

BOARD DIVERSITY IMPACT ON CORPORATE PROFITABILITY AND ENVIRONMENTAL, SOCIAL, AND GOVERNANCE PERFORMANCE: A STUDY OF CORPORATE GOVERNANCE

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Abstract

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With the growing interest in understanding how environmental, social, and governance (ESG) factors interact and influence one another, as evidenced by increased attention from decision-makers, policymakers, stakeholders, investors, and corporate managers, this research aims to advance the existing literature on the subject (Ahmad et al., 2021; Al-Jaifi et al., 2023). This research aims to address a gap in the literature by examining the influence of board diversity (BD) in terms of board independence (BI) and gender diversity (GD) (i.e., female directors) on corporate ESG performance (ESGP), specifically considering the moderating effect of these two variables on the relationship between corporate profitability (CP) and ESGP. The analysis is based on a dataset encompassing 126 firm-year observations from 30 Saudi non-financial public listed companies spanning the period from 2013 to 2022. The results of the direct models show that CP has an insignificant negative impact, while BD, particularly in terms of independent directors and female directors, enhances ESGP. Moreover, the results from the moderation models indicate that while BI does not show a statistically significant positive impact on the relationship, GD demonstrates an insignificant negative effect on ESGP.

Keywords: ESG Performance, Corporate Profitability, Board Diversity, Board Independence, Board Gender Diversity, Female Directors, Saudi Arabia

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1. INTRODUCTION

The emerging challenge of climate change is a global phenomenon of immense magnitude that demands the attention of the international community (Alsagr & Van Hemmen, 2021; Daugaard & Ding, 2022). In light of escalating concerns regarding climate change, environmental degradation, and corporate misconduct, businesses have come under intense scrutiny as significant contributors to social, environmental, and economic problems (Aydoğmuş et al., 2022; Bamahros et al., 2022; Porter & Kramer, 2011; Weston & Nnadi, 2021). Recognizing the urgent need for environmental preservation, countries worldwide have taken steps to reduce pollution and encourage environmentally responsible behavior through initiatives such as carbon taxes and emissions trading schemes (Cheng et al., 2023; Ortiz-de-Mandojana et al., 2016). Consequently, governments have enacted updated legislation designed to safeguard the interests of consumers, investors, and other stakeholders (Cheng et al., 2023; Minutolo et al., 2019) and increasingly focused on implementing measures to address these issues in recent years. Consequently, the research focus has shifted towards investigating corporate environmental, social, and governance (ESG) factors, with particular emphasis on the association between ESG performance (ESGP) and corporate evaluation (Zhou et al., 2022).

Strategic decision-makers must address sustainability as a critical management paradigm to achieve competitive success in today's business landscape. Failure to do so may lead to the inevitable extinction of firms, according to experts. Furthermore, the integration of sustainability into a corporation's mission and stakeholder relationships is believed to be the defining factor for success or failure in the twenty-first century (Galbreath, 2011). In order to achieve their social and environmental objectives, companies may finance their initiatives through their own resources, which may subsequently impact their financial performance (FP). On the other hand, in the absence of such resources, these companies may seek debt financing and bear the financial burdens of interest in order to present themselves to society in a more ethical manner that is responsive to environmental and social developments.

The influence of corporate profitability (CP) and resources on ESG can be substantial, as demonstrated by a study conducted by Burkhardt et al. (2020). Their results highlight the importance of considering firm performance and resources when analyzing the ESG. Companies must balance their growth objectives with the prioritization of environmental concerns to ensure effective ESG practices. By doing so, firms can navigate resource constraints, maintain sustainable initiatives, and achieve positive environmental performance.

The demand for ESG data in the market is increasing, as ESG considerations serve as the foundation for sustainable investment (Ahmad et al., 2021; Ammer et al., 2020; Bamahros et al., 2022). Major rating agencies are increasingly focusing on analyzing ESG information and transforming it into quantitative data. Enhancing corporate ESG disclosure management, enhancing ESG ratings, and further improving ESGP will be key

elements of the strategy and policy for any listed company (Chen, 2023). This regulatory landscape has left companies susceptible to mounting pressure from both regulators and society at large, demanding greater accountability regarding environmental matters and climate change (Al-Jaifi et al., 2023). Consequently, businesses find themselves increasingly held responsible for their actions (Aydoğmuş et al., 2022; Weston & Nnadi, 2021; Yu et al., 2018). These institutional changes have not only redefined the competitive landscape but have also positioned environmental issues as a central focus within the realm of corporate governance discussion (Ortiz-de-Mandojana et al., 2016).

The sustainability of a company is closely intertwined with the extent to which it acknowledges and addresses the concerns of its various stakeholders, as per stakeholder theory. This theory emphasizes the importance of corporate boards adopting a stakeholder management approach that aims to optimize outcomes for all stakeholder groups rather than favoring a particular one, such as shareholders. Nevertheless, comprehending and satisfying the needs and anticipations of various stakeholders demands a relational standpoint and the proficiency to foster advantageous associations with every one of them (Galbreath, 2011).

The relationship between board characteristics and ESGP has garnered significant attention from decision-makers, policymakers, stakeholders, investors, and corporate managers (Ahmad et al., 2021; Minutolo et al., 2019). This growing interest stems from the need for a comprehensive understanding of how ESGP and various factors interact and influence each other (Ahmad et al., 2021; Al-Jaifi et al., 2023; Bilyay-Erdogan, 2022; Hamdi et al., 2022). Previous research has primarily focused on examining the direct impact of ESG on CP and performance (Hamdi et al., 2022) and has overlooked the impact of CP on ESGP taking into consideration the moderating effect of board attributes.

Corporate governance plays a crucial role in enhancing company performance, with a focus on implementing structures and mechanisms for effective corporate management. Key elements of corporate governance, such as board attributes including board independence (BI) and gender diversity (GD), have garnered limited attention in existing literature (Al-Jaifi et al., 2023; Rahmadani et al., 2023). Particularly within Gulf Cooperation Council (GCC) nations like Saudi Arabia, there is a lack of research exploring the influence of board attributes on ESGP despite growing recognition of environmental concerns (Arayssi et al., 2020). Therefore, a comprehensive investigation into the impact of CP on ESGP, while considering the moderating role of board attributes, is essential. Building upon previous literature, this study aims to address this research gap by examining how BI and GD, as pillars of corporate governance, influence the relationship between CP and ESGP. These board attributes are highlighted as critical moderating variables in the context of corporate performance and corporate social responsibility (CSR) (Pekovic & Vogt, 2021).

Furthermore, this research study adds valuable insights to the prevailing body of ESG literature by offering fresh empirical evidence derived from

a comprehensive investigation conducted in Saudi Arabia. This particular country, being an emerging market and a member of the GCC, does not enforce obligatory ESG disclosure by businesses, making the findings even more significant. The limited literature on environmental sustainability in developing markets makes the Saudi Arabian financial market an analytically interesting subject. Hence, there is still an emerging field for studying this issue in the country (Ammer et al., 2020).

This study employed unbalanced panel data comprising 126 firm-year observations from 30 non-financial public listed companies in Saudi Arabia over the period spanning from 2013 to 2022. The outcomes of this study emphasize the significant direct influence of board diversity (BD), specifically in terms of BI and GD, in enhancing ESGP. On the other hand, the impact of CP was found to be insignificant and negative. However, when considering BI and GD as moderators of the relationship between CP and ESGP, a nuanced picture emerged. Notably, the influence of BI exhibits a statistically insignificant positive effect on the relationship, in contrast to the insignificant negative effect demonstrated by GD.

The remainder of the paper is structured as follows. Section 2 offers a concise review of the literature on the connection between CP, BI, GD, and ESGP, and formulates the hypotheses. Section 3 outlines the methodology of the study. Section 4 presents the obtained results and Section 5 discusses them. Section 6 concludes the paper with an analysis of the study's limitations and suggestions for future research.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. ESG in Saudi Arabia

The incorporation of sustainability principles into the ESG investment strategy of the Public Investment Fund (PIF) of Saudi Arabia is advancing significantly. The country is taking steps to reduce its carbon footprint, promote sustainability, and ensure that its citizens have access to quality education and healthcare. Mohammed Al-Rumaih — chief executive officer (CEO) of the Saudi Stock Exchange (Tadawul) said: “As part of Vision 2030, ... our commitment to ESG is vital to achieving these goals. The Saudi Exchange has a central role to play in encouraging sustainable financial growth” (Institutional Investor, 2022, para.10). The Saudi government has set ambitious goals to reduce its greenhouse gas emissions by 30% by 2030 (Krimly, 2021).

Saudi Arabia's PIF is making strides in integrating sustainability principles into its ESG investment strategy, expanding its assets under management portfolio of \$450 billion and demonstrating a commitment to responsible investing. This is part of the government's broader objective to enhance the Kingdom's non-oil gross domestic product (GDP) by \$300 billion by 2025, with a focus on investing in listed companies engaged in renewable energy, water, electricity, and carbon management projects (Arab News, 2022). Moreover, the Saudi government is actively working towards enhancing social conditions by

implementing programs that promote equal access to education and healthcare for all citizens, irrespective of their socio-economic status.

Unlike many developed countries, Saudi Arabia allows companies to choose whether or not to disclose their ESG practices, making it an intriguing context for analysis (Harjoto & Wang, 2020). According to Ammer et al. (2020), the Tadawul's participation in the United Nations's Sustainable Stock Exchanges (UN SSE) Initiative in 2018 marked a significant step towards integrating sustainability into the Saudi capital market. Through this partnership, corporations are motivated to improve their commitment to sustainable practices, with a particular focus on social and environmental goals such as responsible production, consumption, and addressing climate-related challenges. This development highlights the increasing importance of incorporating ESG considerations into the operations and decision-making processes of firms operating in the Saudi market.

2.2. Theoretical framework

Prior empirical studies have extensively utilized three main theoretical perspectives, namely legitimacy theory, agency theory, and stakeholder theory, to establish a comprehensive understanding of the association between FP, governance mechanisms and ESGP (Bamahros et al., 2022; Bhatia & Makkar, 2019; Cheng et al., 2023; Naseem et al., 2017; Qureshi et al., 2020). By examining these theoretical perspectives, the link between board attributes and ESGP can be explored in a more scientific and professional manner.

The relationship between governance mechanisms, corporate ESG/CSR, and CP is often examined through the perspective of legitimacy theory, which suggests a social contract exists between a company and society wherein stakeholders bestow upon the company the right to operate (Bamahros et al., 2022). This social contract necessitates continuous reaffirmation and adherence to societal expectations, leading companies to emphasize CSR as a means to secure societal approval and legitimacy (Bhatia & Makkar, 2019). Companies with poor environmental and social performance may face risks to their social legitimacy and image, prompting them to disclose discretionary CSR performance statements to enhance stakeholder perceptions and uphold their moral claim to the social contract (Bilyay-Erdogan, 2022; Qureshi et al., 2020).

The importance of agency theory has been emphasized by a study conducted by Bhatia and Makkar (2019), highlighting the role of board members in ensuring stakeholder interests are prioritized through vigilant oversight of managerial decisions to prevent conflicts and opportunistic behavior. This approach, as indicated by García Martín and Herrero (2018), can help mitigate agency problems and associated costs, ultimately strengthening the internal control system. Consequently, the implementation of an enhanced governance structure not only boosts managers' performance but also elevates the effectiveness of ESG initiatives (Naseem et al., 2017).

The importance of stakeholder theory lies in advocating for firms to prioritize the interests of all

stakeholders, showcasing the value of a diverse board in representing various shareholder viewpoints, especially those concerning environmental matters (Al-Jaifi et al., 2023). According to stakeholder theory, the success of a company hinges on not just shareholder concerns, but also those of employees, clients, the environment, local communities, and others, driven by legal, economic, and ethical considerations (Cheng et al., 2023). Consequently, enhancing corporate governance practices plays a crucial role in elevating levels of corporate social performance (DasGupta & Pathak, 2023). Fostering enduring relationships with stakeholders requires firms to address the expectations and concerns of key stakeholders through transparent reporting of sustainability efforts in the realm of ESG initiatives (Bamahros et al., 2022).

2.3. Corporate profitability and ESG performance

The concept of ESG has become increasingly important in the corporate world in recent times (Ahmad et al., 2021; Ballesteros et al., 2012; Galletta et al., 2022; Harjoto & Wang, 2020; Nollet et al., 2016; Usman & Amran, 2015; Zhou et al., 2022) and received a growing interest among both business professionals and academics (Ahmad et al., 2021; Bilyay-Erdogan, 2022; Cheng et al., 2023). According to Cheng et al. (2023), corporate ESG is of increasing importance due to the rise in demand for ESG data in sustainable investment. Rating agencies and market participants now place greater emphasis on analyzing ESG information and transforming it into quantitative data. As a result, listed companies are heavily focusing on enhancing their ESG disclosure management, improving ESG ratings, and ultimately enhancing their overall ESGP.

The concept of ESG encompasses environment, social responsibility, and governance, with a primary emphasis on evaluating the performance of an enterprise or company's investment strategy through the lens of sustainability and ethical impact (Ahmad et al., 2021; Cheng et al., 2023). ESG serves as a means of measuring the extent of a company's involvement in CSR, representing the "sustainable efficiency of a firm" (Baran et al., 2022). Integrating ESGP indicators is widely considered the most effective approach to evaluating a company's sustainable performance, aligning with the concept of sustainable financial value which encompasses the integration of ESG considerations within the standard financial framework (Hřebíček et al., 2014).

According to stakeholder theory, multiple studies have consistently indicated that companies achieving excellence in ESGP experience superior FP and enjoy higher market valuation compared to their industry counterparts (Chouaibi et al., 2021; Hamdi et al., 2022). The association between specific components of ESG and FP may differ across different market contexts (Hamdi et al., 2022). As businesses increasingly recognize the importance of ESG considerations in their operations, they are faced with the challenge of translating these ethical principles into the best business results (Syed, 2017). One challenge associated with the implementation of ESG into business is understanding the potential benefits that can be gained from implementing such

initiatives. Extensive research has been conducted to understand the benefits of ESGP, and the evidence suggests that it holds significant value for corporations (Aydoğmuş et al., 2022; Bilyay-Erdogan, 2022; Burkhardt et al., 2020; Cheng et al., 2023). Companies that demonstrate stronger ESGP are often valued more highly in the market (Ahmad et al., 2021; Jo & Harjoto, 2011; Zhou et al., 2022) and may lead to higher financial return and higher certainty equivalent return (Ahmed et al., 2021).

In addition, companies with robust ESGP enjoy reduced costs of equity (Dhaliwal et al., 2010). This suggests that investors view these companies as less risky and are willing to accept lower returns in exchange for holding their shares. Furthermore, improved credit ratings have been associated with companies that prioritize ESGP (Attig et al., 2013). Lenders and credit agencies perceive these companies as more creditworthy, which can lead to lower borrowing costs and increased access to capital. Lastly, companies with strong ESGP exhibit higher analyst forecast accuracy (Dhaliwal et al., 2011). This suggests that their commitment to ESG practices provides analysts with valuable information and insights, enabling them to make more accurate predictions about future FP.

In a recent investigation carried out by Burkhardt et al. (2020), the objective was to examine the potential impact of FP on the association between GD and environmental performance. It was found that firms facing resource constraints and driven by growth objectives may compromise their environmental initiatives and sustainability practices. This suggests that prioritizing environmental concerns and effectively addressing ESG factors can be challenging for such firms.

Contrary to popular belief, certain perspectives argue that the incorporation of ESG considerations can have a detrimental impact on expected returns (Hong & Kacperczyk, 2009). However, Nollet et al. (2016) contend that the connection between a company's FP and its CSR remains tenuous. Though a positive correlation has been commonly observed, there have also been instances of negative outcomes (Mittal et al., 2008) and inconsistent findings (Schreck, 2011).

In the Saudi context, a recent research study conducted over the decade from 2010 to 2019 has revealed findings that shed light on the relationship between CP and ESG disclosure among non-financial public listed companies. The study, carried out by Bamahros et al. (2022), found that the return on equity (ROE) as a measure of CP did not demonstrate a significant influence on the extent of ESG disclosures made by these companies.

Thus, the first research hypotheses formulated is as follows:

H1: Corporate profitability affects corporate ESG performance.

2.4. Board independence

The effectiveness of corporate governance hinges significantly on the presence of independent directors within the board structure, acting as a crucial monitoring mechanism to safeguard shareholder interests while maintaining a delicate balance with management (Al-Jaifi et al., 2023). Furthermore, independent directors play a pivotal

role in driving sustainable initiatives within organizations, emphasizing the critical need for a comprehensive examination of their impact on ESGP, particularly in emerging markets (Shakil et al., 2021).

Drawing from the agency theory, independent directors are endowed with greater oversight and control over managerial functions, ensuring a level of accountability that aligns with stakeholder expectations (Al-Jaifi et al., 2023). Their adherence to the tenets of the stakeholder theory further underscores their responsiveness to social demands, environmental concerns, and the imperative to integrate sustainable practices into corporate strategies (Cucari et al., 2018). As a consequence, firms with BI are more inclined to engage in environmental activities, disclose ESG-related information, and navigate the complex interplay between financial objectives and environmental stewardship (Akbas, 2016; Hamdi et al., 2022; Khan et al., 2013; Liao et al., 2015).

It is evident that independent directors wield a significant influence over ESGP, environmental endeavors, and the harmonization of divergent interests among managers, shareholders, and stakeholders (García Martín & Herrero, 2020; Kufo & Shtembari, 2023). By prioritizing board compositions dominated by independent outsiders, companies strive to bolster accountability and transparency within their governance frameworks, thus fostering an environment where decisions are made in the best interests of all stakeholders, including shareholders and society at large (Kufo & Shtembari, 2023). The strong ethical compass exhibited by independent directors, driven by a keen awareness of their reputational risks and societal responsibilities, propels them to navigate corporate landscapes with prudence and deliberation (Khan et al., 2013; Kufo & Shtembari, 2023).

Contrary to prevailing assumptions, a study conducted by Bamahros et al. (2022) in the Saudi context explored the relationship between BI and the level of ESG disclosure in non-financial public listed companies. The findings of the research unveiled that there was no substantial evidence to support the idea that BI directly impacts the extent of ESG disclosures within these companies.

Thus, the second and third research hypotheses formulated are as follows:

H2: Board independence affects corporate ESG performance.

H3: Board independence moderates the relationship between corporate profitability and ESG performance.

2.5. Board gender diversity

The literature on the environment and sustainability underscores the potential impact of having a diverse gender composition on the board of directors, in relation to both financial outcomes and the performance of companies in terms of ESG factors (Burkhardt et al., 2020). The significance of women in board positions has recently gained considerable attention, with several countries even implementing laws to ensure female representation on corporate boards. Despite these efforts, the existing research has failed to present

compelling evidence regarding the impact of women on boards of directors. Therefore, further examinations are required to delve into the influence of women directors on both board decision-making and effectiveness (Nielsen & Huse, 2010).

Increasing GD on boards has been shown to have implications for stakeholder relationships and corporate accountability, leading to improved ethical conduct and economic and social growth (Galbreath, 2011). Several studies, such as the research conducted by Al-Jaifi et al. (2023) and García Martín and Herrero (2018), have put forth the notion that boards comprising a diverse range of genders possess a heightened awareness and understanding of social and environmental matters. According to Nielsen and Huse (2010), women have the ability to wield their influence when it comes to CSR and environmental initiatives. This heightened sensitivity towards such issues underscores the substantial influence that female directors can have in shaping organizational practices. This sensitivity can be attributed, in part, to women's professional experience, as women have often worked in companies with a stronger social and environmental focus due to gender inequalities (García Martín & Herrero, 2020). Moreover, female directors have a greater likelihood of effectively engaging with various stakeholders and meeting their needs, showcasing social responsiveness (Galbreath, 2011).

The operational control tasks of the board include the monitoring of budgetary and planning cycles. Strategic control, on the other hand, encompasses various activities such as engaging in long-term strategy discussions, conducting environmental monitoring, benchmarking performance, and utilizing quality indices. Additionally, it involves active engagement with stakeholders to ensure effective governance and decision-making (Nielsen & Huse, 2010). By fostering greater GD on corporate boards, companies can improve their sustainability performance and strengthen their commitment to stakeholder engagement, while also addressing challenges that may limit the effectiveness of women as directors in shaping environmental outcomes (Galbreath, 2011). However, according to Cambrea et al. (2023), the presence of women as independent directors does not directly impact ESGP. The researchers propose that female board members may be more effective in enhancing ESG outcomes if they assume advisory roles rather than strictly monitoring ones.

Systemic barriers and biases often impede women directors from fully contributing to sustainable decisions, as male directors may exhibit sex-based biases that limit female influence on environmental matters (Galbreath, 2011). Recent studies suggest that a critical mass of at least two female directors on boards enhances decision-making processes and corporate responsiveness to stakeholder demands, particularly in addressing climate change impacts. Achieving this critical mass of female directors has been shown to significantly improve a company's carbon performance, emphasizing the importance of increasing women's representation on corporate boards for effective sustainability initiatives (Ben-Amar et al., 2017; Burkhardt et al., 2020; Number & Velte, 2021).

These results suggest that increasing GD on corporate boards can have a beneficial impact on stakeholder relationships, accountability, and ethical conduct, ultimately leading to enhanced ESGP. Based on that, the fourth and fifth hypotheses can be formulated as follows:

H4: Board gender diversity affects corporate ESG performance.

H5: Board gender diversity moderates the relationship between corporate profitability and ESG performance.

3. RESEARCH METHODOLOGY

3.1. Sample and data sources

This study's data is obtained from the Refinitiv database, formerly known as ASSET4 and subsequently rebranded as Thomson Reuters ESG Scores in 2017 (De Villiers et al., 2022). These scores, range from 0 to 100 and are used by researchers (Ahmad et al., 2021). This data source has been widely recognized for its credibility, consistency (Al-Jaifi et al., 2023), and widespread utilization

(Ahmed et al., 2021; Al-Jaifi et al., 2023; Burkhardt et al., 2020; García Martín & Herrero, 2020; Kouaib, 2022).

Some studies have developed an index to quantify a company's sustainable efforts by assessing its responses to 39 environment-related questions, rather than relying on the ASSET4 database for ESG measurement (García Martín & Herrero, 2020). Nevertheless, De Villiers et al. (2022) highlighted in their literature review that previous CSR research extensively employs Thomson Reuters' ASSET4 database, indicating that studies using ASSET4 are well acknowledged in the literature.

All public listed companies in Tadawul from 2013 to 2022 have been included in our initial sample (227 companies, 2270 firm-year observations). We exclude all the financial companies listed under banks, diversified financials and insurance sectors (46 companies, 460 firm-year observations). After that, we exclude all observations with missing data. This left unbalanced panel data with 126 firm-year observations of 30 companies as can be shown in Table 1.

Table 1. Sample composition

Sector	Frequency	Percentage	Cum.
Commercial & professional services	2	1.59	1.59
Consumer services	3	2.38	3.97
Energy	4	3.17	7.14
Food & beverages	12	9.52	16.67
Food & staples retailing	4	3.17	19.84
Healthcare equipment & services	7	5.56	25.4
Materials	52	41.27	66.67
Real estate management & development	6	4.76	71.43
Retailing	4	3.17	74.6
Software & services	1	0.79	75.4
Telecommunication services	22	17.46	92.86
Utilities	9	7.14	100
Total	126	100	

3.2. Regression model and variables definitions

This study employs unbalanced panel data regression models to investigate the impact of CP, and board attributes (specifically BI and GD) on ESGP, while also exploring the moderating role of these board attributes within a panel data framework to enhance generalizability and minimize

temporal errors (Bell et al., 2022). The random effects model is chosen due to its assumption of randomly distributed firm-specific terms, which increases efficiency and eliminates the need to estimate parameters for each individual firm (Ahmad et al., 2021). A number of models were formulated to outline the parameters of this investigation:

$$ESG = \alpha_0 + \beta_1(Roa)_{it} + \beta_2(Logassets)_{it} + \beta_3(Cashflow)_{it} + \beta_4(Sec)_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

$$ESG = \alpha_0 + \beta_1(indep_perc)_{it} + \beta_2(Logassets)_{it} + \beta_3(Cashflow)_{it} + \beta_4(Sec)_{it} + \mu_i + \varepsilon_{it} \quad (2)$$

$$ESG = \alpha_0 + \beta_1(gender_perc)_{it} + \beta_2(Logassets)_{it} + \beta_3(Cashflow)_{it} + \beta_4(Sec)_{it} + \mu_i + \varepsilon_{it} \quad (3)$$

$$ESG = \alpha_0 + \beta_1(Roa)_{it} + \beta_2(indep_perc)_{it} + \beta_3(gender_perc)_{it} + \beta_4(Logassets)_{it} + \beta_5(Cashflow)_{it} + \beta_6(Sec)_{it} + \mu_i + \varepsilon_{it} \quad (4)$$

$$ESG = \alpha_0 + \beta_1(Roa)_{it} + \beta_2(indep_perc)_{it} + \beta_3(indepXroa)_{it} + \beta_4(Logassets)_{it} + \beta_5(Cashflow)_{it} + \beta_6(Sec)_{it} + \mu_i + \varepsilon_{it} \quad (5)$$

$$ESG = \alpha_0 + \beta_1(Roa)_{it} + \beta_2(gender_perc)_{it} + \beta_3(genderXroa)_{it} + \beta_4(Logassets)_{it} + \beta_5(Cashflow)_{it} + \beta_6(Sec)_{it} + \mu_i + \varepsilon_{it} \quad (6)$$

$$ESG = \alpha_0 + \beta_1(Roa)_{it} + \beta_2(indep_perc)_{it} + \beta_3(gender_perc)_{it} + \beta_4(indepXroa)_{it} + \beta_5(genderXroa)_{it} + \beta_6(Logassets)_{it} + \beta_7(Cashflow)_{it} + \beta_8(Sec)_{it} + \mu_i + \varepsilon_{it} \quad (7)$$

where, α is the intercept, β 's are the regression coefficients, i the individual firm, t the period and ε the error term. The dependent variable (DV) of our study is ESGP (ESG), and the independent variables (IVs) include the CP (return on assets — *Roa*), BI (*indep_perc*), and board GD (*gender_perc*). In addition to the IVs, our study incorporates control variables (CVs) to mitigate any external influences. Following prior studies such as Al-Jaifi et al. (2023) and Kouaib (2022), these control variables

encompass the firm's size (*Logassets*), cash flow (*Cashflow*) and industry sector (*Sec*). To further explore the moderating impact of BD, we introduce interaction terms in the form of multiplication. These terms, such as *indepXroa* and *genderXroa*, serve as indicators of the moderation effect in our analysis.

To provide a comprehensive overview of our measurement framework, we have presented a detailed breakdown of the DV, IVs, and CVs in Table 2.

Table 2. Variables definitions and measurements

Variables	Acronym	Measurement	Expected sign
Dependent variable			
ESG performance	<i>ESG</i>	The aggregated ESG index score was constructed using the annual ESG factors provided by the Refinitiv database	
Independent variables			
Corporate profitability	<i>Roa</i>	Return on assets which is the percentage of net income to total assets	(+)
Board independence	<i>indep_perc</i>	Percentage of independent non-executive directors to the total number of directors on the board of a firm	(+)
Board gender diversity	<i>gender_perc</i>	Percentage of female directors to the total number of directors on the board of a firm	(+)
Moderating variables			
Interaction of board independence and firm profitability	<i>indepXroa</i>	Multiplication term of board independence and firm profitability	(+)
Interaction of board gender diversity and firm profitability	<i>genderXroa</i>	Multiplication term of board GD and firm profitability	(+)
Control variables			
Corporate size	<i>Logassets</i>	Natural logarithm of total assets	
Corporate cash flow	<i>Cashflow</i>	Corporate cash flow	
Industry sector	<i>Sec</i>	Dummy for industries	

4. RESEARCH RESULTS

4.1. Descriptive results

The descriptive statistics for all the variables of this study are shown in Table 3. With respect to the ESGP, the statistics reported that the mean value

is 31% with a minimum of less than 1% and a maximum of 78%. This average is higher than the average of 20.23% and 19.66% reported by Kouaib (2022) and Kouaib and Amara (2022) respectively. These findings also provide evidence of the big differences in board behaviours toward corporate ESG initiatives.

Table 3. Descriptive Statistics for independent, dependent and control variables

Variable	Obs.	Mean	Std. dev.	Min	Max	VIF	1/VIF
<i>ESG</i>	126	31.43874	20.86524	0.966269	77.97155		
<i>indep_perc</i>	126	41.83351	13.02907	9.090909	75	1.34	0.745136
<i>gender_perc</i>	126	1.464455	3.913632	0	18.18182	1.13	0.88714
<i>Roa</i>	126	8.501817	8.808817	-4.07	42.85	1.35	0.742507
<i>Logassets</i>	126	22.78662	1.622261	20.05909	27.22272	2.27	0.439646
<i>Cashflow</i>	126	5850000000	22700000000	-154000000	185000000000	2.09	0.477651
Mean VIF						1.64	

Note: VIF – variance inflation factor.

The mean percentage of independent directors is 41.8, ranging from 9 to 75. With regard to the proportion of female directors, the average percentage within the board, spanning from zero to 18.18, stands at 1.46. The analysis further reveals a notable dearth of female representation on the boards under scrutiny, signaling a bias towards

male occupancy, rather than embracing a gender balance. According to the findings of the study, the analysis demonstrates that the average CP stands at 8.5, with a minimum of -4 and a maximum of 42.85. This suggests that while certain companies from the sample experienced losses, there were also companies that achieved profits.

Table 4. Pairwise correlations among variables ($n = 126$ firm-year observations)

Variable	<i>ESG</i>	<i>indep_perc</i>	<i>gender_perc</i>	<i>Roa</i>	<i>Logassets</i>	<i>Cashflow</i>
<i>ESG</i>	1					
<i>indep_perc</i>	-0.2285**	1				
<i>gender_perc</i>	0.1080	0.0338	1			
<i>Roa</i>	-0.1550*	0.0993	0.0937	1		
<i>Logassets</i>	0.4714***	-0.4404***	0.1390	-0.1937**	1	
<i>Cashflow</i>	0.1426	-0.0491	0.3308***	0.2812***	0.5387***	1

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed significance).

Table 4 shows the results of the Pearson pairwise correlations to determine the relationships among the variables. The outcomes of the analysis demonstrate that there exists a negative correlation between ESGP and BI ($r = -0.2285$), as well as CP ($r = -0.1550$), significant at the 5% and 1% levels of significance respectively. This implies that when the proportion of independent directors and CP increment, the performance of firms in terms of ESG tends to decline. The analysis indicates a significant positive association between ESGP and corporate size. Upon examination of the correlation matrix, it becomes evident that there is no correlation among the independent variables, with the highest correlation coefficient being 0.5387. This observation demonstrates that the presence of multicollinearity is not a concern in this analysis (Alsagr & Van Hemmen, 2021).

4.2. Diagnostic tests

In order to ensure the accuracy of the findings obtained from the regression analysis, the VIF and tolerance factor (1/VIF) were utilized to examine multicollinearity (Al-Dubai, 2023), while the Wooldridge test and modified Wald test were employed to examine autocorrelation and groupwise heteroskedasticity, respectively (Al-Dubai & Abdelhalim, 2021; Al-Dubai &

Alotaibi, 2023; Alshirah et al., 2021). The analysis of the results presented in Table 3 indicates that there is no need for concern regarding the presence of multicollinearity as both the VIF and the 1/VIF values reported are significantly below the recommended thresholds of 10 and 0.10, respectively (Hair et al., 2010; Pallant, 2011). Furthermore, all our models suffer from heteroscedasticity and autocorrelation problems. The insignificant Hausman test statistic suggested that the random-effects regression model was deemed more appropriate than the fixed-effects model.

4.3. Random-effects generalized least squares regression analysis results (Direct effect)

Table 5 presents the findings of the direct models utilized in this study, which aimed to test $H1$, $H2$, and $H4$. The results of the first model (Model 1) revealed a negative impact of CP on ESGP, albeit statistically insignificant. These findings align with Burkhardt et al.'s (2020) study, which also observed that CP insignificantly affected various environmental factors, including the aggregate score. The findings indicate that relying solely on CP may not be enough to improve ESGP. It is suggested that factors other than profitability might have a greater impact on driving ESGP within these corporate entities.

Table 5. Random-effects generalized least squares regressions, heteroskedasticity-robust standard errors (Direct effect)

Variable	Model 1		Model 2		Model 3		Model 4	
	Coef.	z	Coef.	z	Coef.	z	Coef.	z
<i>Roa</i>	-0.0528	-0.26					-0.0462	-0.22
<i>indep_perc</i>			0.280*	1.82			0.246*	1.87
<i>qender_perc</i>					1.421***	19.65	1.347***	21.66
<i>Logassets</i>	12.96***	5.42	14.63***	5.13	12.63***	6.91	14.27***	6.36
<i>Cashflow</i>	-3.95e-12	-0.19	-3.23e-11	-1.32	-1.02e-11	-0.52	-2.73e-11	-1.06
<i>Sec</i>	Included		Included		Included		Included	
<i>Cons</i>	-221.4***	-4.67	-274.1***	-4.34	-215.3***	-5.86	-264.2***	-5.52
Number of obs.	126		126		126		126	
Number of groups	30		30		30		30	
Obs. per group								
Min	1		1		1		1	
Average	4.2		4.2		4.2		4.2	
Max	10		10		10		10	
R ² within	0.1362		0.2081		0.2674		0.3202	
R ² between	0.6518		0.6367		0.6715		0.6710	
R ² overall	0.5502		0.5495		0.5776		0.5877	
Prob > chi ²	0.0000		0.0000		0.0000		0.0000	

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed significance).

The results of Models 2, 3, and the joint model show that BI and GD have a positive impact on ESGP at 10% and 1% levels of significance, respectively. The findings of this study are in line with those of Cambrea et al. (2023) and Burkhardt et al. (2020) and provide strong evidence supporting the significant role that independent directors fulfil in corporate boards, as they actively advocate for the interests of both shareholders and stakeholders (Cambrea et al., 2023; Haniffa & Cooke, 2005). These directors are instrumental in promoting the implementation of long-term strategies, including CSR and sustainable business practices (Jo & Harjoto, 2011; Khan et al., 2013). It is noteworthy that independent directors exhibit heightened concern regarding the detrimental effects on their reputation when companies have a poor environmental track record (Burkhardt et al., 2020; Cambrea et al., 2023). In fact, they bear the potential responsibility for any environmental damages caused by the company itself.

In Models 3 and 4, the results reveal a significant and positive relationship between the GD and the ESGP, underscoring the beneficial impact of female representation on ESG initiatives within the firm. Moreover, it demonstrates that an increasing percentage of female directors yields even greater benefits in enhancing ESGP. These findings align closely with the research conducted by Al-Jaifi et al. (2023) in the Asia-Pacific region, which similarly highlights the positive and significant relationship between GD and ESGP. Furthermore, they are consistent with the conclusions drawn by Alazzani et al. (2017) regarding the influential role of a high proportion of female directors in improving the social performance of Malaysian companies. The study by Cambrea et al. (2023) further reinforces these observations by emphasizing the necessity of a critical mass of female directors to drive improvements in ESGP. In contrast to their

male counterparts, female directors exhibit distinct characteristics that shape their oversight of managers and the contributions they bring to board discussions (Cambrea et al., 2023). Notably, female directors demonstrate a greater sensitivity to societal needs (Alazzani et al., 2017), and are more inclined to foster goodwill and steer clear of risky propositions in order to cultivate strong relationships with stakeholders (Al-Jaifi et al., 2023).

4.4. Random-effects generalized least squares regression analysis results (Moderation effect)

Table 6 presents the results of moderation analyses examining the impact of BI (Model 1), GD (Model 2), and the combined impact of both variables (Model 3). In all models, the interaction terms of BI and CP (*indepXroa*), as well as GD and CP

(*genderXroa*), revealed positive and negative coefficients, respectively, though both were found to be statistically insignificant. These findings suggest that while BI and GD may have direct positive effects, these benefits could be diminished when companies prioritize CP over other considerations. This emphasis on profitability could lead to a reduced focus on sustainable practices and ultimately hinder the ability of diverse boards to drive superior ESGP. Therefore, it is essential for organizations to take into account additional factors such as their priorities and FP to ensure that diverse boards can effectively promote ESGP. Achieving a balance between short-term profitability goals and long-term benefits of ESG integration is critical for organizations to enhance their overall sustainability efforts.

Table 6. Random-effects generalized least squares regressions, heteroskedasticity-robust standard errors (Moderation effect)

Variable	Model 1		Model 2		Model 3	
	Coef.	z	Coef.	z	Coef.	z
<i>Roa</i>	-0.378	-0.92	-0.00625	-0.03	-0.190	-0.41
<i>indep_perc</i>	0.220	1.46			0.216	1.56
<i>indepXroa</i>	0.00703	0.58			0.00341	0.27
<i>gender_perc</i>			1.675***	5.97	1.411***	5.23
<i>genderXroa</i>			-0.0290	-0.94	-0.00760	-0.30
<i>Logassets</i>	14.50***	4.78	12.54***	6.06	14.14***	5.38
<i>Cashflow</i>	-3.61e-11	-0.98	1.02e-11	0.41	-2.73e-11	-0.61
<i>Sec</i>	Included		Included		Included	
Cons	-268.1***	-4.09	-213.4***	-5.22	-260.3***	-4.69
Number of obs.	126		126		126	
Number of groups	30		30		30	
Obs. per group						
Min	1		1		1	
Average	4.2		4.2		4.2	
Max	10		10		10	
R ² within	0.2080		0.2706		0.3206	
R ² between	0.6414		0.6718		0.6721	
R ² overall	0.5536		0.5783		0.5882	
Prob > chi ²	0.0000		0.0000		0.0000	

Note: **p* < 0.1, ***p* < 0.05, ****p* < 0.01. (two-tailed significance).

4.5. Robustness analysis results

In order to ensure the robustness of the findings, this study utilizes Prais-Winsten regressions, as depicted in Table 7, to reassess the direct influence of the three IVs. The outcomes presented in Models 3 and 4 validate the substantial and positive

direct impact of GD on ESGP. Additionally, we conducted a thorough analysis of the moderation effect by employing Prais-Winsten regressions. The results from Table 8 not only validate but also strengthen the findings presented in Table 6. This serves as strong evidence to support the robustness of our research conclusions.

Table 7. Praise-Winsten regression, heteroskedastic panels corrected standard errors (Direct effect)

Variable	Model 1		Model 2		Model 3		Model 4	
	Coef.	z	Coef.	z	Coef.	z	Coef.	z
<i>Roa</i>	-0.167	-1.42					-0.174	-1.53
<i>indep_perc</i>			0.108	1.03			0.127	1.18
<i>gender_perc</i>					0.864***	2.98	0.889***	3.17
<i>Logassets</i>	11.68***	9.03	12.45***	9.00	12.13***	9.86	12.52***	9.74
<i>Cashflow</i>	-3.95e-12	-0.08	-3.96e-11	-0.97	-3.16e-11	-0.63	-4.30e-12	-0.15
<i>Sec</i>	Included		Included		Included		Included	
Cons	-194.8***	-7.44	-218.9***	-7.21	-205.2***	-8.30	-220.2***	-7.53
Number of obs.	126		126		126		126	
Number of groups	30		30		30		30	
Obs. per group								
Min	1		1		1		1	
Average	4.2		4.2		4.2		4.2	
Max	10		10		10		10	
R ²	0.4436		0.4342		0.4773		0.4872	
Prob > chi ²	0.0000		0.0000		0.0000		0.0000	

Note: **p* < 0.1, ***p* < 0.05, ****p* < 0.01 (two-tailed significance).

Table 8. Praise-Winsten regression, heteroskedastic panels corrected standard errors (Moderation effect)

Variable	Model 1		Model 2		Model 3	
	Coef.	z	Coef.	z	Coef.	z
Roa	-0.450	-1.27	-0.143	-1.11	-0.169	-0.39
indep_perc	0.0550	0.39			0.115	0.82
indepXroa	0.00649	0.86			0.000537	0.06
gender_perc			1.103***	3.57	1.068***	2.94
genderXroa			-0.0308	-1.53	-0.0261	-0.92
Logassets	12.16***	9.23	11.74***	9.41	12.37***	9.38
Cashflow	-4.91e-13	-0.02	3.76e-11	1.41	2.76e-11	0.81
Sec	Included		Included		Included	
Cons	-209.3***	-6.80	-196.2***	-7.77	-216.6***	-7.09
Number of obs.	126		126		126	
Number of groups	30		30		30	
Obs. per group						
Min	1		1		1	
Average	4.2		4.2		4.2	
Max	10		10		10	
R ²	0.4629		0.4823		0.4836	
Prob > chi ²	0.0000		0.0000		0.0000	

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed significance).

In order to address potential endogeneity within our model, we conducted explicit endogeneity tests by utilizing the Hausman and Taylor (1981) instrumental variables approach (“xthtaylor” in Stata). This estimation technique allows for the consideration of both time-varying and time-invariant endogenous regressors (Beaudry & Larivière, 2016), and has been widely adopted in

both linear and nonlinear models (Hausman, 2019) for obtaining robust estimates in the presence of endogenously correlated explanatory variables (Arora & Gaur, 2022; Beaudry & Larivière, 2016; Hausman, 2019; Iimura & Cross, 2018). Following the methodology of Arora and Gaur (2022), we treated all main variables of interest as endogenous covariates in our empirical design.

Table 9. Hausman-Taylor estimation (Direct effect)

Variable	Model 1		Model 2		Model 3		Model 4	
	Coef.	z	Coef.	z	Coef.	z	Coef.	z
TV exogenous								
Cashflow	-6.05e-12	-0.06	-3.52e-11	-0.36	-9.45e-12	-0.10	-2.98e-11	-0.32
Logassets	13.22627***	4.83	15.17017***	5.48	12.55284***	5.10	14.24458***	5.56
TV endogenous								
Roa	-0.0355679	-0.20					-0.0160026	-0.10
indep_perc			0.3036868***	3.00			0.2535853***	2.64
gender_perc					1.514488***	4.31	1.395009***	4.06
TI exogenous								
Sec	Included		Included		Included		Included	
Number of obs.	126		126		126		126	
Number of groups	30		30		30		30	
sigma_u	15.529012		15.568231		13.498478		13.952988	
sigma_e	8.7253446		8.3414796		8.0331895		7.7296142	
Rho	0.76005046		0.7769506		0.73846209		0.76517598	

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. TV refers to time-varying; TI refers to time-invariant.

The outcomes of the Hausman-Taylor estimations depicting direct and moderating models in Tables 9 and 10 validate the findings from our primary models in Tables 5 and 6. The robustness of our random-effects generalized least squares

regressions is affirmed by the Hausman-Taylor estimator, underscoring our conclusion that BI and GD exert a positive influence on ESGP, although this impact may diminish when companies prioritize CP over other factors, as evidenced in Table 10's results.

Table 10. Hausman-Taylor estimation (Moderation effect)

	Model 1		Model 2		Model 3	
	Coef.	z	Coef.	z	Coef.	z
TV exogenous						
Cashflow	-3.84e-11	-0.38	1.06e-11	0.10	-2.85e-11	-0.27
Logassets	15.07522***	5.19	12.33401***	4.92	14.01634***	5.32
TV endogenous						
Roa	-0.2827098	-0.52	0.0327136	0.18	-0.1465062	-0.23
indep_perc	0.2569747*	1.80			0.2238637	1.59
indepXroa	0.0053139	0.47			0.0031261	0.25
gender_perc			1.806595***	3.14	1.465419**	2.32
genderXroa			-0.0328517	-0.65	-0.0081641	-0.14
TI exogenous						
Sec	Included		Included		Included	
Number of obs	126		126		126	
Number of groups	30		30		30	
sigma_u	16.147092		13.465635		13.868806	
sigma_e	8.3221862		8.0166142		7.7284132	
Rho	0.79011686		0.73831893		0.76305051	

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. TV refers to time-varying; TI refers to time-invariant.

5. DISCUSSION

The findings of this study provide further support for the existing literature that emphasizes the importance of BD, particularly in terms of BI and GD, for enhancing ESGP. Independent directors contribute significantly to corporate boards by advocating for the interests of shareholders and stakeholders alike (Burkhardt et al., 2020; Cambrea et al., 2023). Their active involvement helps in promoting long-term strategies, including the adoption of ESG and sustainable business practices (Jo & Harjoto, 2011; Khan et al., 2013). Moreover, they are more likely to be aware of the potential negative consequences of a poor environmental track record on their reputation and future directorship opportunities within other organizations (Burkhardt et al., 2020; Cambrea et al., 2023).

The presence of female directors on corporate boards is also found to have a positive impact on ESGP (Al-Jaifi et al., 2023; Cambrea et al., 2023). Research suggests that they bring distinct leadership qualities to the boardroom, which can enhance the quality of board discussions and oversight (García Martín & Herrero, 2020). These qualities often include more participatory and communal leadership styles compared to their male counterparts. By promoting GD within corporate boards, organizations can strengthen their commitment to stakeholder engagement and improve their overall ESGP.

However, it is important to recognize that the positive contribution of BI and GD may be compromised when CP becomes the primary focus. Companies prioritizing growth opportunities may allocate fewer resources towards sustainable practices, indicating a lower priority placed on achieving superior ESGP. This suggests that while board composition plays a significant role in shaping ESGP, other factors, such as company priorities and profitability, may interfere with the ability of diverse boards to fully influence sustainable practices. It is crucial for organizations to strike a balance between profitability and sustainable practices, understanding the long-term benefits of incorporating ESG considerations into their decision-making processes. By doing so, companies can effectively align their financial goals with their commitment to social and environmental responsibility.

6. CONCLUSION

In summary, the aim of this study was to investigate the moderating impact of BD, specifically in terms of

independence and gender, on the relationship between CP and ESGP. The research concentrated on non-financial Saudi public listed companies spanning from 2013 to 2022. The findings demonstrate that both BI and GD have a positive direct impact on ESGP. Furthermore, the results from the moderation analyses indicate that the interaction between BI and CP yields a positive coefficient, albeit not statistically significant. Similarly, the interaction between GD and CP results in an insignificant negative coefficient, contrary to the significant positive impact observed in the direct model. It is crucial to acknowledge that diverse boards may encounter challenges in fully leveraging ESGP if concerns about profitability overshadow the long-term advantages of incorporating ESG considerations into decision-making processes. Therefore, organizations should recognize ESGP as a strategic objective and integrate it as a fundamental component of their corporate governance practices. By doing so, they can enhance value not only for their stakeholders but also for the sustainable development of their business in the long term.

This research holds practical implications for organizations aiming to enhance their ESGP. Companies looking to improve their ESGP should prioritize balancing profitability with sustainable practices, recognizing that focusing solely on profit may hinder diverse boards' ability to drive sustainable initiatives and long-term success through integrating ESG considerations into decision-making processes for enhanced financial and ethical alignment.

A key limitation of our research lies in the exclusive use of the ASSET4 database for ESG measurement, necessitating future studies to explore additional data sources or deploy manual indices for validation. Moreover, are encouraged to delve into the individual impacts of ESG score components as alternative dependent variables, rather than solely focusing on aggregated scores. Future research on ESGP should consider exploring the moderating impact of various board attributes such as size, ownership, meetings, busyness, education, and experience, as well as examining the establishment of different organizational committees. A longitudinal analysis focusing on whether the presence of a CSR Sustainability Committee influences improvements in ESGP over time is recommended. Additionally, expanding beyond the analysis of CP to include other measures of performance, such as Tobin's Q, could offer valuable insights.

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