Research Article

Received: 8 September 2024 / Accepted: 31 October 2024 / Published: 05 November 2024

Corporate Governance and Firm Performance: Emphasis on Environmental Sustainability Performance: Evidence from Saudi Arabia

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DOI: https://doi.org/10.36941/ajis-2024-0183

Abstract

This study explores the connection between the characteristics of the board of directors and firm performance. Additionally, it examines whether environmental sustainability performance impacts the relationship between these characteristics and firm performance. This research utilized a sample composed of 917 firm-year observations, which were obtained from firms listed in Saudi Arabia during the years 2015 and 2021, using data gathered via annual reports of the companies listed in the Saudi market; Environmental, Social, and Governance standards were gathered from the Bloomberg database. More specifically, data on business performance are gathered from the data stream. This research employs ordinary least squares regression to investigate the immediate connections between the traits of the board of directors and the company's performance. In addition, the outcomes utilize Feasible Generalized Least Squares regression as an additional evaluation method. This study finds a substantial connection between board size, board independence, board meetings, environmental sustainability performance, and firm performance. Moreover, this study found that environmental sustainability performance does not affect the relationship between corporate governance and firm performance.

Keywords: *board of directors' characteristics, firm performance, environmental sustainability performance and Saudi Arabia market*

1. Introduction

This study is based on two ideas. First, corporate governance (CG) such as board characteristics (BDCs) affects firm performance (FIPE). Second, the ongoing discussion about the significance of environmental sustainability performance (ESP), measured by environmental, social, and governance (ESG) disclosures by corporations, has a moderating effect on the previously mentioned association. Environmental sustainability has become integral to CG because of the mounting pressure on businesses to adopt ethical and sustainable practices. Commonly referred to as ESG standards, these signify the incorporation of environmental factors into CG (Hoang, 2018). Moreover, when stakeholder pressure increases for firms' ethical and sustainable operations, the association between performance and governance and sustainability practices becomes relevant (Aguilera et al., 2021). Thus, over the last few years, the focus has been on the relationship between CG and FIPE, with a

specific focus on environmental sustainability (Hussain, Rigoni, & Orij, 2018).

One of the key purposes of many contemporary businesses is to improve their FIPE (Ajala & Adesanya, 2022). Despite the significance of FIPE to businesses, it can be affected by BDCs (Abubakar, Yahaya, & Joshua, 2023). Okolie and Uwejeyan (2022) defined BDCs as attributes that enable the effective pursuit of stakeholder interests, comprising both quantitative and qualitative elements. Quantitative factors include board size (BODSIZ) and independence (BODIND), whereas qualitative factors involve sound judgments and positive outcomes (Kamaludin, Ibrahim, & Sundarasen, 2020). Several scholars have concentrated their efforts on examining BDCs spearheaded by the renowned economist Adam Smith. Subsequently, investigators expanded their perspectives to discover the critical attributes of the board of directors and their influence on FIPE through extensive research and analysis (Kanakriyah, 2021). Furthermore, the COVID-19 pandemic and commercial crises have heightened the importance of enhancing FIPE and assessing the effectiveness of corporate boards. Thus, the efficiency of BDCs is contingent upon a set of characteristics that influence FIPE (Kanakriyah, 2021). Accordingly, the significance of this work lies in uncovering these qualities to aid in the development of board formation techniques that guarantee optimal performance.

How BDCs impact on performance and the moderating function of environmental sustainability are important questions for future research (Fayyaz, Jalal, Venditti, & Minguez-Vera, 2023). Thus, the uniqueness of this paper lies in its focus on examining the moderating effect of ESP measured by ESG on the association between BDCs and FIPE. The significance of corporate ESG activities has surged in response to the growing demand for sustainable development (Jung & Yoo, 2023). Furthermore, investors now view a company's ESG activities as crucial for investment decisions, given that ESG performance directly affects mid- to long-term value and FIPE (Abate, Basile, & Ferrari, 2021). This means that institutional investors act as agents of change, compelling their investee firms to adopt sustainable ESG practices. According to the literature, effective governance enhances long-term performance because there is a connection between a company's objectives and environmental and social goals (Alsayegh et al., 2020; Barko, Cremers, & Renneboog, 2021). For instance, when sustainability is incorporated in governance, these firms are in a position to address stakeholder demands (Matos, 2020). In the dynamic landscape of modern business, the intersection of environmental sustainability, FIPE, and CG is crucial (Alajaji, 2023). Hussain et al. (2018) also implied that understanding how environmentally conscious practices influence CG and performance is paramount on a global scale. Although CG systems strive to enhance accountability, transparency, and organizational efficiency, there is a research gap in incorporating environmental sustainability metrics into performance assessments (Alnor et al., 2023; Joshi & Li, 2016). Therefore, the incorporation of environmental factors into ESG frameworks warrants further exploration to understand their effects on CG practices and FIPE (Huang, 2022).

Thus, the main objective of this work is to address the significant gap between theoretical and empirical support for BDCs and ESP, and their relationship with FIPE. Furthermore, the study examines the role of ESP as a moderating factor that impacts the association between BDCs and FIPE using data from Saudi Arabia. Saudi Arabia is a member of the Group of the Twenty, and it provides a compelling backdrop for investigating the intricate relationships between CG frameworks, FIPE, and environmental sustainability, given its robust economic growth and commitment to achieving the sustainable development goals of Vision 2030 (Halisçelik & Soytas, 2019; Khalil, Khalil, & Khalil, 2022). Saudi Arabia also advocates ESG practices across industries as an example for the MENA region. Therefore, research exploring the relationship between CG, sustainability, and FIPE remains scarce despite this progress, which is a significant gap in the literature. Thus, this investigation provides empirical data on the effects of BDCs and ESP on FIPE. The conclusions will be of great use to those who need to make decisions in their countries, investors who are looking for new opportunities for effective investments, and leaders who want to make their countries' economies more efficient and stable.

Based on what has been explained and clarified above, this work builds a number of contributions to the literature, the most important of which are as follows: First, previous studies

focused solely on studying the variables of BDCs and FIPE or the variable of ESG with FIPE (Obeitoh, Bulusson, & Yusuf, 2023; Malik & Kashiramka, 2024). Accordingly, our study focused on combining the variables of BDCs and ESG with FIPE, because this combination will deliver a clear picture of how the variables of BDCs and FIPE or ESG interact with performance, and in turn enhance the previous literature that will help future researchers to take the results of this study into consideration. Our study also fills a research gap in the association between ESG and FIPE. As reported by Jung and Yoo (2023), there is a scarcity of investigate on the impact of ESG on FIPE. Second, previous research has focused on the association between CG variables and the variable of ESG with FIPE in developed countries, but there are few studies in the market of developing countries (Carnini Pulino et al, 2022). Third, there is a lack of explore on the moderating influence of ESG on the association between FIPE and BDCs. More importantly, this relationship has not yet been examined in Saudi Arabia. Thus, our study fills this gap by clarifying whether ESG enhances the connection between FIPE and BDCs.

This work is organized as follows: Section 2 reviews the literature and research hypotheses, including agency and stakeholder theories, which elucidate the relationship between BDCs and FIPE in the context of environmental sustainability. Section 3 outlines the research methodology and data collection processes. Section 4 presents the empirical findings and their implications. Finally, Section 5 discusses the study's outcomes, limitations, and potential avenues for future research.

2. Literature Review and Research Hypothesis

The relationship between BDCs and FIPE has garnered significant attention, particularly regarding sustainability practices. Academic interest in board diversity and independence has increased as businesses have come to recognize the importance of sustainability. Adams and Ferreira (2009) have shown that diverse boards are associated with better FIPE, with gender diversity enhancing governance and decision making. Ferrero-Ferrero, Fernández-Izquierdo, and Muñoz-Torres (2015) state that the importance of integrating environmental sustainability into CG practices is increasingly recognized.

The relationship between BDCs and FIPE can be explored by using several theoretical frameworks. Agency theory, a key CG framework, examines the dynamics between principals and agents, addressing conflicts of interest between executives or managers (agents) and shareholders or owners (principals) (Panda & Leepsa, 2017; Goshen & Squire, 2017). Agency theory highlights the pivotal function of the board in overseeing and regulating management, with the objective of ensuring that management's interests are in line with those of the shareholders (Panda & Leepsa, 2017; Tseer, Musah, & Avogo, 2023). Research indicates that increased board independence correlates with better governance and performance outcomes (Ntim & Osei, 2011), suggesting that a diverse and independent board enhances oversight, reduces agency conflicts, and ultimately leads to improved FIPE, with research indicating that increased board independence correlates with better governance and performance outcomes (Ntim & Osei, 2011).

Stakeholder theory also plays a crucial role in advocating addressing the concerns of all stakeholders, not just shareholders, for long-term success (Baumfield, 2016). According to this theory, stakeholders hold significant resources that are crucial to the success of businesses; hence, the need to maintain favorable relationships with them (Malik & Kashiramka, 2024). Diverse boards are better equipped to comprehend and meet needs of several stakeholders, leading to improved CG and performance. Research supports the idea that stakeholder-oriented governance can enhance a firm's reputation and performance (Baumfield, 2016). Effective management of stakeholder interests such as shareholders, suppliers, communities, and the environment is essential for a company's sustainability (Lozano, Carpenter, & Huisingh, 2015).

Stakeholder pressure is a key driver of sustainable practices (Xu et al., 2022), as stakeholder resources are essential for business success (Malik & Kashiramka, 2024). Eriandani and Winarno (2023) argue that strong performance in governance, social responsibility, and environmental sustainability enhances the perceived investor value. Therefore, the focus on sustainable practices has

led to studies examining their impact on the association between BDCs and FIPE. Jain and Jamali (2016) argued that boards committed to CG and socially responsible practices can improve a firm's reputation and performance. Similarly, Hussain et al. (2018) found that boards engaged in sustainability efforts often experienced enhanced FIPE. Wu (2017) also notes that boards dedicated to sustainability not only boost their ethical reputation, but also achieve better financial results. Thus, this paper discovers the connection between BDCs and FIPE by considering the moderating role of ESP measured by ESG disclosure. The significance of corporate ESG activities has surged in response to the growing demand for sustainable development (Jung & Yoo, 2023). Investors now view ESG activities as crucial to their decision-making processes, significantly impacting mid- to long-term values and FIPE (Abate, Basile, & Ferrari, 2021).

2.1 Board of directors' characteristics and Firm Performance

The board of directors serves as a significant governance mechanism with the primary objective of overseeing corporate actors and guiding strategic decisions. This is done with the goal of enhancing firms' overall performance of firms (Kumar & Zattoni, 2018). The extensive field of CG and business management has dedicated significant research attention to examining the association between the quality of BDCs and FIPE (Baysinger & Butler, 2019). Fayyaz et al. (2023) argue that, considering the significance of board diversity for effective CG, research has increasingly focused on the association between FIPE and board diversity. It is crucial to note that the effectiveness of a board is not universally applicable, as it can differ depending on elements such as industry, company size, and contextual circumstances, making a one-size-fits-all solution impractical (Ajai, 2019). Nevertheless, certain overarching characteristics have been identified as potential influencers of FIPE (Pagach & Warr, 2015).

In addition to elements such as BODSIZ and BODIND, which impact FIPE, the composition and diversity of the board are pivotal factors. Diverse boards encompassing individuals with varied backgrounds, skills, and perspectives have been identified as influential contributors to robust decision-making processes. Research suggests that such diversity fosters creativity, innovation, and adaptability, thereby enhancing a company's problem-solving capabilities and strategic considerations (Pucheta-Martínez & Gallego-Álvarez, 2020; Sierra-Morán et al, 2024). Beyond these traditional factors, demographic diversity, including age and gender, plays a significant role in administrative outcomes. A well-balanced and diverse board is vital for efficient decision-making, ultimately shaping the overall success of the organization (Fayyaz et al., 2023).

2.1.1 Board size and Firm Performance

The relationship between BODSIZ and FIPE has been extensively examined in CG literature, yielding a range of viewpoints. From an agency theory perspective, Volonté (2015) argues that having more directors can reduce agency conflicts, leading to better decision making and improved FIPE. According to this theory, larger corporate boards enhance their monitoring function, leading to improved FIPE (Agyemang Badu & Appiah, 2017). Furthermore, a larger board is argued to bring diverse perspectives and specialization, thereby enriching decision-making capabilities through increased resource accessibility, networks, and information (Joseph & Gaba, 2020). Studies such as those by Abdulazeez, Ndibe, and Mercy (2016), Bhatt and Bhattacharya (2015) and Johl et al. (2015) suggest that larger boards are positively correlated with improved performance. Similarly, Akhter and Hassan (2024), Abdullah (2023), and Nepal and Deb (2022) support the notion that increased BODSIZ positively contributes to FIPE, reinforcing the notion that larger boards may positively contribute to FIPE.

On the other hand, some research highlights that larger boards might increase a leader's authority and influence, potentially leading to more conflicts and a negative impact on performance (Alabdullah & Churiyah, 2023; Jenter, Schmid & Urban, 2023). Le, Ting, Kweh, and Ngo (2023) also

emphasize the detrimental effects of larger boards on FIPE. Ozkan (2011) argues that smaller boards are considered more effective because of the enhanced communication and interactions among directors, which in turn positively impacts FIPE. However, Lawal and Yahaya (2024) reported that BODSIZ was not related to FIPE.

As can be summarized from the above discussion, the connection between BODSIZ and FIPE is multifaceted. The differing viewpoints highlight the intricate relationship between BODSIZ and FIPE, underscoring the requirement for a nuanced comprehension of industry-specific market dynamics and corporate intricacy (Lawal & Yahaya, 2024). Based on the preceding discussion, the following hypothesis was formulated:

H1: There is a statistically significant relationship between BODSIZ and FIPE.

2.1.2 Board independence and Firm Performance

BODIND, which refers to the range to which a business's board of directors consists of individuals not involved in managerial or executive roles within the business, is a critical aspect of CG (Baysinger & Butler, 2019). Independent directors are predictable to represent shareholders' interests, deliver an unbiased viewpoint, and act as checks and balances (Bebchuk & Hamdani, 2017). The prevalent belief is that the inclusion of independent directors can enhance CG by monitoring and ensuring decisions align with shareholders' interests, serving as a check on management (Armour, Enriques, Hansmann, & Kraakman, 2017).

The body of research on BODIND and FIPE consistently underscores the critical role independent directors play in strengthening CG. According to Baysinger and Butler (2019) and Armour et al. (2017), independent directors, by not engaging in daily operations, provide impartial perspectives and serve as checks on management, which help align decisions with shareholders' interests and promote transparency and better governance, thus improving FIPE. According to agency theory, BODIND increases performance (Al-Absy & Hasan, 2023). This view is further supported by Alabdullah & Zubon (2023) and Hu, Lin, & Tosun (2023), who demonstrate that independent directors positively impact operational performance through effective oversight and conflict mitigation. Additionally, Liu, Miletkov, Wei, & Yang (2015) and Sethi, Sahu, & Maity (2023) confirm that independent directors enhance FIPE by offering valuable strategic guidance and oversight.

Nevertheless, some studies present conflicting relationships between the percentage of independent directors and FIPE. Fuzi, Halim, & Julizaerma (2016) and Karim, Manab, & Ismail (2023) argue that increasing the number of independent directors alone is insufficient to ensure improved performance; rather, it is crucial to focus on the quality and efficacy of these directors. Uribe-Bohorquez, Martínez-Ferrero, & García-Sánchez (2018) also highlight the positive impact of independent directors, noting their role in objective decision-making and improved governance. This collection of findings recommends that the efficiency of independent directors, through their meaningful contributions, expertise, and engagement, is a more critical element in defining FIPE than mere numerical presence. Additionally, earlier research suggests that maximizing the number of independent directors on a board does not necessarily lead to enhanced organizational performance (Bhatt & Bhattacharya, 2015; Fuzi et al., 2016; Johl et al., 2015; Rashid, 2018). Based on the preceding discourse, the hypothesis that follows has been developed:

H2: There is a statistically significant relationship between BODIND and FIPE.

2.1.3 Board meeting and Firm Performance

Board meetings (BODMET) are recognized as a vital component of CG, ensuring effective supervision to guarantee that management decisions align with the best interests of the commercial and its stakeholders (Garcia-Torea, Fernandez-Feijoo, & de la Cuesta, 2016). BODMET play a crucial role in determining the success and direction of a company (Fenwick, McCahery, & Vermeulen, 2019).

BODMET effectiveness can significantly influence a corporation's overall performance (Francis, Hasan, & Wu, 2015), serving as a platform for deliberating and making strategic decisions (Judge & Talaulicar, 2017). According to agency theory, corporate boards, which convene more often, possess a heightened ability to offer insightful advice, oversee, and discipline management, resulting in improved FIPE for the corporation (Ntim & Osei, 2011). Decisions taken during these meetings influence the firm's strategic orientation, with wise choices leading to more competitive strategies, enhanced overall performance, and improved strategies (Bouwman, Nikou, & de Reuver, 2019).

The association between the frequency and effectiveness of BODMET and FIPE is a multifaceted topic explored in various studies. Some studies, such as those by Alabdullah (2023) and Obeitoh et al. (2023), suggest a positive correlation between frequent BODMET and the overall FIPE. Others including research by Abdulsamad, Yusoff, & Lasyoud (2018), present a counterpoint, indicating that excessive meticulous planning and scheduling may adversely impact a firm's success. Similarly, Danoshana and Ravivathani (2019), Khatib and Nour (2021), and Johl et al. (2015) argued that an increase in the number of meetings may not always yield positive results and could potentially lead to decreased FIPE. They also found that FIPE is negatively affected by BODMET. Furthermore, Bhatt and Bhattacharya (2015) suggest that the mere frequency of meetings may not be the decisive factor; rather, the effectiveness, quality, and focus of these meetings, coupled with strategic decision making, play a more significant role in influencing a corporation's overall performance. In summary, the association between the frequency and thoroughness of BODMET and FIPE is nuanced, with varying perspectives highlighting the need for a deeply comprehending of BODMET dynamics and their contributions to a company's success. Drawing from the preceding discourse, the following hypothesis was devised.

H3: There is a statistically significant relationship between BODMET and FIPE.

2.1.4 Board commitment and Firm Performance

Another aspect of BDCs that has received attention from several authors is the level of board commitment (BODCOM), but it has unfortunately received insufficient attention in the literature. (Al-Matari, 2022). Thus, this study aimed to address this gap. BODCOM denotes the board of directors' dedication, involvement, and accountability in overseeing and guiding the organization's strategic direction (Naciti, 2019). A committed board ensures effective strategic oversight and aligns company initiatives with long-term goals (Salvioni, Gennari, & Bosetti, 2016). This commitment enables the organization to respond to market dynamics and seize opportunities, thereby improving its performance (Day & Schoemaker, 2016). According to agency theory, job separation leads to independent responsibilities, informed decision-making, enhanced firm evaluation and monitoring, stakeholder integrity, and information (Jensen, 1986).

BODCOM, characterized by the active participation and engagement of board members in governance activities, is vital for enhancing FIPE. According to Fenwick et al. (2019), the effectiveness of BODMET, which reflects BODCOM, significantly affects a company's overall performance. Their research indicates that committed boards are more likely to engage in strategic discussions that align with a firm's long-term goals, thereby improving performance outcomes. Additionally, Judge and Talaulicar (2017) emphasize that BODCOM is essential for effective decision-making processes. They argued that dedicated and actively involved board members contribute to better oversight and governance, leading to enhance financial performance. This finding supports the idea that a committed board is better equipped to navigate challenges and make informed decisions that benefit the firm.

Garcia-Torea et al. (2016) highlight the role of BODCOM in ensuring that management choices are consistent with the benefit of the business and its stakeholders. Their findings suggest that higher levels of BODCOM correlate with enhanced FIPE, as committed boards are more likely to prioritize a firm's strategic objectives and stakeholder interests. Similarly, Al-Matari (2022) finds that BODCOM has a positive influence on FIPE in the Saudi financial sector. Ejike and CNA (2020) also tested the

role of BODCOM on the impact of BDCs on FIPE, and found that BODSIZ and BODIND have significant positive effects on FIPE if they are extremely committed, meaning that BODCOM is related to FIPE. Based on the previous discussion, the following hypothesis is proposed.

H4: There is a statistically significant relationship between BODCOM and FIPE.

2.1.5 Board experience and Firm Performance

Board members with extensive experience not only bring industry expertise and strategic perspectives but also possess a deep understanding of the historical context and evolution of the business landscape (Clohessy & Acton, 2019). This historical perspective enables them to anticipate trends, assess risks, and formulate well-informed decisions consistent with the organization's long-term objectives. Their seasoning judgment is invaluable in steering the company through industry changes, economic fluctuations, and competitive challenges (Bolisani & Bratianu, 2017). In addition to navigating industry shifts, experienced board members are adept at long-term strategic planning, considering both immediate and future implications of decisions. Their ability to foresee potential obstacles and opportunities allows boards to develop robust and adaptive strategies that contribute to a company's sustained success (Bolisani & Bratianu, 2017).

Board experience (BODEXP), encompassing the knowledge, skills, and backgrounds of board members, is crucial for influencing FIPE. According to Williams (2018), experienced board members contribute to more informed decision making, leading to improved strategic outcomes for the firm. Their expertise allows them to effectively navigate complex business environments, thereby enhancing their overall performance. Day and Schoemaker (2016) also emphasize that experienced boards are more adept at responding to dynamic market conditions. Their research showed that boards with widespread experience are more inclined to formulate strategic decisions aligned with long-term business objectives, ultimately enhancing FIPE. This suggests that the collective experience of board members significantly affects a firm's ability to manage challenges and seize opportunities.

This study employed the ratio of accounting experts on the board as a metric for assessing BODEXP. Güner, Malmendier, and Tate (2008) emphasize that the significance of board members possessing an adequate comprehension of accounting principles and financial statements, as this will facilitate improved oversight and ultimately benefit shareholders. Some earlier research indicates a positive correlation between the accounting and financial experience of the board of directors and FIPE (Ahmad, Sadiqa, & Khan, 2021; Boshnak, Alsharif, & Alharthi, 2023; Johl et al., 2015; Lee, Wen, & Thi-Thanh-Nguyen, 2024; Zayed, 2017). Based on the preceding discussion, the following hypothesis is proposed.

H5: There is a statistically significant relationship between BODEXP and FIPE.

2.2 Environmental Sustainability Performance and Firm Performance

Stakeholder pressure is a major driving force behind businesses adopting and engaging in sustainable practices (Xu, Graves, Shan, & Yang, 2022). According to stakeholder theory, stakeholders hold significant resources that are vital to the achievement of businesses; hence, they need to maintain favorable relationships with them (Malik & Kashiramka, 2024). Hasanbeigi and Price (2015) and Javaid, Haleem, Singh, Suman, and Gonzalez (2022) note that the adoption of ecologically sustainable methods often leads to improved resource utilization and increased efficiency in waste reduction and reducing water usage, resulting in cost savings for the company. Thus, positive environmental sustainability strategies are increasingly linked to a growing body of data that positively influence various aspects of FIPE (Kearney & Morris, 2015). Martinez (2015) highlights that organizations aligning their operations with environmentally friendly principles tend to attract environmentally conscious consumers, thereby increasing brand loyalty. This enhanced customer loyalty can result in higher sales and profitability (Eriandani & Winarno, 2023), further supporting the relationship between ESP and overall FIPE.

In recent years, the significance of business ESG activities has improved owing to the increasing order of sustainable development (Jung & Yoo, 2023). Nowadays, investors also consider a firm's ESG activities to be a significant factor in their investment decisions. This is because a company's ESG act has a direct impact on its mid- to long-term values and FIPE (Abate, Basile, & Ferrari, 2021). Therefore, this paper utilizes ESG disclosure as a measure of ESP and considers studies that examined ESG disclosure's influence on FIPE.

Several investigations such as Carnini Pulino, Ciaburri, Magnanelli, and Nasta (2022); Dong, Liang, and Wanyin (2023); Eriandani and Winarno (2023); Malik and Kashiramka (2024), discovered that ESG positive influences FIPE. This positive influence is mainly supported by stakeholder theory, which asserts that investing in ESG initiatives leads to a positive reputation for a firm (Ademi & Klungseth, 2022). This theory also implies that by keeping a positive association with stakeholders can help companies gain a competitive edge (Freeman, Wicks, & Parmar, 2004). This subsequently leads to a rise in request for the business's products, ultimately resulting in a favorable impact on its financial performance (Behl, Kumari, Makhija, & Sharma, 2022). In contrast, Duque-Grisales and Aguilera-Caracuel (2021) and Ruan and Liu (2021) found that FIPE is negatively impacted by ESG. Furthermore, some works documented that ESG is not significantly related to FIPE (Junius, Adisurjo, Rijanto, & Adelina, 2020; Narula, Rao, Kumar, & Matta, 2024). Based on the preceding discussion, the following hypothesis was formulated:

H6: There is a statistically significant relationship between ESP and FIPE.

2.3 The moderating of Environmental Sustainability Performance on the association among Firm Performance and Board of directors' characteristics

Boards dedicated to CG play a critical role in shaping companies' ethical and social responsibility practices of companies (Jain & Jamali, 2016). Beyond their primary responsibility to ensure effective governance, boards often recognize the importance of adopting socially conscious policies. This broader focus is driven by the understanding that ethical considerations and social responsibility contribute to an enhanced reputation and standing for the business among stakeholders, including investors, consumers, and the public (Wu, 2017).

The ESP measured by ESG has been highlighted for its impact on FIPE in a few empirical studies. Although these investigates have shown mixed outcomes for the influence of ESG on FIPE, the stakeholder theory favor a positive connotation, which proposes that businesses should consider the needs of all stakeholders, including ESG factors, which are fundamental to this perspective (Bukari, Agyemang, & Bawuah, 2024). Ntim and Soobaroyen (2013) state that by introducing ESG factors into its CG structure, a company can significantly improve its reputation, reduce potential risks, and develop stronger connections with a diverse group of stakeholders, ultimately resulting in an improved FIPE corporation.

Although theories have shown the role of ESP in the association between BDCs and FIPE, very few empirical studies have examined this influence. This study attempts to fill this gap by investigating this relationship. However, studies have identified a negative correlation between the lack of BODIND and corporate social responsibility, governance, and FIPE. The absence of BODIND may compromise ethical decision making and hinder the implementation of accountable corporate practices, potentially impacting the corporation's long-term success (Karim et al., 2023). Jain and Jamali (2016) argue that boards dedicated to CG recognize the importance of adopting socially responsible policies to enhance a firm's reputation and performance. Their findings suggest that when boards prioritize sustainability, they positively influence the relationship between BDCs and FIPE. Hussain et al. (2018) also provided evidence that specific CG systems, when implemented, can generate support among practitioners for sustainable practices, resulting in a range of positive benefits for the organization. Their research indicates that boards actively engaging in sustainability initiatives can improve the overall FIPE. Additionally, earlier research outcomes imply that the connotation between a diverse board and company success is moderated and partially mediated by

ESG disclosure, reinforcing the idea that ESP moderates the relationship between BDCs and FIPE (Fayyaz et al., 2023). Based on these findings, we propose the following hypothesis:

H7: There is a statistically moderating effect of ESP on the relationship between BDCs and FIPE.

3. Research Method

To achieve the objectives of the study, correlational studies were utilized to investigate the relationship between BDCs, such as BODSIZ, BODIND, BODMET, BODCOM, and BODEXP as independent variables, FIPE as the dependent variable, and ESP as the moderating variable.

In this work, the panel data technique was used to investigate the impact of the independent variables on the dependent variable, namely, FIPE. Previous research in the accounting field has employed this method. Similarly, this study uses panel data. For example, in studies conducted by (Al-Matari, Al-Swidi, & Fadzil, 2014).

3.1 Data Collection

As discussed earlier, the data required for the study concerning BDCs are gathered from annual reports of the businesses listed in the Saudi market, and ESG is gathered from the Bloomberg database. Furthermore, data regarding FIPE were gathered from the data stream.

Our analysis was limited to Saudi companies that had an annual ESG rating in the Bloomberg database and had the necessary data from 2015 to 2021. The total number of companies listed on the Saudi market as of December 2021 is 216, and there are fewer missing data points for some companies with no reports of ESG are 85 firms. Thus, the final sample consists of 917 company-year observations, which are included in the study's models and represent 131 companies across the period from 2015 to 2021.

3.2 Measurement of variables

Descriptions of how to measure all variables as independent, dependent, moderating, and control variables are presented in Table 1.

Table 1: Measurement of All Variables

Variable and abbreviation	Measurement
Firm Performance, FIPE	It is measured market value added by the log of variance among the market value and book value of equity (Al-Matari, Al-Swidi, & Fadzil, 2014).
Board size, BODSIZ	It is calculated by the total number of board size (Johl et al, 2015).
Board independence, BODIND	It is estimated by the ration of board independence to gross number of board size (Johl et al, 2015).
Board meeting, BODMET	It is measured by how many annual meetings of board size per year (Johl et al, 2015).
Board commitment, BODCOM	It is measured by the ration of the meetings attendance for all the board members through a year (Al-Matari, 2022).
Board experience, BODEXP	The experience of the board is typically assessed based on the proportion of accounting experts serving on the board (Johl et al, 2015).
Environmental sustainability performance, ESP	It is measured by the Bloomberg score is based on the level of ESG disclosures such as, Environmental, Social and Governance made by a firm (Qasem et al, 2022).
ESG_ BODSIZ	Interaction between Environmental sustainability performance * Board size
ESG_ BODIND	Interaction between Environmental sustainability performance * Board independence

Variable and abbreviation	Measurement
ESG_ BODMET	Interaction between Environmental sustainability performance * Board meeting
ESG_ BODCOM	Interaction between Environmental sustainability performance * Board commitment
ESG_ BODEXP	Interaction between Environmental sustainability performance * Board experience
Growth, Growth	It is measured by the change in sales divided by lagged sales
Loss, LOSS	It is measured by dummy variable: 1 is the firm have loss and 0 if other (Al-Sayani, & Al-Matari, 2023)
Leverage, LEVG	It is estimated by gross debts to total assets (Al-Matari, 2021).
Total Assets, TOAS	The logarithm of market capitalisation (Al-Homaidi et al, 2021)

3.3 Model Regression

The goal of this study is to examine the relationship between BDCs and FIPE, and whether ESP impacts this relationship by utilizing the following two models:

Model 1:

FIPE =α0+β1* BODSIZ +β2* BODIND +β3* BODMET +β4* BODCOM +β5* BODEXP + β6*ESG +β7* Growth +β8* LOSS +β9* LEVG + β10* TOAS +β11*YEARS + ε (1)

Model 2:

FIPE =α0+β1* BODSIZ +β2* BODIND +β3* BODMET +β4* BODCOM +β5* BODEXP + β6*ESG + β7* ESG_ BODSIZ + β8* ESG_ BODIND + β9* ESG_ BODMET + β10* ESG_ BODCOM + β11* ESG_ BODEXP + β12* Growth +β13* LOSS +β14*LEVG + β15* TOAS +β16*YEARS + ε (2)

4. Study Findings

4.1 Descriptive Analysis

The descriptive statistics of the continuous variables are shown in Table 2. State version 18 was used to calculate the mean, standard deviation, and minimum and maximum of the descriptive statistics. Based on the descriptive analysis summarised in Table2, the mean value of the FIPE is -1506853, with a minimum of -1.09E+09 and a maximum of 3.71E+08. Moreover, the mean value of the BODSIZ, BODIND, BODMET, BODCOM, BODEXP and ESG are 7.601963, 0.386234, 5.805664, 0.90822, 1.962637 and 0.979677 with a minimum of 3, -0.06667, 3, 0.777778, 0 and -0.04054, and a maximum of 11, 0.604762, 18, 0.993333, 5 and 2.783784, respectively. Finally, the mean values of the control variables Growth, LOSS, LEVG, and TOASSET were 0.353083, 0.267176, 0.416961, and 2.36E+07, respectively.

Table 2: Results of Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
FIPE	917	-1506853	7.98E+07	-1.09E+09	3.71E+08
BODSIZ	917	7.601963	1.643844	3	11
BODIND	913	0.386234	0.095435	-0.06667	0.604762
BODMET	913	5.805664	2.23652	3	18
BODCOM	909	0.90822	0.038649	0.777778	0.993333
BODEXP	910	1.962637	0.866647	0	5
ESG	917	0.979677	0.71776	-0.04054	2.783784
Growth	917	0.353083	13.89853	-82.1065	409.3897
LOSS	917	0.267176	0.442726	0	1
LEVG	917	0.416961	0.237884	0	1.015606
TOAS	917	2.36E+07	1.14E+08	0	1.91E+09

4.2 Correlation Analysis

As shown in Table 3, Pearson's correlation analysis was applied to evaluate and elucidate the strengths of the relationships among the paper variables. Table 3 provides the correlation coefficient (r) values that show the strength of the association between the variables and aids in assessing this strength. The results of this study demonstrate that all correlations were lower than 0.80. This supports the claim that, in order to guarantee that the multicolinearity problem is not existing in this paper, the correlation matrix should not be greater than 0.80 (Tu, Clerehugh, & Gilthorpe, 2004).

Table 3: Results of Pearson Correlation Analysis

Variable	FIPE	BODSIZ	BODIND	BODMET	BODCOM	BODEXP	ESG	Growth	LEVG	TOAS
FIPE	1.000									
BODSIZ	0.201***	1.000								
BODIND	0.128***	0.361***	1.000							
BODMET	-0.004	0.219***	0.039***	1.000						
BODCOM	0.059	0.065*	0.068	-0.029	1.000					
BODEXP	0.066*	0.283***	0.076***	0.121***	0.099**	1.000				
ESG	0.368***	0.070***	-0.004	0.165***	0.065	0.045***	1.000			
Growth	0.079**	0.034	-0.004	0.025	-0.017	-0.002	0.057	1.000		
LEVG	0.112**	0.106***	0.177***	-0.025	-0.084**	-0.020	0.045*	-0.021	1.000	
TOAS	0.037	0.100**	0.009	0.004	0.002	0.091	0.034	0.044	0.015	1.000

Determining the variance inflation factor (VIF) in Table 4 is the next step to further investigate the potential issue of multicollinearity, as a VIF greater than 10 indicates a multicollinearity problem (Bennaceur et al., 2023). The observed VIF values ranged from 1.05 and 2.00, indicating the absence of multicollinearity.

Table 4: Multicollinearity Test

Variable	VIF	1/VIF
BODSIZ	1.31	0.762
BODIND	1.19	0.843
BODEXP	1.11	0.901
LEVG	1.11	0.902
LOSS	1.1	0.906
BODMET	1.09	0.916
ESG	1.09	0.921
BODCOM	1.03	0.968
TOAS	1.02	0.979
Growth	1.01	0.993
Mean VIF	1.11	

4.3 Regression Results

The Lagrange Multiplier (LM) test is performed to compare the ordinary least squares (OLS) and regression random effect (RE) models. These two models differ primarily in that they consider individual influences. Therefore, the existence or absence of ui, which stands for RE, can be the basis for the creation of a statistical test. The LM test was appropriate for this assessment. If the LM test yielded a significant chi-square value, meaning a p-value greater than 0.05, then the pooled estimation appropriateness of the null hypothesis was accepted. Based on the outcome of the LM analysis, the value of prob was more than 0.05; thus, the pooled OLS regression was appropriate. OLS

regression is the most commonly used regression technique, which assumes that the errors are homoscedastic and normally distributed (Hayes & Cai, 2007).

Table 5: Regression Results of Models

Variable	- Linear regression - model 1			Variable	- Linear regression - model 2		
	Coef.	t	P>t	FIPE	Coef.	t	P>t
BODSIZ	0.085	4.35	0.000	BODSIZ	0.069	2.09	0.037
BODIND	0.514	1.66	0.096	BODIND	0.144	0.26	0.795
BODMET	-0.038	-3.14	0.002	BODMET	-0.047	-1.89	0.059
BODCOM	0.281	0.4	0.691	BODCOM	0.711	0.62	0.535
BODEXP	0.007	0.21	0.837	BODEXP	0.038	0.65	0.518
ESG	0.388	9.45	0.000	ESG	0.503	0.52	0.601
ESG _ BODSIZ	-	-	-	ESG _ BODSIZ	0.016	0.64	0.522
ESG _ BODIND	-	-	-	ESG _ BODIND	0.339	0.79	0.431
ESG _ BODMET	-	-	-	ESG _ BODMET	0.008	0.4	0.687
ESG _ BODCOM	-	-	-	ESG _ BODCOM	-0.392	-0.38	0.706
ESG _ BODEXP	-	-	-	ESG _ BODEXP	-0.028	-0.6	0.549
Growth	0.003	1.75	0.08	Growth	0.003	1.68	0.094
LOSS	-0.151	-2.37	0.018	LOSS	-0.149	-2.32	0.02
LEVG	0.26	2.16	0.031	LEVG	0.264	2.16	0.031
TOAS	0.007	0.4	0.691	TOAS	0.006	0.36	0.722
YEARS				YEARS			
_cons	4.709	7.14	0.000	_cons	4.58	4.38	0.000
Number of obs	917			Number of obs	917		
Prob > F	0.000			Prob > F	0.000		
R-squared	0.224			R-squared	0.226		
Adj R-squared	0.205			Adj R-squared	0.202		
Root MSE	0.698			Root MSE	0.7		

The outcomes of the linear regression analysis revealed the impact of various independent variables on FIPE, presenting the coefficients, t-values, and p-values for each predictor. Notably, BODSIZ (Coef. = 0.085, t = 4.35, p = 0.000). The positive and statistically significant correlation between BODSIZ and FIPE, as indicated in Table 5, supports H1. This conclusion suggests that BODSIZ plays a key role in improving FIPE. Theoretically, our results support the idea put forth by agency theory that bigger business boards enhance their monitoring function, leading to improved FIPE (Agyemang Badu & Appiah, 2017). This conclusion aligns with Joseph and Gaba's (2020) arguments, which assert that a larger board fosters diverse perspectives and specialization, thereby enhancing decision-making capabilities by providing greater accessibility to resources, networks, and information. This finding aligns with the outcomes of prior studies, which also identified a significantly positive relationship between BODSIZ and FIPE (Akhter & Hassan, 2024; Alabdullah, 2023; Nepal & Deb, 2022).

As shown in Table 5, FIPE is positively affected by BODIND; thus, this outcome supports hypothesis H2 and aligns with agency theory, which recommends that BODIND increases performance (Al-Absy & Hasan, 2023). This positive influence demonstrates that incorporating more BONDING on the board enables the effective monitoring of manager behavior, resulting in enhanced FIPE. This means that having more BODIND on the board enhances oversight and decision-making by bringing in fresh perspectives, reducing the likelihood of bias, and removing conflicts of interest (Alabdullah & Zubon, 2023). This outcome aligns with previous investigate, such as Alabdullah and Zubon (2023) and Hu, Lin, and Tosun (2023), who found that BODIND positively influences FIPE.

Danoshana and Ravivathani (2019) and Johl et al. (2015) argued that an increase in the number of meetings may not always yield positive results and could potentially lead to decreased FIPE. The

outcomes of our study align with the arguments presented by the authors. Based on the outcomes in Table 5, BODMET negatively impacts FIPE; thus, hypothesis H3 is accepted. This negative association indicates that BODMET frequency does not enhance FIPE. This conclusion asserts that although frequent BODMET meetings are necessary for effective governance, an undue emphasis on quantity, without taking into account the quality of these meetings, can have a damaging influence on the performance of the organization (Bhatt & Bhattacharya, 2015). Furthermore, this outcome is consistent with a prior study that identified a significantly negative association between BODMET and FIPE (Abdulsamad, Yusoff, & Lasyoud, 2018; Khatib and Nour 2021; Johl et al., 2015). However, the outcomes of this investigate do not validate the hypotheses proposed by agency theory, which suggests that increased meeting frequency can result in enhanced FIPE (Ntim & Osei, 2011).

This study hypothesized that increased BODCOM and BODEXP prohibitively affect FIPE. This finding is not similar to the expectation, as apparent in Table 5. The p-values of BODCOM and BODEXP are 0.691and 0.837, respectively, meaning that the results do not support H4 and H5. This outcome indicates that directors' commitment to the board and financial experience are not necessary for improving FIPE. Thus, this result does not support the hypotheses presented by previous studies, which conclude that BODCOM and BODEXP contribute to the company's sustained success. Furthermore, this discovery is inconsistent with prior research that identified a significant connection between BODEXP and BODCOM and FIPE (Al-Matari, 2022; Lee et al., 2024).

Conversely, ESG (Coef. = 0.388, t = 9.45, p = 0.000) achieved statistical significance at the conventional level. This finding supports our predictions, which state that ESG has a relationship with FIPE; therefore, H6 is accepted. This outcome indicates that corporations with a higher level of ESG disclosure surpass those with less disclosure of ESG; therefore, implementing good ESG disclosure levels can enhance FIPE. This positive influence is mainly supported by stakeholder theory, which asserts that investing in ESG initiatives leads to a positive reputation for the business (Ademi & Klungseth, 2022). This finding also supports the argument presented by Malik and Kashiramka (2024) that improving a company's FIPE can be achieved by ESG. Moreover, this result is similar to those of earlier studies that found a statistically significant positive correlation between ESG and FIPE (Carnini Pulino et al., 2022; Dong et al., 2023; Eriandani & Winarno, 2023; Malik & Kashiramka, 2024).

Hypothesis H7 states that there is a statistically significant association between the moderating effect of ESP on the association between BDCs and FIPE. The findings of our study confirm a statistically non-significant correlation between the moderating effect of ESP on the connotation between BDCs and FIPE, as shown in Table 5. This means that despite the importance of the vital role that ESP in FIPE, ESP does not moderate the impact of BDCs on FIPE. This finding is inconsistent with the results of previous investigations, such as Akhter and Hassan (2024) and Fayyaz et al. (2023), who confirmed this relationship.

5. Additional Analysis

As mentioned earlier, pooled OLS is used in this paper based on the outcome of the LM test, so we employed panel data regression as an additional analysis. In other words, we adopted Feasible Generalized Least Squares (FGLS) as a panel data regression to ensure control for serial correlation and heteroscedasticity in the model. FGLS regression addresses heteroscedasticity by estimating the parameters of the model while considering varying levels of variance across observations. This is achieved by applying weights to the observations based on their estimated variances, which allows for more accurate parameter estimates. By considering heteroscedasticity, FGLS regression can improve the precision of the estimated effects, help identify significant predictors, and provide more reliable and efficient results (Greene, 2018).

The outcomes in Table 6 confirm that the outcomes of the additional analysis are consistent with those of the main test. This means that the consistent outcomes obtained from the two statistical approaches lend credibility to the findings, thereby reinforcing their dependability. Table 6 demonstrates that BODSIZ, BODIND, and ESG are related to FIPE and that this relationship has a

positive impact. It also showed that BODMET negatively influenced FIPE. However, BODCOM and BODEXP have an insignificant correlation with FIPE, and ESG did not play a role in impacting the connection between BDCs and FIPE. In conclusion, we employed both FGLS and Pooled OLS regression techniques to examine our findings thoroughly. Both methods produced coherent results and validated the stability of the relationships between the variables, thus strengthening the robustness and dependability of our research outcomes.

Table 6: Cross-sectional time-series FGLS regression

	Model (1)			Model (2)			
Variable	**Coef.**	**z**	**P>z**	**Variable**	**Coef.**	**z**	**P>z**
BODSIZ	0.091	5.02	0.000	BODSIZ	0.081	2.66	0.008
BODIND	0.522	1.76	0.079	BODIND	-0.178	-0.34	0.734
BODMET	-0.038	-3.27	0.001	BODMET	-0.041	-1.73	0.083
BODCOM	0.623	0.92	0.357	BODCOM	0.91	0.83	0.406
BODEXP	0.002	0.07	0.941	BODEXP	0.033	0.6	0.549
ESG	0.377	9.84	0.000	ESG	0.236	0.26	0.792
ESG _ BODSIZ	-	-	-	ESG _ BODSIZ	0.01	0.43	0.665
ESG _ BODIND	-	-	-	ESG _ BODIND	0.646	1.51	0.117
ESG _ BODMET	-	-	-	ESG _ BODMET	0.003	0.16	0.876
ESG _ BODCOM	-	-	-	ESG _ BODCOM	-0.158	-0.16	0.870
ESG _ BODEXP	-	-	-	ESG _ BODEXP	-0.026	-0.6	0.551
Growth	0.003	1.42	0.155	Growth	0.003	1.4	0.161
LOSS	-0.178	-2.95	0.003	LOSS	-0.174	-2.89	0.004
LEVG	0.288	2.52	0.012	LEVG	0.289	2.52	0.012
TOAS	0.007	0.44	0.657	TOAS	0.006	0.38	0.701
YEARS	Include			YEARS	Include		
_cons	4.355	6.9	0.000	_cons	4.414	4.4	0.000
Number of obs				Number of obs			
Number of groups	7			Number of groups			
Wald chi2(16)	222.13			Wald chi2(21)	227.75		
Prob > chi2	0			Prob > chi2	0		
Coefficients: generalized least squares				Coefficients: generalized least squares			
Panels: heteroskedastic				Panels: heteroskedastic			
Correlation: no autocorrelation				Correlation: no autocorrelation			

6. Conclusion

The key objective of this study is to offer a comprehensive evaluation of the empirical literature on the association between CG (BDCs) and FIPE. Furthermore, this paper purposed to explore the moderating influence of ESP in the link between BDCs and FIPE. To achieve this aim, this study formulated hypotheses based on the theories and results of previous empirical research. It also employs a sample size of 917 firm-year observations. Observations were conducted for companies listed in Saudi Arabia in 2015 and 2021.

This study revealed a significant correlation among BODSIZ, BODIND, BODMET, ESG, and FIPE. This significant correlation was positive between BODSIZ, BODIND, and ESG and FIPE, while BODMET had a negative effect on FIPE. However, this study confirmed that FIPE was not affected by BODCOM or BODEXP. It has also been reported that ESG does not moderate the effect of BDCs on FIPE. These findings indicate that BODSIZ, BODIND, and ESG can increase the FIPE of firms and are consistent with agency and stakeholder theory arguments. They also stated that BODMET could reduce FIPE, and that the role of ESG in influencing the connection between BSCs and FIPE is not an important element. Furthermore, this paper carried out an additional analysis to confirm the stability

of the main outcomes and discovered similar results. The consistent outcomes of both statistical methods improve the reliability and credibility of the study's findings.

These results provide a clear understanding of the most important BDCs that have a positive impact on improving the level of FIPE. In addition to the role that ESG plays in business performance, the concept of ESG is new to the Saudi Arabian business environment. Thus, these results will be of great use to current and potential investors in the Saudi market to help them make investment decisions. When formulating ESG and FIPE policies and strategies, these outcomes will be useful to policymakers and regulators in Saudi Arabia to help them update and develop regulations related to Saudi companies. Regulatory authorities need to develop a framework for incorporating FIPE methodologies into the financial reporting of companies and encourage corporations to adopt more sustainable practices. Regulatory authorities should continuously provide guidance, support, and financial aid to corporations for their ESG initiatives. Consequently, it is essential that Saudi authorities consider these findings and emphasize the importance of board members' involvement in improving FIPE and ESG disclosure. Furthermore, the discoveries of this paper have significant practical implications for researchers seeking to understand the role of BDCs and ESG in FIPE, particularly in the context of Saudi Arabia.

In addition, it is vital to note that this study exclusively examined market value-added as a substitute for FIPE. There are other different assessments for FIPE, such as return on assets and Tobin's Q. Thus, this work recommends further investigations using all different measurements of FIPE to provide a comprehensive view of the impact of BDCs and ESG on FIPE to those interested in this matter. Additionally, it is suggested that the influence of audit committees of Saudi enterprises listed on FIPE be explored, as this study focused on BDCs. In the future, academics should investigate supplementary variables that could augment the connection between CG and FIPE. To meet the goals of this study, we used non-financial businesses within the Saudi market as a sample; thus, the outcomes of this study do not represent all firms in this market. Therefore, this study recommends additional research using the financial sector to obtain clear insight into the impact of BDCs on FIPE and the role of ESG in this relationship in all sectors of the Saudi market.

7. Funding

"This work was funded by the Deanship of Graduate Studies and Scientific Research at Jouf University under grant No (DGSSR-2023-03-02331)".

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