the correlation analysis results, generally positive and significant relationships were observed between the dependent variable, ESG score, and the independent variables. The size of the board of directors, the proportion of female members, the expertise of the board of directors, and the connections of the board members with other companies are significantly and positively related to the ESG score. In particular, it is seen that the proportion of women on the board of directors is one of the variables with the highest relationship with the ESG score.

Table 5. Correlation Matrix and VIF Value

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	VIF
(1) ESG Score	1.000								-
(2) B_Size	0.067	1.000							1.37
	(0.223)								
(3) B_Gend	0.277	-0.242	1.000						1.09
	(0.000)	(0.000)							
(4) B_Skill	0.233	-0.039	0.000	1.000					1.03
	(0.000)	(0.485)	(0.996)						
(5) B_Affi	0.341	0.333	-0.065	0.089	1.000				1.17
	(0.000)	(0.000)	(0.238)	(0.104)					
(6) Firm_Size	0.229	0.426	-0.217	0.077	0.277	1.000			1.30
	(0.000)	(0.000)	(0.000)	(0.162)	(0.000)				
(7) LEV	0.202	0.182	0.003	-0.056	0.098	0.059	1.000		1.20
	(0.000)	(0.001)	(0.955)	(0.317)	(0.077)	(0.061)			
(8) ROA	-0.067	-0.065	-0.045	0.043	-0.158	-0.141	-0.585	1.000	1.16

	(0.222)	(0.241)	(0.415)	(0.435)	(0.004)	(0.000)	(0.000)

Since the correlation coefficients between the variables do not exceed 80% and the Variance Inflation Factor (VIF) values are below 10 (the highest VIF value is 1.37), there is no multicollinearity problem between the independent variables, and the model is reliable (Hair, Black, Babin, Anderson, & Tatham, 2009: 197). The results of the model selection tests, which were performed to determine the appropriate model for the dependent variable, are presented in Table 6.

Table 6. Model Selection

	F test	Significance level	**Breusch Pagan LM test**	Significance level	**Hausman Test**	Significance level	**Model**
ESG Score	13.03	0,0000***	132,20	0,0000***	68,76	0,0000	*Fixed Effect*

**** p<0,01, ** p<0,05 and * p<0,1 indicate significance level.*

The F and Hausman test results show that the fixed effects model is appropriate. Reaching a significance level of 1% in the tests performed reveals that the models are statistically significant. Since heteroscedasticity and autocorrelation problems were detected in the model (χ^2 = 5006.71; p > χ^2 = 0.0000; Modified Bhargava Durbin = 1.2201; Baltagi-Wu LBI = 1.7051; p > F = 0.000), the presence of these issues indicated potential inefficiency in the standard error estimates. Therefore, a robust estimator was employed to increase the reliability and accuracy of the coefficient estimates. Table 7 includes multiple regression results showing the effect of board characteristics on ESG performance. The regression analysis determined that the effect of board size (B_Size) on ESG performance was negative. While this finding is similar to the results obtained by Abdelkader, Gao, and Elamer (2024), and Disli, Yilmaz, and Mohamed (2022) in the literature, it differs from the studies conducted by Arhinful, Mensah, and Owusu-Sarfo (2024), Birindelli, Dell'Atti, Iannuzzi, and Savioli (2018), Husted & Sousa-Filho (2019), and Suttipun (2021). Large boards of directors may lead to a loss of efficiency in decision-making processes, making it challenging to implement strategies related to ESG performance. Increased coordination costs and stakeholder disagreements can further hinder the consistent adoption of ESG policies. These findings indicate that as board size increases, decision-making mechanisms tend to become longer and more complex, which may negatively affect the effective implementation of ESG-related strategies.

Table 7. Results of Robust Fixed Effects Regression Analysis

Variables	Hypothesis	Exp. Sign.	b/(t)
B_Size	H1	-	-.0246*** (-3.91)
B_Gend	H2	+	.3928*** (2.86)
B_Skill	H3	+	.1296** (2.47)
B_Affi	H4	+	-.0580 (-1.59)
Firm_Size			.1238*** (5.47)
LEV			-.0154 (-0.16)
ROA			.1917 (1.60)
Constant			-1.9158*** (-3.67)
Number of Firms			62
Observation			325
F test			17.19
Prob>F			0.0000
R-sq: within			0.4279

***, ** and * indicate a significance level of 1%, 5% and 10%, respectively.

Table 7 shows that gender diversity (B_Gend) on the board of directors positively and significantly affects ESG performance. This finding is similar to the results obtained by Bigelli, Mengoli, and Sandri (2023), Birindelli, Dell'Atti, Iannuzzi, and Savioli (2018), Disli, Yilmaz, and Mohamed (2022), Suttipun, (2021), Ünal, Temiz, and Özdemir (2024), and Wasiuzzaman & Subramaniam (2023) in the literature, while it differs from the studies conducted by Husted and Sousa-Filho (2019) and Abdelkader, Gao, and Elamer (2024). Boards of directors with female directors tend to give more importance to sustainability-oriented strategies. This situation, which is frequently emphasized in the literature, can be explained by the fact that female directors are more sensitive to ethical management, social responsibility, and environmental sustainability issues.

The skills and expertise of board members (B_Skill) positively influence ESG performance. This effect is consistent with the findings reported by Arhinful, Mensah, and Owusu-Sarfo (2024), Birindelli, Dell'Atti, Iannuzzi, and Savioli (2018), Harjoto, Laksmana, and Lee (2015), and Shaukat, Qiu, & Trojanowski, (2016). Members with expertise in areas required by the industry, such as accounting, finance, and law, can play a more effective role in developing and implementing sustainability-focused strategies (Campanella, Serino, Crisci, & D'Ambra, 2021). Consequently, having members with industry expertise on the board of directors can contribute to the more effective adoption and implementation of ESG policies throughout the firm.

There is no significant negative relationship between board members' external affiliations (B_Affi) and ESG performance. This suggests that the multiple external affiliations held by executives may limit their focus on ESG initiatives. Although the literature indicates that managers with external affiliations can control environmental uncertainties, reduce uncertainties in strategy development and implementation, and contribute to firm strategies Pearce & Zahra (1992), overly affiliated members may not give sufficient importance to ESG practices due to conflicts of interest and time constraints. Furthermore, managers with an industrial background tend to have a profit-oriented perspective, which may lead them to prioritize environmental responsibilities less (Kassinis & Vafeas, 2002). This situation can be considered a possible reason why the relationship between board members' external affiliations and ESG performance is not positive.

As a result, this study provides important insights by examining the effects of board characteristics on ESG performance. The analysis reveals that board size (H1) negatively and significantly affects ESG performance, while gender diversity (H2) and the expertise level of board members (H3) positively and significantly contribute to ESG performance. In contrast, the external connections and relationships of board members (H4) do not appear to have a significant effect. These findings suggest that, in non-financial companies, board characteristics play a decisive role in shaping ESG policies, whereas institutional regulations may be more influential in other sectors. Overall, the results contribute to a deeper understanding of how board structures influence the development and implementation of sustainability strategies, highlighting the importance of board composition in fostering effective ESG performance.

5. CONCLUSION

ESG performance stands out as a key metric for assessing companies' long-term success and social contributions. This study examined 325 firm-year observations of 62 non-financial companies traded on the Borsa Istanbul (BIST) between 2014 and 2023 using unbalanced panel data. It analyzed the effects of board structural characteristics on ESG performance. The findings reveal that board composition plays a decisive role in ESG performance.

The analysis results indicate that board size has a negative impact on ESG performance. This can be explained by the difficulties in coordination in decision-making processes as the board grows and the presence of members who do not adequately fulfill their responsibilities (similar to free

riders). The literature also suggests that the ideal board size should be around eight or nine members, and that larger boards may decrease their effectiveness (Lipton & Lorsch, 1992: 67). In this context, companies need to optimize their boards not only in terms of size but also in terms of decision-making effectiveness and functional coordination. The findings also indicate that board gender diversity and the level of expertise and competence possessed by board members positively impact ESG performance. The presence of a sufficient number of women (Critical Mass Theory) on boards strengthens the impact of diversity on ESG. It fosters a more inclusive perspective in corporate decision-making processes (Yadav & Prashar, 2023). The presence of expert and competent board members improves the quality of ESG-related strategic decisions and contributes to companies' achievement of their long-term sustainability goals. These results support the assumption that the knowledge and skills of board members positively impact a firm's environmental and social performance, as predicted by resource dependence and agency theories.

On the other hand, the high busyness of members with external connections, their inability to dedicate sufficient time to the firm, and their attempts to juggle multiple tasks may limit their positive contribution to ESG performance. For companies, this result highlights the importance of strategic planning that considers the nature of board members' networks and the time they have available to the firm.

The findings also have practical and regulatory implications. Increasing gender diversity on boards and increasing the number of female directors to three or more is a key strategy to strengthen ESG performance. Furthermore, regulations that restrict the selection of board members who lack industry-specific knowledge, skills, and expertise can contribute to improving ESG performance. This allows companies to have more effective boards that both meet stakeholder expectations and support sustainability goals. The findings clearly highlight the importance of strategic and regulatory interventions aimed at board composition to improve ESG performance.

In the future, researchers can examine the effects of board characteristics on ESG performance using broader data sets and different methodologies. Furthermore, the long-term effects of corporate governance reforms and changes made by regulatory bodies on ESG can be investigated. Artificial intelligence and other digital transformation technologies, particularly using natural language processing (NLP) and machine learning techniques, can enable analysis of companies' sustainability reports and activity documents on a big data scale. This allows for more objective, rapid, and comprehensive assessments of the relationships between governance structures and ESG performance.

In conclusion, sustainability is not merely a choice; it is a strategic priority in the modern business world. It is recommended that companies carefully plan their board structure and consider regulatory frameworks in line with their long-term value creation objectives.

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