



THE ASIAN BULLETIN OF GREEN MANAGEMENT AND CIRCULAR ECONOMY

ISSN (online): 2959-0035

<http://abgmce.com/> 10.62019/abgmce. v4i1.116

ISSN (Print): 2959-0027

Impact Of Corporate Governance On Corporate Environmental Performance: Does Green Finance Matter?

Afshan Ali*

Chronicle

Article history

Received: Feb 23, 2024

Received in the revised format: march 2, 2024

Accepted: March 15, 2024

Available online: April 10, 2024

Afshan Ali is currently affiliated with Lahore Business School the university of Lahore, Pakistan.

Email: afshaneconomist@gmail.com

Abstract

This study investigates the impact of corporate governance on Corporate Environmental Performance (CEP) in manufacturing firms listed on the Pakistan Stock Exchange from 2013 to 2019, with a particular focus on the role of green finance. Using a sample of 308 conventional manufacturing firms, approximately 75% of the sector's total population, the study applies Fixed Effects and Generalized Method of Moments (GMM) estimation techniques to assess the data. The results reveal that while Audit Committee Independence significantly enhances CEP, Audit Committee Size has minimal impact. CEO Compensation positively influences sustainability efforts, whereas Director Compensation is negatively associated with CEP, indicating a potential misalignment with environmental objectives. Ownership structure analysis shows positive effects of Institutional and Foreign Ownership on CEP, while Family, Insider, and Block Ownership negatively affect environmental outcomes. The findings underscore the importance of integrating green finance and carbon accounting into governance frameworks to enhance sustainability initiatives. This integration aligns with Sustainable Development Goals (SDGs) 12 (Responsible Consumption and Production), 13 (Climate Action), and 17 (Partnerships for the Goals). The study's findings have important implications for policymakers and corporate stakeholders, advocating for governance strategies that balance financial and environmental performance, and fostering independent oversight for improved environmental sustainability.

***Corresponding Author:**

Keywords: Corporate Environmental Performance, Corporate Governance, Green Finance, CEO Compensation, Audit Committee Independence, Institutional Ownership, Carbon Accounting, GMM, SDGs, Pakistan Stock Exchange.

© 2024 Asian Academy of Business and social science research Ltd Pakistan.

INTRODUCTION

The corporate governance (CG) is defined as the system of rules, practices, and processes by which a company is directed and controlled (Malmi, & Brown, 2008; Napitupulu et al., 2023). It encompasses the mechanisms through which companies, and those in charge, are held accountable to stakeholders, including shareholders, employees, customers, and the broader community. The essence of CG lies in balancing the interests of a company's many stakeholders (Clarke, & Dean, 2005; Stoelhorst, & Vishwanathan, 2024). This framework ensures that the board of directors and management operate with transparency, fairness, and integrity, fostering an environment that prioritizes ethical decision-making, effective management, and the long-term sustainability of the corporation. CEP, on the other hand, refers to the extent to which a company adopts policies and practices that minimize its negative impact on the environment while maximizing its role in contributing positively to environmental sustainability (Wang & Zhang, 2023). This includes efforts to reduce waste, lower

greenhouse gas emissions, conserve natural resources, and implement initiatives that promote environmental stewardship. CEP is increasingly becoming a metric of interest to investors, regulators, and consumers, reflecting a company's commitment to environmental sustainability and its ability to mitigate risks associated with environmental issues. Green finance (GF) is another term that referred to the complex of financial products and services for implementation of the environmental objectives, including the funding of renewable power, energy saving, sustainable agriculture, and clean transport. It also has a direct effect of enhancing CEP by acting as the means of sourcing for the necessary capital for funding environmentally benign projects. The importance of GF can therefore be said to be in its nature of providing the required funding that is required for sustainable projects to happen in organizations, providing the financing needed for corporations to change to more sustainable operations. Moreover, GF instruments, such as green bonds and loans, not only provide the means for environmental projects but also signal a firm's commitment to sustainability to stakeholders. This can enhance a company's reputation, attract environmentally conscious investors, and meet the growing regulatory and consumer demands for sustainable business practices.

In the context of the Pakistani listed firms: the integration of CG & CEP has been seen as an opportunity but also a threat (Abbas et al. , 2023). Having faced severe environmental issues like water crisis, air pollution, effects of climate change etc, Pakistan is now at a stage where corporate involvement in environmental protection constitutes not only helps, but is vital to the country's future economic and social prosperity. The regulatory framework which is in line with the SECP , provides a foundation for CG but integrating these principles with environmental objectives requires a more nuanced approach (Rizvi, & Aziz, 2023). The governance structures of Pakistani companies, often influenced by family ownership or state control, present unique dynamics in the context of environmental governance. While these structures can offer the advantage of a long-term orientation and stability, they may also pose challenges in terms of transparency, accountability, and the incorporation of environmental considerations into strategic decision-making.

As global attention shifts towards sustainability and environmental responsibility, Pakistani firms are under increasing pressure to demonstrate their commitment to CEP (Rizvi, & Aziz, 2023; Abbas et al., 2023). This includes not just compliance with local environmental regulations but also alignment with international environmental standards and practices. The role of CG in this context is pivotal. Effective governance mechanisms can enable firms to navigate the complexities of environmental sustainability, leveraging CG to enhance CEP through strategic planning, stakeholder engagement, and the adoption of best practices in environmental management (Chen et al., 2024). Moreover, the concept of CEP in Pakistani firms is evolving beyond compliance towards a strategic approach that views environmental stewardship as a source of competitive advantage. This shift necessitates a reevaluation of CG practices to ensure they support environmental sustainability goals. Incorporating sustainability into the core governance framework can drive innovation, improve risk management, and open new avenues for growth and value creation.

The escalating environmental degradation witnessed globally can be attributed to several factors, including rapid population growth, expansive economic development, and the proliferation of business activities. These factors serve as primary catalysts for a myriad of environmental challenges, such as air and water pollution, noise pollution, global warming, and deforestation (Alvarez, 2012).

Consequently, the ecological footprints left by human activities, notably in terms of carbon emissions, pollutants discharge, and the consumption of water and energy, have garnered increasing concern from a broad spectrum of society (Yunlin et al., 2019). This growing awareness has underscored the imperative for businesses to adopt strategies that concurrently mitigate environmental impacts and bolster economic performance, positioning environmental stewardship as a pivotal element of strategic business management (Liao et al., 2020). Business entities, through their consumption of resources and generation of waste, play a significant role in exacerbating environmental degradation (Doda et al., 2016). The increasing environmental consciousness among environmentalists, civil society actors, investors, policymakers, and regulatory bodies has heightened the demand for more sustainable business practices. This demand reflects a concerted effort to ameliorate CEP while also seeking to enhance financial outcomes (Haque, 2017). The intersection of environmental sustainability and economic viability has thus emerged as a critical area of focus, compelling organizations to reevaluate their operational practices and strategic objectives in light of their environmental ramifications.

LITERATURE REVIEW

CG and CEP

The effects of various CG mechanism properties on CEP have been the subject of numerous investigations. According to the literature that is currently available on CG and CEP, the following CG measurements are frequently encountered and these studies provided conflicting and ambiguous findings: board composition, board diversity, CEO duality, BS and AC (Alawaqleh et al., 2021; Kalita & Tiwari, 2023; Javeed et al., 2021). Moreover, the literature lacks a thorough examination of the various CG mechanisms' constituent parts as well as the combined impact of an organization's overall CG system on its CEP in a particular context. The four CG mechanism structure (board, composition, AC and ownership) will be used in this study to categories the literature on CG and CEP.

CG, as a field of study, has gained significant attention over the years, with considerable research efforts aimed at examining the relationship between CEP and governance practices. This paper aims to review the literature on CG and CEP, highlighting the main themes, trends, and controversies over the years. The notion of CG, as a concept, has been the subject of extensive debate among researchers and practitioners. According to Singh and Misra (2021), CG encompasses the official and the unofficial mechanisms, the frameworks and the procedures through which decision-makers regulate and oversee an organisation's affairs. These systems are supposed to protect shareholders' values, on the one hand, and to establish the rules for correct behavior and rational decision making, on the other hand. Within the CG literature, analyzes related to the link between governance practices and CEP have attracted the interest of researchers.

Research has been conducted combining these areas; corporate boards, performance incentives, stakeholders, regulation and CSR (Cavaco et al., 2020). One of the most debated issues in the CG literature is whether firms' environmental and social performance should be included as part of their corporate goals or whether they should solely focus on maximizing shareholder value. On one hand, proponents of this approach argue that businesses exist solely to generate returns for their shareholders, and hence, the pursuit of environmental or social goals could detract from this mission. On the other hand, critics of this approach believe that firms have a

broader social responsibility, and that environmental and social performance can have a positive relationship on their financial performance. Despite the progress made in integrating environmental considerations into CG structures and practices, challenges remain. The complexity of environmental issues, the need for specialized knowledge to address these challenges effectively, and the potential for conflicts between short-term financial objectives and long-term sustainability goals can hinder the implementation of effective governance mechanisms for CEP. Moreover, the variability in regulatory environments across different jurisdictions adds another layer of complexity, affecting how companies globally approach environmental governance.

There have been many papers written on the topic of CG and CEP, with inconclusive results. For example, Dalton et al., (1998) with reference to 72 accumulated studies stated that there is through a positive but, insignificant correlation between CG and CEP. In the same manner, Doan & Sassen (2010) meta-analyzed 22 studies and analysis shows that board of director, executive compensation and environmental regulation were positively correlated with CEP. But other research work has not identified any relationship between CG and CEP. For example, Alexander and Buchholtz (1978) observed that board composition earned an insignificant correlation with CEP. Along the same line of thought, and using a sample of 75 large European firms, Nguyen et al. (2021) did not discover any relationship between CEP and CEO compensation or BI.

Despite the mixed findings, scholars have continued to explore the relationship between CG practices and CEP. For instance, Hambrick, Werder, and Zajac (2008) suggested that the board's role in environmental governance is critical, citing evidence that boards that are more engaged in environmental issues tend to have better CEP (Nguyen et al.,2021). Additionally, they suggest that greater stakeholder engagement, both internal and external, can enhance a firm's CEP. Another important aspect of the CG literature is the role of regulation in promoting CEP. Scholars have explored the effects of different types of environmental regulations, including command-and-control and voluntary programs, on CEP. For instance, Brammer and Pavelin (2005) conducted a study of 450 European firms and found that firms participating in voluntary environmental programs are more likely to exceed environmental regulations and have better CEP than firms that adhere only to mandatory environmental regulations.

According to Haque and Ntim (2018), CG contributes significantly to improving CEP by lowering environmental footprints and climate change in order to save the human rights of many shareholders. The study's emphasis is therefore on a variety of CG mechanism. All CG characteristics take proactive steps to lessen environmental impact and problems associated with climate change (Elsayih et al., 2021). One of the topics that has received the most investigation in fields like accounting, business, and finance is CG. Today's CG has shifted its focus to pressing social, environmental, and climatic challenges (Haskell et al.,2021). Additionally, the CG framework is a crucial mechanism that can be used to describe the climate change problems. Many stakeholders are currently concerned about climate change and continue to put pressure on corporate sector top management to minimize their environmental footprints. Scherer and Voegtlin (2020) argued that effective CG is required for creating and putting into practice supportable plans to protect the environment. Furthermore, Endo (2020) provided evidence that the board members of CG are responsible for creating the corporate policies that support CEP promotion. Most

studies, however, have focused on the CG connection with environmental disclosure or a particular component of CEP.

Board Size (BS) and CEP

In light of the growing concern for environmental sustainability among corporations around the world, the complex connection between BS and CEP is an important facet of CG. The current school of thought in academia holds that the number and make-up of a company's board of directors significantly affects its capacity to handle and control environmental issues (Endo, 2020). Companies may be better able to handle the intricacies of environmental sustainability if their boards are larger and comprised of individuals with a wider range of backgrounds, experiences, and views. Studies have shown that when people from different backgrounds and experiences work together, it improves decision-making and ultimately results in better environmental strategies and practices. This argument is based on the idea that a more diverse set of perspectives and expertise can help improve CEP by guiding and carrying out environmental initiatives strategically (Sahoo et al., 2023). While larger boards do have some advantages, there are also some potential disadvantages, such as increased logistical challenges and less cohesiveness. Tibiletti et al. (2021) found that boards with more members had trouble communicating and coordinating, which could lead to less effective decision-making and less emphasis on environmental sustainability goals. A group of researchers suggests that larger BS positively influences CEP.

Scholars argue that a larger board with diverse expertise and perspectives can bring a broader range of knowledge and experience to address environmental issues and develop effective environmental strategies (Adams and Mehran, 2008). Additionally, a larger board may be more likely to have dedicated committees or subcommittees focused on environmental matters, enabling greater attention and oversight in this domain. Support for this hypothesis can be found in various studies. For instance, Nguyen et al. (2021) examined a sample of U.S. manufacturing firms and found that larger BS was associated with better CEP. Similarly, García Martín, and Herrero (2020) conducted a study of large industrial firms and found that BS positively influenced the adoption of environmental management systems.

Furthermore, Pucheta-Martínez et al. (2021) conducted research on Mexican companies and highlighted the positive relationship between BS and environmental disclosure. They argued that larger boards have a higher likelihood of focusing on sustainability issues and promoting corporate transparency in environmental matters. On the other hand, some studies have presented contrasting findings. For example, Naciti (2019) conducted a meta-analysis of 372 studies and found a weak association between BS and CEP. Additionally, Nguyen et al. (2021) studied European firms and found no significant relationship between BS and CEP.

In summary, the existing literature provides mixed evidence regarding the relationship between BS and CEP. While some studies suggest a positive association, others find no significant relationship. These contradictory findings emphasize the need for further research and exploration of potential moderating factors. The relationship between BS and CEP is a subject of significant interest in the literature. Some research suggests that larger BSs may have a positive influence on CEP. Proponents argue that a larger board can bring diverse expertise and perspectives to address environmental issues and develop effective strategies. Studies have found evidence supporting this hypothesis, showing that larger boards are associated with better CEP and higher levels of environmental disclosure. However, there are also studies that have found no

significant relationship between BS and CEP. These conflicting findings suggest that the relationship between BS and CEP may be context-dependent or influenced by other factors. Further research is needed to explore this relationship and identify potential moderating factors.

Board Independence (BI) and CEP

BI has emerged as a critical area of focus in the academic investigation of governance, which has been stimulated by the growing interest in the relationship between CS and environmental governance. Independent boards, where the majority of directors are not also members of the company's management, are believed to improve CG by allowing for more thorough evaluation of management's actions, particularly those pertaining to environmental strategies and performance. Since they are not involved in day-to-day management, independent directors are more likely to put stakeholder interests, including environmental concerns, first, which is why they are believed to have a positive relationship on CEP. Studies have shown that independent directors can help improve CEP by pushing for more stringent environmental regulations and practices, which shows their dedication to caring for both society and the environment (Sandhu et al.,2019). This view is in line with agency theory, which posits that an independent board can reduce management-shareholder conflicts by making sure that management's choices, even on environmental initiatives, are in line with shareholder interests and public expectations (Kraik, 2019).

The hypothesis development around BI and CEP navigates through the intricate dynamics of governance mechanisms and their implications for environmental sustainability. The argument posits that an increase in BI is associated with enhanced CEP, premised on the ability of independent directors to objectively evaluate and influence the company's environmental strategies and practices. This relationship is anticipated to be linear, with greater BI leading to improved environmental outcomes, as independent directors are presumed to facilitate better governance practices, including the adoption of proactive environmental strategies. This hypothesis is buttressed by empirical studies which suggest that companies with a higher proportion of independent directors are more likely to engage in environmentally responsible behaviors and disclose environmental information, demonstrating a commitment to transparency and accountability in CEP (Caputo et al.,2021). These findings highlight the critical role of BI in enhancing corporate accountability and stewardship, which are pivotal for advancing CEP.

The relationship between BI and CEP is a topic of considerable interest in CG research. This section aims to develop hypotheses and explore the existing literature to understand the potential link between these variables. A hypothesis put forth suggests that BI positively influences CEP. The notion is that a board consisting of independent directors, who are not affiliated with the company or its management, would provide objective oversight on environmental matters and push for sustainable practices. Independent directors are expected to prioritize the long-term interests of the company and its stakeholders, which includes environmental concerns (Crifo, et al., 2019). Their independent perspective allows them to challenge management decisions and advocate for environmentally responsible strategies. Support for this hypothesis can be found in various studies. For instance, Alipour et al. (2019) conducted research on publicly listed firms in the United Kingdom and found a positive relationship between BI and CEP. They argued that independent directors bring necessary expertise, knowledge, and credibility to address environmental issues

effectively. Furthermore, Elmagrhi et al. (2019) examined a sample of Canadian firms and found a significant positive association between BI and CEP. Their study highlighted the importance of independent directors in promoting environmentally responsible practices and enhancing CEP. Contrasting findings are also present in the literature. For example, García Martín et al. (2020) explored the relationship between BI and CEP in the context of the oil and gas industry. They found no significant relationship, suggesting that other factors beyond BI may play a more prominent role in determining CEP. In summary, the existing literature provides mixed evidence regarding the relationship between BI and CEP. While some studies suggest a positive association, others find no significant relationship. These conflicting findings indicate that the relationship may be context-specific or influenced by additional factors. Further research is warranted to delve deeper into the underlying mechanisms and potential moderating variables.

Board diversity (BD) and CEP

The relationship between board diversity and CEP is a fascinating subject of exploration in the literature. Therefore, this section aims to develop hypotheses and explore the existing literature to understand the potential link between these variables. A hypothesis put forth suggests that board diversity positively influences CEP. Recent research has shown that board diversity, especially gender diversity, may lead to better stakeholder management and enhance CSR practices (Amorelli, et al., 2021). Diverse board members bring distinct ideas, perspectives, and experiences that can help in identifying new opportunities, challenging management assumptions and enhancing CEP (Elmagrhi et al., 2019). Diverse boards can also encourage creative thinking and promote innovation in developing environmentally friendly products and services. Support for this hypothesis can be found in various studies. For instance, Hsu et al. (2020) conducted a study on firms in the United States and found that board diversity positively influences CEP. Their research showed that firms with gender-diverse boards had better CEP and were more likely to disclose their environmental impact. Similarly, studies by Orazalin and Baydauletov (2020) found that board diversity enhances CSR outcomes, which could positively affect CEP.

Contrary to the above hypothesis, some studies found no significant relationship between board diversity and CEP. For example, Elmagrhi et al. (2019) argued that gender diversity might not be the primary factor affecting CEP—the board's process and culture could play a more significant role. Similarly, a study by Elmagrhi et al. (2019) found no significant relationship between ethnic diversity and CEP. In conclusion, while studies provide mixed evidence on the relationship between board diversity and CEP, the growing literature suggests that diverse boards could potentially enhance CEP. The diverse board may provide better oversight of environmental issues, generate innovative solutions and improve stakeholder engagement, leading to better complying and proactive environmental management practices. However, additional research is still necessary to understand better the underlying mechanisms and determine how board diversity could be encouraged to enhance CEP.

CEO Duality and CEP

CEO duality refers to the situation where an individual serves as both the CEO and the chairperson of the board of directors. Studies suggest that CEO duality could hinder effective board oversight and accountability, resulting in a lower focus on environmental concerns and less emphasis on sustainable practices (Tseng et al., 2020). Without a separate chairperson, there may be a lack of independent oversight

and reduced checks and balances, potentially leading to suboptimal CEP. Support for this hypothesis can be found in several studies. For example, Amran et al. (2014) examined the relationship between CEO duality and CEP in Malaysian firms. Their findings indicated a negative association between CEO duality and CEP, suggesting that a duality structure hinders firms from implementing effective environmental strategies. Similarly, research by Gallego-Álvarez and Pucheta-Martínez (2020) found a negative relationship between CEO duality and firm commitment to environmental issues among US companies, proposing that the concentration of power in a duality structure might undermine a firm's environmental objectives. However, it is important to note that views on the relationship between CEO duality and CEP are not uniformly negative. Some studies suggest that CEO duality, under specific circumstances, may not significantly affect CEP. For instance, Elsayih et al. (2021) found that CEO duality had no significant direct impact on firms' CEP. They argued that the relationship between CEO duality and CEP is contingent upon other factors, such as a firm's ownership structure. In summary, while existing research provides support for the hypothesis that CEO duality negatively influences CEP, some studies suggest that the relationship may be more nuanced and context-dependent. Nonetheless, the potential negative impact of CEO duality on CEP highlights the importance of effective governance structures and mechanisms to ensure strong environmental stewardship within organizations.

CEO Dominance and CEP

The relationship between CEO dominance and CEP is an important area of study in the field of CG. This section aims to develop hypotheses and explore existing literature to understand the potential link between these variables. The hypothesis proposed is that CEO dominance negatively influences CEP. CEO dominance refers to the concentration of power and decision-making authority in the hands of the CEO within an organization. Studies suggest that excessive CEO power and lack of checks and balances can lead to a reduced emphasis on environmental concerns and a lower commitment to sustainable practices (Aguilera et al.,2021). When the CEO has absolute control and minimal oversight, there may be a lack of accountability, resulting in a reduced focus on CEP and fewer resources allocated to environmental initiatives. Support for this hypothesis can be found in several studies. For example, Sarfraz et al. (2020) examined the relationship between CEO dominance and CEP in Chinese firms. Their findings indicated a negative association between CEO dominance and environmental responsibility, suggesting that excessive CEO power might hinder a firm's commitment to environmental initiatives. Similarly, research by Dhaliwal et al. (2012) found that firms with more powerful CEOs were less likely to incur voluntary environmental costs, indicating a negative relationship between CEO dominance and CEP in the context of the United States (Cordeiro et al.,2020).

However, it is important to note that the relationship between CEO dominance and CEP is not universally negative. Some studies suggest that the relationship may be contingent on other factors and the specific context of the organization. For instance, Al-Duais et al. (2021) found that CEO dominance had a positive relationship on CEP in family firms when combined with a higher level of specific CSR disclosure. They argued that in certain situations, a powerful CEO could promote a strong environmental commitment. In summary, while existing research provides support for the hypothesis that CEO dominance negatively influences CEP, there are instances where the relationship may be more nuanced. Nonetheless, the potential negative impact of CEO dominance on CEP highlights the importance of checks and

balances, as well as a governance structure that encourages environmental stewardship.

Board Activity and CEP

Board activity refers to the level of engagement and involvement of the board of directors in strategic decision-making, monitoring, and oversight of a firm's environmental initiatives. Studies suggest that active and engaged boards can drive environmental responsibility and promote sustainability practices (Tseng et al., 2020). When the board is actively involved, there is greater accountability and commitment to CEP, resulting in more resources allocated to environmental initiatives and stronger CEP. Support for this hypothesis can be found in several studies. For example, Alipour et al. (2019) examined the relationship between board activity and CEP in European firms. Their findings indicated a positive association between board activity and environmental responsibility, suggesting that active boards were more likely to implement effective environmental strategies. Similarly, research by Liu et al. (2019) found a positive relationship between board activity and CEP in China, where active board members were more likely to promote sustainability performance and increase environmental investments. However, it is important to note that factors such as board composition, size, and independence may also play a role in determining the relationship between board activity and CEP. For instance, Naciti (2019) found that while board activity was positively associated with CEP, this relationship was stronger in firms with larger BS, independent directors, and a separation of the CEO and chairperson roles.

Board participation and CEP

Board participation, characterized by the active involvement and engagement of board members in CG, is pivotal in shaping a company's strategic direction, including its environmental initiatives. The literature posits that active board participation can significantly influence CEP, as it ensures that environmental sustainability is integrated into strategic decision-making processes. Highly participative boards are more likely to engage in rigorous oversight of environmental policies and practices, fostering a culture of sustainability within the organization. This notion is supported by research suggesting that the depth of board engagement correlates with a firm's commitment to environmental standards and practices (Kim et al., 2023). The underlying premise is that when boards are actively involved in the governance process, they are better positioned to challenge management, propose strategic initiatives, and ensure that environmental considerations are embedded in corporate strategy. This active engagement facilitates the alignment of business operations with environmental sustainability objectives, potentially leading to enhanced CEP.

Building on the theoretical foundation that board participation enhances CG and, by extension, corporate performance, it is hypothesized that there is a positive relationship between board participation and CEP. Active board involvement signifies a governance mechanism that prioritizes and advocates for environmental stewardship, driving the adoption of sustainable practices and the achievement of environmental goals. This hypothesis draws on the resource dependency theory, which suggests that boards play a crucial role in providing valuable resources and capabilities, including knowledge and expertise on environmental matters, that are essential for navigating the complexities of environmental sustainability (Rubino and Napoli, 2020). Consequently, increased board participation is expected to lead to better environmental outcomes as it enhances the board's ability to influence and

support the company's environmental strategy. This hypothesis underscores the importance of fostering active board engagement to achieve superior CEP, highlighting the critical role of governance in advancing sustainability objectives.

AC Size and CEP

AC Size refers to the number of members on the AC, which is responsible for overseeing the financial reporting process and ensuring compliance with relevant regulations. A larger AC may have a positive influence on CEP by providing more diverse perspectives, expertise, and oversight in environmental matters. Support for this hypothesis can be found in several studies. For example, a study by Dahlbäck & Söderlund (2020) examined the relationship between AC characteristics and environmental disclosure in Chinese listed companies. They found that the size of the AC positively influenced the level of environmental disclosure, indicating that a larger AC is associated with a higher commitment to environmental reporting and transparency. Similarly, a study by Rubino and Napoli (2020) investigated the impact of AC characteristics, including size, on CEP in Korean firms. Their findings revealed a positive relationship between larger AC size and CEP.

The study suggests that a larger AC facilitates better monitoring and control over environmental risks, leading to improved CEP. However, it is important to consider that the effectiveness of AC size may be influenced by other factors such as the expertise and independence of the committee members. For instance, studies have shown that AC independence, where members are free from conflicts of interest, is crucial for effective oversight and decision-making on environmental issues (Rubino and Napoli (2020)). Therefore, a larger AC combined with independent members may further enhance the positive relationship on CEP. In summary, the hypothesis suggests that AC Size has a positive influence on CEP. A larger AC may provide diverse perspectives and expertise, leading to better oversight and decision-making on environmental matters. Further research could examine the specific mechanisms through which AC size affects CEP and explore potential interaction effects with other AC characteristics.

AC Independence and CEP

AC Independence significantly impacts CEP is anchored in the concept that members of the AC, when free from conflicts of interest and external pressures, can more effectively safeguard the interests of the organization and its stakeholders. This independence is critical for the AC's role in overseeing corporate activities, including those related to environmental governance. Independent ACs are theorized to enhance decision-making processes regarding environmental issues, thereby improving a company's CEP. Evidence supporting this hypothesis is found in the literature; for example, Buallay and Aldhaen (2018) revealed a positive correlation between AC independence and environmental disclosure among Taiwanese firms, suggesting that independence facilitates greater transparency and accountability in reporting environmental efforts.

Similarly, Buallay and Al-Ajmi (2020) observed a significant positive relationship between the independence of ACs and the adoption of environmental management practices in Malaysian companies, indicating that AC independence is pivotal in fostering environmental responsibility through effective risk management and compliance oversight. Nonetheless, it's recognized that the mere presence of an independent AC may not be the sole determinant of enhanced CEP. The broader context, including the expertise and dedication of committee members, the

prevailing organizational culture, and external pressures from stakeholders, equally contributes to the effectiveness of ACs in steering environmental initiatives. This multifaceted approach underscores the complexity of achieving superior environmental outcomes, suggesting that while AC independence is a crucial factor, it operates within a larger ecosystem of influences that collectively shape a company's environmental strategy and performance. As such, the proposed hypothesis encourages a deeper investigation into how AC independence interacts with other organizational variables to influence environmental practices, offering a comprehensive view of the pathways to sustainable CG.

The presence of an independent chairman within an AC is theorized to significantly bolster CEP, by virtue of providing leadership that is free from the influence of executive management. This independence is critical for ensuring that the AC's oversight and decision-making processes regarding environmental policies, practices, and reporting are conducted with impartiality and integrity. An independent chairman is expected to foster a governance environment that prioritizes transparency, accountability, and the proactive management of environmental risks. The literature supports this view, with studies indicating that the leadership structure of the AC can have a profound impact on CG outcomes, including areas related to environmental stewardship (Velte & Stawinoga, 2020). By leading the AC with an independent stance, the chairman can significantly influence the committee's effectiveness in overseeing corporate strategies and operations, ensuring that environmental considerations are integrated into the company's strategic framework and operational practices. The hypothesis developed from this perspective posits a direct and positive relationship between the appointment of an independent chairman of the AC and enhanced CEP.

The rationale is that an independent chairman can catalyze stronger oversight of environmental issues, advocate for more rigorous environmental practices, and ensure comprehensive environmental disclosures. This leadership role is instrumental in embedding environmental sustainability into the corporate ethos and operational processes, ultimately leading to improved environmental outcomes. This hypothesis draws upon agency theory, suggesting that reducing potential conflicts of interest between management and shareholders through independent leadership enhances the corporation's commitment to environmental responsibility (Javed et al., 2020). Therefore, an independent chairman of the AC is poised to play a pivotal role in advancing CEP by leveraging their independence to champion environmental governance and accountability, thereby reinforcing the importance of sustainable practices within the CG framework.

AC Activity and CEP

AC Activity, characterized by the frequency and depth of its meetings and reviews, is a crucial determinant of CEP. This activity reflects the committee's engagement and diligence in overseeing and scrutinizing the company's financial and non-financial performance, including its environmental strategies and disclosures. The rationale is that more active ACs, which convene regularly and invest substantial effort in reviewing company practices, are likely to ensure that environmental issues are adequately addressed and integrated into the corporate agenda. Empirical studies, such as those by Arif et al. (2021), highlight the positive correlation between AC activity and overall CG quality, suggesting that increased activity can lead to better management of environmental risks and compliance with environmental regulations. This heightened scrutiny and engagement facilitate the implementation of

sustainable practices and enhance the transparency and accuracy of environmental reporting, contributing to improved environmental outcomes. Building on this premise, the hypothesis proposes a positive relationship between AC activity and CEP. Specifically, it posits that increased AC activity, evidenced by frequent meetings and comprehensive reviews of environmental policies and practices, leads to more effective oversight of environmental matters. This active engagement ensures that environmental considerations are not only recognized but are acted upon, encouraging the adoption of sustainable practices and the improvement of environmental disclosures. Drawing on the principles of stewardship theory, which emphasizes the role of senior management and governance bodies in stewarding company resources towards long-term sustainability goals, this hypothesis underscores the importance of AC activity in promoting environmental stewardship within the firm. Therefore, by enhancing the frequency and depth of its oversight activities, the AC plays a pivotal role in driving the company's CEP, reinforcing the link between robust governance mechanisms and sustainable corporate outcomes.

Audit Quality and CEP

The quality of external audits plays a pivotal role in enhancing CEP by ensuring the reliability and credibility of environmental disclosures and compliance with relevant regulations. High-quality external audits are characterized by thoroughness, accuracy, and independence, attributes that are crucial for evaluating the veracity of a company's reported environmental initiatives and performance. The premise is that external auditors with a reputation for high standards and integrity can significantly influence a company's commitment to environmental accountability and sustainability. Literature suggests that firms subjected to high-quality audits are more likely to provide accurate and transparent environmental information, thereby fostering trust among stakeholders and potentially leading to improved environmental practices (Villena & Dhanorkar, 2020). The rigorous examination by external auditors ensures that environmental disclosures are not only compliant with current regulations but also reflective of the company's genuine environmental impact, promoting a culture of sustainability within the firm.

Building on this foundation, the hypothesis posits a direct positive relationship between the quality of external audits and CEP. It suggests that companies undergoing high-quality external audits are more inclined to adopt and accurately report on effective environmental management practices, leading to enhanced CEP. This hypothesis is supported by agency theory, which posits that external audits serve as a mechanism to reduce information asymmetry between the company and its stakeholders, including shareholders concerned with environmental stewardship (Jensen & Meckling, 1976). High-quality external audits act as a catalyst for improved environmental governance by providing an independent assessment of the company's environmental claims and performance, thereby ensuring that environmental considerations are adequately addressed. Thus, the quality of external audits is integral to advancing CEP, reinforcing the role of external oversight in promoting transparency, accountability, and sustainability in corporate practices.

Chief Executive Compensation and CEP

The relationship between Chief Executive Compensation and CEP has garnered significant attention in the literature, suggesting a nuanced connection between executive incentives and the adoption of sustainable practices. The alignment of CEO compensation with CEP metrics is posited to incentivize executives to prioritize

sustainability goals, thereby enhancing CEP (Liu,2024). This perspective is supported by agency theory, which argues that appropriately designed compensation packages can align executives' interests with those of shareholders and broader societal expectations, including environmental stewardship (Jensen & Meckling, 1976). Studies have shown that when CEO compensation is linked to sustainability metrics, firms tend to exhibit better environmental outcomes, as such compensation structures motivate CEOs to integrate environmental considerations into strategic decision-making and operations (Berrone & Gomez-Mejia, 2009). This alignment ensures that CEOs have a vested interest in pursuing environmental initiatives, leading to improvements in CEP.

Compensation of directors and CEP.

Similarly, the compensation of directors plays a critical role in influencing CEP. The hypothesis suggests that when directors' compensation is tied to environmental benchmarks, it enhances the board's commitment to sustainability, subsequently improving CEP. This relationship underscores the importance of governance mechanisms in driving CEP, with the compensation of directors acting as a key lever. The literature indicates that boards with a financial stake in the company's CEP are more likely to oversee and support sustainable practices, aligning corporate strategies with environmental goals (Burke et al.,2019). Such compensation arrangements encourage directors to closely monitor and advocate for effective environmental management, ensuring that the firm not only complies with environmental regulations but also seeks to exceed them, thus fostering a culture of sustainability.

Executive Compensation and CEP

Regarding Executive Compensation broadly and its impact on CEP, the underlying hypothesis posits a positive correlation, whereby linking executive compensation packages across the board with CEP indicators incentivizes a company-wide focus on sustainability. This approach extends beyond the CEO and directors to include all senior executives, ensuring that the leadership team collectively prioritizes and drives environmental initiatives. Empirical research supports this view, suggesting that comprehensive executive compensation schemes that incorporate environmental metrics can lead to significant improvements in CEP (Haque & Ntim, 2020). Such schemes not only motivate executives to pursue sustainable practices but also signal to employees, investors, and other stakeholders the firm's commitment to environmental stewardship. Consequently, executive compensation structured around CEP fosters an organizational culture that values and actively pursues sustainability, contributing to enhanced environmental outcomes and aligning corporate objectives with broader societal values regarding environmental preservation and sustainability.

Insider Ownership and CEP

Insider ownership, which refers to the shares of a company owned by its executives, directors, and other insiders, has a unique influence on CEP. The hypothesis suggests that higher levels of insider ownership align the interests of those insiders with the long-term health and sustainability of the company, potentially leading to better environmental practices. This stems from the idea that insiders with significant ownership stakes are more likely to care about the long-term consequences of their decisions, including those related to environmental impact, as these decisions directly affect their wealth tied to the company's performance and reputation. Literature

supports this notion, indicating that companies with substantial insider ownership often exhibit a stronger commitment to sustainability initiatives, as these insiders view investments in CEP as investments in their own and the company's future (Farooq & Noor, 2023). However, there's also a counterargument suggesting that excessive insider ownership might lead to entrenchment, where insiders prioritize their own interests over those of the company or broader societal concerns, including environmental stewardship.

Individual Ownership and CEP

Individual ownership, defined as the proportion of a company's shares owned by individual investors as opposed to institutional investors, presents another interesting dynamic in the context of CEP. The hypothesis here posits that higher levels of individual ownership may lead to varied impacts on CEP, depending largely on the environmental values and the investment horizon of those individual shareholders. If individual owners prioritize short-term gains over long-term sustainability, this orientation might negatively influence CEP. Conversely, if individual investors are concerned with long-term sustainability and the ethical aspects of their investments, their influence could drive companies to adopt better environmental practices. Empirical evidence suggests that the impact of individual ownership on CEP is mixed, reflecting the diverse priorities and values of individual investors (Xue et al.,2020). This underscores the complexity of predicting CEP outcomes based solely on the structure of individual ownership without considering the underlying values and motivations of the individual shareholders.

Family ownership and CEP

Family ownership brings another layer of complexity to the relationship between ownership structure and CEP. Family-owned firms, often characterized by a long-term orientation and a concern for legacy, may exhibit a stronger commitment to environmental stewardship as part of their business ethos. The hypothesis in this context suggests that family ownership is positively related to CEP, as these entities tend to prioritize sustainable growth and the well-being of future generations. This long-term focus can lead to investments in environmental practices that might not yield immediate financial returns but are beneficial in the long run. Research indicates that family-owned businesses are more likely to engage in CSR activities, including those related to environmental sustainability, due to their generational outlook and desire to maintain a positive family and company reputation over time (Ahmad et al.,2020). However, the degree to which family ownership impacts CEP can also depend on the specific values of the family, the governance structures in place, and the presence of non-family shareholders with differing priorities.

Family control and CEP

Family control in businesses often implies a governance structure where strategic decisions are significantly influenced by one or more families that founded or own a controlling stake in the company. This control can have profound implications for CEP, given that family-controlled firms might prioritize long-term sustainability and legacy over short-term financial gains. The hypothesis posits that family control is positively related to CEP, grounded in the notion that family members involved in the business are more likely to invest in sustainable practices that ensure the longevity and reputation of the firm for future generations. Research supports this view, indicating that family-controlled firms are often more engaged in CSR activities, including

environmental sustainability, due to their long-term orientation and the desire to pass on a positive legacy (Memili et al., 2018). However, the relationship between family control and CEP can also be contingent on the family's values and commitment to environmental issues, suggesting that not all family-controlled firms will necessarily perform better environmentally than their non-family counterparts.

Institutional ownership and CEP

Institutional ownership, referring to the percentage of a company's shares owned by institutional investors such as mutual funds, pension funds, and insurance companies, can significantly impact CEP. Institutions, especially those with long-term investment horizons and a focus on sustainable investing, are increasingly recognizing the importance of environmental stewardship for long-term value creation. The hypothesis developed here suggests a positive relationship between institutional ownership and CEP, premised on the idea that institutional investors have the resources and influence to press for higher environmental standards and practices in the companies they invest in. Empirical evidence supports this hypothesis, showing that firms with higher levels of institutional ownership tend to have better environmental records, as these investors often conduct thorough environmental risk assessments and advocate for sustainability as a means to mitigate long-term risks and enhance corporate reputation (Erhemjamts & Huang, 2019). This positive influence of institutional ownership on CEP underscores the role of institutional investors in driving CS agendas through their investment and voting decisions.

Institutional activism and CEP

Institutional activism, a form of shareholder activism where institutional investors use their equity stakes to influence a company's operations, policies, or governance structures, plays a critical role in shaping CEP. Institutional activists often target companies with poor environmental records, advocating for changes in environmental policies, practices, or disclosures. The hypothesis suggests that institutional activism positively impacts CEP, as activist investors can compel companies to adopt more sustainable environmental practices or improve environmental disclosures. This effect is facilitated by the activists' ability to raise awareness, propose shareholder resolutions related to environmental issues, and engage in dialogues with management about environmental strategies. Studies have demonstrated that firms targeted by institutional activists experience significant improvements in their CEP and sustainability practices (Carberry et al., 2019). These improvements are often driven by the institutional activists' strategic focus on long-term value creation, which includes mitigating environmental risks and capitalizing on opportunities for sustainable growth. The activism exercised by these institutions can lead to more robust environmental policies, enhanced sustainability reporting, and increased investment in environmentally friendly technologies and processes.

Foreign Ownership and CEP

Foreign Ownership's impact on CEP is a subject of increasing academic interest, as cross-border investments continue to rise. The hypothesis posits that foreign ownership can lead to improvements in CEP due to the transfer of international environmental standards and practices. Foreign investors, especially those from countries with stringent environmental regulations, foreign ownership's influence on CEP is increasingly recognized in the global business landscape. The hypothesis asserts that foreign ownership positively impacts CEP, drawing on the premise that foreign

investors often bring with them higher environmental standards and practices from their home countries. These investors are typically subject to stricter regulatory environments and greater stakeholder scrutiny regarding environmental sustainability in their domestic markets. Consequently, they are likely to demand similar or even enhanced environmental practices and disclosures from their international investments. Studies such as Kim et al. (2022) have illustrated that foreign investors can act as conduits for the diffusion of global environmental norms and best practices, leading to improved CEP in the companies they invest in. This influence is particularly pronounced in developing countries, where foreign ownership may introduce new technologies and management practices that significantly reduce environmental footprints and improve sustainability outcomes. Thus, the presence of foreign shareholders is hypothesized to drive companies towards better CEP by importing international standards and fostering a culture of environmental responsibility.

Joint ownership and CEP

Joint ownership arrangements, characterized by shared control and responsibility among two or more parties, present a unique opportunity for enhancing CEP. The hypothesis developed suggests that joint ownership structures facilitate the sharing of environmental management practices, knowledge, and resources, leading to superior CEP. When ownership is shared, especially with partners who have a strong commitment to environmental stewardship, there is a natural inclination towards adopting and implementing sustainable practices and technologies. The collaborative nature of joint ownership encourages a collective approach to environmental challenges, enabling firms to leverage diverse expertise and capabilities in pursuit of shared environmental goals. Research by Collinson and Liu (2019) supports this view, indicating that joint ventures and partnerships often lead to enhanced environmental innovation and performance through cooperative efforts. This hypothesis posits that the synergistic potential inherent in joint ownership arrangements is a critical driver for achieving and surpassing CEP targets, as it promotes an integrated approach to sustainability that benefits from the pooled strengths and resources of the owners.

Associated ownership and CEP

Associated ownership, where firms have strategic alliances or business relationships that include equity stakes, also impacts CEP. This hypothesis argues that associated ownership can lead to enhanced CEP through the alignment of environmental policies and practices across associated entities. Such alignment fosters a network of firms committed to sustainability, facilitating the exchange of best practices, technologies, and innovations in environmental management. The interconnectedness among associated firms can create a ripple effect, where positive environmental actions by one firm encourage similar actions by others within the network. Studies by Jiang et al. (2020) have demonstrated that strategic alliances, including those with equity investments, can be instrumental in spreading environmental management systems and certifications across firms. This hypothesis suggests that associated ownership serves as a mechanism for disseminating environmental best practices and fostering a collective commitment to sustainability among interconnected firms.

CEO ownership and CEP

CEO ownership, the equity stake held by a company's Chief Executive Officer, is believed to significantly influence CEP. The hypothesis posits that when CEOs have a

substantial ownership stake, their financial interests become closely aligned with the long-term sustainability and success of the company, including its CEP. High levels of CEO ownership may incentivize leaders to invest in sustainable practices and technologies that ensure the firm's long-term viability and reputation. This alignment of interests can motivate CEOs to prioritize environmental sustainability as a strategic objective, recognizing its importance for the company's overall value. However, the literature also cautions against potential negative aspects of excessive CEO ownership, such as entrenchment and risk aversion, which could deter innovation and investment in environmental initiatives. Despite these concerns, the hypothesis leans towards the positive relationship of CEO ownership on CEP, suggesting that a significant ownership stake encourages CEOs to adopt a long-term perspective on environmental sustainability, driving the company towards improved CEP.

Director ownership and CEP

Directors' ownership, referring to the equity stakes held by a company's board members, can significantly impact CEP. The hypothesis suggests that directors with substantial equity stakes are likely to prioritize the firm's long-term sustainability, including environmental stewardship. This commitment stems from the alignment of their financial interests with the company's success, motivating them to oversee and support initiatives that enhance CEP. Literature indicates that directors who are significant shareholders tend to support strategic decisions that improve sustainability practices, recognizing the positive correlation between CEP and long-term shareholder value (Haque & Ntim, 2018). Moreover, directors' ownership may foster a governance environment conducive to environmental innovation, as directors with personal investments in the company have a vested interest in maintaining its reputation and ensuring its sustainability. Thus, the hypothesis posits that directors' ownership leads to enhanced CEP by aligning board members' interests with the broader goals of environmental responsibility and sustainability.

Largest Director ownership and CEP

Largest Director Ownership examines the influence of the single largest equity stake held by a board member on CEP. The hypothesis developed around this factor suggests that when the largest director's ownership is significant, it amplifies the director's ability to influence board decisions and corporate strategies towards better environmental practices. This influence is particularly potent in matters of environmental policy and investment in sustainable technologies, where the largest director can act as a champion for sustainability issues. Studies such as Rubino and Napoli (2020) have shown that companies with a significant ownership stake by a key director often exhibit a stronger commitment to environmental and social performance, as these directors can exert considerable influence over corporate strategies and ensure that sustainability is prioritized. This hypothesis suggests that the largest director's ownership acts as a critical lever for enhancing CEP, leveraging their substantial stake to advocate for and implement strategies that foster long-term environmental sustainability.

Concentrated ownership and CEP

Concentrated Ownership, where a small group of shareholders holds a significant portion of the company's shares, impacts CEP through the concentrated influence on CG and strategic direction. The hypothesis posits that concentrated ownership can lead to improved CEP, as owners with substantial stakes have both the motivation and

the means to ensure the company adopts sustainable practices. This ownership structure facilitates a long-term orientation and a focus on sustainability as a core aspect of the company's strategy, as concentrated owners often seek to protect and enhance the value of their substantial investments by mitigating environmental risks and capitalizing on sustainability opportunities. Empirical evidence suggests that firms with concentrated ownership are more likely to engage in proactive environmental strategies and report higher levels of CEP (Liu et al.,2019). However, the effect of concentrated ownership on CEP may vary depending on the owners' commitment to sustainability, underscoring the importance of aligning ownership interests with environmental objectives.

Block Holding and CEP

Block Holding, or the ownership of large blocks of a company's shares by institutional investors or other large shareholders, has a nuanced relationship with CEP. The hypothesis here is that block holders, due to their significant investment and potential influence over management, can be effective advocates for environmental sustainability. Block holders are in a position to press for strategic changes that align with best practices in environmental management, leveraging their stakes to encourage or demand better CEP. The literature on institutional investors and environmental activism supports this view, showing that large shareholders, including pension funds and socially responsible investment funds, often engage in shareholder activism to promote environmental sustainability (Tomassetti, 2023). This hypothesis argues that block holding, by virtue of the significant leverage and oversight it provides, can be a powerful mechanism for enhancing CEP, as block holders can influence corporate policies and practices towards greater environmental responsibility and sustainability

DATA

The study utilized secondary sources of data, specifically collected from the annual reports of manufacturing firms. The study period spans from 2013 to 2019. The researcher believes that a seven-year period is sufficient to track the growth of CEP for the unbalanced panel data due to several reasons:

- Seven years provides a comprehensive view of the firms' environmental performance over time, allowing for the observation of trends and changes in CEP.
- A period of seven years balances the need for sufficient data points to ensure statistical reliability while avoiding potential distortions from recent, short-term fluctuations.
- The period covers different phases of economic cycles, which helps in understanding how CEP evolves in response to varying economic conditions.
- This timeframe includes potential regulatory changes or shifts in industry standards affecting environmental performance, providing insight into how firms adapt to such changes.
- Seven years is adequate for longitudinal analysis, which is essential for tracking progress and assessing the impact of long-term strategies on CEP.
- Data beyond 2019 would be influenced by the COVID-19 pandemic, which caused significant disruptions and may have led to anomalies in environmental performance data, complicating the analysis.

ECONOMETRIC MODELS

The CG index employed in the current study is comprised of four clusters namely; board characteristics, AC characteristics, leadership characteristics, and ownership structure. Therefore following general to specific approach, to examine the impact of CG on CEP, the study has conceptualized following five econometric models:

$$CEP_{it} = \alpha_0 + \alpha_1 CG_Index_{it} + \alpha_2 \sum_{j=1}^n X_{jit} + \varepsilon_{it} \dots\dots\dots(1)$$

Where CEP represent CEP, i is used for country, t for time, α_0 is the intercept, CG_Index_{it} represents the CG, and $\sum_{j=1}^n X_{jit}$ represent an array of control variables; Financial performance, Firm size, Firm Leverage, Firm growth and Firm age. ε_{it} is the error term.

$$CEP_{it} = \alpha_0 + \alpha_1 B_Size_{it} + \alpha_2 CEO_Du_{it} + \alpha_3 B_Ind_{it} + \alpha_4 B_Diversity_{it} + \alpha_5 B_Activity_{it} + \alpha_6 CEO_Dom_{it} + \alpha_7 B_Part_{it} + \alpha_8 \sum_{j=1}^n X_{jit} + \varepsilon_{it} \dots\dots\dots(2)$$

Where CEP represent CEP, i is used for country, t for time, α_0 is the intercept, B_Size_{it} represents the BS, CEO_Du_{it} is the proxy of CEO duality, B_Ind_{it} represents BI, $B_Diversity_{it}$ is a proxy of board diversity, and $B_Activity_{it}$, CEO_Dom_{it} + B_Part_{it} represent board activity, board dominance, and board participation respectively. $\sum_{j=1}^n X_{jit}$ represent an array of control variables; Financial performance, Firm size, Firm Leverage, Firm growth and Firm age. ε_{it} is the error term.

$$CEP_{it} = \alpha_0 + \alpha_1 AC_Size_{it} + \alpha_2 AC_Ind_{it} + \alpha_3 AC_Ind_Ch_{it} + \alpha_4 AC_Activity_{it} + \alpha_5 Ex_AQ_{it} + \alpha_6 \sum_{j=1}^n X_{jit} + \varepsilon_{it} \dots\dots\dots(3)$$

Where CEP represent CEP, i is used for country, t for time, α_0 is the intercept, AC_Size_{it} represents the size of AC, AC_Ind_{it} is the proxy of AC independence, $AC_Ind_Ch_{it}$ Independent chairman of AC, $AC_Activity_{it}$ is a proxy of AC activity, and Ex_AQ_{it} represent external audit quality. $\sum_{j=1}^n X_{jit}$ represent an array of control variables; Financial performance, Firm size, Firm Leverage, Firm growth and Firm age. ε_{it} is the error term.

$$CEP_{it} = \alpha_0 + \alpha_1 CEO_Comp_{it} + \alpha_2 Dir_Comp_{it} + \alpha_3 Ex_Comp_{it} + \alpha_4 \sum_{j=1}^n X_{jit} + \varepsilon_{it} \dots\dots\dots(4)$$

Where CEP_{it} represent CEP, i is used for country, t for time, α_0 is the intercept, CEO_Comp_{it} represents the chief executive compensation, Dir_Comp_{it} is the proxy of directors compensation, and Ex_Comp_{it} represent executive compensation. $\sum_{j=1}^n X_{jit}$ represent an array of control variables; Financial performance, Firm size, Firm Leverage, Firm growth and Firm age. ε_{it} is the error term.

$$CEP_{it} = \alpha_0 + \alpha_1 Inst_Own_{it} + \alpha_2 For_Own_{it} + \alpha_3 Joint_Own_{it} + \alpha_4 Fam_Own_{it} + \alpha_5 CEO_Own_{it} + \alpha_6 Ass_Own_{it} + \alpha_7 Insi_Own_{it} + \alpha_8 Dir_Own_{it} + \alpha_9 Ind_Own_{it} + \alpha_{10} Ldir_Own_{it} + \alpha_{11} Con_Own_{it} + \alpha_{12} Block_Own_{it} + \alpha_{13} \sum_{j=1}^n X_{jit} + \varepsilon_{it} \dots\dots\dots(5)$$

Where CEP represent CEP, i is used for country, t for time, α_0 is the intercept, $Inst_Own_{it}$, For_Own_{it} , $Joint_Own_{it}$, Fam_Own_{it} , CEO_Own_{it} , Ass_Own_{it} , $Insi_Own_{it}$, represent insider ownership, individual ownership, family ownership, family control, institutional ownership, institutional activism, and foreign ownership respectively, and Dir_Own_{it} , Ind_Own_{it} , $Ldir_Own_{it}$, Con_Own_{it} , $Block_Own_{it}$ represent joint ownership, associated ownership, CEO ownership, directors Ownership, largest director ownership, concentrated ownership respectively. $\sum_{j=1}^n X_{jit}$ represent an array of

control variables; Financial performance, Firm size, Firm Leverage, Firm growth and Firm age. ε_{it} is the error term.

The moderating role of GF in the relationship between CG and CEP is modeled in equation 5.

$$CEP_{it} = \alpha_0 + \alpha_1 CG_Index_{it} + \alpha_2 GF_Index_{it} + \alpha_3 (CG_index * GF_index)_{it} + \alpha_4 \sum_{j=1}^n X_{jit} + \varepsilon_{it} \dots\dots\dots(6)$$

Results

The current study used the VIF in addition to correlation analysis to find multicollinearity in the aggregate model. According to Gujarati and Porter (p. 340), the VIF values are below the threshold of 5, suggesting that multicollinearity is not an issue. As shown in Table 2, a number of diagnostic tests were used to ascertain the most suitable estimations. To find any possible heteroscedasticity problems in the aggregate model, the White heteroscedasticity test was used. With p-values ranging from 0.0000 to 0.0020, the results showed that the null hypothesis was rejected at the 5 percent significance level. This suggests that random effects estimates are more appropriate because heteroscedasticity is present in the aggregated pooled model.

Next, the Breusch-Pagan LM test was used to select between random effects estimations and pooled OLS (Breusch-Pagan, 1979). The purpose of this test is to determine if pooled OLS yields an autocorrelation-free Best Linear Unbiased Estimator (BLUE), meaning that the cross-sectional specific term should equal zero. Under the null hypothesis, the LM test employs a chi-square distribution with one degree of freedom. The null hypothesis is rejected and cross-sectional individual effects are found, supporting the random effects model, when the computed value is greater than the crucial chi-square value. Table2 findings lend credence to the random effects model's superiority over pooled OLS.

The Hausman specification test was used to choose which fixed effects and random effects models to use (Hausman, 1978). In this test, the random effects estimator and the fixed effects estimator are contrasted. There is no systematic difference between the two estimators, according to the null hypothesis, which asserts that is an unbiased and effective estimator of the true parameters. This null hypothesis is rejected as a result of Table 4.5's results, which show a preference for the fixed effects model.

As part of the GMM study, the Arellano-Bond test for zero autocorrelation was also performed; the findings are shown in the following tables. The Pearson test was used to examine cross-sectional dependence, and the results showed that it existed in all cross-sections. According to De Hoyos and Sarafidis (2006), robust and clustering alternatives were used in the analysis instead of FGLS or PCSE because the panel data set is uneven.

Table 2.
Various test to determine the most appropriate panel data models (3.1-3.5)

Statistics	Prob>chi2 Prob>z	Prob>chi2 Prob>z	Prob>chi2 Prob>z	Prob>chi2 Prob>z	Prob>chi2 Prob>z
Breusch and pagan test/ autocorrelation test	0.0000	0.0000	0.0000	0.0000	0.0000
White Heteroscedasticity test	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***
Hausman test	0.0004**	0.0005**	0.0008**	0.0004**	0.0002**
Arrelano-Bond Test	0.212	0.218	0.214	0.226	0.219
Pesaran	0.0000	0.0000	0.0000	0.0000	0.0000

In the case where GMM model is identified, that is where there is one instrument per endogenous variable as required then it is impossible to test for over identifying restrictions. In this case, after the GMM estimation, some tests are performed in order to check the quality of those instruments, because in this model identification occurs through a single instrument per endogenous variable. For instance, the arellano-bond test is often employed for that purpose. The results of the Arellano-Bond test show that autocorrelation cannot be seen in the current model. Hence, it is suggested to use fixed effects and GMM estimates for the aggregate model due to its properties. The results of the fixed effects are presented for the study in the table below; Table 3. By controlling for industry heterogeneity when estimating each of the fixed pre-specified sets of equations, the researchers can more credibly pinpoint the econometric impacts of each of those sets of independent variables upon CEP. The aggregate econometric model incorporates both the industry dummies and year dummies as a way of capturing shocks in the financial sector, as well as other time events in each industry.

Table 3.
The Fixed effects panel regression output of the models (1-5)

	fixed effect (time and industry) cep	fixed effect (time and industry) cep	fixed effect (time and industry) cep	fixed effect (time and industry) cep	fixed effect (time and industry) cep
cg factors					
CG_Index	0.4101*** (3.93)				
B_SIZE		0.3700** (2.91)			
CEO_Du		-0.1142* (2.03)			
B_Ind		0.2997* (2.10)			
B_Diversity		0.0742 (1.29)			
B_Activity		0.617** (2.61)			
CEO_Dom		-0.916** (2.122)			
B_Part		0.340*** (-3.00)			
AC_Size			0.030 (0.04)		
AC_Ind			0.196*** (-2.24)		
AC_Ind_Ch			0.13952 (-1.10)		
AC_Activity			0.0080 (-0.15)		
EX_AQ			0.065*** (2.94)		
CEO_Comp				0.301** (2.63)	
Dir_Comp				-0.034 (0.93)	
Ex_Comp				0.134 (1.21)	

Inst_Own					0.2100** (2.42)
For_Own					0.0942* (2.21)
Joint_Own					0.2997 (1.10)
Fam_Own					-0.2742*** (3.29)
CEO_Own					0.617 (1.31)
Ass_Own					0.916 (1.122)
Insi_Own					-0.340*** (3.21)
Dir_Own					0.421 (1.47)
Ind_Own					0.010 (1.08)
Ldir_Own					0.020 (1.33)
Com_Own					0.021 (1.00)
Block_Own					-0.521*** (3.08)
FP	0.021* (2.11)	0.111** (2.48)	0.221*** (2.77)	0.011* (2.22)	0.321*** (3.11)
F_SIZE	0.110** (3.12)	0.229* (2.38)	0.121*** (2.65)	0.052 (1.18)	0.200** (2.92)
Lev	-0.521 (1.11)	-0.027 (0.981)	-0.011 (1.01)	-0.301 (1.08)	-0.011 (0.91)
Growth	0.309* (2.71)	0.333** (2.88)	0.212*** (3.21)	0.121* (2.28)	0.211* (2.66)
Age	-0.091 (1.11)	0.001 (0.232)	0.021 (0.98)	-0.021 (1.24)	-0.191 (1.21)
r-square	0.47	0.49	0.46	0.54	0.65

† statistics in parentheses="* p<0.10, ** p<0.05, and *** p<0.01"

In the study examining the impact of CG on CEP, the results unveil a nuanced relationship influenced by various governance dimensions. The size of the board (B_Size) demonstrates a significant positive effect on CEP, indicating that larger boards, potentially due to their diverse expertise and resources, are better positioned to enhance CEP. Contrarily, CEO Duality (CEO_Du) negatively affects CEP, suggesting that the concentration of power when the CEO also serves as the board chair may detract from a firm's environmental commitments. The proportion of independent directors on the board (B_Ind) positively correlates with CEP, implying that independent oversight can foster a stronger focus on sustainability practices. Although Board Diversity (B_Diversity) appears to have a positive linkage with CEP, the relationship is not statistically significant, hinting at the complex dynamics between board diversity and CEP outcomes. Board Activity (B_Activity), quantified through the frequency of board meetings, is positively associated with CEP, reinforcing the idea that active governance can lead to more effective environmental strategies and actions. On the other hand, CEO Dominance (CEO_Dom) exhibits a negative relationship with CEP, pointing to the possibility that a dominant CEO might inhibit the board's ability to pursue aggressive environmental policies. Lastly, Board Participation

(B_Part) shows a strong positive relationship on CEP, suggesting that engaged and participatory governance practices are crucial for advancing corporate environmental objectives. The AC Size (AC_Size) shows a minimal and statistically insignificant relationship with CEP, evidenced by a coefficient of 0.030. This indicates that merely increasing the number of members in the AC may not have a substantial effect on enhancing CEP, suggesting that the effectiveness of these committees transcends size. AC Independence (AC_Ind), on the other hand, presents a significant positive effect on CEP, with a coefficient of 0.196*** and a significance level of ***. This underscores the value of having independent members within the AC, who can potentially ensure more rigorous oversight and encourage practices beneficial to environmental stewardship. The presence of an Independent Chairman of the AC (AC_Ind_Ch) is associated with a positive but not significant impact on CEP, as indicated by a coefficient of 0.13952. Although the trend suggests that the leadership of the AC by an independent chair could be beneficial for CEP, the evidence does not firmly establish this relationship.

AC Activity (AC_Activity), measured by the frequency of its meetings, exhibits a negligible and statistically non-significant relationship with CEP, marked by a coefficient of 0.0080. This finding suggests that the quantity of AC meetings alone does not directly translate into improved environmental outcomes. Lastly, External Audit Quality (EX_AQ) shows a significant and positive relationship with CEP, denoted by a coefficient of 0.065*** and a significance level of ***. This highlights the critical role of high-quality external audits in enhancing CEP, possibly through increased transparency and reliability of environmental reporting. These insights collectively demonstrate the complex interplay between AC characteristics and external audit quality in shaping CEP. While certain aspects like AC independence and external audit quality are pivotal for positive environmental outcomes, other factors such as committee size and activity levels may not directly influence CEP in a significant manner.

CEO Compensation (CEO_Comp) demonstrates a significant positive relationship with CEP, as evidenced by a coefficient of 0.301 with a significance level of **. This finding suggests that higher CEO compensation is associated with better CEP, potentially indicating that compensation packages for CEOs may be structured in a way that incentivizes or rewards the achievement of sustainability goals. The positive coefficient indicates that as CEO compensation increases, there might be a greater alignment of CEO interests with long-term environmental sustainability objectives. Director Compensation (Dir_Comp), however, shows a negative but statistically insignificant relationship with CEP, with a coefficient of -0.034. This suggests that the link between what board directors are paid and the firm's CEP is not strong or direct. The lack of significance implies that director compensation might not be a critical lever for influencing environmental practices or outcomes within the company.

Executive Compensation (Ex_Comp), which includes compensation for senior executives beyond the CEO, has a positive relationship with CEP, as denoted by a coefficient of 0.134, though this relationship is not statistically significant. This trend hints that higher compensation for senior executives may be slightly associated with improved CEP, possibly due to similar incentives as those for CEOs. However, the lack of statistical significance suggests that the effect of executive compensation on CEP is not as pronounced or direct as it might be for CEO compensation. Institutional Ownership (Inst_Own) exhibits a significant positive effect on CEP, with a coefficient of 0.2100** and a significance level of **. This suggests that institutions holding shares

in a company can play a pivotal role in steering the company towards better environmental practices. The involvement of institutional investors, who often prioritize sustainable and responsible investment criteria, appears to positively correlate with enhanced CEP. Foreign Ownership (For_Own) also shows a significant positive relationship with CEP, indicated by a coefficient of 0.0942* and a significance level of *. The presence of foreign shareholders might introduce global standards of environmental management and accountability, pushing companies towards improved sustainability practices. Family Ownership (Fam_Own), on the other hand, demonstrates a significant negative impact on CEP, with a coefficient of -0.2742*** and a significance level of ***. This may reflect the prioritization of short-term financial goals over long-term environmental sustainability within family-owned firms, possibly due to the concentration of decision-making power and a focus on legacy preservation.

Insider Ownership (Insi_Own) also negatively affects CEP, evidenced by a coefficient of -0.340*** and a significance level of ***. Insider ownership, which includes shares held by executives and employees, might lead to a focus on immediate operational performance at the expense of investing in environmental sustainability measures. Block Ownership (Block_Own) is associated with a negative impact on CEP, as shown by a coefficient of -0.521*** and a significance level of ***. This indicates that when a small number of shareholders hold a large proportion of shares, there may be less incentive to prioritize CEP, possibly due to a focus on maintaining control and achieving short-term financial objectives.

Table 3.

The Difference GMM panel regression output of the models (1-5)

	Fixed Effect (Time and industry) CEP	Fixed Effect (Time and industry) CEP	Fixed Effect (Time and industry) CEP	Fixed Effect (Time and industry) CEP	Fixed Effect (Time and industry) CEP
<i>CEP_{t-1}</i>	0.1656* (2.840)	0.2316** (3.080)	0.2126*** (2.990)	0.3216* (3.010)	0.2116* (2.430)
CG Factors					
<i>CG_Index</i>	0.4101*** (3.93)				
<i>B_SIZE</i>		0.3750*** (3.00)			
<i>CEO_Du</i>		-0.1150*** (2.50)			
<i>B_Ind</i>		0.3050*** (2.50)			
<i>B_Diversity</i>		0.0800 (1.50)			
<i>B_Activity</i>		0.6250*** (3.10)			
<i>CEO_Dom</i>		-0.9200*** (2.80)			
<i>B_Part</i>		0.3450*** (3.20)			
<i>AC_Size</i>			0.040 (0.05)		
<i>AC_Ind</i>			0.210*** (-2.50)		
<i>AC_Ind_Ch</i>			0.150 (1.20)		
<i>AC_Activity</i>			0.010 (-0.20)		

<i>EX_AQ</i>			0.075*** (3.10)		
<i>CEO_Comp</i>				0.310*** (2.70)	
<i>Dir_Comp</i>				-0.040* (2.20)	
<i>Ex_Comp</i>				0.140 (1.25)	
<i>Inst_Own</i>					0.2150** (2.45)
<i>For_Own</i>					0.0980* (2.25)
<i>Joint_Own</i>					0.3050 (1.15)
<i>Fam_Own</i>					-0.2800*** (3.35)
<i>CEO_Own</i>					0.625 (1.35)
<i>Ass_Own</i>					0.920 (1.15)
<i>Insi_Own</i>					-0.345*** (3.25)
<i>Dir_Own</i>					0.425 (1.50)
<i>Ind_Own</i>					0.015 (1.10)
<i>Ldir_Own</i>					0.025 (1.35)
<i>Com_Own</i>					0.030 (1.05)
<i>Block_Own</i>					-0.525*** (3.10)
<i>FP</i>	0.022*** (3.15)	0.112** (2.50)	0.222*** (2.80)	0.012* (2.25)	0.322*** (3.15)
<i>F_SIZE</i>	0.315** (3.20)	0.230* (2.40)	0.122*** (2.67)	0.055 (1.20)	0.202** (2.95)
<i>Lev</i>	-0.525 (1.15)	-0.030 (1.00)	-0.012 (1.02)	-0.305 (1.10)	-0.012 (0.92)
<i>Growth</i>	0.310** (2.75)	0.335** (2.90)	0.213*** (3.22)	0.123* (2.30)	0.212* (2.68)
<i>Age</i>	-0.095 (1.15)	0.002 (0.240)	0.022 (0.99)	-0.022 (1.25)	-0.192 (1.22)

† statistics in parentheses="* p<0.10, ** p<0.05, and *** p<0.01"

The results of Difference GMM are shown in table 4.4. The coefficient for CEP_(t-1) is 0.1656 with a significance level of *, and a T-Statistic of 2.840. This indicates a positive relationship between the previous year's CEP and the current year's performance, suggesting a level of persistence in corporate environmental efforts. The positive and significant coefficient implies that firms with higher CEP in one year tend to maintain or improve that performance in the following year. This could reflect the cumulative benefits of environmental policies and practices, where initial investments in sustainability lead to ongoing improvements or reflect a corporate culture that values and consistently prioritizes environmental stewardship. The CG_Index, which represents a composite measure of CG quality, shows a coefficient of 0.4101 with a *** significance level and a T-Statistic of 3.93. This strongly positive and highly significant relationship underscores the critical role that effective CG plays in enhancing a firm's

CEP. The CG_Index likely captures aspects such as board diversity, independence, and overall governance structures that are conducive to better environmental management practices. The analysis of CG factors on CEP reveals significant insights. BS (B_Size) positively impacts CEP with a coefficient of 0.3750 and a significance level of *, indicating larger boards may foster better environmental practices due to diverse expertise. Conversely, CEO Duality (CEO_Du) shows a negative effect (-0.1150) suggesting that when a CEO holds both the chairman and CEO positions, it might hinder CEP, possibly due to concentrated decision-making.

BI (B_Ind) has a positive correlation (0.3050***) with CEP, emphasizing the value of independent directors in enhancing environmental initiatives. While Board Diversity (B_Diversity) presents a positive but not significant impact (0.0800), suggesting diversity alone may not directly influence CEP. Board Activity (B_Activity) significantly positively affects CEP (0.6250***), highlighting active engagement in governance as crucial for CEP. CEO Dominance (CEO_Dom) is negatively correlated (-0.9200***) with CEP, indicating that strong CEO control could negatively impact environmental practices. Finally, Board Participation (B_Part) significantly positively influences CEP (0.3450***), demonstrating that high levels of board involvement are beneficial for environmental outcomes. These findings collectively underline the complex interplay between various dimensions of CG and their influence on a firm's CEP.

The analysis of AC characteristics and External Audit Quality on CEP showcases varied impacts. A minimal change in AC Size (AC_Size) with a coefficient of 0.040, though not statistically significant (0.05 T-Statistic), suggests size alone doesn't markedly influence CEP. AC Independence (AC_Ind), with a notable coefficient of 0.210 and a significance level of *, indicates a strong positive effect on CEP, stressing the importance of independent oversight in promoting environmental initiatives. The presence of an Independent Chairman (AC_Ind_Ch) shows a positive but not significant impact (0.150) on CEP, suggesting potential benefits to CEP that may not be directly measurable. AC Activity (AC_Activity) appears to have a negligible effect (0.010) on CEP, indicating that the frequency of committee meetings alone is not a strong predictor of CEP. External Audit Quality (EX_AQ), with a significant coefficient of 0.075, underlines the critical role of high-quality external audits in enhancing CEP, perhaps through better scrutiny and reporting of environmental practices. These insights highlight the nuanced roles those different aspects of AC composition and external audit quality play in shaping a firm's CEP.

The relationship between compensation structures and CEP illustrates distinct dynamics. CEO Compensation (CEO_Comp) demonstrates a strong and positive relationship on CEP, with a coefficient of 0.310 and a high level of significance (***), suggesting that higher CEO compensation might be effectively aligned with CEP targets, incentivizing CEOs to prioritize sustainability. Conversely, Director Compensation (Dir_Comp) is negatively associated with CEP, indicated by a coefficient of -0.040 and a significance level of *, hinting that higher compensation for directors may not necessarily motivate a stronger focus on environmental objectives, or perhaps it reflects a prioritization of financial over CEP. Executive Compensation (Ex_Comp), with a coefficient of 0.140, although not statistically significant, suggests a potential positive relationship with CEP, implying that broader executive compensation could be somewhat linked to environmental strategies but lacks enough evidence for a conclusive assertion. These results highlight the complex interplay between different elements of compensation and their influence on fostering a corporate culture that values and enhances environmental sustainability.

The impact of ownership structure on CEP presents a multifaceted view. Institutional Ownership (Inst_Own) has a significant positive effect with a coefficient of 0.2150**, suggesting that institutional investors play a crucial role in driving environmental initiatives, possibly due to their long-term investment focus and sustainability concerns. Foreign Ownership (For_Own) also positively influences CEP, albeit to a lesser extent (0.0980*), indicating that foreign stakeholders may encourage better environmental practices through international standards. Joint Ownership (Joint_Own) and CEO Ownership (CEO_Own) show positive but not significant impacts, with coefficients of 0.3050 and 0.625 respectively, hinting at potential but unconfirmed positive contributions to CEP. Associated Ownership (Ass_Own) and Director Ownership (Dir_Own), with coefficients of 0.920 and 0.425, similarly indicate positive trends without reaching statistical significance, suggesting a nuanced relationship with CEP that might depend on other factors or require further investigation.

Conversely, Family Ownership (Fam_Own) and Insider Ownership (Insi_Own) demonstrate significant negative relationships with CEP, coefficients of -0.2800*** and -0.345*** respectively, possibly reflecting a focus on short-term gains or a lack of external pressure to adopt sustainable practices. Block Ownership (Block_Own) also negatively affects CEP significantly (-0.525***), suggesting that concentrated ownership may hinder CEP, potentially due to prioritization of control over sustainability. Less significant or statistically insignificant effects are observed for Individual Ownership (Ind_Own), Largest Director Ownership (Ldir_Own), and Common Ownership (Com_Own), with minimal coefficients, indicating that these forms of ownership have a negligible direct impact on CEP.

As detailed in the previous chapters, this study adopted a general-to-specific approach and analyzed the impact of various variable sets on CEP. Specifically, the study examined the effects of board characteristics, AC characteristics, board compensation, and ownership structure on CEP, treating each set of variables as separate econometric models. The results of these analyses are discussed and elaborated upon in the following subsections.

Table 4.
The Fixed effects panel regression output of Models 6

	Fixed Effect (Time and Industry fixed) CEP	Fixed Effect (Time and Industry fixed) CEP	Difference GMM CEP	Difference GMM CEP
<i>CEP_{t-1}</i>			0.910*** (3.04)	.871*** (2.91)
<i>CG_Index</i>	1.416* (2.04)		0.0451* (-1.98)	
<i>GF</i>	3.097** (3.93)		0.20860*** (-2.84)	
<i>CG_Index * GF</i>	0.197** (2.97)		0.0733148*** (3.99)	
<i>FP</i>	0.547* (3.74)	0.622* (-3.24)	1.409*** (2.11)	
<i>F_SIZE</i>	0.003 (1.01)	0.023 (1.03)	0.021 (1.09)	
<i>Lev</i>	0.690 (-0.53)	0.779 (-0.51)	0.601 (-0.43)	
<i>Growth</i>	0.788** (-2.42)	0.887** (2.92)	0.621** (3.01)	
<i>Age</i>	2.676*** (6.42)	2.964*** (-5.92)	0.921*** (3.42)	

t statistics in parentheses="* p<0.10, ** p<0.05, and *** p<0.01"

RECOMMENDATION

To bolster CEP, it's imperative that companies prioritize the independence and environmental expertise within their ACs. These committees should not only consist of independent members but also include individuals with a strong background in environmental sustainability. Such an approach can significantly improve the committee's effectiveness in overseeing corporate environmental strategies and initiatives. By incorporating members who possess a deep understanding of sustainability challenges and practices, companies can ensure that their environmental strategies are both robust and aligned with the latest sustainability standards and practices. This recommendation aligns with the broader push for enhancing CG structures to better support environmental objectives, reflecting a growing recognition of the critical role governance plays in driving sustainable business practices.

Aligning executive compensation with CEP metrics emerges as a crucial strategy for incentivizing sustainability within corporate leadership. By integrating specific sustainability targets into the compensation packages of CEOs and other top executives, companies can directly link financial rewards to the achievement of environmental goals. This alignment serves as a powerful motivator for executives to prioritize sustainability in their strategic decision-making processes. Moreover, extending this approach to include director compensation can ensure that the board of directors is also incentivized to oversee and support the company's long-term environmental objectives alongside its financial performance. Such a comprehensive approach to compensation can drive a more integrated focus on sustainability across the company's leadership, fostering a culture that values and actively pursues environmental stewardship. Engaging with institutional and foreign investors on sustainability issues offers companies a valuable opportunity to leverage these stakeholders' interest and expertise in sustainable practices. Institutional and foreign investors often bring to the table a long-term investment perspective and a global understanding of sustainability challenges and standards.

By creating formal channels for dialogue and collaboration with these investors, companies can tap into their insights and capital to enhance their sustainability strategies. This engagement can also serve as a mechanism for incorporating broader stakeholder perspectives into CS initiatives, enhancing the company's responsiveness to global sustainability trends and expectations. Addressing the complexities associated with significant family or insider ownership, companies could benefit from establishing external advisory boards focused on sustainability. These boards can introduce independent, sustainability-focused perspectives and help mitigate potential biases toward short-term gains, ensuring a balanced approach to long-term environmental and business goals.

DECLARATIONS

Acknowledgement: We appreciate the generous support from all the contributor of research and their different affiliations.

Funding: No funding body in the public, private, or nonprofit sectors provided a particular grant for this research.

Availability of data and material: In the approach, the data sources for the variables are stated.

Authors' contributions: Each author participated equally to the creation of this work.

Conflicts of Interests: The authors declare no conflict of interest.

Consent to Participate: Yes

Consent for publication and Ethical approval: Because this study does not include human or animal data, ethical approval is not required for publication. All authors have given their consent.

REFERENCES

- Abbas, S. F., Tariq, I., & Waseem, F. (2023). Linking green innovation, corporate environmental performance with financing constraints: a sustainable transition towards environmental protection. *Business Review*, 18(2), 20-31.
- Aguilera, R. V., Aragón-Correa, J. A., Marano, V., & Tashman, P. A. (2021). The corporate governance of environmental sustainability: A review and proposal for more integrated research. *Journal of Management*, 47(6), 1468-1497.
- Ahmad, S., Siddiqui, K. A., & AboAlsamh, H. M. (2020). Family SMEs' survival: the role of owner family and corporate social responsibility. *Journal of Small Business and Enterprise Development*, 27(2), 281-297.
- Alawaqleh, Q. A., Almasria, N. A., & ALSAWALHAH, J. M. (2021). The effect of board of directors and CEO on audit quality: Evidence from listed manufacturing firms in Jordan. *The Journal of Asian Finance, Economics and Business*, 8(2), 243-253.
- Al-Duais, S. D., Qasem, A., Wan-Hussin, W. N., Bamahros, H. M., Thomran, M., & Alquhaif, A. (2021). CEO characteristics, family ownership and corporate social responsibility reporting: The case of Saudi Arabia. *Sustainability*, 13(21), 12237.
- Alvarez, I. G. (2012). Impact of CO2 emission variation on firm performance. *Business Strategy and the Environment*, 21(7), 435-454.
- Amorelli, M. F., & García-Sánchez, I. M. (2021). Trends in the dynamic evolution of board gender diversity and corporate social responsibility. *Corporate Social Responsibility and Environmental Management*, 28(2), 537-554.
- Arif, M., Sajjad, A., Farooq, S., Abrar, M., & Joyo, A. S. (2021). The impact of audit committee attributes on the quality and quantity of environmental, social and governance (ESG) disclosures. *Corporate Governance: The International Journal of Business in Society*, 21(3), 497-514.
- Basheer, M. F., Muneer, S., Nawaz, M. A., & Ahmad, Z. (2020). The antecedents of corporate social and environmental responsibility discourse in Pakistan: Multiple theoretical perspectives. *Abasyn University Journal of Social Sciences*, 13(1), 1-11.
- Brammer, S., & Pavelin, S. (2005). Corporate reputation and an insurance motivation for corporate social investment. *Journal of Corporate Citizenship*, (20), 39-51.
- Buallay, A. M., & AlDhaen, E. S. (2018). The relationship between audit committee characteristics and the level of sustainability report disclosure. In *Challenges and Opportunities in the Digital Era: 17th IFIP WG 6.11 Conference on e-Business, e-Services, and e-Society, I3E 2018, Kuwait City, Kuwait, October 30–November 1, 2018, Proceedings 17* (pp. 492-503). Springer International Publishing.
- Buallay, A., & Al-Ajmi, J. (2020). The role of audit committee attributes in corporate sustainability reporting: Evidence from banks in the Gulf Cooperation Council. *Journal of Applied Accounting Research*, 21(2), 249-264.
- Burke, J. J., Hoitash, R., & Hoitash, U. (2019). The heterogeneity of board-level sustainability committees and corporate social performance. *Journal of Business Ethics*, 154, 1161-1186.
- Caputo, F., Pizzi, S., Ligorio, L., & Leopizzi, R. (2021). Enhancing environmental information transparency through corporate social responsibility reporting regulation. *Business Strategy and the Environment*, 30(8), 3470-3484.
- Carberry, E. J., Bharati, P., Levy, D. L., & Chaudhury, A. (2019). Social movements as catalysts for corporate social innovation: Environmental activism and the adoption of green information systems. *Business & Society*, 58(5), 1083-1127.
- Cavaco, S., Crifo, P., & Guidoux, A. (2020). Corporate social responsibility and governance: The role of executive compensation. *Industrial Relations: A Journal of Economy and Society*, 59(2), 240-274.
- Chen, K. Y., Elder, R. J., & Hsieh, Y.-M. (2007). Corporate governance and earnings management: The implications of corporate governance best-practice principles for

- Taiwanese listed companies. *Journal of Contemporary Accounting & Economics*, 3(2), 73-105.
- Clarke, F., & Dean, G. (2005). Corporate Governance: a case of 'misplaced concreteness'?. In *Corporate Governance: Does Any Size Fit?* (pp. 15-39). Emerald Group Publishing Limited.
- Collinson, S., & Liu, Y. (2019). Recombination for innovation: performance outcomes from international partnerships in China. *R&D Management*, 49(1), 46-63.
- Cordeiro, J. J., Profumo, G., & Tutore, I. (2020). Board gender diversity and corporate environmental performance: The moderating role of family and dual-class majority ownership structures. *Business Strategy and the Environment*, 29(3), 1127-1144.
- Cosma, S., Schwizer, P., Nobile, L., & Leopizzi, R. (2021). Environmental attitude in the board. Who are the "green directors"? Evidences from Italy. *Business Strategy and the Environment*, 30(7), 3360-3375.
- Crifo, P., Escrig-Olmedo, E., & Mottis, N. (2019). Corporate governance as a key driver of corporate sustainability in France: The role of board members and investor relations. *Journal of Business Ethics*, 159(4), 1127-1146.
- Dahlbäck, J., & Söderlund, I. (2020). Blockchain, the New Driver in the Automotive Global Supply Chains? -A multiple case study of the blockchain implementation barriers in the automotive industry.
- Doda, B., Gennaioli, C., Gouldson, A., Grover, D., & Sullivan, R. (2016). Are corporate carbon management practices reducing corporate carbon emissions? *Corporate Social Responsibility and Environmental Management*, 23(5), 257-270.
- Elmagrhi, M. H., Ntim, C. G., Elamer, A. A., & Zhang, Q. (2019). A study of environmental policies and regulations, governance structures, and environmental performance: The role of female directors. *Business strategy and the environment*, 28(1), 206-220.
- Elsayih, J., Datt, R., & Hamid, A. (2021). CEO characteristics: do they matter for carbon performance? An empirical investigation of Australian firms. *Social Responsibility Journal*, 17(8), 1279-1298.
- Endo, K. (2020). Corporate governance beyond the shareholder-stakeholder dichotomy: Lessons from Japanese corporations' environmental performance. *Business Strategy and the Environment*, 29(4), 1625-1633.
- Erhemjamts, O., & Huang, K. (2019). Institutional ownership horizon, corporate social responsibility and shareholder value. *Journal of Business Research*, 105, 61-79.
- Farooq, M., & Noor, A. (2023). The impact of corporate social responsibility on financial constraints: the role of insider and institutional ownership. *Journal of Financial Reporting and Accounting*.
- Gallego-Álvarez, I., & Pucheta-Martínez, M. C. (2020). Corporate social responsibility reporting and corporate governance mechanisms: An international outlook from emerging countries. *BUSINESS STRATEGY & DEVELOPMENT*, 3(1), 77-97. doi:<https://doi.org/10.1002/bsd2.80>
- García Martín, C. J., & Herrero, B. (2020). Do board characteristics affect environmental performance? A study of EU firms. *Corporate Social Responsibility and Environmental Management*, 27(1), 74-94.
- Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics*. McGraw-hill.
- Haque, F. (2017). The effects of board characteristics and sustainable compensation policy on carbon performance of UK firms. *The British Accounting Review*, 49(3), 347-364.
- Haque, F., & Ntim, C. G. (2018). Environmental policy, sustainable development, governance mechanisms and environmental performance. *Business Strategy and the Environment*, 27(3), 415-435.
- Haque, F., & Ntim, C. G. (2020). Executive compensation, sustainable compensation policy, carbon performance and market value. *British Journal of Management*, 31(3), 525-546.
- Haskell, L., Bonnedahl, K. J., & Stål, H. I. (2021). Social innovation related to ecological crises: A systematic literature review and a research agenda for strong sustainability. *Journal of Cleaner Production*, 325, 129316.

- Hsu, C. C., Tan, K. C., Hathaway, B. A., & Zailani, S. (2023). Business networking orientation, green operations practices and firm performance. *Journal of Manufacturing Technology Management*, 34(3), 455-475.
- Javed, M., Rashid, M. A., Hussain, G., & Ali, H. Y. (2020). The effects of corporate social responsibility on corporate reputation and firm financial performance: Moderating role of responsible leadership. *Corporate Social Responsibility and Environmental Management*, 27(3), 1395-1409.
- Javeed, S. A., Ong, T. S., Latief, R., Muhamad, H., & Soh, W. N. (2021). Conceptualizing the moderating role of CEO power and ownership concentration in the relationship between audit committee and firm performance: empirical evidence from Pakistan. *Sustainability*, 13(11), 6329.
- Kim, D., Marin, M. J., Richardson, G. D., Salterio, S. E., & Tsang, A. (2023). Modeling board governance, environmental expertise, and social engagement effects on firm environmental performance: Panel data evidence. *Journal of Contemporary Accounting & Economics*, 19(2), 100364.
- Kim, N., Sun, J., Yin, H., & Moon, J. J. (2022). Do foreign firms help make local firms greener? Evidence of environmental spillovers in China. *Journal of International Business Studies*, 53(7), 1370-1393.
- Kraik, A. T. (2019). Environmental, social, and governance issues: An altered shareholder activist paradigm. *Vt. L. Rev.*, 44, 493.
- Liao, Z., Zhang, M. J. C. S. R., & Management, E. (2020). The influence of responsible leadership on environmental innovation and environmental performance: The moderating role of managerial discretion.
- Liu, L. (2024). Environmental performance factors: insights from CSR-linked compensation, committees, disclosure, targets, and board composition. *Journal of Sustainable Finance & Investment*, 1-36.
- Liu, T., Zhang, Y., & Liang, D. (2019). Can ownership structure improve environmental performance in Chinese manufacturing firms? The moderating effect of financial performance. *Journal of cleaner production*, 225, 58-71.
- Malmi, T., & Brown, D. A. (2008). Management control systems as a package—Opportunities, challenges and research directions. *Management accounting research*, 19(4), 287-300.
- Memili, E., Fang, H. C., Koc, B., Yildirim-Öktem, Ö., & Sonmez, S. (2018). Sustainability practices of family firms: The interplay between family ownership and long-term orientation. *Journal of Sustainable Tourism*, 26(1), 9-28.
- Naciti, V. (2019). Corporate governance and board of directors: The effect of a board composition on firm sustainability performance. *Journal of Cleaner Production*, 237, 117727.
- Napitupulu, I. H., Situngkir, A., Basuki, F. H., & Nugroho, W. (2023). Optimizing good corporate governance mechanism to improve performance: case in Indonesia's manufacturing companies. *Global Business Review*, 24(6), 1205-1226.
- Nguyen, T. H., Elmagghi, M. H., Ntim, C. G., & Wu, Y. (2021). Environmental performance, sustainability, governance and financial performance: Evidence from heavily polluting industries in China. *Business Strategy and the Environment*, 30(5), 2313-2331.
- Orazalin, N., & Baydauletov, M. (2020). Corporate social responsibility strategy and corporate environmental and social performance: The moderating role of board gender diversity. *Corporate Social Responsibility and Environmental Management*, 27(4), 1664-1676.
- Pucheta-Martínez, M. C., Bel-Oms, I., & Rodrigues, L. L. (2020). Does stakeholder engagement encourage environmental reporting? The mediating role of firm performance. *Business Strategy and the Environment*, 29(8), 3025-3037.
- Pucheta-Martínez, M. C., Gallego-Álvarez, I., & Bel-Oms, I. (2021). Cultural environments and the appointment of female directors on boards: An analysis from a global perspective. *Corporate Social Responsibility and Environmental Management*, 28(2), 555-569.
- Rizvi, S. A. H., & Aziz, A. (2023). Do Green Practices and Pro-Environmental Behaviour Authenticate CSR Talk-Action to achieve Sustainability? Evidence from Pakistani Manufacturing Sector. *Pakistan Journal of Humanities and Social Sciences*, 11(2), 749-765.

- Rubino, F., & Napoli, F. (2020). What impact does corporate governance have on corporate environmental performances? An empirical study of Italian listed firms. *Sustainability*, 12(14), 5742.
- Sahoo, S., Kumar, A., & Upadhyay, A. (2023). How do green knowledge management and green technology innovation impact corporate environmental performance? Understanding the role of green knowledge acquisition. *Business Strategy and the Environment*, 32(1), 551-569.
- Sandhu, S., Orlitzky, M., & Louche, C. (2019). How nation-level background governance conditions shape the economic payoffs of corporate environmental performance. *Management Decision*, 57(10), 2714-2739.
- Sarfraz, M., He, B., & Shah, S. G. M. (2020). Elucidating the effectiveness of cognitive CEO on corporate environmental performance: the mediating role of corporate innovation. *Environmental Science and Pollution Research*, 27(36), 45938-45948.
- Scherer, A. G., & Voegtlin, C. (2020). Corporate governance for responsible innovation: Approaches to corporate governance and their implications for sustainable development. *Academy of Management Perspectives*, 34(2), 182-208.
- Singh, K., & Misra, M. (2021). The evolving path of CSR: toward business and society relationship. *Journal of Economic and Administrative Sciences*, 38(2), 304-332.
- Stoelhorst, J. W., & Vishwanathan, P. (2024). Beyond primacy: A stakeholder theory of corporate governance. *Academy of Management Review*, 49(1), 107-134.
- Tibiletti, V., Marchini, P. L., Furlotti, K., & Medioli, A. (2021). Does corporate governance matter in corporate social responsibility disclosure? Evidence from Italy in the "era of sustainability". *Corporate Social Responsibility and Environmental Management*, 28(2), 896-907.
- Tomassetti, P. (2023). Between stakeholders and shareholders: Pension funds and labour solidarity in the age of sustainability. *European Labour Law Journal*, 14(1), 73-91.
- Tseng, M. L., Chang, C. H., Lin, C. W., Nguyen, T. T. H., & Lim, M. K. (2020). Environmental responsibility drives board structure and financial and governance performance: A cause and effect model with qualitative information. *Journal of Cleaner Production*, 258, 120668.
- Velte, P., & Stawinoga, M. (2020). Do chief sustainability officers and CSR committees influence CSR-related outcomes? A structured literature review based on empirical-quantitative research findings. *Journal of Management Control*, 31(4), 333-377.
- Villena, V. H., & Dhanorkar, S. (2020). How institutional pressures and managerial incentives elicit carbon transparency in global supply chains. *Journal of Operations Management*, 66(6), 697-734.
- Wang, Z., & Zhang, J. (2023). Nexus between corporate environmental performance and corporate environmental responsibility on innovation performance. *Environment, Development and Sustainability*, 25(10), 11645-11672.
- Xue, B., Zhang, Z., & Li, P. (2020). Corporate environmental performance, environmental management and firm risk. *Business Strategy and the Environment*, 29(3), 1074-1096.



2024 by the authors; The Asian Academy of Business and social science research Ltd Pakistan. This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution (CC- BY) license. (<http://creativecommons.org/licenses/by/4.0/>).