University of Southampton

Faculty of Social Sciences - Southampton Business School

Business Studies and Management

Impact of Corporate Governance Mechanisms on Environmental, Social and Governance (ESG) Performance

by

Babajide Michael Oyewo

ORCID: 0000-0002-4499-601X

Thesis submitted in partial fulfilment of the requirements for the award of Doctor of Philosophy

September 2023

University of Southampton

Abstract

Faculty of Social Science

Department of Accounting, Southampton Business School

Thesis for the degree of Doctor of Philosophy

Impact of Corporate Governance Mechanisms on Environmental, Social and Governance (ESG) Performance

By Babajide Michael Oyewo

This thesis contains three research papers on the impact of corporate governance mechanisms on Environmental, Social and Governance (ESG) performance using international evidence of top multi-national entities (MNEs) along with an introductory and concluding chapter. The essays present interconnected studies on; (i) the impact of board composition on ESG performance; (ii) corporate governance drivers of environmental performance; and (iii) impact of board diversity on ESG performance in the millennium development goals (MDGs) and sustainable development goals (SDGs) eras.

The first research paper investigates the association between board composition and ESG performance. We test the impact of five board composition elements on ESG performance, notably board independence, CEO duality, board gender diversity, interlocking directorship, and ESG committee, whilst controlling for other corporate governance variables, firm-level attributes, and country-level governance factors. Panel quantile regression (PQR) was applied to analyse data covering a 15-year period (2006–2020) from 336 top MNEs, operating in 42 non-financial industries, located in 32 countries and 5 geographical regions. Fixed effect regression (OLS), multiple discriminant analysis, two-stage least squares (2SLS), and propensity score matching (PSM) regression analysis were used to analyse data. Whereas results from linear models show that board independence, board gender diversity, and existence of ESG committee are positively associated with ESG performance, PQR reveals that the relationship is curvilinear. Linear models show that CEO duality has no significant impact on ESG performance, but PQR reveals that sustained CEO duality erodes ESG performance. Furthermore, whilst linear models show that interlocking directorship has negative impact on ESG performance, PQR reveals that the presence of interlocking directors with vast cross-directorship experience enhances ESG performance.

The second research paper examines the extent to which corporate governance (CG) mechanisms affect corporate environmental performance (CEP). The study tested the impact of seven key CG mechanisms on CEP, broadly categorised into board structure and operations (board meeting, board independence and CEO

duality), board diversity (board gender diversity and board nationality diversity), and ESG structure (ESG committee and ESG-linked compensation). Panel quantile regression (PQR) was applied to analyse data covering a 15-year period (2006-2020) from 244 top multinational entities operating in 30 environmentally sensitive industries located in 31 countries distributed across 5 geographical regions. Binary logistic regression, two-stage least squares regression (2SLS)/ instrumental variables (IV) regression and propensity score matching (PSM) regression analysis were applied to assess the robustness of result. Result shows that at the aggregate/ combined level for all countries, board gender diversity and presence of ESG committee are the strongest drivers of CEP. However, when disaggregated into geographical regions, the impact of CG mechanisms on CEP is contextual and varies across jurisdictions. Following from the positive impact of board gender diversity and board nationality diversity on CEP, to strengthen board effectiveness and environmental sustainability performance, board nomination committees should select or recommend for selection director nominees that strengthen gender diversity and nationality diversity.

The third research paper investigates the impact of board diversity (namely board nationality diversity, board gender diversity, and board skills diversity) on ESG performance using a sample of Forbes 500 top multinational entities (MNEs), spanning 45 industries, 36 countries and 5 geographical regions, covering a 15-year period (2006-2020) of the millennium development goals (MDGs) era and sustainable development goals (SDGs) eras. Fixed effect linear regression, two-stage least squares (2SLS)/ instrumental variable (IV) regression, and propensity score matching regression were used to analyse data. Results show that at the aggregate level, board nationality diversity, board gender diversity, and board skills diversity are positively associated with ESG performance, with board nationality diversity emerging as the foremost determinant. When disaggregated into industries, the impact of board nationality diversity and board skills diversity on ESG performance is greater in the non-financial industry, whereas the impact of board gender diversity is more in the financial industry. When assessed from the standpoint of the MDGs/SDGs era, board nationality diversity and board skills diversity have greater impact on ESG performance in the MDGs era (2006-2015), whilst the impact of board gender diversity is more in the SDGs era (2016-2020). Overall, the study concludes that board diversity is an effective strategy for improving ESG performance.

Keywords: board leadership; corporate environmental performance; corporate governance; critical mass theory; ESG performance; gender diversity; interlocking directorship; legitimacy theory; nationality diversity; resource-based view theory; skills diversity; stakeholder theory; sustainable development goals (SDGs).

Table of Contents

List of Tables

List of Figures

List of Appendices

Research Thesis: Declaration of Authorship

Print name: Babajide Michael Oyewo

Title of thesis: Impact of Corporate Governance Mechanisms on Environmental, Social and Governance (ESG) Performance

I declare that this thesis and the work presented in it is my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;

Signature: Date: September 2023

Acknowledgements

Glory be to God the Father, God the Son, and God the Holy Spirit

My deepest gratitude goes to the Almighty God; the One who gave me the intellectual and physical strength to complete this work. I acknowledge Him as my source, my strength, my light, and my all-in-all.

My first round of appreciation goes to my supervisors, Prof. Venancio Tauringana, and Dr. Ishmael Tingbani, (Associate Professor of Accounting) who meticulously and professionally supervised this research work. Prof. Venancio Tauringana, aside being my main supervisor, is also my academic father. He encouraged me to put in for the Ph.D. programme in the University of Southampton; without his guidance, I may not have enrolled for a doctorate degree in the University, let alone complete the programme in good time. I also appreciate him for bringing out the best in me by constantly challenging me to continuously improve. Dr. Ishmael Tingbani, aside from being my second supervisor, is also a great mentor and researcher-per-excellence. His simplicity and openness have indeed inspired me to be an academic that should leave positive impact in the lives of people I encounter. He has undoubtedly been a pillar of encouragement till date.

I am grateful to the academics in the Department of Accounting at the University of Southampton, particularly Professor Alaa Zalata, Dr. Faizul Haque, and Dr Zhifeng Chen who examined me during my first- and second-year progression reviews. I acknowledge Mrs Debbie Evans who assisted me a great deal during the application process for the PhD. programme at the University. She also provided valuable guidance and assistance during my studies; she indeed made my study at the University enjoyable. My appreciation goes to Dr. Pingli Li, the hardworking ex-Director of PhD programmes, Southampton Business School.

Finally, I appreciate my Wife, Mrs. Jumoke Oyewo ("Tenderoni"), my Son, Jesujoba Oyewo ("Tender J"), and my daughter, Jesundara Oyewo ("Dara") for their love, care, spiritual support and perseverance during the period of my study and at all other times.

Babajide Michael Oyewo

This research work is dedicated to the Glory and Power of the Almighty God: My source and strength

and to

my amazing wife, Jumoke Oyewo ("Tenderoni") whose optimism, support, understanding, and love made this journey possible;

and to my son, Jesujoba Oyewo ("Tender J"), and my daughter, Jesundara Oyewo ("Dara") who are source of constant inspiration in my life and reminder of just how blessed my wife and I are.

Abbreviations

CEP – Corporate Environmental Performance
CG – Corporate Governance
MDGs – Millennium Development Goals
SDGs – Sustainable Development Goals

Chapter One: Introduction and Background

Chapter 1: Introduction and Background

1.1 Research Background

There have been calls in recent times to improve sustainability practice from the environmental, social and governance (ESG) standpoint as stakeholders are increasingly becoming interested in how organisations are creating value for stakeholders without comprising the resources available for future generations (Huang et al., 2014; Barakat et al., 2015). Whilst sustainability issues have received much attention in literature from the perspective of the triple bottom line of environmental (planet), social (people) and economic (profit) sustainability (Moses & Tauringana, 2022), this appears not to be the case for sustainability from the standpoint of environmental, social and governance (ESG) dimensions (Ngu & Amran, 2019). The ESG approach de-emphasises the focus on economic sustainability, but focuses tightly on environmental, social and governance issues which are arguably more pressing concerns in the sustainable challenges confronting the world (Du Rietz, 2018).

ESG issues are increasing gaining popularity among stakeholders because they focus on measures organisations are taken to commit to sustainability and address sustainability challenges (Elsayih et al., 2021). Whilst commercial enterprises will want to naturally report on their economic impact in terms of financial performance and how they are creating values for owners to improve their stock prices, ESG measures may be a truer reflection of sustainability because they de-emphasize financial performance. Meanwhile, financial performance measures have several limitations such as being subjected to manipulation, short-termism and providing an imbalanced/ one-sided picture of performance (Lai &Tam, 2017). On the other hand, ESG measures narrow down on environmental, social and governance issues which are arguably more sustainable and address the concerns of wider stakeholder groups, unlike economic performance indicators which are primarily geared towards addressing the concerns of owners/ shareholders.

The environmental pillar of the ESG framework focuses on environmental sustainability issues such as how the activities of the organisation is impacting living and non-living organisms in their natural environment; the impact of man's activities on the ecosystem comprising of water, land, and air; the use of natural resources as input for production activities (including water and energy); the output generated from human activities such as wastes, effluents and emissions; and compliance with environmental rules and regulations aimed at minimising

negative production and consumption externalities (Brammer & Pavelin, 2008). Environmental sustainability practice extends beyond an organisation to the environmental practices of other organisations within its value chain such as suppliers of resource inputs and distributors of finished products. In sum, environmental sustainability practices cover the environmental practice of an organisation and other organisations within its value chain such as the sourcing and usage of materials, energy, water, biodiversity, emissions, effluents and waste, products and services, compliance, transport, overall supplier environmental assessment, and environmental grievance mechanisms. Environmental sustainability disclosure also addresses a company's attitude, policy, or behaviour towards its impact on the environment in relation to emissions, pollution, cleaning up (after pollution), re-landscaping or energy efficiency (Braam et al., 2016).

The social dimension of the ESG framework focuses on the social impact of the organisation in the society. It encompasses issues such as labour practices, working conditions of employees, respecting human rights at workplace, issues affecting the society, community impact of the organisation, and product responsibility issues such as consumer health and safety, minimising negative consumption externalities, customer privacy, compliance with health and safety rules and regulations, among others (Clarkson et al., 2019).

The governance element of the ESG framework encompasses the measures put in place to ensure that the organisation conducts its business in a responsible manner that avoids or minimises environmental and social inconveniences. The governance element underpins the overall ESG framework since it is the collection of efforts to ensure compliance such as legal structure, internal audits, ethics, value system of an organisation in promoting sustainability practice, audit of ESG activities (Harjoto & Wang, 2020). Overall, the governance element is the gateway to a solid ESG framework as it also addresses the ESG strategy of the organisation or measures put in place to achieve ESG outcomes.

Considering that ESG focuses strictly on environmental, social and governance issues with less emphasis on economic performance, a truer reflection of the commitment of organisations to addressing sustainability challenges are the ESG measures. Although there are various factors that affect ESG practice, research suggests that corporate governance (CG) mechanisms are key drivers of ESG (Chithambo & Tauringana, 2017; Tingbani, et al., 2020).

1.2 Research Motivation, Aims and Research Papers

Corporate governance (CG) is an important consideration in the ESG discourse because governance largely determines the quality of decision-making in organisations and how such decisions influence corporate outcomes. According to the Carroll's pyramid of corporate social responsibility (CSR), there are four levels that organisation should demonstrate concern for sustainability. These four tiers also evince the motivation for addressing ESG issues in the ascending order of economic, legal, ethical, and philanthropic motivation (Carroll, 2016). The economic pillar demonstrates the economic motivation for involvement in ESG projects in terms of enhancing the financial performance of organisations (Smith et al., 2001). In essence, organisations will get involved in ESG projects to improve their ESG performance for the purpose of enjoying higher customer patronage, increase share price, negotiate better financing arrangement, and sway government decisions in favour of their organisations, amongst other financial benefits or consideration. This approach reveals that ESG projects are embarked upon not necessarily for the public good but for the benefit of the organisation (Spence, 2016).

The legal pillar suggests that organisations will get involved in ESG projects because of regulation or because some of the ESG activities are required by law or monitored by legislation and government actions (Carroll et al., 2012). In essence, coercive pressure is imposed on organisations to engage in sustainability, and the absence of law or regulation will cause organisations not to get involved in addressing sustainability challenges. However, considering that getting involved in sustainability projects is voluntary in many jurisdictions in the world (Kend, 2015; Clarkson et al., 2019), legal considerations may not strongly motivate companies to engage in ESG projects or improve ESG performance. In the third stage of the Carroll's CSR pyramid (i.e., ethical consideration), companies will want to get involved in ESG issues because of the desire to do what is right for the society, which brings in the ethical motivation. However, decision as to doing what is right for the environment and society rests with the highest decision-making body in the organisation (i.e., corporate board made up of the directors; Leka, 2022; Liu et al., 2023).

In the philanthropic echelon of the pyramid, organisations will want to get involve in ESG projects for the purpose of demonstrating good corporate citizenship (Lee, 2008; Carroll et al., 2012). At this stage, ESG activities go above and beyond a society's expectations of what is required. Society will label a business as unethical if it does not meet philanthropic responsibilities. Decisions on meeting and exceeding the expectations of the society also rests

with top management in corporate entities (De Villiers et al., 2011; Bongiovanni et al., 2022). In sum, whilst the economic and legal, motivations for ESG projects represent the lower echelon of the pyramid, the ethical and philanthropic motivation are the upper echelon, principally driven by top management decision-making structure in corporate entities (i.e., corporate governance). Against this backdrop, a growing number of research has linked corporate governance mechanisms (e.g., board independence, CEO duality, board diversity, interlocking directorship, ESG committee, and ESG-linked compensation) to ESG performance (Ioannou & Serafeim, 2012; Mangena et al., 2012; Chithambo & Tauringana, 2017; Aguilera et al., 2019; Tang et al., 2020; Tingbani, et al., 2020; Doni et al., 2021; Ryou et al. 2022).

Studies have shown that good corporate governance (CG) practice promotes robust ESG practice, as companies emplacing effective CG mechanisms may not engage in deliberately selecting sustainability endeavours that are positive and favourable (i.e., no "green washing" of ESG reports). In essence, good CG arrangements can be positively attributed to improved ESG practice (Tang et al, 2020; Ramdhony et al., 2021). However, this debate is unsettled because various studies have reported mixed results. Whilst some studies note that robust CG mechanisms drive ESG practice (e.g., Doni, 2021; Tang et al., 2020), others have countered this claim by presenting empirical evidence that it is not always the case that CG mechanisms lead to positive ESG performance outcomes (e.g., Brammer & Pavelin, 2008; Jamil et al., 2021). More studies are therefore required to address these conflicting results.

As a way of resolving mixed results, there have been calls for more inter-industry and cross-country studies (Erin et al., 2021; Tauringana & Moses, 2021). Many studies on the influence of CG mechanisms on ESG issues have been conducted within a country, economic region, or geographical region (e.g., Ong et al., 2020; Elsayih et al., 2021; Konadu et al., 2021; Nuber & Velte, 2021). Such studies provide a limited knowledge on the subject. In response, there have been calls for more research using international sample. To advance knowledge on determinants of ESG performance, an international approach with samples cutting across various industries, countries, and regions (geographical and/ or economic) is required to enhance generalisability of results (Zaman et al., 2020; Moses & Tauringana, 2022).

To further resolve controversies surrounding the impact of CG on ESG performance, there have been suggestions to study the relationship over a long-time frame (Zaman et al., 2020). This is because the trend in the relationship between CG and ESG performance may not be

clear in the short run. In response, there have been calls for more longitudinal studies. However. most studies examine the relationship in the short to medium term (e.g., Ong et al., 2020; Erin et al., 2021; Nuskiya et al., 2021). The launching of Agenda 2030, effective January 2016, makes it compelling to conduct a longitudinal study across the MDGs era (2000-2015) and SDGs era (2016-2030). The sustainable development goals (SDGs) require top companies to deepen their commitment to addressing sustainable development challenges (according to SDG 17: partnership for the goals) through their CG mechanisms, considering that CG is a major apparatus for self-regulation in private sector entities. With the coming into effect of sustainable development goals (SDGs), CG may impact ESG performance differently in the MDGs era (2000-2015) and SDGs era (2016-2030) because companies will want to improve their ESG performance to legitimise their existence. However, little is known on the nexus between CG mechanisms and ESG performance in this regard. Most prior inter-country studies adopting a longitudinal approach, did not disaggregate results into MDGs and SDGs eras (e.g., García-Sánchez et al., 2019; Lu & Wang, 2021). This is an important omission in literature that would have to be addressed to advance our understanding of the determinants of ESG performance (Wang & Li, 2023). It is imperative to conduct a longitudinal study spanning the MDGs and SDGs eras in an inter-country setting because such study can advance knowledge on efforts multinational entities (MNEs) are making to actualise Agenda 2030 through CG—corporate boards have ultimate responsibility for organisation's ESG performance (Leka, 2022; Liu et al., 2023).

A study on the association between CG and ESG performance may inform policy formulation in relation to ESG/sustainability policy, SDGs, and corporate governance reform. To encourage sustainable, long-term growth, scholars have observed a trend among companies to incorporate metrics associated with sustainability into long-term and short-term incentive plans (Flammer, et al., 2019; Okafor & Ujah, 2020; Lu & Wang, 2021). Likewise, investors have also become more vocal in encouraging the use of such ESG metrics to reform corporate governance mechanism, board composition and executive compensation. For example, in June 2012, the United Nations Principles for Responsible Investment ("UNPRI") released guidance for the integration of environmental, social and governance issues in executive pay (Glass Lewis, 2016). This guidance, which was established through discussion with investors and issuers, addresses the three key areas of constructing compensation packages that successfully utilise sustainability/ESG metrics: (i) identifying appropriate ESG metrics for each company; (ii) linking these metrics to executive pay packages; and (iii) providing high-quality disclosure on

sustainability-linked compensation plans. However, to ensure that sustainability policies and corporate governance reforms achieve their intended purposes, empirical evidence is required on how various corporate governance mechanisms impact ESG elements and the overall ESG performance in the SDGs era. SDG 17 on partnership for the goals calls on MNEs as key private sector entities instrumental to achievement of SDGs. Considering that CG is a major apparatus for self-regulation in private sector entities (García-Sánchez et al., 2019; Wang & Li, 2023), findings from the current study on the relationship between CG and ESG performance may inform policy formulation on CG reforms that could help MNEs achieve their SDGs targets.

Against his backdrop, it becomes important to investigate the extent to which CG affects ESG performance in an international context using a longitudinal approach. These issues are addressed in three interrelated research papers with titles as follows:

(i) Paper 1: Board Composition and ESG Performance: A Quantile Regression Cross-country Evidence from Top Multinational Entities

(ii) Paper 2: Corporate Governance Drivers of Environmental Performance: International Evidence from Environmentally Sensitive Industries

(iii) Paper 3: Does Board Diversity Improve ESG Performance? Evidence From Top Multinational Entities in The MDGs And SDGs Era

1.3 Methodology

In paper 1, the study adopts a panel research design. The population of the study is comprised of 2000 largest international companies according to the Forbes Global 2000 list prepared as of 2021. The Forbes Global 2000 is a comprehensive list of the world's largest, most powerful public companies, as measured by revenues, profits, assets and market value. Companies on the list are largest companies in the world, and as such are closely monitored for their ESG commitment. Furthermore, they are globally visible firms. Sample selection based on visibility and size has been widely used in prior studies (Giannarakis et al., 2014). Top 500 companies on the Forbes list were selected as sample for the study. Prior studies have extensively applied the Forbes ranking as a sampling frame (Martínez-Ferrero & García-Sánchez, 2017). Financial service institutions were excluded due to significant difference in their business and the manner of the evaluation of their wealth and in their corporate structures (Tingbani, et al., 2020). After excluding 160 financial service companies, 340 non-financial companies emerged, but 4 entries

with no ESG report were deleted, leaving a total of 336 firms. The final sample selection of firms cuts across 32 countries and 42 industry groups.

In paper 2, the study deploys a quantitative research design, using a panel data analysis and secondary data source. The use of secondary data is considered advantageous in this study to ensure well-validated and substantiated findings. The population of the study comprises of top 500 companies on the Forbes list operating in environmentally sensitive industries. Companies on the Forbes list represent largest business organisations in the world and are closely monitored for their commitment to environmental sustainability because of their global impact. Using this selection criterion, 245 companies emerged. After deleting one entry with no ESG report in the Refinitiv/DataStream database, the final sample is made up of 244 firms processed for analysis.

Paper 3 deploys a panel research design. Panel studies are advantageous because they allow for the collection of data over a long period of time, whilst also overcoming the limitations of cross-sectional and time-series studies (Petersen, 2009). The use of panel data by the current study enables the researchers to collect both cross-sectional data and time-series data of several MNEs over a 15-year time frame (2006-2020), thus enhancing generalisability of result. The population of the study is comprised of 2000 largest multinational entities (MNEs)/ international companies on the Forbes list 2021. The Forbes Global 2000 companies is a comprehensive list of the world's largest, most powerful public companies, as measured by revenues, profits, assets and market value. Companies on the list represent largest companies in the world that are globally visible and are closely monitored for their ESG performance. Sample selection based on visibility and size has been widely used in prior studies (e.g., Giannarakis et al., 2014; Ngu & Amran, 2019). Top 500 companies on the Forbes list were selected as sample for the study. There are 340 non-financial and 160 financial service firms making up the top 500 companies. After excluding 4 non-financial and 15 financial service firms with no ESG report, the final sample is made up of 336 non-financial firms and 145 financial service firms, making a total of 481 firms included in the studies (Appendix 4.1). The sample selection cuts across 45 industries, 36 countries, and 5 geographical regions.

1.4 Contributions of the study to knowledge.

1.4.1 Contributions to Knowledge in Paper 1

The current study contributes to literature by advancing our knowledge on the corporate governance determinants of ESG performance from four perspectives. First, we contribute to the limited international studies on the interaction between board composition and ESG performance (e.g., Jensen & Meckling, 1976; Aguilera & Jackson, 2003; De Villiers et al., 2011; Mangena et al., 2012; Zhang et al., 2013; Mangena et al., 2020) by analysing empirical evidence covering a 15-year period (2006-2020) from 336 top MNEs from 32 countries and 42 non-financial industries. The longitudinal research design and international approach adopted by the current study in investigating the subject allows for more generalisability of results.

Second, we contribute to methodology by applying a novel method (PQR)—which could detect both linear and non-linear relationships between dependent and independent variables— to analyse the influence of board composition on ESG performance. Such a methodologically rigorous approach is useful in (i) partly addressing mixed result reported in literature on the nature of relationship between study variables; and (ii) demonstrating that results of linear models applied in prior studies could be misleading. Whilst linear models show that board leadership attributes such as board independence, gender diversity and ESG committee enhances ESG performance thereby confirming the result of prior studies (e.g., Jensen & Meckling, 1976; Aguilera & Jackson, 2003; De Villiers et al., 2011; Mangena et al., 2012; Zhang et al., 2013; Mangena et al., 2020), PQR reveals that board composition elements impact ESG performance differently across the quantiles, showing that the relationship is curvilinear. The current study, thus, empirically demonstrates that the impact of board composition on ESG performance depends on the level of engagement with ESG projects. The consistently positive significant impact of board independence on ESG performance in the upper quantiles of ESG performance confirms that board independence enhances ESG performance. PQR shows that whilst combining the role of CEO and Chairperson may not initially appear to affect ESG performance, the persistence of CEO duality erodes ESG performance. This extends discussion in extant literature that when board members continue to serve in the dual capacity of CEOs and board Chairpersons, abuse of power may be inevitable, and this may erode ESG performance (Ashfaq & Rui, 2019; Buallay & Al-Ajmi, 2020). Board gender diversity has a significant positive impact on ESG performance under the OLS technique. However, PQR reveals that the impact of board gender diversity on ESG performance depends on the level of

engagement with ESG projects, showing that the relationship is non-linear. The consistently positive significant impact of board gender diversity on ESG performance in the upper quantiles of ESG performance confirms that board gender diversity enhances ESG performance in line with prior studies (e.g., Nuber & Velte, 2021; Konadu et al., 2021; Gull et al., 2023; Liu et al., 2023). Furthermore, linear model reveals that interlocking directorship erodes ESG performance; PQR reveals that whereas the presence of interlocking directors with limited cross directorship experience may erode ESG performance, the presence of interlocking directors with vast cross directorship experiences strengthens ESG performance.

Third, we present evidence on how board composition impacts ESG performance differently in the MDGs and SDGs eras, thus contributing to the debate on efforts MNEs are making in addressing sustainable development challenges through board leadership. Finally, our study contributes to the stakeholder theory and RBV theory by providing empirical validation that outside directors, gender diversity on corporate boards, presence of interlocking directors and existence of ESG committee are strategic assets that can be deployed to improve ESG performance of organisations as suggested by the RBV theory (Saqib et al., 2021; Malik & Shim, 2022). The study also contributes to the stakeholder theory by showing that the appointment of independent directors/ NEDs, separation of the role of board Chairperson from company CEO, allowing for more female directors on the board, appointment of interlocking directors, and constituting an ESG committee are effective corporate governance strategies for strengthening board performance and addressing sustainable development challenges in the interest of stakeholders.

1.4.2 Contributions to Knowledge in Paper 2

The study contributes to knowledge in several ways by addressing observed gaps in literature. First, the study adopts an international approach by analysing evidence from 244 top MNEs operating in 30 environmentally sensitive industries in 31 countries, distributed across 5 geographical regions. It exposes the CG factors affecting CEP within an international context. Second, the study presents evidence that the impact of CG mechanisms on corporate environmental performance (CEP) is contextual and varies across jurisdictions, thereby confirming the submission of prior studies (e.g., Mangena et al., 2012; Chithambo & Tauringana, 2017; Zaman et al., 2020; Pandey et al., 2022). It attempts to reconcile/ explain

mixed results reported in prior studies on the impact of CG on CEP by presenting evidence on how the influence of CG varies by geographical regions.

Third, the study makes methodological contribution by using novel techniques such as PQR, to analyse the CG-CEP nexus. This is in response to call to use state-of-the-art regression methods to ensure well validated results which have not been particularly addressed in most prior studies. It deploys a novel statistical technique (PQR) to establish the case that the CG-CEP relationship is not linear—an important consideration that has not been taken to account by most prior studies, but which has partly contributed to mixed results. PQR reveals that the impact of CG on CEP is dependent on the level of engagement with environmental sustainability projects. Considering that gender diversity has low and statistically insignificant coefficients in the lower quantiles (q 0.10 to q 0.30), but has significant and notable coefficients in the upper quantiles (q 0.50 to 0.70), it implies that board gender diversity has greater impact on CEP at higher levels of environmental sustainability engagement, thereby confirming the result of prior studies on the positive impact of board gender diversity on environmental performance (e.g., Tingbani et al., 2020; Lopatta, et al., 2020; Elsayih et al, 2021; Nuber & Velte, 2021). PQR also shows that although the presence of the ESG committee can enhance CEP, the effectiveness of the committee may decline in the long run if the activities of the committee are not reviewed on a regular basis or if the membership of the committee is not reinvigorated from time to time.

Fourth, the study adopts a longitudinal approach by decomposing the impact of CG mechanisms on CEP in the MDGs (2006-2015) and SDGs (2016-2020) era, whilst presenting evidence on how the CG apparatus impacts CEP differently across the periods. The study presents empirical evidence that the SDGs deepened the level of commitment to environmental sustainability when compared to the MDGs era. Finally, the study makes contribution to stakeholder theory and legitimacy theory by furnishing empirical evidence that MNEs will emplace CG mechanisms as a strategy for improving CEP to entrench corporate legitimacy and gain stakeholders' acceptance, thereby confirming the validity of the theories (Jensen & Meckling, 1976; Suchman, 1995; Agyemang et al., 2020; Disli et al., 2022).

1.4.3 Contributions to Knowledge in Paper 3

The study contributes to knowledge within the context of the research gaps. It addresses the first research gap by concurrently investigating the impact of various dimensions of board

diversity (i.e., board nationality diversity, board gender diversity, and board skills diversity) on ESG performance, thereby confirming the result of prior studies that board diversity enhances ESG performance (e.g., Tingbani et al., 2020; Konadu et al., 2021; Gull et al., 2023). It specifically adds to the limited literature on the relevance of under-researched elements of board diversity (board nationality and board skills diversity) on ESG performance.

The study tackles the second research gap by investigating the subject in an international context in both financial and non-financial firms. Whereas most prior studies have been limited to a country, geographical region and or industry, the international approach adopted by analysing evidence from 481 MNEs spanning 45 industries, 36 countries and 5 geographical regions enhances the generalisability of result. Meanwhile, the simultaneous investigation of both genetic diversity (i.e., nationality diversity and gender diversity) and cognitive diversity (i.e., skills diversity) using international sample of top MNEs provide a more rigorous analysis of board diversity-ESG performance nexus.

The third research gap is addressed by using a longitudinal approach to assess the relationship between board diversity and ESG performance in the pre-SDGs/ MDGs era (2000-2015) and the SDGs era (2016- 2020). The study presents empirical evidence on (a) the extent to which various dimensions of board diversity has impacted ESG performance in the MDGs era differently from the SDGs era; (b) how MNEs are responding to the UN agenda for sustainable development in terms of strengthening diversity among top management team since the SDGs implementation took effect over 7 years ago; (c) efforts MNEs are making towards achieving the SDGs through board diversity with a view towards improving ESG performance, as upliftment in ESG practice would anticipatorily contribute to actualising agenda 2030 set to expire in less than 8 years from now.

The fourth research gap is addressed by using a multi-theoretical approach to explain the positive influence of board diversity on ESG performance on one hand (i.e., resource-based view theory), as well as the magnitude and significance of the impact of board diversity on ESG performance (through the critical mass theory). The study, thus, makes contribution to theory. Whereas limited earlier studies have applied the critical mass theory within the context of gender diversity, the current study empirically validates and confirms the applicability of the critical mass to not only board gender diversity but extends it to nationality diversity and skills diversity (Tingbani et al., 2020; Nuber & Velte, 2021).

Finally, the study contributes to knowledge by empirically demonstrating that board diversity impacts ESG performance differently in the non-financial and financial Industries. Whereas board nationality diversity and board skills diversity have greater impact on ESG performance in the non-financial industry, the impact of board gender diversity is more in the financial industry when compared to the non-financial industry. This could be attributable to the significantly higher level of board nationality diversity in the non-financial industry in comparison to the financial industry. On the other hand, board gender diversity has greater impact on ESG performance in the financial industry in comparison to the non-financial industry because of the significantly higher level of board gender diversity in the financial industry in comparison to the non-financial industry. Overall, the result supports the conclusion that board diversity enhances ESG performance and achieving higher board diversity level is an effective strategy for improving ESG performance.

1.5 Outline of the Thesis

The rest of the thesis proceed as follows; Chapter 2 presents Paper 1, Chapter 3 presents Paper 2, and Chapter 4 presents Paper 3. The research report is concluded in Chapter 5.

Chapter Two: Research Paper 1

Board Composition and ESG Performance: Cross-country Evidence from Top Multinational Entities

Chapter 2: Board Composition and ESG Performance: Cross-country Evidence from Top Multinational Entities

Abstract

The research problem

Environmental, social and governance (ESG) issues have continued to attract attention in developed and developing countries. However, many companies may choose not to disclose ESG information, thus creating a gap between the demand for and supply of ESG information. These developments have spurred debates on determinants of ESG accounting. Although there are various factors influencing ESG performance, responsibility for the oversight of an organisation's sustainability/ ESG matters lies firmly with the board of directors. The current study, therefore, investigates the association between board composition and ESG performance in an international setting in the MDGs and SDGs eras.

Motivation and theoretical reasoning

Whilst board composition could enhance ESG performance according to stakeholder theory and resource-based view theory (RBV), review of extant literature reveals three gaps which motivates the current study. First, international studies on the impact of board composition on ESG performance are limited. Second, the nature of relationship between board composition and ESG performance may be non-linear; meanwhile, most studies have ignored the possibility of curvilinear relationship by using linear regression models to analyse the relationship. Third, with the coming into effect of Agenda 2030, board leadership may impact ESG performance differently in the MDGs era (2000-2015) and SDGs era (2016-2030). However, little is known on efforts multinational entities (MNEs) are making to actualise Agenda 2030 through their board leadership composition.

The test hypotheses

We test the impact of five board composition elements on ESG performance, notably board independence, CEO duality, board gender diversity, interlocking directorship, and ESG committee, whilst controlling for other corporate governance variables, firm-level attributes, and country-level governance factors.

Adopted methodology and findings

Panel quantile regression (PQR) was applied to analyse data covering a 15-year period (2006–2020) from 336 top MNEs, operating in 42 non-financial industries, located in 32 countries and 5 geographical regions. To compare the results of linear and non-linear regression models, fixed effect regression (OLS), multiple discriminant analysis, two-stage least squares (2SLS), and propensity score matching (PSM) regression analysis were performed. Whereas results from linear models show that board independence, board gender diversity, and existence of ESG committee are positively associated with ESG performance, PQR reveals that the relationship is curvilinear, implying that impact of board composition elements on ESG performance depends on the level of engagement with ESG projects. Linear models show that CEO duality has no significant impact on ESG performance but PQR reveals that sustained CEO duality erodes ESG performance. Furthermore, whilst linear models show that interlocking directorship has negative impact on ESG performance, PQR reveals that the presence of interlocking directors with vast cross-directorship experience progressively enhances ESG performance.

Implications of the study

The curvilinear relationship between board composition and ESG performance revealed by PQR informs the recommendation that board composition should be balanced to optimise ESG performance.

Keywords: board leadership; ESG; interlocking directorship; resource-based view theory; SDGs; stakeholder theory

2.1 Introduction

Environmental, social and governance (ESG) issues, such as climate change, waste management/ recycling, water reclamation, social inequality, and employee welfare, among others, have continued to attract attention in developed and developing countries (Radhakrishnan et al. 2018). Consequently, investors, regulators, customers, environmental interest groups and other stakeholders are demanding for ESG/ sustainability reports, as they become more interested in how organisations are creating value without comprising resources available for future generations (Ryou et al. 2022). Sustainability issues have received much attention in literature from the perspective of triple bottom line of environmental (planet), social (people) and economic (profit) sustainability (Moses & Tauringana, 2022). This appears not to be the case for sustainability from the dimension of environmental, social and governance matters (Ioannou & Serafeim, 2012; Ryou et al. 2022). The ESG approach de-emphasises economic sustainability, but focuses tightly on environmental, social and governance issues which are arguably more pressing concerns in the sustainable challenges confronting the world (Du Rietz, 2018).

Whereas commercial enterprises will want to naturally report their economic impact in creating value for owners to improve company stock prices, ESG measures may be a truer reflection of sustainability commitment, because ESG de-emphasises financial performance. However, considering that ESG indicators focus strictly on environmental performance, social sustainability, and governance measures emplaced to address sustainable development challenges, many companies may choose not to disclose ESG information (Ryou et al. 2022), thus creating a gap between the demand for and supply of ESG information. Companies choosing to disclose ESG information may 'greenwash' such reports through opportunistic reporting behaviour (Barbu et al. 2022; Tsang et al. 2022). As a response, there have been calls for the regulation of ESG reporting (e.g., Christensen et al., 2022; Ryou et al. 2022), although ESG accounting is currently voluntary in many jurisdictions (Kend, 2015; Clarkson et al., 2019).

These developments have spurred debates on determinants of ESG accounting and reporting (e.g., Pinnuck et al., 2021; Wang & Li, 2023). Although there are various factors influencing ESG performance of organisations, responsibility for the oversight of an organisation's sustainability/ ESG matters lies firmly with the board of directors (Leka, 2022; Liu et al., 2023). Therefore, a growing number of studies suggests that board composition could enhance ESG

performance (e.g., Mangena et al., 2012; Aguilera et al., 2019; Tingbani, et al., 2020). This argument is premised on various theories, including stakeholder theory and resource-based view theory (RBV). The stakeholder theory would support the proposition that restructuring board composition such as appointment of independent/ non-executive directors (NEDs), separating the role of board chairperson from company chief executive officer (CEO), allowing for more female director representation on the board, appointment of interlocking directors, and constituting a functional ESG committee could strengthen board performance in addressing sustainable development challenges in the interest of stakeholders (Fama & Jensen, 1983; Kassinis & Vafeas, 2002). Similarly, the RBV theory underpins the argument that the competence and independence of NEDs, differences in the genetic makeup and social roles of male and female directors, experience and connection of interlocking directors, and expertise of ESG committee members are strategic assets that can be leveraged to improve ESG performance of organisations (Barney, 1991; Bongiovanni et al., 2022). It may be expected, therefore, that a well constituted board leadership could enhance ESG performance. However, the review of the related literature on the association between board leadership and ESG performance reveals some gaps which the current study seeks to address.

First, many studies on the influence of board leadership mechanisms on ESG issues have been conducted within a country, economic region, or geographical region (e.g., Ong et al., 2020; Elsayih et al., 2021; Konadu et al., 2021; Nuber & Velte, 2021). Such studies provide a limited knowledge on the subject. In response, there have been calls for more research using international sample. To advance knowledge on determinants of ESG performance, an international approach with samples cutting across various industries, countries, and regions (geographical and/ or economic) is required to enhance generalisability of results (Zaman et al., 2020; Moses & Tauringana, 2022).

Second, empirical findings on the influence of board leadership on ESG issues are mixed (e.g., Brammer & Pavelin, 2008; Chithambo & Tauringana, 2017; Tang et al., 2020; Doni et al., 2021). Therefore, the debate on board leadership determinants of ESG performance is unsettled. To resolve conflicting results reported in the literature, the following have been suggested (Zaman et al., 2020; Nuskiya et al., 2021): (i) the relationship between board composition and ESG performance may be non-linear (Nuskiya et al., 2021), as the linearity of relationship assumed between variables may be responsible for mixed results. Meanwhile, most studies have applied statistical techniques underpinned by linearity of relationship between dependent and independent variables (e.g., Dragoa et al., 2015; Tingbani, et al., 2020;

Elsayih et al., 2021; Konadu et al., 2021). Only a few studies have used novel analytical methods that could detect both linear and non-linear relationships among variables (e.g., García-Sánchez et al., 2019; Cancela et al., 2020). To resolve inconsistencies in result, it is crucial to apply more sophisticated statistical methods such as panel quantile regression (PQR) to analyse the association between board leadership and ESG performance; (ii) drawing from the prior argument that board leadership composition-ESG performance relationship may be curvilinear, more longitudinal studies are required to reveal trends on the nature of relationship (Zaman et al., 2020). Most studies investigating ESG issues cover a short to medium timeframe (e.g., Ong et al., 2020; Erin et al., 2021; Nuskiya et al., 2021). A more nuanced analysis of the association between the variables may not emerge unless a longitudinal analysis is undertaken (Aguilera et al., 2019).

Third, tackling ESG issues has now becoming more pressing in both developed and developing countries (Radhakrishnan et al. 2018; Barbu et al. 2022; Ryou et al. 2022). This resonates with the United Nations sustainable development goals (United Nations, 2023). The United Nations Millennium Declaration, signed in September 2000 and specifying millennium development goals (MDGs) commits world leaders to combat poverty, hunger, disease, illiteracy, environmental degradation, and discrimination against women (Moses & Tauringana, 2022). The sustainable development goals (SDGs), set up in 2015 by the United Nations, are a collection of 17 interlinked global goals designed to be a blueprint to achieve a better and more sustainable future for all (Erin et al., 2022). Unlike the MDGs which only target developing countries, the SDGs apply to all countries—whether rich, middle-income, or poor (United Nations, 2023). The international relevance and wider applicability of the SDGs to both developed and developing countries imply greater diffusion of ESG targets, and more motivation for corporate entities to emplace robust board leadership structure to strengthen ESG performance. In the light of the foregoing, it is conceivable that the board composition implemented by organisations to achieve ESG targets may have changed over the period. With the coming into effect of Agenda 2030, board leadership may impact ESG performance differently in the MDGs era (2000-2015) and SDGs era (2016-2030). However, little is known on the nexus between board composition and ESG performance in this regard. However, most prior inter-country studies adopting a longitudinal approach, did not disaggregate results into MDGs and SDGs eras (e.g., García-Sánchez et al., 2019; Lu & Wang, 2021). This is an important omission in literature that would have to be addressed to advance our understanding of the determinants of ESG performance (Wang & Li, 2023). It is imperative to conduct a

longitudinal study spanning the MDGs and SDGs eras in an inter-country setting because such study can advance knowledge on efforts multinational entities (MNEs) are making to actualise Agenda 2030 through board leadership composition— corporate boards have ultimate responsibility for organisation's ESG performance (Leka, 2022; Liu et al., 2023).

The aim of the current study is to examine the association between board composition and ESG performance in an international setting in the MDGs and SDGs eras, using advanced quantitative methods. We investigate five elements of board leadership composition, namely board independence, CEO duality, board gender diversity, interlocking directorship, and ESG committee (as board oversight mechanism for sustainability/ ESG matters). These board leadership elements have been stressed in literature as notable determinants of organisational performance (Dowell et al., 2011; Mudiyanselage, 2018; Mangena et al., 2020), but are yet to be rigorously investigated in an international setting.

We address the research gaps as follows. The first research gap is tackled by investigating the association between board composition and ESG performance in an international context. We analyse empirical evidence from 336 top MNEs, operating in 42 non-financial industries, located in 32 countries and 5 geographical regions. The second research gap is addressed by: (i) applying panel quantile regression analysis (PQR) to uncover possible curvilinear relationship between variables, whilst also applying linear regression models to demonstrate that linear models may produce misleading results on the association between the variables; and (ii) adopting a longitudinal approach, covering a 15-year (2006–2020) period and analysing 3,321 firm-year observations. The third research gap is addressed by conducting a longitudinal study (2006–2020), and disaggregating the results into the MDGs (2006-2015) and SDGs (2016-2020) eras.

Whereas results from linear models (such as fixed effect OLS, discriminant analysis, two-stage least squares, and propensity score matching regression) show that board independence, board gender diversity, and existence of ESG committee are positively associated with ESG performance, PQR reveals that the relationship is curvilinear. Linear models show that CEO duality has no significant impact on ESG performance, but PQR reveals that sustained CEO duality erodes ESG performance. Furthermore, whilst linear models show that interlocking directorship has negative but no statistically significant impact on ESG performance, PQR reveals that interlocking directors with vast cross-directorship experience enhance ESG performance. Whilst the impact of board composition on ESG performance follows a similar

trajectory in the MDGs and SDGs eras, board independence and board gender diversity have greater impact on ESG performance in the SDGs era in comparison to the MDGs era because of the injection of more NEDs and female directors in the SDGs era.

Our study contributes to knowledge from four perspectives. First, we contribute to the limited international studies on the interaction between board composition and ESG performance. Second, we contribute to methodology by applying a novel method (PQR) to analyse relationship between variables, thus partly addressing mixed result in the literature, and demonstrating that linear models used in prior studies may be misleading. Third, we present evidence on how board composition impacts ESG performance differently in the MDGs and SDGs eras, thus contributing to the debate on efforts MNEs are making in addressing sustainable development challenges through board leadership. Finally, the study provides empirical validation for the stakeholder theory and RBV theory.

The rest of the paper proceeds as follows: Section 2 covers literature review and hypotheses development. Next, the methodology is explained in Section 3. Results and discussion are presented in Section 4. The paper is concluded in Section 5.

2.2 Literature Review and Hypotheses Development

2.2.1 Theoretical Framework

(a) Stakeholder Theory

According to the stakeholder theory, society expects corporations to behave in a manner that is beneficial to stakeholders, and not only owners/ shareholders (Jensen & Meckling, 1976). This stems from the consideration that stakeholders consider business organisations as socio-economic entities and not as economic entities (Kassinis & Vafeas, 2002). The stakeholder theory assumes that firms are not only accountable to shareholders but also to various interest groups in society that influence corporations. This is because stakeholder theory defines the group of stakeholders that are interested in the business and what sort of accountability the organisation is willing to recognise and discharge to satisfy these stakeholders (Fama & Jensen, 1983).

The stakeholder theory is relevant to the current study, as it explains the importance of board leadership elements such as appointment of independent/ non-executive directors (NEDs),

separation of the role of board chairperson from company CEO, allowing for more female director representation on the board, appointment of interlocking directors, and constituting a functional ESG committee to enhance ESG performance in the interest of stakeholders (Mangena et al., 2020). Whilst a wide variety of stakeholders would argue to have an equal right for implementation of ESG initiatives that is beneficial to them, managers would have to ensure a balance in the selection of ESG projects implemented, whilst concentrating on the most salient stakeholders that have high level of interest and influence on the activities of the organisation (Kassinis & Vafeas, 2002). Involvement in sustainable development projects to enhance ESG performance is a useful avenue for enhancing such relationship with mainstream stakeholders (Du Rietz, 2018).

(b) Resource-Based View Theory

The resource-based view (RBV) theory explains the process of how organisations acquire resources and capabilities, which enable them to compete with other firms (Barney, 1991). Resources possession is a source of competitive advantage for firms (Tauringana, 2021). The resources of an organisation include assets, organisational processes, information and knowledge, capabilities, and firm attributes (e.g., organisational lifecycle, size, affiliation, goodwill, etc.) which, altogether, enable MNEs to conceive and implement strategies (Daft, 1983). The RBV is an internal approach to strategy formulation, whereby an organisation appraises resources that are sources of strengths and exploits the resources to formulate resource-based strategies that maximises opportunities in the external business environment (Barney, 1991). The contextualisation of the RBV theory to the current study supposes that availability of resources will affect ability of MNEs to hire competent directors to improve board performance and achieve ESG targets. Resources availability will also affect the extent to which organisations are able to finance ESG projects. Whilst large-sized and matured organisations may have more resources to hire competent board members to enhance ESG performance, small-sized and growing companies may be limited by the availability of resources (Tauringana, 2021). The RBV theory underpins the argument that the competence and independence of NEDs, differences in the genetic makeup and social roles of male and female directors, experience and connection of interlocking directors, and expertise of ESG committee members are strategic assets that can be leveraged to improve ESG performance of organisations (Rao & Tilt, 2016; Daniliuc et al., 2020; Liu et al., 2023). As a consequence,

organisations having more resources to constitute a team of competent board members may record more success in implementing ESG projects (Martínez-Ferrero et al., 2021; Firoozi & Keddie, 2021), and a positive association between board composition and ESG performance may be anticipated.

2.2.2 Hypotheses Development

Board independence

Independent directors/ non-executive directors (NEDs) strengthen board effectiveness and the quality of decision-making (Mangena et al., 2020). In line with stakeholder theory, appointment of independent directors/ NEDs to enhance board independence is an effective governance strategy in reducing managerial opportunism (Fama & Jensen, 1983). Outside directors (i.e., independent/NEDs) have a motivation to act independently and as efficient monitors to protect the interest of stakeholders (Mathuva et al., 2019). They, thus, checkmate managerial opportunism (Jensen & Meckling, 1976). A board with sufficient number of independent directors will likely promote ESG engagement (Tauringana & Chithambo, 2015; Mudiyanselage, 2018). This stems from the consideration that well constituted boards with adequate number of independent and well experienced NEDs can adequately monitor the activities of executive directors, thus enhancing ESG performance. According to the RBV theory, the experience and independence which NEDs bring to the board are valuable assets that can enhance ESG performance (Rao & Tilt, 2016). Empirically, board independence has been positively linked to addressing ESG issues (Ong et al., 2020; Elsayih et al., 2021). In contrast, other scholars argue that smaller boards with a lesser number of outside directors effectively reduce agency conflicts (Ahmed et al., 2006), because large boards are weak and ineffective (Ntim & Soobaroyen, 2013; Shamil et al., 2014). Nevertheless, Wang & Hussainey (2013) contend that larger boards with a greater number of independent directors are associated with communication and coordination problems, therefore board independence may not necessarily improve board effectiveness in terms of enhancing ESG performance. Moreover, having too many NEDs may be counter-productive, as this could give rise to social loafing in group situations. The counter-productivity of too many NEDs on board effectiveness in improving ESG practice may also be linked to the concept of social loafing, whereby a team member puts in less effort in a group when individual performance is not visible (Varshney, 2019). As a result, other studies have argued that board independence may not necessarily

strengthen ESG performance, as increasing the number of independent board members may not guarantee enhanced board performance (Zhang et al., 2013; Adel, et al., 2019; Correa-Garcia et al., 2020). However, the current study supports the proposition that Board independence will enhance ESG performance based on the RBV theory and extant literature supporting a positive association. Therefore,

H1: Board independence is positively associated with ESG performance

CEO duality

Chief executive officer (CEO) duality occurs when the functions and powers of the company CEO and the board Chairperson are combined in one person (Dowell et al., 2011). The composition of an entity is typically made up of NEDs/ outside directors and executive board members such that the Chairperson of the board is a NED, and the CEO is an executive board member (Mangena et al., 2012). Corporate governance codes set out separate functions for the CEO and the Chairperson to ensure separation of powers, promote segregation of duties, and avoid conflict of interest. When the CEO performs a dual responsibility, this may create a tendency for making sub-optimal decisions and deriving personal benefits from actions or decisions made in official capacity as company CEO and board Chairperson (Jensen & Meckling, 1976). Separating the Chairperson/CEO roles and responsibilities strengthens board independence and enhances board effectiveness. CEO duality is therefore likely to diminish board performance. Arguing from the stakeholder theory perspective, CEO duality may erode ESG performance because CEO serving as Chairperson may use their position to dodge decisions involving investment in ESG projects (Mangena et al., 2020). By invoking the stakeholder theory, scholars have argued that the greater the proportion of outside directors on the board, the better will be the quality of decision and overall board performance (Haji & Anifowose, 2016). Corporate boards with adequate number of outside directors, and with NED as Chairperson may have the strength of number to make decisions/ take actions that strengthen ESG performance (Mangena et al., 2020). On the other hand, when the CEO performs a dual responsibility, they may be more knowledgeable about the operations of the organisation and may use such knowledge and position to take decisions that are in the best interest of the organisation (Rudyanto & Veronica Siregar, 2018). Since CEO duality combines the responsibilities of both positions into one person, it can help to cultivate a much stronger and

more unified leadership figure. This dual-purposed leader can use their greater influence of control and management to lead the company toward greater growth and stability, thus leading to better ESG outcomes (Michelon & Parbonetti, 2012). Therefore, it may not always be the case that persons performing dual roles of board chairperson and company CEO may use such positions to seek rent (Adel, et al., 2019). Whilst some studies find no significant relationship between CEO duality and ESG performance (Michelon & Parbonetti, 2012; Adel, et al., 2019), some studies report a positive association between CEO duality and ESG practice (Jizi et al., 2014). However, many studies have linked the separation of CEO function from Board Chairperson to improved ESG performance (Ashfaq & Rui, 2019; Buallay & Al-Ajmi, 2020; Harun et al., 2020; Lu & Wang, 2021). Therefore,

H2: CEO duality is negatively associated with ESG performance

Board gender diversity

Board gender diversity refers to the mix of male and female directors on the board. Differences in the genetic and cognitive make-up of men and women may affect approaches and commitment level to addressing ESG matters (Gull et al., 2023; Liu et al., 2023) . Whilst males are usually individuated and competitive, women are known to be more generous, humanitarian, and stakeholder oriented (Konadu et al., 2021). Female directors are, therefore, likely to respond positively to environmental and social sustainability issues in comparison to their male counterparts (Liu et al., 2023), which ultimately affects ESG performance (Nuber & Velte, 2021). However, a gender-diverse board with an adequate mix of male and female directors may outperform a mono-gender/ gender-biased board, because the skills mix of male and female directors should be complementary and could lead to better ESG outcomes (Tingbani, et al. 2020). The stakeholder theory supports appointment of more female directors because the collectivist nature of women would prompt them to commit to sustainability initiatives that reduce social challenges and address environmental pollution in the interest of stakeholders (Gull et al., 2023). Based on the RBV theory, female directors boost firm reputation and corporate board performance (Konadu et al., 2021). Therefore, a positive association between board gender diversity and ESG performance may be expected (Nuber & Velte, 2021; Konadu et al., 2021; Gull et al., 2023; Liu et al., 2023). On the other hand, Board gender diversity may not drive ESG performance. The counter-productivity of too many female or male directors on board effectiveness in improving ESG practice may also be linked to the concept of social loafing, whereby a team member puts in less effort in a group when individual

performance is not visible (Shamil et al., 2014; Varshney, 2019). Furthermore, intra-group conflict among the group of male or female directors may erode group cohesion (Harun et al., 2020), and as a result, gender diversity among board members may have a counterproductive effect on board performance and ESG outcome (Cucari et al. 2018). This supports the argument that the impact of board gender diversity on ESG performance may be negative or not statistically significant. Empirically, some studies report a negative association (e.g., Shamil et al., 2014; Cucari et al. 2018; Masud et al. 2018), while others find no significant relationship between board gender diversity and ESG performance (Al-Shaer et al., 2021; Harun et al., 2020). However, based on the stakeholder theory and the RBV theory, and in line with studies positing a positive association between board gender diversity and ESG performance, the current study supports the proposition that:

H3: Board gender diversity is positively associated with ESG performance.

Interlocking directorship

Interlocking directorship (also known as cross directorship/ multiple directorship) happens when director(s) are board members of more than a company (Dragoa et al., 2015). This typically applies to outside directors (independent/ non-executive directors) because they sit on the board of multiple companies, and this keeps them busy. Interlocking directorship has therefore been associated with board busyness (Dragoa et al., 2015; Daniliuc et al., 2021). Interlocking directorship presents opportunity for cross-fertilisation of ideas and exposure to various management practice, which could be beneficial to companies with busy directors (Daniliuc et al., 2020; Harun et al., 2020). Interlocking directorship facilitates information transparency, encourages sharing of experience, and makes benchmarking of managerial practice possible (Dragoa et al., 2015). Directors having seats on the board of other companies may have a better knowledge of industry practice and could utilise such knowledge to improve governance practices, such as strategies for managing ESG challenges (Black & Kim, 2012; Daniliuc et al., 2021). On the other hand, directors having seats across the board of other companies may be more knowledgeable about the business practices in the industry and may use such insider knowledge to make decisions that satisfy their ulterior motives (Black & Kim, 2012). Furthermore, directors with multiple directorship experience may also use such privilege position to dominate other directors with no multiple directorships because of the level of knowledge and connection they have with other companies, which may confer them

with respect, prestige, and more recognition over and above co-directors with no cross-directorship experience (Daniliuc et al., 2021). Owing to conflict of interest arising from sitting on multiple boards, cross directorship compromises the director's ability to monitor or advise management effectively, which adversely affects firm performance. This supports the argument that the impact of interlocking directorship on ESG performance may be negative or not statistically significant as reported in prior studies (Harun et al.,2020). However, from the perspective of the RBV theory, the competence and networking capabilities of interlocking directors are strategic assets that can uplift ESG performance of companies (Black & Kim, 2012; Mangena et al., 2012). Studies have documented a positive association between interlocking directorship and ESG performance (Haniffa & Cooke, 2005; Ong et al., 2020), although there are studies presenting contrary empirical results (Harun et al.,2020). Therefore:

H4: Interlocking directorship is positively associated with ESG performance.

ESG Committee

ESG committee is an important board oversight committee that supports an organisation's ongoing commitment to addressing ESG matters (Leka, 2022). The establishment of ESG committee helps organisations to actively tackle sustainable development challenges, whilst also facilitating the formulation of ESG strategies and overseeing the successful implementation of ESG projects. Thus, activities of ESG committees contribute to the achievement of ESG targets (Kend, 2015). ESG committee membership is usually drawn from knowledgeable directors and members of top management team that are familiar with sustainability issues. ESG committee members with sustainability/ ESG expertise ensure that the ESG strategy of the organisation is relevant, timely and well formulated in alignment with pressing sustainable development issues (Uyar et al., 2022). ESG committee chairpersons with experience and monitoring expertise play crucial roles in steering the affairs of ESG committee to deliver its mandate of improving ESG performance (Vafeas, 2002). Conveying regular ESG committee meetings provides an avenue for ESG committee members to deliberate on ESG issues and be actively involved in ESG risk management. Having frequent ESG committee meetings is regarded as an important consideration that inspires confidence that the ESG committee is effective in discharging its responsibilities as a watchdog for the organisation on corporate sustainability matters (Elsayih et al., 2021). According to the stakeholder theory, it is the interest of stakeholders that organisations constitute ESG committee because the

committee supports the company's ongoing commitment to addressing ESG issues. The ESG committee also assists in shaping engagements with stakeholders with respect to ESG matters. Whereas ESG committee may promote ESG performance, it is also plausible that the existence of the ESG committee may be counterproductive in improving ESG performance for some reasons. First, social loafing may set in among ESG committee members in the sense that a/some committee member(s) may be exerting less effort to achieve ESG goals of the organisation when they work in a group than when working alone (Varshney, 2019). The ESG committee may therefore sometimes be less productive than the combined performance of their members working as individuals. Second, ESG committee may be meeting frequently as may be statutorily required, to demonstrate that members are performing their fiduciary duties to the organisation (Uyar et al., 2022). However, if such meetings do not focus on key ESG issues, with a view towards resolving sustainability challenges and enhancing the overall ESG performance of the organisation, the constitution of the ESG committee may be counter-productive and may not achieve its intended purpose (Al-Shaer et al., 2021). In line with the RBV theory, diversity in skills, experience, and background of ESG committee members are strategic assets that assist organisations in developing company ESG strategy, improving company's understanding of ESG matters and implementing ESG projects. In sum, the existence of ESG committee is an important board leadership attribute that enhances ESG performance (Dixon-Fowler et al., 2017; Elsayed & Ammar, 2020; Elsayih et al., 2021). Result on the impact of ESG committee on ESG performance is mixed. While majority of the studies report a positive impact (Kend, 2015; Cucari et al., 2018 ; Adel, et al., 2019; Elsayed & Ammar, 2020; Doni, 2021; Elsayih et al., 2021; Jamil et al., 2021; Lu & Wang, 2021), others submit that the impact is negative (Al-Shaer et al., 2021), and some other studies report no significant relationship (Masud et al., 2018). However, based on the stakeholder theory and the RBV theory, and in line with studies positing a positive association between ESG Committee and ESG performance, the current study supports the proposition that:

H5: The existence of ESG Committee is positively associated with ESG performance.

2.3 Methodology

2.3.1 Design, Population and Sample

The current study adopts a panel research design. The population of the study is comprised of 2000 largest international companies according to the Forbes Global 2000 list prepared as at 2021. The Forbes Global 2000 is a comprehensive list of the world's largest, most powerful public companies, as measured by revenues, profits, assets and market value. Companies on the list are largest companies in the world, and as such are closely monitored for their ESG commitment. Furthermore, they are globally visible firms. Sample selection based on visibility and size has been widely used in prior studies (Giannarakis et al., 2014). Top 500 companies on the Forbes list were selected as sample for the study. Prior studies have extensively applied the Forbes ranking as a sampling frame (Martínez-Ferrero & García-Sánchez, 2017). Financial service institutions were excluded due to significant difference in the nature of their business and the manner of the evaluation of their wealth and in their corporate structures (Tingbani, et al., 2020). After excluding 160 financial service companies, 340 non-financial companies emerged, but 4 entries with no ESG report were deleted, leaving a total of 336 firms. The final sample selection of firms cuts across 32 countries and 42 industry groups.

2.3.2 Variable Measurement and Source of Data

2.3.2.1 Variable Measurement

(a) Dependent Variable

ESG performance was measured by ESG score provided by Refinitiv/ DataStream (Ioannou & Serafeim, 2012; Pekovic & Vogt, 2020). The ESG score measures company's ESG performance based on verifiable reported data in the public domain across three areas of environmental, social and governance indicators (Refinitiv, 2022). The environmental pillar focuses on the environmental impact of the organisation in 3 categories of resource use (4 themes), emissions (4 themes) and environmental innovations (2 themes). The social pillar examines the impact of the organisation on the society from 4 categories of workforce (4 themes), human rights (1 theme), community (1 theme) and product responsibility (3 themes). The governance pillar considers the quality of governance as well as the structures emplaced to improve governance quality in 3 categories of management (2 themes), shareholders (2 themes) and corporate social responsibility (CSR) strategy (2 themes). Overall, there are 10

categories, 25 themes and 186 metrics (environmental = 68; social = 62; and governance = 56) making up the Refinitiv's ESG assessment (Refinitiv, 2022). The scores across the 186 metrics are combined to determine the ESG performance on a scale of 0 (lowest) to 100 (highest), indicating a positive polarity with lower score indicating low ESG performance and higher score evincing high ESG performance (Refinitiv, 2022). Alternative measure of ESG performance, ESG combined (ESGC) score was used. The ESGC score overlays the ESG score with ESG controversy (impact of negative events) to provide a comprehensive evaluation on the company's sustainability impact and conduct in near real time.

(b) Independent Variables

Five board composition variables uniquely affecting ESG performance were investigated viz: board independence, CEO duality, board gender diversity, interlocking directorship, and ESG Committee. Alternative measures of variables were also applied in the analysis to check robustness of result (Table 2.1, Panel A).

(c) Control Variables

We include six broad categories of control variables that may affect ESG performance based on the literature (Nuber & Velte, 2021; Cuadrado-Ballesteros & Bisogno, 2020; Wang & Shailer, 2022): (i) corporate governance; (ii) firm attributes; (iii) industry type/ environmental sensitivity; (iv) Era (MDGs/ SDGs eras); (v) country-level governance; and (vi) National culture orientation (3 cultural dimensions that distinctively affect ESG performance based on Hofstede model). As suggested by the institutional theory (DiMaggio & Powell, 1991; Saqib et al., 2021), various country-level control variables were included in the studies because they may affect ESG performance of companies across different countries (Scott, 2004; Lewis et al., 2019). The institutional theory posits that social, economic, and political factors constitute an institutional structure of a particular environment which provides firms with advantages for engaging in specific types of activities. Businesses tend to perform more efficiently if they receive the institutional support (DiMaggio & Powell, 1991). Therefore, multinational entities (MNEs) operating in different countries with varying institutional environments will face diverse pressures to implement ESG targets (Saqib et al., 2021). In essence, heterogeneity in country-level governance factors such as Rule of Law, Regulatory Quality, Control of

Corruption, Voice & Accountability, Political Stability, Government Effectiveness in enforcement of rules may encourage or dissuade corporate entities from engaging in various ESG activities, which may impact their ESG performance. It is therefore important to control for the impact of country environmental factors on ESG performance in line with the institutional theory.

2.3.2.2 Data Sources

Secondary data covering a 15-year period (2006-2020) were collected from multiple sources such as Refinitiv/ DataStream database, annual reports, world bank database, Transparency international database and Hofstede insights. The major source of data for Board leadership composition, ESG performance and firm attributes was Refinitiv/ DataStream database because of its reliability and rigorous process for amassing data in the database (Pekovic & Vogt, 2020; Ioannou & Serafeim, 2012). A summary of definitions of variables, variable measurement and data sources is presented in Table 2.1 (Panel A).

<insert Table 2.1 Panel A here>

2.3.4 Model Specification

Consistent with prior studies, a panel multivariate regression between board composition and ESG performance was performed (Mangena et al., 2020; Tingbani et al., 2020). The regression Model for the study is specified as follows:

$$ESGPF_{it} = \beta_0 + \beta_1 BINDP_{it} + \beta_2 BDUAL_{it} + \beta_3 BDGEN_{it} + \beta_4 BDINT_{it} + \beta_5 BDCOM_{it} + \beta_6 BSIZE_{it} + \beta_7 BMEET_{it} + \beta_8 NTDIV_{it} + \beta_9 GOVTC_{it} + \beta_{10} ESGPY_{it} + \beta_{11} ESGAUD_{it} + \beta_{12} ESGAUT_{it} + \beta_{13} FSIZE_{it} + \beta_{14} FPROF_{it} + \beta_{15} FLEV_{it} + \beta_{16} FLIQD_{it} + \beta_{17} INDUS_{it} + \beta_{18} ERA_{it} + \beta_{19} ECODVT_{it} + \beta_{20} WGC_{it} + \beta_{21} WGV_{it} + \beta_{22} WGP_{it} + \beta_{23} WGG_{it} + \beta_{24} WGR_{it} + \beta_{25} WGL_{it} + + \beta_{26} NPD_{it} + \beta_{27} NID_{it} + \beta_{28} NLG_{it} + €_{it} \quad \textit{(Eq. 2.1)}$$

where $ESGPF_{it}$ is ESG performance of firm *i* at time *t* and all other variables are defined and measured in Table 2.1 (Panel A).

2.3.5 Methods for Data Analysis

Panel quartile regression (PRQ) was performed to detect the nature of relationship between variables across five quantiles, q (0.20. 0.40, 0.60, 0.80 and 0.95). PQR has certain advantages over linear models as follows (Coad & Rao, 2008; Borgen, 2016): (a) PQR allows for changes in relationship between dependent variable (DV) and independent variables (IVs) across a range of quantiles in conditions where a marginal change (board leadership composition) might result in significant differences in outcomes (ESG performance). In essence, the sharp difference between board composition conditions can be used as an exogenous variation to draw causal inference of specific ESG outcome; (b) PQR makes no assumption about the distribution of DV, and as a result can optimise analysis of the curvilinear relationship between DV and IVs using the interior-point non-linear optimisation algorithm; (c) PQR adequately control for outliers, as in consequence can provide a more nuanced analysis of relationship between DV (ESG performance) and IVs (board leadership composition). The PQR result shows the quantiles of the dependent variable (ESG performance), conditional to the values of the explanatory variables (board composition elements). The PQR model allows us to characterise all the conditional distribution of ESG performance across the various quantiles, q 0.20 to q 0.95, based on the various CG mechanisms, since different estimations of ESG performance for different quantiles are obtained. The result can be interpreted as differences in ESG performance due to changes in the board composition mechanisms.

To compare the results of linear and non-linear regression models, fixed effect regression (OLS), multiple discriminant analysis, two-stage least squares (2SLS), and propensity score matching (PSM) regression analysis were performed.

2.4 Results and Discussion

2.4.1 Descriptive and Multicollinearity

Country analysis of companies is presented in Table 2.1 (Panel B), and industry grouping of companies is presented in Table 2.1 (Panel C).

<insert Table 2.1 Panel B here>

<insert Table 2.1 Panel C here>

Descriptive analysis of variables, in terms of mean scores (M), for full sample, industry environmental sensitivity, and era (MDGs/ SDGs) is presented in Table 2.2 (Panel A), while frequency analysis of categorical variables is presented in Table 2.2 (Panel A).

<insert Table 2.2 (Panel A) here>

<insert Table 2.2 (Panel B) here>

From the result in Table 2.2 (Panel A), the mean ESG score at 61.790/ 100 reveals that the ESG performance of companies is generally moderate. This is also confirmed by the mean ESGC score of 54.660/100, and ESG ranking of 7.930/12. Board independence (in terms of NED to board size ratio) is at 76.660%, while board committee independence (i.e., independence across "required" board committee such as audit committee, compensation committee and nomination committee) averages 83.170%, confirming that board independence level among sample is generally high. CEO duality is prevalent among companies, going by CEO/Chairperson duality rate of 0.520, and Chairperson as ex-CEO rate of 0.400. Board Gender Diversity is low among MNEs (M = 16.900%), whilst interlocking directorship appears to be generally nascent among companies going by the board busyness index of 1.326. The mean scores for variables also differ for environmentally sensitive and non-environmentally sensitive industries, as well as the MDGs and SDGs eras (Table 2.2, Panel A).

From the result in Table 2.2 (Panel B), more than half of the companies operate in environmentally sensitive industries (3321, 72.5%), while others operate in non-environmentally sensitive industries (1262, 27.5%). Furthermore, in more than half of the companies under investigation, the CEO doubles as Chairperson (2403, 52.4%), whilst a reasonable number of the companies have their chairmen as ex-CEOs (1856, 40.5%). Few of the companies have started linking executive compensation to ESG performance (1388, 30.3%), and the government has no controlling interest in almost all the companies (4311, 94.1%). In addition, most companies have an ESG Committee (3462, 75.5%). More than half of the companies produce audited ESG report (2421, 52.8%) but very few have such reports audited by the big 4 audit firms (1137, 24.8%). Taken together, results in Table 2.2 (Panel A) and Table 2.2 (Panel B) reveal that firms differ in their level of ESG performance, have different governance structures and are also dissimilar in firm-level attributes in terms of size (revenue), profitability, leverage and liquidity. These differences, combined with the differences in their base countries (Table 2.1, Panel B) and industry grouping (Table 2.1, Panel

C), provide a robust context for examining the impact of board composition on ESG performance in an international setting.

Result of correlation analysis in Table 2.3 shows that correlation among variables is generally low, with the highest correlation coefficient at 0.429, $p < 0.01$, which is below the recommended threshold of 0.90 (Mangena et al., 2020). This shows that correlation among variables is generally low, and multicollinearity is not a concern.

<insert Table 2.3 here>

2.4.2 Board composition and ESG performance: Baseline Result

2.4.2.1 Baseline result Using ESG score

Result from the analysis of the impact of board composition variables on ESG performance is presented in Table 2.4. The result of fixed effect (OLS) is set side-by-side with that of PQR for the purpose of comparison of results based on both methods. The result of PQR in Table 2.4 is graphed in Figure 2.1.

<insert Table 2.4 here>

<insert Figure 2.1 here>

The PQR result in Table 2.4 shows the quantiles of the dependent variable (ESG performance), conditional to the values of the explanatory variables (board composition elements). The result can be interpreted as differences in ESG performance due to changes in the board composition mechanisms.

From the result in Table 2.4, OLS shows that board independence is positively and significantly associated with ESG performance ($b = 2.550$, $p < 0.05$). PQR, on the other hand, reveals that board composition elements impact ESG performance differently across the quantiles, showing that the relationship is curvilinear. Board independence has low and statistically insignificant coefficients in lower quantiles – q 0.20 ($b = -.606$, $p > 0.10$) and q 0.40 ($b = .765$, $p > 0.10$) – but its impact rises and assumes statistical significance in q 0.60 ($b = 2.926$, $p < 0.01$), peaks at q 0.80 ($b = 5.427$, $p < 0.01$), and starts declining at q 0.95 ($b = 4.517$, $p < 0.01$). The PQR result suggests that the impact of board independence on ESG performance depends on the level of engagement with ESG projects, with greater impact created at higher levels of ESG engagement. Furthermore, the consistently positive significant impact of board independence on ESG performance in the upper quantiles of ESG performance confirms that board independence enhances ESG performance, and result supports acceptance of H1. The non-linear relationship between board independence and ESG performance is graphically represented by the downward facing U-shaped curve in Figure 2.1.. Positive association between board independence and ESG performance aligns with literature (Ong et al., 2020; Elsayih et al., 2021). Considering that board independence creates greater impact at higher levels of ESG performance, the presence of independent directors should be maximised to ensure productive engagement on ESG issues. In essence, the justification for hiring independent directors is upliftment in ESG performance.

Regarding the impact of CEO duality on ESG performance, OLS reveals no significant association. PQR shows that at the lower quantiles (q 0.20 to q 0.40), CEO duality has no significant impact on ESG performance. However, CEO duality starts to impact ESG performance negatively and significantly at higher quantiles from q 0.60 ($b = -1.035$, $p < 0.05$), and subsequently. The result could be interpreted to mean that at lower levels of ESG engagement, the impact of CEO duality does not become apparent. However, as level of ESG engagement improves, sustained CEO duality erodes ESG performance. This is graphically depicted by an upward facing U-shaped curve in Figure 2.1. In essence, whilst combining the role of CEO and Chairperson may not initially appear to affect ESG performance, the persistence of CEO duality erodes ESG performance. The result supports the acceptance of H2 and aligns with extant literature that when board members continue to serve in the dual capacity of CEOs and board Chairpersons, abuse of power may be inevitable, and this may erode ESG performance (Ashfaq & Rui, 2019; Buallay & Al-Ajmi, 2020).

Board gender diversity has a significant positive impact on ESG performance under the OLS technique ($b = 9.079$, $p < .01$). However, PQR reveals that the impact of board gender diversity on ESG performance depends on the level of engagement with ESG projects, showing that the relationship is non-linear. The impact of board gender diversity on ESG performance improves from q 0.20 ($b = 8.874$, $p < .01$) to q 0.40 ($b = 12.110$, $p < .01$) but starts declining from q 0.60 ($b = 11.096$, $p < .01$) to q 0.80 ($b = 5.733$, $p < .01$). Although the coefficient rises again at q 0.95 ($b = 11.414$, $p < .01$), the highest coefficient is in q 0.40. The non-linear relationship is shown by the S-shaped curve in Figure 2.1. The consistently positive significant impact of board gender diversity on ESG performance in the upper quantiles of ESG performance (q 0.40, q 0.60 and q 0.95) confirms that board gender diversity enhances ESG performance. The result supports the acceptance of H3, and aligns with extant literature on the relevance of board gender diversity in improving ESG outcomes (Nuber & Velte, 2021; Konadu et al., 2021; Gull et al., 2023; Liu et al., 2023).

With respect of interlocking directorship, OLS shows that the impact of interlocking directors on ESG performance is negative but not significant. This is consistent with results of prior studies that have applied linear models and reported a negative association between interlocking directorship and organisational performance (e,g, Dragoa et al., 2015; Daniliuc et al., 2020; Daniliuc et al., 2021). However, PQR reveals an upward trend, whereby the impact of interlocking directorship is negative in the lower quantiles of ESG performance (q 0.20 and q 0.40), but starts assuming an upward trajectory in the upper quantiles from q 0.60 to q 0.95,

with the strongest significant positive impact recorded in q 0.95 (b = 0.634, p < .10). This is represented by an upward sloping curve in Figure 1. The significant positive impact at the upper quantile (q 0.95) result validates the acceptance of H4 and confirms that interlocking directors with vast cross-directorship experience enhance ESG performance. The result validates the argument in literature that competence and board networking capacities of busy directors are strategic assets that can enhance board performance (Haniffa & Cooke, 2005; Ong et al., 2020).

Result of OLS shows that ESG committee is positively associated with ESG performance (b = 13.970, p < .01). However, PQR reveals that although the existence of ESG committee enhances ESG performance, the relationship is not linear. Whilst the impact of ESG committee rises between q 0.20 (b = 15.477, p < .01) and q 0.40 (b = 16.487, p < .01), it starts declining from q 0.60 (b = 14.551, p < .01) all through to q 0.95 (b = 8.160, p < .01) of ESG performance. This trend is represented by the downward sloping curve in Figure 1. Considering the overall positive impact of ESG committee on ESG performance, acceptance of H5 is supported, and the supports discussion in literature on the relevance of ESG committee as board oversight mechanism for sustainability/ ESG matters (Dixon-Fowler et al., 2017; Elsayed & Ammar, 2020; Elsayih et al., 2021). The curvilinear relationship between ESG committee and ESG performance as revealed by PQR suggests that although ESG committee could enhance ESG performance (q 0.20 to q 0.60), the activities of the ESG committee need to be reviewed to ensure effective engagement with ESG projects to enhance ESG performance. This is because, based on PQR results, the continued existence of the ESG committee without a reinvigoration of committee effectiveness may diminish ESG performance in the long run (q 0.80 to q 0.95). Furthermore, the declining impact of the ESG committee on ESG performance may also be indicative of social loafing among committee members which may dwindle the performance of the committee (Zhu et al., 2019).

To assess the extent to which the board composition elements separately impact ESG performance, we reckon with the effect size of the regression coefficients in Table 2.4. Using this basis, existence of ESG committee (OLS, b = 13.970; PQR, b = 8.160 to 16.487) and board gender diversity (OLS b = 9.079; PQR coefficients ranging from b = 5.733 to 12.110) have foremost impact on ESG performance.

In Figure 2.1, OLS result is represented by the straight lines in the graphs, while the standard errors are depicted by the straight dotted lines laying above and below the straight OLS lines. The PQR graphs are represented by the undulating lines, and the standard errors by grey

oscillating lines, clearly showing that the relationship between the various CG variables and ESG is not linear. Whereas the OLS presents a misleading result that the relationship between CG variables and ESG performance is linear (which might have possibly accounted for the mixed results in prior studies, as a gamut of studies have applied OLS regression in analysis) PQR reveals that the relationship is curvilinear, as the impact of board composition dependents on the level of engagement with ESG projects.

Overall, the acceptance of H1, H2, H3, H4, and H5 empirically validates the stakeholder theory that board composition are effective monitoring mechanisms emplaced by owners for the benefit of stakeholders (within the realm of the stakeholder theory) to ensure that the organisation is properly governed by those charged with such responsibilities, including formulating, and implementing robust ESG performance (Du Rietz, 2018; Mangena et al., 2020). This further corroborates the argument that board composition engenders ESG performance as posited by stakeholder theory invoked as theoretical framework in the current study. In essence, owners and other stakeholders will emplace various CG mechanisms to ensure the achievement of ESG targets. Positive association between board independence, board gender diversity, interlocking directorship and ESG committee validates the RBV theory that competence and independence of NEDs, differences in the genetic makeup and social roles of male and female directors, experience and connection of interlocking directors, and expertise of ESG committee members are strategic assets that can be leveraged to improve ESG performance of organisations (Barney, 1991; Bongiovanni et al., 2022).

2.4.2.2 Baseline result Using ESG score and alternative measure of independent variables

Table 2.5 presents result of analysis using alternative measurement of variables, notably board independence (i.e., independence ratio across "required" committees such as audit committee, compensation committee and nomination committee) and CEO duality (i.e.., Chairperson as ex-CEO). Alternative measurements were also applied for some control variables such as board meetings (measured by board meeting attendance rate), and board nationality diversity (in terms of board executives diversity ratio).

<insert Table 2.5 here>

Result in Table 2.5 is generally consistent with the baseline result (Table 4) for the OLS model and PQR. Specifically, Board independence has a significant positive impact on ESG

performance in the OLS analysis (b = 11.002, p < .05). PQR shows the impact to be positive, statistically significant but declining from q 0.20 (b = 11.352, p < .01) to q 0.95 (b = 8.752, p < .01), thus corroborating the result that the impact of board independence on ESG performance depends on the level of engagement with ESG projects.

Although CEO duality (in terms of Chairperson as ex-CEO) has no statistically significant coefficients for both OLS and PQR, PQR shows that the impact is progressively negative from q 0.20 (b = 0.893, SE = 0.667) to q 0.95 (b = -0.717, SE = 0.860). This confirms that CEO duality in terms of ex-CEO serving as board chairperson erodes ESG performance, as the negative impact becomes more pronounced in the upper quantiles (q 0.80 and q 0.95). This aligns with the result in Table 2.4 that sustained CEO duality erodes ESG performance (Ashfaq & Rui, 2019; Buallay & Al-Ajmi, 2020).

Board gender diversity has a significant positive impact on ESG performance as revealed by OLS and PQR models. However, consistent with the baseline result in Table 2.4, the relationship between board gender diversity and ESG performance is curvilinear, rising (q 0.20 and 0.40), peaking (q 0.60) and declining (q 0.80), reiterating the result that the impact of board gender diversity on ESG performance depends on the level of engagement with ESG projects. Interlocking directorship follows a similar pattern to the baseline result (Table 2.4), with OLS revealing a negative but statistically insignificant impact on ESG performance, whilst PQR shows that interlocking directorship progressively strengthens ESG performance (Table 2.5). Both OLS and PQR confirm that ESG committee is positively and significantly associated with ESG performance, although PQR reveals downward facing U-shape—rising (q 0.20), peaking at q 0.40, and falling in the upper quantiles q 0.60 to q 0.95 (Table 2.5). The result buttresses the finding in Table 2.4 that the relevance and effectiveness of the ESG committee may wane if activities of the committee are not regularly reviewed and reinvigorated with a view towards improving ESG performance.

Taken together, the result in Table 2.5 is consistent with the baseline result in Table 2.4 with respect to the impact of the variables on ESG performance. The effect sizes of the coefficients in Table 2.5 are comparable with that of Table 2.4 and produce consistent ranking with existence of ESG committee and board gender diversity emerging as notable determinants of ESG performance.

2.4.2.3 Board composition and ESG performance in Environmentally sensitive and non-environmentally sensitive industries

Industry environmental sensitivity may influence ESG commitment of organisations, with MNEs operating in highly environmentally sensitive industries having a higher tendency to address ESG issues because they pollute the environment more in comparison to non-environmentally sensitive industries (Konadu et al., 2020). Empirical evidence shows that ESG performance, board composition and governance structure of firms in both industries differ (Table 2.2, Panel A). To examine the extent to which board composition elements influence ESG performance based on industry environmental sensitivity, we split our sample into environmentally sensitive and non-environmental sensitive industries using the classification applied in prior studies (Baboukardos, 2017; Konadu et al., 2021), and rerun the analysis using the main measurement of ESG performance (i.e., the ESG score). The result is presented in Table 2.6.

<insert Table 2.6 here>

Whilst OLS result for environmentally sensitive industries shows a significant positive impact of board independence, board gender diversity and ESG Committee on ESG performance, the influence of CEO duality and interlocking directorship is negative (Table 2.6). However, PQR reveals a curvilinear relationship between the variables and ESG performance. In the non-environmentally sensitive industries (Table 2.6), OLS shows that the impact of board independence, board gender diversity and interlocking directorship is not significant, whilst ESG committee positively influences ESG performance, and CEO duality negatively affects ESG performance (Table 2.6). On the other hand, PQR shows that the variables significantly influence ESG performance across the quantiles at various inflection points. PQR result is generally consistent with the baseline result in Table 2.4.

In comparing the result of both industries, PQR reveals that whilst the inclusion of more NEDs successively strengthens ESG performance in environmentally sensitive industries (Table 2.6), the inclusion of more NEDs erodes ESG performance in non-environmentally sensitive industries as revealed by the inflection point in q 0.80 (Table 2.6). The need for appointment of more outside directors on the board of environmentally sensitive industries may be important in strengthening board independence as a monitoring mechanism for company executives, as they have a higher propensity to dodge investment in ESG projects and maximise returns for shareholders. Given the nature of their business in terms of polluting the environment, high polluting MNEs have a higher moral burden to address ESG issues (Baboukardos, 2017). In

line with the stakeholder theory, appointment of sufficient number of NEDs may, thus, be an effective strategy in ensuring corporate boards take decisions that protects the interest of stakeholders (Jensen & Meckling, 1976; Du Rietz, 2018).

The impact of board gender diversity on ESG performance follows a similar trajectory in both industries (Table 2.6), whereby board gender diversity initially enhances ESG performance, peaks and then declines. However, the effect size of board gender diversity is greater in the environmentally sensitive industries in the upper quantiles (q 0.60 = 11.106; q 0.80 = 8.914; q 0.95 = 17.678) in comparison to the non-environmentally sensitive industries (q 0.60 = 8.467; q 0.80 = 6.590; q 0.95 = 2.483). Overall, results support the argument that the impact of board gender diversity on ESG performance depends on the level of engagement with ESG projects (Table 2.6). In both industries, whereas the presence of interlocking directors with limited cross directorship experience initially erodes ESG performance, the presence of more interlocking directors with diverse cross directorship experience on the board strengthens ESG performance (Table 2.6).

2.4.2.4 Board Composition and ESG Performance in MDGs and SDGs Eras

Baseline result shows that the effect of the MDGs/SDGs era dichotomy on ESG performance is positive and significant for both OLS and PQR (Table 2.4), meaning that ESG performance generally improved between the MDGs era (2006-2015) and SDGs era (2016-2020) (Table 2.2, Panel A). Further analysis, using independent sample t-test, shows that the Mean ESG score in MDGs/ pre-SDGs era (M = 58.767, n = 2,937) is lower than the mean ESG score for SDGs era (M = 67.151, n = 1,646), and the difference is statistically significant (t = -14.244, $p < 0.01$). Based on the proposition that corporate governance mechanisms such as board composition may impact ESG performance differently in the MDGs and SDGs eras (Erin et al., 2022; Moses & Tauringana, 2022), we split our sample into the MDGs and SDGs eras and examine the impact of board leadership variables on ESG performance. Result is presented in Table 2.7.

<insert Table 2.7 here>

In the MDGs era, OLS reveals that board independence is positively associated with ESG performance (Table 2.7). PQR however reveals that board independence has more impact on ESG performance in the upper quantiles (q 0.60 to q 0.95), supporting the argument that the presence of outside directors strengthens ESG performance (q 0.80). Whereas OLS shows that the impact of CEO duality is negative on ESG performance, PQR shows that continued CEO duality progressively diminishes ESG performance. Whereas OLS shows that board gender

diversity and ESG committee are positively and significantly associated with ESG performance, PQR reveals a curvilinear relationship, consistent with baseline result in Table 2.4. Whilst OLS reveals that interlocking directorship has a negative and statistically insignificant impact on ESG performance, PQR shows that the presence of more experienced interlocking directors with seats on multiple corporate boards progressively enhances ESG performance. Result for the SDGs era follows a similar pattern to the MDGs era in terms of the impact of the board composition variables on ESG performance for both OLS and PQR. However, a closer examination reveals that the effect size of board independence is greater in the SDGs era when compared to the MDGs era (in q 0.40, SDGs = 1.338; MDGs = -.027; in q 0.60, SDGs = 4.070, MDGs = 2.367; in q 0.80, SDGs = 6.836, MDGs = 4.383). OLS result confirms this trend (SDGs = 6.788, $p < 0.01$; MDGs =4.943, $p < 0.01$). Greater impact of board independence on ESG performance in the SDGs era may be attributable to the appointment of more outside directors in the SDGs era (board independence ratio in Table 2.2, Panel A; SDGs = 77.660%; MDGs = 76.110%). Relatedly, the effect size of board gender diversity is greater in the SDGs era in comparison to the MDGs era (in q 0.20, SDGs = 15.150; MDGs = 12.355; in q 0.40, SDGs = 16.212, MDGs = 15.763; in q 0.60, SDGs = 15.248, MDGs = 12.673). This is confirmed by the result of OLS (SDGs = 12.282, $p < 0.01$; MDGs = 4.316, $p < 0.10$). Greater impact of board gender diversity on ESG performance in the SDGs era may be attributable to more female board representation in the SDGs era (board gender diversity ratio in Table 2.2, Panel A; SDGs = 22.000%; MDGs = 14.050%). Literature documents that in the SDGs era, countries are enforcing legislation for the promotion of gender equality and the empowerment of women in top management teams (Bongiovanni et al., 2022; Gull et al., 2023). Taken together, our result on the association between board composition and ESG performance persists after controlling for the effect of the MDGs and SDGs eras.

2.4.3 Robustness Check

2.4.3.1 Alternative measure of ESG performance (i.e., ESGC)

To check the robustness of the result, we use an alternative measure of ESG performance called the ESG combined (ESGC) score. The ESGC adjusts the ESG score for ESG controversy (impact of negative events). The ESGC is, thus, a more conservative estimate of ESG performance of an organisation as it overlays the ESG score with negative social and environmental impact of MNEs operations. The result of the analysis, using ESGC as the dependent variable, is presented in Table 2.8.

<insert Table 2.8 here>

In Table 2.8, the impact of board independence on ESG performance (using ESGC score) is positive, significant, and curvilinear (i.e., rises, peaks, then falls) as earlier revealed by the baseline result in Table 4 using ESG score. PQR shows as well that CEO duality reduces ESG performance as coefficients of the variable starts falling sharply from q 0.40 ($b = 2.589$, $p < .05$) all through to q 0.95 ($b = -0.304$, $p > 0.10$). Board gender diversity has a progressively positive impact from q 0.20 all through to q 0.95. Presence of interlocking directors with vast cross directorship experience also strengthens ESG performance. Existence of ESG committee (Table 2.8) also has a significant positive impact across the quantiles, although the impact progressively declines—emphasising the importance of reinvigorating the functions of the ESG committee to ensure continued relevance in enhancing ESG performance. Overall, result in Table 2.8 is consistent with baseline result in Table 4 in terms of the nature of relationship between the dependent and independent variables, and the effect size of model fitness statistics (R^2/ Pseudo R^2 coefficients), confirming that result is robust to alternative measure of ESG performance.

2.4.3.2 Robustness Check Using alternative measure of ESG Performance (ESG letter grade/ranking) and Alternative method of data analysis (discriminant analysis)

To further examine the robustness of result, the ESG letter grades were converted to ESG ranking and applied as alternative measures of ESG performance. The Refinitiv/ DataStream letter grades for ESG are in twelve categories, ranging from 'D-' (lowest) to 'A+' (highest). Numeric values were assigned based on the classification of D- (assigned 1) to A+ (assigned 12). Thereafter, discriminant analysis was performed on ESG performance as a categorical variable. Discriminant analysis is a technique that is used to analyse research data when the criterion or the dependent variable is categorical (Malhotra & Birks, 2007). As applied in the current study, the purpose of the discriminant analysis is dual. First, to assess the extent to which the board composition variables determine the grade/category of ESG performance. Second, to evaluate the magnitude of contribution of the variables to ESG performance. Result of the analysis (using ESG letter grade/ Ranking) is presented in Table 2.9.

<insert Table 2.9 here>

The discriminant analysis generated 11 functions. However, functions 1 to 8 were statistically significant and are reported (Table 2.9). A statistically significant discriminant function with the highest % of variance explained, highest Eigenvalue and lowest Wilks' Lambda, represents

the best function in a discriminant analysis (Malhotra & Birks, 2007). Using this basis, Function 1 represents the best fit because (i) it explains 83% of variance; (ii) has the highest Eigenvalue of 1.695; and (iii) has the lowest Wilks' Lambda. The statistical significance of the discriminant Function 1 confirms that the independent variables are valid determinants of ESG performance. This provides empirical support for the stakeholder theory and RBV theory informing the association between board composition and ESG performance. By reading-off the coefficients to assess the discriminating power of the independent variables (Table 2.9), the strong drivers of ESG performance are the existence of ESG Committee (0.497), and board gender diversity (0.174). The aligns with the baseline result in Table 2.4 and Table 2.5. Overall, this suggests that our result is robust to alternative measure of ESG performance (i.e., ESG letter grade/ranking) and alternative method of data analysis (using discriminant analysis).

2.4.4 Treatment of Endogeneity

Ullah et al (2021) identified three types of endogeneity such as measurement error, omission of variables, and simultaneity bias. Measurement error occurs when a variable is imperfectly measured (Wooldridge, 2002). To address this, existing proxies used in prior studies were applied. In addition, alternative measurement of (a) the dependent variable/ ESG performance (i.e., ESG combined score, and ESG letter grades/ ranking); (b) independent variables, and (c) control variables were used. To ensure non-omission of key variables that may affect ESG performance, a number of governance, firm-level, industry-type and country-level control variables were included in the study as suggested in the review. Simultaneity happens when two variables on either side of a model equation influence each other at the same time (Merton, 1968). In other words, the flow of causality is not a hundred percent from a right-hand side variable (response variable) to a left-hand side variable (i.e., an explanatory variable). To ascertain underlying changes in response variable (ESG performance) with respect to changes in explanatory variables (board leadership composition) and control variables, PQR was used in the analysis, with additional robustness checks performed using fixed effect OLS regression and multiple discriminant analysis. To ensure thoroughness, the ESG performance sensitivity was assessed across five quantiles (i.e., quantiles 0.20, 0.40, 0.60, 0.80 and 0.95). Prior studies have used quantile regression analysis to treat endogeneity problem (Chernozhukov & Hansen, 2006; Lee, 2007).

Literature suggests that there could be simultaneity between ESG performance and board gender diversity (Tingbani et al., 2021; Konadu et al., 2021). To address any potential endogeneity, two-stage least squares (2SLS)/ instrumental variable (IV) regression and propensity score matching was employed in line with prior studies (Gull et al., 2023).

2.4.4.1 Two-stage least squares (2SLS) / Instrumental variable (IV) regression

To perform 2SLS/ IV regression, (a) executive director (ED) gender diversity, measured as proportion of female executives to total executive directors; and (b) ratio of strictly independent directors to board size were applied as instruments for board gender diversity (Tingbani et al, 2020; Elsayih et al, 2021). These variables were selected as instruments for board gender diversity because they affect the overall composition of female board directors on the board in the sense that; (a) the number of female executive directors ultimately contribute to the total number of female directors on board (Konadu et al., 2020); (b) the presence of strictly independent directors may facilitate the appointment of more female board directors given that the level of board gender diversity should be reasonable/ attain a 'critical mass' before board gender diversity can appreciably influence ESG performance (Nuber & Velte, 2021). To assess the validity of the instruments, Anderson statistics for under-identification test, Stock-Yogo weak identification test, and Sargan statistic (overidentification test of all instruments) were employed. For the under-identification test, the Anderson canon. corr. LM statistics at 464.056, has the chi-square p value less than 5% (i.e., $p = 0.001 < 0.05$). For the Weak identification test, the result of the analysis shows that the Cragg-Donald Wald F statistic (257.439) is greater than each of the Stock-Yogo weak ID test critical values (at 19.93, 11.59, 8.75, and 7.25). For the overidentification test, the Sargan statistic p value is greater than 5% ($p > 0.05$). These diagnostics tests establish that the instruments are appropriate for the analysis. The 2SLS result, using ESG score and ESG ranking as proxies for ESG performance is presented in Table 2.10.

<insert Table 2.10 here>

The result in Table 2.10 is generally consistent with the baseline linear model result (i.e., fixed effect OLS; Table 2.4) in terms of the influence of the variables on both measures of ESG performance (i.e., ESG score and ESG ranking/letter grade), as well as the coefficient of determination (R^2 of 0.301 and 0.314). This suggests on one hand that the result is robust to endogeneity, and on the other hand that linear models may present a misleading result on the influence of the independent variables on ESG performance.

2.4.4.2 Propensity Score Matching

To further alleviate any potential endogeneity between board gender diversity and ESG performance, propensity score match (PSM) was applied (Tawiah et al., 2022; Gull et al., 2023). The median score of board gender diversity (Median = 17.00%) was used to dichotomise sample into control group (MNEs with board gender diversity ≤ 17.00%) and the treatment group (MNEs with board gender diversity > 17.000%) The groups were matched using nearest neighbour (NN) matching, which generated 2,359 cases for the treatment group and 2,224 cases for the control group.

Thereafter, the propensity scores (i.e., probability of being assigned to a treated/ control group) were generated by regressing the covariates on the binary grouping of board gender diversity (code '0' for control group, and code '1' for treatment group). This procedure eliminates potential endogeneity issue, whilst also minimising likely model misspecification (Tawiah et al., 2022). The propensity scores (pscore) generated by the process were then substituted for board gender diversity, and the fixed effect regression was rerun using ESG score and ESG ranking as proxy for ESG performance. Result of the analysis is presented in Table 2.11.

<insert Table 2.11 here>

The result in Table 2.11 is consistent with the baseline linear model result (i.e., fixed effect OLS; Table 2.4) in terms of the influence of the independent variables on both measures of ESG performance. This further confirms that after addressing endogeneity concerns, linear models may present a misleading result on the association between board leadership, interlocking directors and ESG performance. However, the curvilinear relationship revealed by PQR reiterates the need to balance board composition to optimise ESG performance.

2.5 Discussion of Findings

Regarding the impact of board independence on ESG performance, OLS result shows that board independence is positively and significantly associated with ESG performance. PQR, on the other hand, reveals that the result is curvilinear, implying that the impact of board independence on ESG performance depends on the level of engagement with ESG projects, with greater impact created at higher levels of ESG engagement. Furthermore, the consistently positive significant impact of board independence on ESG performance in the upper quantiles of ESG performance confirms that board independence enhances ESG performance, and result

supports acceptance of H1. Considering that board independence creates greater impact at higher levels of ESG performance, the presence of independent directors should be maximised to ensure productive engagement on ESG issues. In essence, upliftment in ESG performance justifies the hiring and inclusion of independent directors on corporate boards. Positive association between board independence and ESG performance aligns with literature (Ong et al., 2020; Elsayih et al., 2021). The result also provides empirical validation for the argument that independent directors/ non-executive directors (NEDs) strengthen board effectiveness and the quality of decision-making in line with stakeholder theory (Mangena et al., 2020). The result also confirms that appointment of independent directors/ NEDs to enhance board independence is an effective governance strategy in reducing managerial opportunism (Fama & Jensen, 1983). As suggested by the stakeholder theory, outside directors (i.e., independent/NEDs) have a motivation to act independently and as efficient monitors to protect the interest of stakeholders (Mathuva et al., 2019). The result also empirically validates the RBV theory that the experience and independence which NEDs bring to the board are valuable assets that can enhance ESG performance (Rao & Tilt, 2016).

With respect to the impact of CEO duality on ESG performance, OLS reveals no significant association. PQR shows that at the lower quantiles (q 0.20 to q 0.40), CEO duality has no significant impact on ESG performance. However, sustained CEO duality starts to impact ESG performance negatively and significantly from q 0.60 ($b = -1.035$, $p < 0.05$), and subsequently. The result could be interpreted to mean that at lower levels of ESG performance, the impact of CEO duality does not become apparent. However, as level of engagement in ESG projects improves, sustained CEO duality erodes ESG performance. The result is consistent with literature that CEO duality erodes ESG performance (Ashfaq & Rui, 2019; Buallay & Al-Ajmi, 2020; Harun et al., 2020; Lu & Wang, 2021). The result buttresses the case for corporate governance codes which encourages setting out separate functions for the CEO and the Chairperson to ensure separation of powers, promote segregation of duties, and avoid conflict of interest. The result empirically validates the contention that when the CEO performs a dual responsibility, this may create a tendency for making sub-optimal decisions and deriving personal benefits from actions or decisions made in official capacity as company CEO and board Chairperson (Jensen & Meckling, 1976). The result supports the contention that CEO duality may erode ESG performance because CEO serving as Chairperson may use their position to dodge decisions involving investment in ESG projects as suggested by the stakeholder theory (Mangena et al., 2020).

Result shows that board gender diversity has a significant positive impact on ESG performance under the OLS technique. However, PQR reveals that the relationship is non-linear, as the impact of board gender diversity on ESG performance depends on the level of engagement with ESG projects. However, the consistently positive significant impact of board gender diversity on ESG performance in the upper quantiles of ESG performance (q 0.40, q 0.60 and q 0.95) confirms that board gender diversity enhances ESG performance. The result supports the acceptance of H3, and aligns with extant literature on the relevance of board gender diversity in improving ESG outcomes (Nuber & Velte, 2021; Konadu et al., 2021; Gull et al., 2023; Liu et al., 2023). The result validates the stakeholder theory and the RBV theory that the collectivist nature of women would prompt them to commit to sustainability initiatives that reduce social challenges and address environmental pollution in the interest of stakeholders (Gull et al., 2023).

With respect of interlocking directorship, OLS shows that the impact of interlocking directors on ESG performance is negative but not significant. This is consistent with results of prior studies that have applied linear models and reported a negative association between interlocking directorship and organisational performance (e,g, Dragoa et al., 2015; Daniliuc et al., 2020; Daniliuc et al., 2021). However, PQR reveals an upward trend, whereby the impact of interlocking directorship is negative in the lower quantiles but starts assuming an upward trajectory from the upper quantiles. The result validates the acceptance of H4 and confirms that interlocking directors with vast cross-directorship experience enhance ESG performance. The result validates the argument in literature that competence and board networking capacities of busy directors are strategic assets that can enhance board performance in line with the RBV (Haniffa & Cooke, 2005; Ong et al., 2020).

Result of OLS shows that ESG committee is positively associated with ESG performance. However, PQR reveals that although the existence of ESG committee enhances ESG performance, the relationship is not linear. The curvilinear relationship between ESG committee and ESG performance as revealed by PQR suggests that although ESG committee could enhance ESG performance (q 0.20 to q 0.60), the activities of the ESG committee need to be reviewed to ensure effective engagement with ESG projects to enhance ESG performance. This is because, based on PQR results, the continued existence of the ESG committee without a reinvigoration of committee effectiveness may diminish ESG performance in the long run (q 0.80 to q 0.95). However, considering the overall positive impact of ESG committee on ESG performance, acceptance of H5 is supported, and the

supports discussing in literature on the relevance of ESG committee as board oversight mechanism for sustainability/ ESG matters (Dixon-Fowler et al., 2017; Elsayed & Ammar, 2020; Elsayih et al., 2021). The result also aligns with the RBV theory that diversity in skills, experience, and background of ESG committee members are strategic assets that assist organisations in developing company ESG strategy, improving company's understanding of ESG matters and implementing ESG projects.

2.6 Conclusion

This study investigates the association between board composition and ESG performance by analysing cross-country evidence from top global companies. We investigate five elements of board leadership composition, namely board independence, CEO duality, board gender diversity, interlocking directorship, and ESG committee (as board oversight mechanism for sustainability/ ESG matters). Whereas results from linear models (such as fixed effect OLS, discriminant analysis, two-stage least squares, and propensity score matching regression) show that board independence, board gender diversity, and existence of ESG committee are positively associated with ESG performance, PQR reveals that the relationship is curvilinear. This implies that the impact of board composition elements on ESG performance depends on the level of engagement with ESG projects. Linear models show that CEO duality has no significant impact on ESG performance, but PQR reveals that sustained CEO duality erodes ESG performance. Furthermore, whilst linear models show that interlocking directorship has negative but no statistically significant impact on ESG performance, PQR reveals that interlocking directors with vast cross-directorship experience progressively enhance ESG performance. Whilst the impact of board composition on ESG performance follows a similar trajectory in the MDGs and SDGs eras, board independence and board gender diversity have greater impact on ESG performance in the SDGs era in comparison to the MDGs era because of the injection of more NEDs and female directors in the SDGs era. Existence of ESG committee, and board gender diversity emerged as strong determinants of ESG performance. The study also concludes that the relationship between Board composition and ESG performance is curvilinear.

The curvilinear relationship between board composition and ESG performance revealed by PQR informs the recommendation that activities and membership of ESG committee would need to be reviewed on a regular basis to reinvigorate ESG committee effectiveness. Overall,

organisations may have to strengthen board composition to achieve the best outcome for ESG implementation.

The current study contributes to literature by advancing our knowledge on the corporate governance determinants of ESG performance from four perspectives. First, we contribute to the limited international studies on the interaction between board composition and ESG performance by analysing empirical evidence covering a 15-year period (2006-2020) from 336 top MNEs from 32 countries and 42 non-financial industries. The longitudinal research design and international approach adopted by the current study in investigating the subject allows for more generalisability of results.

Second, we contribute to methodology by applying a novel method (PQR)—which could detect both linear and non-linear relationships between dependent and independent variables— to analyse the influence of board composition on ESG performance. Such a methodologically rigorous approach is useful in (i) partly addressing mixed result reported in literature on the nature of relationship between study variables; and (ii) demonstrating that results of linear models applied in prior studies could be misleading. Whilst linear models show that board leadership attributes such as board independence, gender diversity and ESG committee enhances ESG performance, PQR reveals that there are inflection points/ limits to which board leadership attributes contribute to ESG outcome. The current study, thus, empirically demonstrates that the impact of board composition on ESG performance depends on the level of engagement with ESG projects, with greater impact created at higher levels of ESG engagement. Furthermore, linear model reveals that interlocking directorship erodes ESG performance; PQR reveals that whereas the presence of interlocking directors with vast cross directorship experiences strengthens ESG performance.

Third, we present evidence on how board composition impacts ESG performance differently in the MDGs and SDGs eras, thus contributing to the debate on efforts MNEs are making in addressing sustainable development challenges through board leadership. Finally, our study contributes to the stakeholder theory and RBV theory by providing empirical validation that outside directors, gender diversity on corporate boards, presence of interlocking directors and existence of ESG committee are strategic assets that can be deployed to improve ESG performance of organisations as suggested by the RBV theory. The study also contributes to the stakeholder theory by showing that the appointment of independent directors/ NEDs, separation of the role of board Chairperson from company CEO, allowing for more female

directors on the board, appointment of interlocking directors, and constituting an ESG committee are effective corporate governance strategies for strengthening board performance and addressing sustainable development challenges in the interest of stakeholders.

List of Tables

Table 2.1 (Panel A): Variable Measurement and Data Sources

S/N	Variable Name	Definition	Measurement/	Supporting literature	Data Source (s)
1	ESGPF	ESG Performance	ESG score (proxy 1) / ESGC score (proxy 2), ranging from 0 (lowest score) to 100 (highest score) ESG letter grade/ ranking, ranging from 'D-' (lowest, assigned 1) to 'A+' (highest, assigned 12).	Pekovic & Vogt, 2020	Refinitiv/ DataStream
2	**Board Leadership Composition**				
2.1	BINDP	Board Independence	Ratio of NEDs to board size (proxy 1) Independence ratio (proxy 2), measured as the average ratio of NEDs to total committee membership across "required" board committee such as audit committee, compensation committee and nomination committee (Klein, 2002; Laux & Laux, 2009)	Erin et al., 2021; Klein, 2002; Laux & Laux, 2009	
2.2	BDUAL	CEO duality	CEO/Chairperson duality (proxy 1), equals "1" if the same person holds CEO and the Chairperson positions, otherwise "0" Chairperson as ex-CEO (proxy 2), equals "1" if Chairperson was ex-CEO, otherwise "0"	Nuskiya et al, 2021; Mangena et al., 2020	
2.3	BDGEN	Board gender diversity	Board gender diversity (proxy 1), ratio of female directors to board size Executive directors gender diversity (proxy 2), ratio of female Executive directors to total executive directors on the board	Nuber & Velte 2021; Konadu et al., 2021; Gull et al., 2023	
2.4	BDINT	Interlocking Directorship	Average number of other corporate affiliations for the board member.	Dragoa et al., 2015; Daniliuc et al., 2021	
2.5	BDCOM	Existence of ESG Committee	If firm has ESG committee, the code of "1" is assigned, otherwise "0"	Doni et al., 2021 ; Elsayih et al., 2021	
3	Firm Governance (Control Variables)				

3.1	BSIZE	Board Size	Number of directors on the board	Harun, et al., 2020; Erin et al., 2021	Refinitiv/ DataStream & Annual Reports
3.2	BMEET	Board Meeting	No. of Board meetings per annum (proxy 1) Board meeting Attendance rate (proxy 2), computed as ratio of number of board meetings attended to total board meetings held per annum	Nuskiya et al, 2021	
3.3	NTDIV	Board Nationality Diversity	Board nationality diversity (proxy 1), measured as ratio of different nationalities on the board to total board size Executive directors nationality diversity (proxy 2), measured as ratio of different nationalities among executive directors to total number of executive directors	Firoozi & Keddie, 2021	
3.4	GOVTC	Government Ownership/ Control	If Government has more than 50% of votes or has a golden share in the company, the code of "1" is assigned, otherwise "0"	Wang & Shailer, 2022	
3.5	ESGPY	ESG-linked pay/ compensation	If firm links executive pay/compensation to ESG performance, the code of "1" is assigned, otherwise "0"	Lu & Wang, 2021	
3.6	ESGAUD	Audit of ESG Report	If ESG report is audited, the code of "1" is assigned, otherwise "0"	Simnett et al., 2009	
3.7	ESGAUT	ESG Auditor Type	If ESG report is audited by Big 4, the code of "1" is assigned, otherwise "0"	Mathuva et al., 2019	
4	Firm Attributes (Control Variables)				
4.1	FSIZE	Size	Turnover (log)	Gull et al., 2023	Refinitiv/ DataStream & Annual Reports
4.2	FPROF	Profitability	Return on Total Assets ratio (ROTA)	Mangena et al., 2012; Wang & Shailer, 2022	
4.3	FLEV	Leverage	Total Debt to Total Assets ratio	Gull et al., 2023	
4.4	FLIQD	Liquidity	Current Assets to Current Liabilities ratio	Harun et al., 2020	
5	INDUS	Industry Type	Code of "1" assigned if company operates in high-profile/ environmentally sensitive/ 'dirty' industry, otherwise "0"	Konadu et al., 2021	
6	ERA	MDGs/ SDGs Era	Code of "1" assigned if SDGs period (2016-2020), otherwise "0" if MDGs era (2006-2015)	Authors' conceptualisation	

7	**Country-level Governance (control variables)**				
7.1	ECODVT	Level of Economic Development	GDP per capita, purchasing power parity (PPP) (current international $)	Lu & Wang, 2021	World Bank
7.2	WGC WGV; WGP; WGG; WGR; WGL;	World Governance Indicators	(i) Control of Corruption (WGC) (corruption perception index as provided by Transparency International); (ii)Voice & Accountability (WGV); (iii)Political Stability and Lack of Violence (WGP); (iv) Government Effectiveness (WGG); (v) Regulatory Quality (WGR); (vi) Rule of Law (WGL), and	Harun et al., 2020; Cuadrado-Ballesteros & Bisogno, 2020	World Bank/ Transparency International
8	**National Culture orientation (control variables)**				
8.1	NPD; NID; NLG	National cultural orientation based on Hofstede Model	Hofstede Model operationalisation of: (i) Power distance (NPD); (ii)Individualism (NID); (iii) long-term orientation (NLG)	Disli et al., 2022	https://www.hofstede-insights.com

Table 2.1 (Panel B): Country Analysis of Companies

S/N	Country	Number of Companies	Weighting (%)
1	Australia	6	1.79%
2	Austria	1	0.30%
3	Belgium	1	0.30%
4	Brazil	2	0.60%
5	Canada	7	2.08%
6	China	42	12.50%
7	Denmark	2	0.60
8	Finland	1	0.30
9	France	17	5.06%
10	Germany	12	3.57%
11	Hong Kong	9	2.68%
12	India	4	1.19%
13	Ireland	4	1.19%
14	Italy	4	1.19%
15	Japan	33	9.82%
16	Luxembourg	1	0.30%
17	Mexico	1	0.30%
18	Netherlands	6	1.79%
19	Norway	2	0.60%
20	Portugal	1	0.30%
21	Russia	5	1.49%
22	Saudi Arabia	4	1.19%
23	Singapore	1	0.30%
24	South Korea	11	3.27%
25	Spain	2	0.60%
26	Sweden	3	0.89%
27	Switzerland	4	1.19%
28	Taiwan	2	0.60%
29	Thailand	1	0.30%
30	United Arab Emirates	1	0.30%
31	United Kingdom	14	4.17%
32	United States	132	39.29%
	Total	**336**	**100%**

Table 2.1 (Panel C): Industry Grouping of Companies

S/N	Industry Group	Number of Companies	Size (%)
1	Aerospace & Defence	9	2.68%
2	Automobiles & Auto Parts	16	4.76%
3	Beverages	7	2.08%
4	Chemicals	12	3.57%
5	Coal	1	0.30%
6	Communications & Networking	2	0.60%
7	Computers, Phones & Household Electronics	8	2.38%
8	Construction & Engineering	11	3.27%
9	Construction Materials	3	0.89%
10	Consumer Goods Conglomerates	7	2.08%
11	Diversified Industrial Goods Wholesale	5	1.49%
12	Diversified Retail	7	2.08%
13	Electric Utilities & IPPs	17	5.06%
14	Electronic Equipment & Parts	1	0.30%
15	Financial Technology & Infrastructure	1	0.30%
16	Food & Drug Retailing	9	2.68%
17	Food & Tobacco	12	3.57%
18	Freight & Logistics Services	10	2.98%
19	Healthcare Equipment & Supplies	8	2.38%
20	Healthcare Providers & Services	8	2.38%
21	Homebuilding & Construction Supplies	3	0.89%
22	Hotels & Entertainment Services	3	0.89%
23	Household Goods	3	0.89%
24	Investment Holding Companies	2	0.60%
25	Leisure Products	1	0.30%
26	Machinery, Tools, Heavy Vehicles, Trains & Ships	17	5.06%
27	Media & Publishing	5	1.49%
28	Metals & Mining	14	4.17%
29	Multiline Utilities	7	2.08%
30	Office Equipment	1	0.30%
31	Oil & Gas	20	5.95%
32	Oil & Gas Related Equipment and Services	3	0.89%
33	Personal & Household Products & Services	6	1.79%
34	Pharmaceuticals	17	5.06%
35	Professional & Commercial Services	3	0.89%
36	Real Estate Operations	13	3.87%
37	Residential & Commercial REITs	1	0.30%
38	Semiconductors & Semiconductor Equipment	11	3.27%
39	Software & IT Services	25	7.44%
40	Specialty Retailers	6	1.79%
41	Telecommunications Services	20	5.95%
42	Textiles & Apparel	1	0.30%
	Total	**336**	**100%**

Table 2.2 (Panel A): Descriptive Statistics of Variables for Full Sample, industries, and MDGs/SDGs Era

Variable	Full Sample (Mean)	Environmentally sensitive (Mean)	Non-Environmentally sensitive (Mean)	MDGs Era (Mean)	SDGs Era (Mean)
ESG score	61.790	63.090	59.165	58.767	67.151
ESGC score	54.660	56.217	51.169	52.185	59.082
ESG ranking	7.930	8.100	7.590	7.580	8.570
Board Independence (NED to board size)	76.660%	75.610%	79.590%	76.110%	77.660%
Board Independence (Committee ind. Ratio)	83.170%	81.890%	88.210%	84.680%	80.460%
CEO Duality (CEO/Chairperson duality)	0.520	0.520	0.530	0.540	0.500
CEO Duality (Chairperson as ex-CEO)	0.400	0.410	0.400	0.350	0.500
Board Gender Diversity	16.900%	16.190%	19.100%	14.050%	22.000%
Interlocking Directorship	1.326	1.296	1.404	1.269	1.429
ESG Committee	0.760	0.780	0.700	0.710	0.830
Board Size	11.990	12.170	11.630	12.160	11.670
Board Meeting (No. of meetings)	8.540	8.800	7.850	8.570	8.470
Board Meeting Attendance rate	71.410%	71.370%	71.670%	67.650%	78.110%
Board Nationality Diversity	9.710%	10.820%	6.980%	8.750%	11.440%
Executives Nationality diversity	3.260%	3.780%	1.990%	2.960%	3.810%
Government Ownership	0.060	0.060	0.050	0.050	0.080
ESG-linked Compensation	0.300	0.320	0.270	0.310	0.280
Audit ESG report	0.530	0.570	0.430	0.460	0.640
ESG Auditor Type	0.250	0.260	0.220	0.230	0.280
Firm Size (Revenue in Million' USD)	48,261.480	48861.108	47130.572	45288.997	53565.359
Profitability (ROTA)	7.250%	6.925%	8.184%	7.330%	7.111%
Total Debt to Assets	26.460%	26.941%	24.876%	25.357%	28.415%
Current Ratio	1.580	1.632	1.447	1.629	1.479
N	**4,583**	**3,321**	**1,262**	**2,937**	**1,646**

Table 2.2 (Panel B): Descriptive Statistics of Variables (Categorical variables)

Variable	*Category*	*Frequency*[1]	*%*
Industry	Environmentally sensitive	3321	72.5
	Non-Environmentally sensitive	1262	27.5
	Total	**4583**	**100.0**
CEO/ Chairperson Duality	CEO doubles as Chairperson	2403	52.4
	CEO different from Chairperson	2180	47.6
	Total	**4583**	**100.0**
Chairperson as ex-CEO	Yes	1856	40.5
	No	2727	59.5
	Total	**4583**	**100.0**
ESG-linked Compensation	Yes	1388	30.3
	No	3195	69.7
	Total	**4583**	**100.0**
Government Ownership	Yes (> 50%)	272	5.9
	No (≤ 50%))	4311	94.1
	Total	**4583**	**100.0**
ESG Committee	Yes	3462	75.5
	No	1121	24.5
	Total	**4583**	**100.0**
Audit of ESG report	Yes	2421	52.8
	No	2162	47.2
	Total	**4583**	**100.0**
ESG-report Auditor Type	Big-4	1137	24.8
	Non Big-4	3446	75.1
	Total	**4583**	**100.0**

[1]*Frequency is measured in terms of number of observations for firm-year*

Table 2.3: Correlation Matrix and Multicollinearity Check

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Board Independence (1)	1															
CEO Duality (2)	.030*	1														
Gender Diversity (3)	.427**	.057**	1													
Interlocking Directorship (4)	.138**	-.067**	.076**	1												
ESG Committee (5)	.052**	-.026	.169***	.036*	1											
Board Size (6)	.049**	.056**	.095**	-.007	.158***	1										
Board Meeting (7)	-.082**	-.056**	.008	.085**	.098**	.051**	1									
Nationality Diversity (8)	.203**	-.224**	.224**	.191**	.143**	.001	-.001	1								
Govt. Ownership (9)	.010	-.158**	-.109**	-.081**	-.040**	-.025	.067**	-.035*	1							
ESG-linked Compensation (10)	.286**	.036*	.281**	.027	.203**	.092**	.046**	.184**	-.063**	1						
Audit ESG report (11)	-.005	-.127**	.141**	.110**	.429***	.176**	.083**	.251**	-.018	.181**	1					
ESG Auditor Type (12)	.117***	-.164**	.159**	.144**	.229**	.191**	.035*	.285**	.050**	.153**	.541**	1				
Firm Size (13)	.051**	-.029*	.079**	.013	.283**	.204**	.100**	.121**	.119**	.108**	.273**	.213**	1			
Profitability (14)	.088**	.029	.061**	.017	.001	-.162**	-.052**	.033*	-.092**	-.028	-.062**	-.100**	-.116***	1		
Total Debt to Assets (15)	.071**	.037*	.065**	-.042**	.004	.063**	.053**	-.012	-.014	.049**	-.006	-.005	-.006	-.224**	1	
Current Ratio (16)	-.096**	.012	-.095**	-.058**	-.104**	-.116**	-.071**	-.084**	-.080**	-.077**	-.104**	-.117**	-.249**	.256**	-.220**	1

***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

Table 2.4: Baseline Regression Result on Association between Board composition and ESG Performance (Full Sample)

Variable	Fixed Effect OLS	Panel Quantile Regression (DV = ESG Score)				
		0.20	**0.40**	**0.60**	**0.80**	**0.95**
Board Independence	2.550**	-.606	.765	2.926***	5.427***	4.517***
	(1.124)	(1.274)	(1.406)	(1.075)	(1.286)	(1.363)
CEO Duality	.033	.333	.385	-1.035**	-.618	-.828
	(.426)	(.942)	(.697)	(.516)	(.487)	(.773)
Board Gender Diversity	9.079***	8.874***	12.110***	11.096***	5.733***	11.414***
	(2.058)	(2.956)	(2.235)	(2.366)	(1.996)	(3.546)
Interlocking Directorship	-.184	-1.158**	-.322	.258	.377	.634*
	(.253)	(.471)	(.381)	(.391)	(.243)	(.381)
ESG Committee	13.970***	15.477***	16.487***	14.551***	11.596***	8.160***
	(.526)	(.871)	(.868)	(.904)	(.782)	(.737)
Governance Control Var						
Board Size	.096	.120*	.036	-.037	.051	-.181
	(.061)	(.067)	(.091)	(.062)	(.059)	(.135)
Board Meeting	.021	-.062	.021	.092**	.127***	.128*
	(.034)	(.043)	(.088)	(.044)	(.041)	(.067)
Board Nationality Diversity	2.770**	1.957**	4.798**	4.914***	2.879***	2.400*
	(1.264)	(.961)	(1.895)	(1.678)	(.975)	(1.235)
Govt. Ownership	-2.038**	-2.704***	-3.353**	-3.124**	-3.188**	-3.693***
	(.914)	(.904)	(1.408)	(1.253)	(1.374)	(1.418)
ESG-linked Compensation	5.308***	6.412***	4.306***	3.849***	3.871***	2.822***
	(.467)	(.693)	(.550)	(.549)	(.586)	(.653)
Audit ESG report	10.506***	12.671***	9.461***	9.568***	8.829***	6.551***
	(.521)	(.849)	(.777)	(.650)	(.723)	(.905)
ESG Auditor Type	.599	2.421***	1.186	-.358	-.509	.205
	(.566)	(.678)	(.741)	(.580)	(.528)	(.770)
Firm Control Var.						
Firm Size	6.593***	6.330***	7.069***	6.590***	5.501***	5.707***
	(.486)	(.582)	(.574)	(.480)	(.624)	(.744)
Profitability (ROTA)	.201***	.069*	.145**	.233***	.239***	.215***
	(.037)	(.039)	(.070)	(.045)	(.046)	(.034)
Total Debt to Assets	-.007	-.030*	-.032*	-.003	.026	.014
	(.013)	(.017)	(.013)	(.017)	(.024)	(.029)
Current Ratio	-.783***	-.938***	-.990***	-.786***	-.052	.427
	(.169)	(.254)	(.208)	(.204)	(.302)	(.379)
Industry	1.738***	2.664***	2.160***	1.892***	1.489***	.745
	(.446)	(.630)	(.472)	(.581)	(.567)	(.897)
Era (MDGs/ SDGs)	4.882***	5.598***	4.583***	3.568***	3.839***	1.640***
	(.518)	(.798)	(.661)	(.642)	(.479)	(.558)
Country-level Gov.						
logGDP	2.384	4.146	2.865	4.121	4.190*	2.128
	(1.959)	(3.043)	(3.201)	(2.751)	(2.492)	(1.918)
Corruption	.146***	.087	.165***	.112**	.089**	.005
	(.038)	(.062)	(.054)	(.051)	(.044)	(.056)
Voice	.084**	.071	.089**	.106***	.181***	.095*
	(.035)	(.056)	(.039)	(.034)	(.047)	(.055)
Political Stability	-.037	.017	-.010	-.030	-.068***	-.040
	(.026)	(.038)	(.034)	(.023)	(.023)	(.029)
Govt Effectiveness	-.170**	-.323**	-.308***	-.218*	-.133*	-.092
	(.077)	(.137)	(.104)	(.119)	(.076)	(.104)

Regulatory Quality	-.354***	-.321***	-.235***	-.352***	-.459***	-.394***
	(.058)	(.105)	(.087)	(.089)	(.079)	(.080)
Rule of Law	.091	.087	.038	.151*	.183**	.266***
	(.066)	(.115)	(.079)	(.079)	(.077)	(.102)
National Culture						
Power Distance	-.358***	-.381***	-.292***	-.303***	-.348***	-.298***
	(.030)	(.040)	(.032)	(.037)	(.036)	(.049)
Individualism	-.026	.023	-.004	-.031	-.059***	-.053*
	(.023)	(.033)	(.032)	(.021)	(.020)	(.030)
long-term orientation	.109***	.129***	.090***	.074***	.082***	.054**
	(.017)	(.025)	(.023)	(.021)	(.015)	(.022)
R^2/ Pseudo R^2	0.616	0.455	0.405	0.359	0.312	0.233
N	**4,583**	**4,583**	**4,583**	**4,583**	**4,583**	**4,583**

Notes: This table reports the fixed effect (OLS) and panel quantile regression (PQR) result for the effect of board composition on ESG performance for the full sample. All variables are defined and measured in Table 2.1 (Panel A). Coefficients are stated, while standard errors are reported in brackets.
***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

Table 2.5: Regression Result on Association between Board composition and ESG Performance with alternative measures of Independent Variables

	Fixed Effect OLS	**Panel Quantile Regression (DV = ESG Score)**				
Variable		**0.20**	**0.40**	**0.60**	**0.80**	**0.95**
Board Independence (Independence ratio)	11.002***	11.352***	10.763***	9.727***	9.358***	8.752***
	(1.093)	(1.477)	(1.472)	(1.624)	(1.478)	(2.394)
CEO Duality (Chair as ex-CEO)	.529	.893	.578	.015	-.520	-.717
	(.417)	(.667)	(.535)	(.646)	(.602)	(.860)
Board Gender Diversity	7.578***	5.672**	11.041***	12.492***	4.949***	11.294***
	(2.021)	(2.492)	(2.372)	(2.369)	(1.772)	(2.980)
Interlocking Directorship	-.410	-1.065***	-.230	.031	.141	.745**
	(.249)	(.281)	(.357)	(.376)	(.244)	(.319)
ESG Committee	13.586***	14.859***	15.620***	14.168***	11.556***	7.516***
	(.521)	(1.119)	(1.176)	(1.079)	(.763)	(.810)
Governance Control Var						
Board Size	.149**	.165	.103	-.024	.068	-.044
	(.060)	(.111)	(.081)	(.102)	(.078)	(.078)
Board Meeting (Attendance rate)	1.839**	.328	1.684	3.230***	2.086***	.885
	(.763)	(.755)	(1.051)	(1.090)	(.792)	(.883)
Board Nationality Diversity (ED Div. ratio)	.012	-.030	.005	.015	.014	.022**
	(.017)	(.019)	(.024)	(.017)	(.016)	(.010)
Govt. Ownership	-1.680*	-1.550	-2.836**	-3.096***	-2.872**	-2.865**
	(.895)	(1.284)	(1.321)	(1.253)	(1.389)	(1.285)
ESG-linked Compensation	5.137***	6.316***	4.188***	3.696***	3.450***	3.088***
	(.462)	(.739)	(.794)	(.567)	(.398)	(.703)
Audit ESG report	10.362***	11.940***	9.560***	9.640***	8.792***	6.807***
	(.514)	(1.097)	(.794)	(.743)	(.508)	(.803)
ESG Auditor Type	.839	2.657***	.977*	.227	-.316	-.285
	(.554)	(.858)	(.550)	(.831)	(.544)	(.805)
Firm Control Var.						
Firm Size (Revenue)	6.595***	6.602***	7.263***	6.667***	5.427***	6.061***

	(.479)	(.597)	(.607)	(.673)	(.763)	(.768)
Profitability (ROTA)	.210***	.101	.162***	.230***	.207***	.208***
	(.036)	(.063)	(.059)	(.053)	(.044)	(.048)
Total Debt to Assets	-.002	-.040*	-.020	.011	.019	.029
	(.013)	(.024)	(.021)	(.014)	(.014)	(.021)
Current Ratio	-.789***	-.986***	-.808***	-.781**	-.407	.377
	(.166)	(.214)	(.254)	(.348)	(.273)	(.375)
Industry	1.730***	2.880***	2.304***	2.132***	2.079***	.639
	(.439)	(.854)	(.541)	(.826)	(.589)	(.590)
Era (MDGs/ SDGs)	4.667***	6.185***	4.768***	3.437***	3.756***	1.214*
	(.511)	(.874)	(.602)	(.608)	(.432)	(.707)
Country-level Gov.						
logGDP	.256	.469	-.782	.575	2.360	2.774
	(1.918)	(2.587)	(2.745)	(3.450)	(3.000)	(2.669)
Corruption	.238***	.229***	.269***	.229***	.159***	.065
	(.037)	(.065)	(.060)	(.061)	(.052)	(.056)
Voice	.072**	.013	.055	.095**	.177***	.135***
	(.034)	(.054)	(.055)	(.046)	(.029)	(.049)
Political Stability	-.018	.057	.009	-.012	-.054***	-.025
	(.025)	(.042)	(.038)	(.025)	(.020)	(.032)
Govt Effectiveness	-.242***	-.401***	-.352***	-.279***	-.257***	-.131
	(.076)	(.095)	(.098)	(.102)	(.096)	(.125)
Regulatory Quality	-.342***	-.331***	-.259***	-.301***	-.447***	-.392***
	(.057)	(.105)	(.087)	(.099)	(.095)	(.110)
Rule of Law	.060	.126	.055	.056	.188***	.168*
	(.064)	(.085)	(.114)	(.092)	(.072)	(.092)
National Culture						
Power Distance	-.326***	-.316***	-.278***	-.278***	-.304***	-.268***
	(.030)	(.057)	(.045)	(.032)	(.041)	(.045)
Individualism	-.028	.031	-.005	-.043	-.032	-.080***
	(.021)	(.034)	(.039)	(.039)	(.029)	(.023)
long-term orientation	.142***	.168***	.138***	.104***	.108***	.058***
	(.016)	(.033)	(.031)	(.024)	(.016)	(.017)
R^2/ Pseudo R^2	0.625	0.462	0.412	0.363	0.315	0.236
N	4,583	4,583	4,583	4,583	4,583	4,583

Notes: This table reports the fixed effect (OLS) and panel quantile regression (PQR) result for the effect of board composition on ESG performance for the full sample, using alternative measurement of some independent and control variables. All variables are defined and measured in Table 2.1 (Panel A). Coefficients are stated, while standard errors are reported in brackets.

***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

Table 2.6: Regression Result on the Association between Board composition and ESG Performance in Environmentally Sensitive and non-Environmentally Sensitive Industries

Variable	Environmentally Sensitive Industries						Non-Environmentally Sensitive Industries					
	Fixed Effect OLS	Panel Quantile Regression (DV = ESG Score)					Fixed Effect OLS	Panel Quantile Regression (DV = ESG Score)				
		0.20	0.40	0.60	0.80	0.95		0.20	0.40	0.60	0.80	0.95
Board Independence	6.203***	-1.053	1.265	3.650**	4.308***	4.555**	.571	10.839***	12.216***	11.539***	13.172***	12.281***
	(1.251)	(1.879)	(2.038)	(1.568)	(1.407)	(2.042)	(2.235)	(2.921)	(3.223)	(2.866)	(2.985)	(2.561)
CEO Duality	-.755	.748	-.147	-1.477**	.062	.482	-5.807***	-2.479*	-2.092	-2.904**	-3.775***	-5.949***
	(.504)	(.940)	(.551)	(.677)	(.613)	(.798)	(.858)	(1.412)	(1.535)	(1.137)	(1.161)	(1.235)
Board Gender Diversity	4.303*	7.256*	12.027***	11.106***	8.914***	17.678***	2.303	20.742***	19.058***	8.467***	6.590	2.483
	(2.212)	(3.957)	(3.214)	(3.713)	(2.525)	(3.031)	(3.531)	(4.996)	(5.595)	(3.089)	(4.490)	(6.386)
Interlocking Directorship	-1.152***	-1.113*	-.355	-.083	.245	1.289***	.149	-2.014***	-1.894***	9.720***	.367	.304
	(.247)	(.584)	(.591)	(.352)	(.338)	(.416)	(.383)	(.448)	(.728)	(2.314)	(.506)	(.488)
ESG Committee	6.916***	14.429***	14.326***	13.553***	10.845***	7.361***	9.643***	23.872***	24.649***	18.812***	12.477***	8.026***
	(.516)	(1.180)	(1.120)	(.960)	(1.131)	(.718)	(.828)	(2.059)	(1.947)	(2.357)	(1.999)	(1.647)
Governance Control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm Control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year (Pre/Post SDG)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country-level Gov.	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
National Culture	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R^2/ Pseudo R^2	0.482	0.465	0.409	0.363	0.315	0.235	0.524	0.517	0.472	0.401	0.344	0.311
N	3,321	3,321	3,321	3,321	3,321	3,321	1,262	1,262	1,262	1,262	1,262	1,262

Notes: This table reports the fixed effect (OLS) and panel quantile regression (PQR) result for the effect of board composition on ESG performance in environmentally sensitive and non-environmentally sensitive industries. Control variables are included but not reported. All variables are defined and measured in Table 2.1 (Panel A). Coefficients are stated, while standard errors are reported in brackets.

***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

Table 2.7: Regression Result on the Association between Board composition and ESG Performance in the MDGs and SDGs Eras

Variable	MDGs Era (2006-2015)						SDGs Era (2016-2020)					
	Fixed Effect OLS	Panel Quantile Regression (DV = ESG Score)					Fixed Effect OLS	Panel Quantile Regression (DV = ESG Score)				
		0.20	0.40	0.60	0.80	0.95		0.20	0.40	0.60	0.80	0.95
Board Independence	4.943***	-1.276	-.027	2.367	4.383***	3.705**	6.788***	-.286	1.338	4.070	6.836**	2.201
	(1.191)	(2.361)	(2.036)	(1.838)	(1.681)	(1.812)	(2.293)	(3.858)	(3.388)	(3.303)	(3.013)	(4.051)
CEO Duality	-2.552***	-.092	-.324	-1.008	-1.165	.577	-2.692***	2.315	.407	-.260	.318	-1.575*
	(.547)	(.856)	(.686)	(.745)	(.760)	(.973)	(.772)	(1.490)	(1.100)	(1.028)	(.804)	(.836)
Board Gender Diversity	4.316*	12.355***	15.763***	12.673***	11.240***	18.099***	12.282***	15.150***	16.212***	15.248***	10.474***	12.014**
	(2.523)	(4.443)	(4.088)	(3.738)	(3.492)	(6.615)	(3.116)	(4.929)	(3.514)	(3.156)	(3.621)	(5.219)
Interlocking Directorship	-.211	-1.159***	-.538	-.044	.331	.722*	-.932	.326	.354	1.021*	.332	.677
	(.232)	(.414)	(.440)	(.574)	(.513)	(.490)	(.571)	(.953)	(.532)	(.556)	(.525)	(.553)
ESG Committee	6.211***	14.324***	14.465***	14.614***	11.687***	8.251***	7.625***	20.092***	17.685***	12.439***	10.797***	6.728***
	(.492)	(1.248)	(.917)	(1.132)	(.984)	(1.765)	(.777)	(1.522)	(1.521)	(1.527)	(1.315)	(1.277)
Governance Control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm Control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country-level Gov.	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
National Culture	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R^2/ Pseudo R^2	0.378	0.446	0.410	0.367	0.328	0.248	0.340	0.439	0.388	0.341	0.301	0.245
N	2,937	2,937	2,937	2,937	2,937	2,937	1,646	1,646	1,646	1,646	1,646	1,646

Notes: This table reports the fixed effect (OLS) and panel quantile regression (PQR) result for the effect of board composition on ESG performance in the MDGs and SDGs Eras. Control variables are included but not reported. All variables are defined and measured in Table 2.1 (Panel A). Coefficients are stated, while standard errors are reported in brackets.

***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

Table 2.8: Regression Result on the Association between Board composition and ESG Performance using ESGC Score

	Fixed Effect OLS	Panel Quantile Regression (DV = ESGC Score)				
Variable		**0.20**	**0.40**	**0.60**	**0.80**	**0.95**
Board Independence	1.463	-.102	-.907	2.964*	4.202***	3.021*
	(1.311)	(1.144)	(1.211)	(1.581)	(1.392)	(1.827)
CEO Duality (CEO/Chair)	1.365***	1.853**	2.589***	.841	-.259	-.304
	(.498)	(.844)	(.621)	(.747)	(.383)	(.455)
Board Gender Diversity	5.342**	3.794	3.523	5.146	7.306**	12.083***
	(2.401)	(3.556)	(4.647)	(3.559)	(3.413)	(3.228)
Interlocking Directorship	-.088	-.796**	-.506	-.314	.290	1.223***
	(.295)	(.319)	(.441)	(.264)	(.356)	(.351)
ESG Committee	12.662***	16.786***	13.592***	11.903***	11.236***	6.172***
	(.614)	(.951)	(.672)	(.778)	(.847)	(.909)
Governance Control	YES	YES	YES	YES	YES	YES
Firm Control	YES	YES	YES	YES	YES	YES
Industry control	YES	YES	YES	YES	YES	YES
Era (MDGs/ SDGs)	YES	YES	YES	YES	YES	YES
Country-level Gov.	YES	YES	YES	YES	YES	YES
National Culture	YES	YES	YES	YES	YES	YES
R^2/ Pseudo R^2	0.394	0.265	0.228	0.209	0.201	0.173
N	**4,583**	**4,583**	**4,583**	**4,583**	**4,583**	**4,583**

Notes: This table reports the fixed effect (OLS) and panel quantile regression (PQR) result for the effect of board composition on ESG performance using alternative measurement of ESG performance (i.e., ESGC score). Control variables are included but not reported. All variables are defined and measured in Table 2.1 (Panel A). Coefficients are stated, while standard errors are reported in brackets.

***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

Table 2.9: Multiple Discriminant Analysis Result on the relationship between Board composition and ESG Performance

	Function (DV = ESG Letter Grade/ Ranking)							
	1	2	3	4	5	6	7	8
Board Independence	.041	.193	.155	-.329	.233	.086	-.105	-.035
CEO Duality	.016	-.196	.093	.114	-.198	.186	.335	.116
Board Gender Diversity	.174	.419	-.142	.182	-.477	.077	.047	.154
Interlocking Directorship	.026	.070	-.153	-.203	-.255	.143	.313	-.004
ESG Committee	.497	-.415	.139	-.032	-.064	.034	.056	-.183
Governance Control	YES	YES	YES	YES	YES	YES	YES	YES
Firm Control	YES	YES	YES	YES	YES	YES	YES	YES
Industry control	YES	YES	YES	YES	YES	YES	YES	YES
Era (MDGs/ SDGs)	YES	YES	YES	YES	YES	YES	YES	YES
Country-level Gov.	YES	YES	YES	YES	YES	YES	YES	YES
National Culture	YES	YES	YES	YES	YES	YES	YES	YES
Eigenvalue	1.695	.182	.051	.040	.019	.015	.013	.009
% of Variance explained	83%	8.9%	2.5%	2%	0.9%	0.7%	0.6%	0.5%
Wilks' Lambda	0.267***	0.719***	0.85***	0.893***	0.929***	0.946***	0.96***	0.973***
N	4,583	4,583	4,583	4,583	4,583	4,583	4,583	4,583

Notes: This table reports the multiple discriminant analysis result for the effect of board composition on ESG performance (full sample), with alternative measurement of ESG performance (i.e., ESG ranking). Control variables are included but not reported. All variables are defined and measured in Table 2.1 (Panel A). Coefficients are stated, while standard errors are reported in brackets.

*** indicates statistical significance at 1%.

Table 2.10: 2SLS/ IV Regression Result on Association between Board composition and ESG Performance

Variable	ESG Score	ESG Ranking
Board Independence	.015*	.066*
	(.592)	(.019)
CEO Duality (CEO/Chair)	-2.476***	-.318***
	(.504)	(.061)
Board Gender Diversity (instrumented)	7.225*	.856***
	(1.339)	(.170)
Interlocking Directorship	-.364*	-.031*
	(.248)	(.030)
ESG Committee	7.906***	1.009***
	(.506)	(.061)
Governance Control	YES	YES
Firm Control	YES	YES
Industry control	YES	YES
Era (MDGs/ SDGs)	YES	YES
Country-level Gov.	YES	YES
National Culture	YES	YES
R^2	0.310	0.314
N	**4,583**	**4,583**

Notes: This table reports the two-stage least squares (2SLS) regression result for the effect of board composition on ESG performance using ESG score and ESG ranking. Control variables are included but not reported. All variables are defined and measured in Table 2.1 (Panel A). Coefficients are stated, while standard errors are reported in brackets.
***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

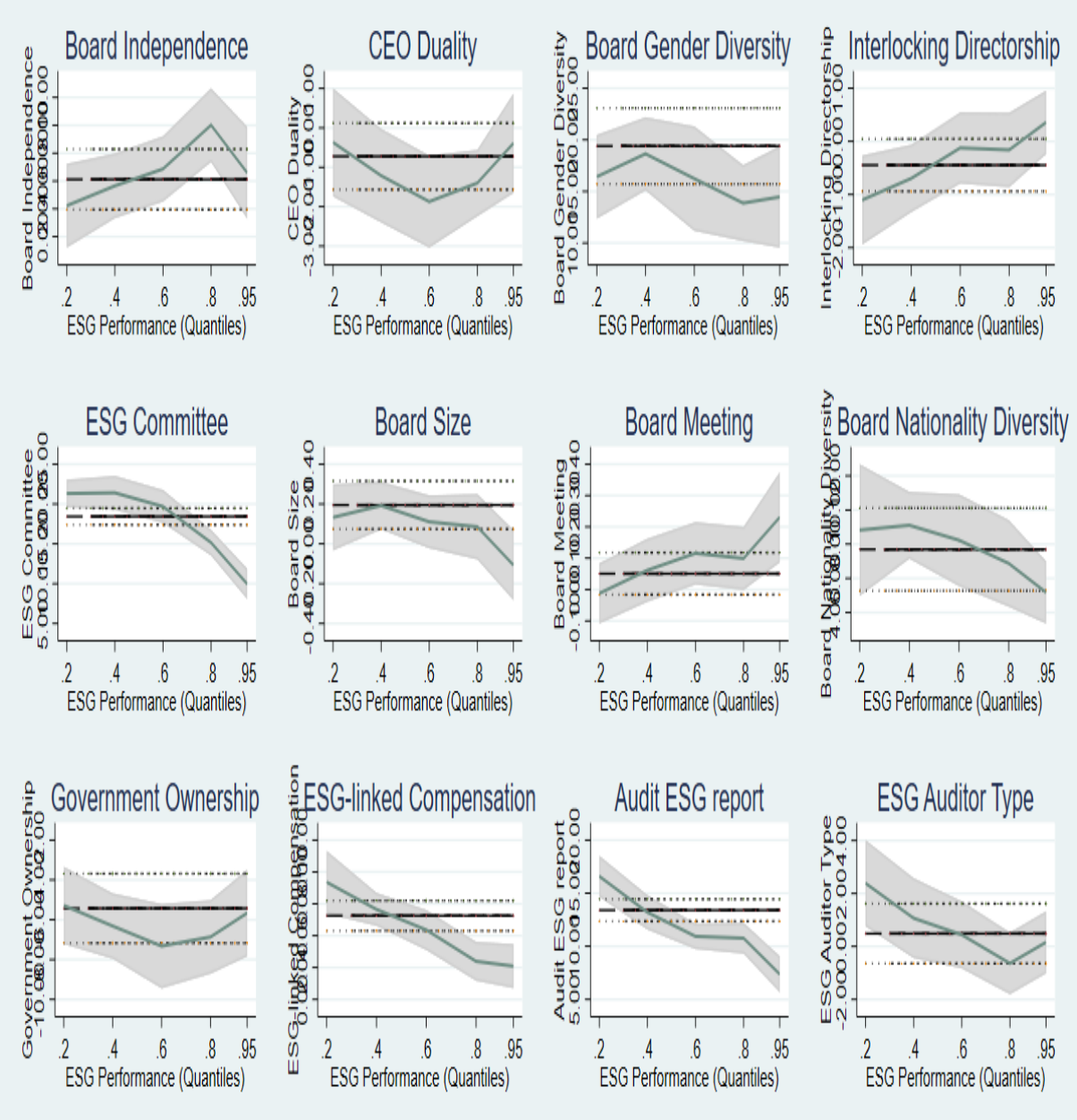
Table 2.11: PSM Regression Result on Association between Board Composition and ESG Performance

Variable	ESG Score	ESG Ranking
Board Independence	4.723***	.477***
	(1.266)	(.155)
CEO Duality (CEO/Chair)	-2.178***	-.285***
	(.436)	(.053)
Board Gender Diversity (pscore)	1.835*	.315*
	(0.736)	(.337)
Interlocking Directorship	-.653***	-.062**
	(.237)	(.029)
ESG Committee	7.735***	.987***
	(.440)	(.054)
Governance Control	YES	YES
Firm Control	YES	YES
Industry control	YES	YES
Era (MDGs/ SDGs)	YES	YES
Country-level Gov.	YES	YES
National Culture	YES	YES
Fixed Effect	YES	YES
R^2	0.481	0.470
N	**4,583**	**4,583**

Notes: This table reports the propensity score matching (PSM) regression result for the effect of board composition on ESG performance using ESG score and ESG ranking. Control variables are included but not reported. All variables are defined and measured in Table 2.1 (Panel A). Coefficients are stated, while standard errors are reported in brackets.
***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

List of Figures

Figure 2.1: PQR Graph on Board Leadership Composition–ESG Performance Relationship (Full Sample)



This figure (Figure 2.1) graphically shows the relationship between board leadership composition, governance control variables, and ESG performance at the aggregate level for the baseline result. Linear model results (OLS) are represented by the straight solid lines in the graphs, while OLS standard errors are depicted by the straight dotted lines surrounding the solid lines. The PQR graphs are represented by the undulating lines, and the PQR standard errors by the grey oscillating lines, clearly showing curvilinear relationship between variables.

Chapter Three: Research Paper 2

Corporate Governance Drivers of Environmental Performance: International Evidence from Environmentally Sensitive Industries

Chapter 3: Corporate Governance Drivers of Environmental Performance: International Evidence from Environmentally Sensitive Industries

Abstract

The research problem

The debate on environmental sustainability appears to be far from over, possibly because stakeholders are increasingly becoming interested in how organisations are balancing the pressure for profit with the pursuit of preserving the planet and ecosystem. The need for organisations to operate in a manner that minimises their negative impact on the environment has been stressed lately because of the high spate of natural disasters in recent times. Whereas there are various factors affecting corporate environmental performance (CEP), the literature suggests that corporate governance (CG) is a major determinant. The current study, therefore, investigates the extent to which CG mechanisms affect CEP in an international setting.

Motivation and theoretical reasoning

Whilst organisations should emplace CG mechanisms as a self-monitoring strategy to minimise environmental pollution in line with the stakeholder theory and legitimacy theory, the review of literature in this respect reveals three gaps which have provided motivation for the study. First, international studies on the impact of CG on CEP are limited. Second, results on the nature of the CG-CEP relationship have been inconsistent. Third, the need for organisations to operate in an environmentally sustainable manner has now become more pressing than ever before especially in the sustainable development goals (SDGs) era. However, little is known on the extent to which CG mechanisms affect CEP differently in the Millennium Development Goals, MDGs (2000-2015) in comparison to the sustainable development goals, SDGs (2016-2030) era.

The test hypotheses

The study tested the impact of seven key CG mechanisms on CEP, broadly categorised into board structure and operations (board meeting, board independence and CEO duality), board diversity (board gender diversity and board nationality diversity), and ESG structure (ESG committee and ESG-linked compensation), whilst controlling for other CG variables, firm-level attributes, and country-level governance factors.

Adopted methodology and findings

Panel quantile regression (PQR) was applied to analyse data covering a 15-year period (2006-2020) from 244 top multinational entities operating in 30 environmentally sensitive industries located in 31 countries distributed across 5 geographical regions. Binary logistic regression, two-stage least squares regression (2SLS)/ instrumental variables (IV) regression and propensity score matching (PSM) regression analysis were applied to assess the robustness of result. Result shows that at the aggregate/ combined level for all countries, board gender diversity and presence of ESG committee are the strongest drivers of CEP. However, when disaggregated into geographical regions, the impact of CG mechanisms on CEP is contextual and varies across jurisdictions.

Implications of the Study

Following from the positive impact of board gender diversity and board nationality diversity on CEP, to strengthen board effectiveness and environmental sustainability performance, board nomination committees should select or recommend for selection director nominees that strengthen gender diversity and nationality diversity. However, drawing from the curvilinear relationship between CG and CEP, nationality diversity, gender diversity, and ratio of NED/ independent directors to board size, among other considerations, should be balanced to ensure optimal board performance in achieving CEP outcomes.

Keywords: corporate governance; corporate environmental performance; ESG, environmentally sensitive industry, legitimacy theory, stakeholder theory

3.1 Introduction

The debate on environmental sustainability appears to be far from over, possibly because stakeholders are increasingly becoming interested in how organisations are balancing the pressure for profit with the pursuit of preserving the planet and ecosystem. The need for organisations to operate in a manner that minimises their negative impact on the environment has been stressed lately (e.g., Radhakrishnan et al. 2018; Nadeem et al, 2020; Barbu et al. 2022). This stems, partly, from the high spate of natural disasters in recent times— ranging from wildfires in Australia and typhoons in Japan, to floods in North America, and severe drought conditions in South America (Kumar et al., 2022)— which is not unconnected to human activities. According to Centre for Research on the Epidemiology of Disasters (CRED), there were 432 disastrous events related to natural hazards in 2021, accounting for 10,492 deaths, affecting 101.8 million people and causing approximately US$ 252.1 billion of economic losses (CRED, 2022). These developments have rekindled the interest of concerned stakeholders in how corporate environmental performance (CEP) can be improved to conserve natural resources and protect global ecosystem from total collapse. Whereas there are various factors affecting CEP, literature suggests that corporate governance (CG) is a major determinant (Ortiz-de-Mandojana et al., 2016; Hussain et al., 2018; Doni et al., 2021). Against this backdrop, it is important to investigate the extent to which CG mechanisms affect CEP.

Whilst it appears there is a consensus that organisations should emplace CG mechanisms as a self-monitoring strategy to minimise environmental pollution and associated externalities arising from their business operations (Ortiz-de-Mandojana et al., 2016), the review of literature in this respect reveals some gaps which the current study seeks to address.

First, although the literature on the association between CG and CEP is growing, international studies on the subject are limited, as most prior studies have focused on a single country/ geographical region (e.g., Agyemang et al., 2020; Tingbani et al., 2020; Elsayih et al., 2021; Konadu et al., 2021; Nuber & Velte, 2021; Nuskiya et al., 2021). Agyemang et al.'s (2020) study of 34 Chinese mining firms covered the period 2000-2018, while Elsayih et al.'s (2021) investigation drew samples from Australian firms that participated in the Carbon Disclosure Project, and Nuskiya et al. (2021) explored 41 Sri Lankan listed firms covering 2015 to 2019. Whereas Konadu et al. (2021) examined US companies listed on the Standards & Poor's 500 index, Tingbani et al. (2020) investigated non-financial UK firms on the London Stock Exchange. The focus of Nuber & Velte's (2021) investigation was non-financial firms in the

European STOXX600 index. The single country/ region approach, limited sample sizes and short- to medium-timeframe covered by these studies limit generalisability of results and may not strongly establish the case for CG drivers of CEP in an international context. To resolve the gap of limited international studies, it has been suggested that more inter-country studies covering a wider timeframe in top-emitting countries and global companies should be carried out (Aragón-Correa et al., 2016; Aguilera et al., 2019; Tauringana & Moses, 2021).

Second, results on the nature of the CG-CEP relationship have been inconsistent (e.g., Agyemang et al., 2020; Cancela et al., 2020), and this may be attributable to several factors, including approaches to measurement of variables, research settings, methods of data analysis and other methodological differences (Zaman et al., 2020). Noting that the CG-CEP nexus may be non-linear (Nuber & Velte, 2021), there have been calls for more research into CG mechanisms affecting CEP using advanced data analysis techniques that can explore linear and curvilinear relationships among variables (Masud et al., 2018; Zaman et al., 2020; Aguilera et al., 2021). Most prior studies have applied linear statistical models (e.g., Huang & Kung, 2010; Ganesan et al., 2017; Tauringana et al., 2017; Masud et al., 2018; Giannarakis et al., 2018). Huang & Kung (2010) applied pooled ordinary least square (OLS) regression to analyse data from 759 large firms in China. Tauringana et al.'s (2017) study of 55 UK firms applied binary logistics regression to evaluate the relationship between corporate boards and commitment to environmental sustainability. Masud et al. (2018) examined CG determinants of CEP using pooled OLS to analyse data from 88 firms across various countries. Giannarakis et al. (2018) applied ordered logit regression to analyse evidence from 215 European firms for 1-year (2014) period. Ganesan et al. (2017) deployed partial least squares (PLS) to examine the impact of CG on CEP in 120 Malaysian firms. To undertake a more nuanced analysis of the relationship between CG mechanisms and CEP, it is important to use innovative techniques, including panel quantile regression (PQR) which can detect both linear and non-linear relationship between variables (Coad & Rao, 2008), as only few studies have applied the technique in CG-CEP research (Nuskiya et al., 2021). PQR provides an alternative to linear regression by allowing for the estimation of relationships across the distribution of an outcome/dependent variable (Canay, 2011). Further, PQR has three main advantages over OLS (and other similar methods of quantitative modelling that require linearity of relationship between dependent and independent variables) as follows (Canay, 2011; Borgen, 2016): (i) PQR makes no assumption about the distribution of the dependent variable; (ii) PQR tends to adequately control for outliers; (iii) PQR optimises the analysis of curvilinear relationship between dependent and

independent variables using interior-point non-linear optimisation algorithm. Furthermore, there have been methodological recommendations to use state-of-the-art regression methods to address endogeneity concerns (e.g., Zaman et al., 2020; Aguilera et al., 2021), as only a limited number of studies on CG-CEP specifically addressed endogeneity (e.g. De Villiers et al., 2011; Eccles et al., 2014).

Third, the need for organisations to operate in an environmentally sustainable manner has now become more pressing than ever before. This has been reiterated through the United Nations Agenda for Sustainable Development Agenda 2030, with sustainable development goals (SDGs) set for both developed and developing countries (Oyewo et al., 2022). Acknowledging that the Millennium Development Goals (MDGs) which preceded the SDGs started some groundwork in challenging corporate entities to commit to CEP (MDG 7 on environment), the SDGs raise the standard by specifying multiple environmental targets covering SDG 6 (clean water and sanitation), SDG 7 (affordable and clean energy), SDG11 (sustainable cities and communities), SDG 12 (responsible consumption and production), SDG 13 (climate action), SDG 14 (life below water), and SDG 15 (life on land) respectively. Considering that SDG 17 (partnerships for the goals) calls on corporate entities as partners to be deliberate about sustainability issues, it is conceivable that business organisations will be more intentional about environmental sustainability by strengthening CG practice to entrench corporate legitimacy and gain stakeholders' acceptance (Barbu, et al., 2022; Oyewo et al., 2022). According to the legitimacy theory, it may be expected that the extent to which CG mechanisms drive CEP would be dissimilar during the MDGs (2000-2015) and SDGs (2016-2030) era, with more commitment to environmental issues demonstrated in the SDGs period. However, there is little knowledge in this regard. Prior studies examining CG-CEP nexus in periods spanning the MDGs/SDGs era did not disaggregated results into these periods (e.g., García-Sánchez et al., 2019; Konadu et al., 2021; Lu & Wang, 2021). Meanwhile, it is important to examine the CG drivers of CEP because such knowledge reveals the extent to which corporate entities are progressing in actualising agenda 2030, with deadline for achievement of targets set to expire in less than 8 years from now. Moreover, such investigation will uncover how corporate entities are tacking environmental sustainability challenges through their CG apparatus.

Against this backdrop, the aim of the study is to examine the impact of CG on CEP in an international setting in the MDGs and SDGs era, using advanced quantitative methods. The study focuses on seven key CG mechanisms affecting CEP suggested in literature (e.g.,

Aguilera & Jackson, 2003; De Villiers et al., 2011; Dixon-Fowler et al., 2017; Flammer et al., 2019; Aguilera et al., 2021; Elsayih et al, 2021), broadly categorised into board structure and operations (board meeting, board independence and CEO duality), board diversity (board gender diversity and board nationality diversity), and ESG structure (ESG committee and ESG-linked compensation).

The research gaps are addressed as follows. The first research gap is tackled by focusing on CG mechanisms influencing CEP in environmentally sensitive industries in an international setting, considering the nature of their business and their high propensity to pollute the environment (Aragón-Correa et al., 2016). In the meantime, knowledge on the subject in such sensitive industries can inform policy recommendations on minimising environmental pollutions (air pollution, water pollution, and land pollution) and curtailing negative production externalities generated by environmentally sensitive companies. The study analyses data covering a 15-year period (2006-2020) from 244 companies appearing on Forbes 500 list and operating in 30 environmentally sensitive industries located in 31 countries across 5 geographical regions.

The second research gap regarding inconsistencies in the results of prior studies is addressed in two ways. One, the study applies panel quantile regression analysis (PQR)—an advanced statistical technique that can detect both linear and non-linear relationship among variables. This stems from the argument that mixed result reported by prior studies may be caused by not acknowledging the possibility of a non-linear relationship among the variables (Nuskiya et al., 2021; Nuber & Velte, 2021). Two, after performing a general analysis of the impact of CG on CEP, the result is decomposed into geographical regions to assess the extent to which result varies by regions. This approach attempts to address inconsistency in result arising from research settings for sample selection.

The third research gap is addressed by conducting a longitudinal study (2006-2020) spanning the MDGs and SDGs periods. Scholars contend that the impact of CG on CEP may take years to manifest (Eccles et al., 2014; Aguilera et al., 2021). The 15-year time frame covering the MDGs (2006-2015) and SDGs (2016-2020) era for both combined (all country) and regional/geographical analysis provides an avenue to evaluate how commitment to environmental sustainability issues has changed overtime, thus presenting empirical evidence on the performance of corporate entities with respect to meeting environmental targets through their governance structure.

Result shows that at the aggregate/ combined level for all countries, board gender diversity and presence of ESG committee are the strongest drivers of CEP. However, when disaggregated into geographical regions, the impact of CG mechanisms on CEP is contextual and varies across jurisdictions. Although board gender diversity and ESG committee emerged as the strongest drivers of CEP in the MDGs and SDGs era, they exert more influence in the SDGs era than in the MDGs era.

The study contributes to knowledge in several ways by addressing the observed gaps. First, the study adopts an international approach by analysing evidence from 244 top multinational entities (MNEs) operating in 30 environmentally sensitive industries in 31 countries distributed across 5 geographical regions using 3,321 firm-year observations. Second, the study presents evidence that the impact of CG mechanisms on CEP is contextual and varies across jurisdictions. Third, the study adopts a longitudinal approach by decomposing the impact of CG mechanisms on CEP in the MDGs (2006-2015) and SDGs (2016-2020) era, as well as presenting evidence on how the CG apparatus impacts CEP differently across the periods. Fourth, the study makes methodological contribution by using novel techniques such as PQR, two-stage least squares regression (2SLS)/ instrumental variables (IV) regression and propensity score matching (PSM) to analyse the CG-CEP nexus. This is in response to call to use state-of-the-art regression methods to address endogeneity concerns which have not been particularly addressed in most prior studies. Finally, the study makes contribution to the stakeholder theory and legitimacy theory by furnishing empirical evidence that MNEs will emplace CG mechanisms as a strategy for improving CEP to legitimise their existence and gain stakeholders' acceptance.

The rest of the paper proceeds as follows; Section 3.2 covers literature review and hypotheses development. Next, methodology is explained in Section 3.3. Results and discussion are presented in Section 3.4, followed by robustness check in Section 3.5. The paper is concluded in Section 3.6.

3.2 Literature Review and Hypotheses Development

3.2.1 Theoretical Framework

The study invokes stakeholder and legitimacy theory as theoretical framework because of their appropriateness and interrelatedness in explaining the motivation of corporate entities in getting involved with environmental sustainability (Mahadeo et al., 2011). Whilst the stakeholder theory recognises that there are various stakeholder-groups that wield various level of influence on the activities of the organisation, the legitimacy theory explains the motive behind satisfying the stakeholders. The use of both theories is informed by the consideration that no single theory fully accounts for the CG-CEP nexus (Hussain et al.,2018).

The stakeholder theory recognises that an organisation is made up various groups interested in the affairs of the entity, possibly because they are directly or indirectly affected by the activities and decision-making system in the organisation (Doni et al., 2021). As stakeholders could positively or negatively affect the firm's interest (Rudyanto & Veronica Siregar, 2018), it is reasonable to monitor stakeholders based on their level of interest and level of influence wielded by them. Frameworks such as the Mendelow matrix has been instrumental in stakeholder mapping for the purpose of formulating appropriate strategies to effectively manage stakeholders (Johnson et al. 2017). An organisation should strive to satisfy the needs of stakeholders as much as possible through a balancing act. Within the context of the current study, organisations would have to consider stakeholders' expectations with respect to protecting the environment and seek to achieve their environmental targets to validate their existence (Spence & Rinaldi, 2014). This argument sets the context for legitimacy theory.

The legitimacy theory explains the process and strategies organisation deploy to get stakeholders' approval. Simply put, the legitimacy theory assumes that an organisation has no reason to exist, unless its value aligns with the interest of the society (Magness, 2006). Following from this, requirements are imposed on organisations to justify their existence by proving their commitment for the advancement of the society. Involvement in environmental sustainability projects is, thus, seen as a veritable tool by business entities to prove their relevance to the society (Mahadeo et al., 2011; Barbu, et al., 2022). Since the society views the relationship with an organisation as a social contract, the burden of proof is upon organisations to demonstrate commitment to environmental sustainability issues. Organisations will emplace robust CG mechanisms to ensure environmental strategies are formulated and environmental projects are well executed to the satisfaction of stakeholders as a legitimising strategy. As suggested by Suchman (1995), legitimacy is not static. Corporate organisations are built on

trust, and those tasked with governance must make deliberate efforts to retain legitimacy by getting involved in environmental sustainability projects and disclosing sufficient information to stakeholders on a regular basis through audited ESG reports.

The non-static nature of legitimacy also provides an avenue for organisations to be strategic in the way ESG reports are rendered. The strategic approach to legitimacy, as proposed by scholars (e.g., Oliver, 1991; Suchman, 1995) argues that organisations can proactively manage legitimacy constituted upon them by external stakeholders, and one of the avenues they can explore to demonstrate their legitimacy is through voluntary ESG audit and disclosure on environmental commitments. Whilst ESG information may be required by law in some jurisdictions (Oyewo & Isa, 2017), organisations taking a strategic approach to environmental sustainability will still regard the rendition of audited ESG report as a strategy to endear institutional investors and stakeholders (Maroun et al., 2014), and would attempt to disclose information on environmental commitment beyond the minimum required by legislation. On the other hand, organisations that are not taking a strategic approach to ESG would simply seek to comply with various regulations by providing relevant environmental sustainability information as a mere reporting exercise. Considering that legitimacy is purposive, intentional, and calculated (Suchman, 1995), organisations seeking opportunities to legitimise their existence and gain stakeholders' acceptance will institute CG mechanisms such as regular board meetings, appointment of independent directors, having gender-diverse and nationality-diverse board, establishment of ESG committee and linking executive compensation to ESG performance, among other efforts. These considerations inform the examination of board structure and operations, board diversity, ESG structure (i.e., activities of ESG committee, and ESG-linked compensation) as CG mechanisms affecting CEP in the current study.

3.2.2 Prior Research and Hypotheses Development

3.2.2.1 Board Structure and Operations

Board structure and operations such as board meeting, board independence and CEO duality may affect commitment to environmental issues.

Board meeting:

The stakeholder theory underpins the argument that board meetings provide an avenue for board members to discuss concerns affecting the interest of various stakeholders, including environmental pollution issues. Regular board meetings are, thus, one of the important

platforms for resolving CEP concerns. Holding regular board meetings provide the opportunity for the board to promptly address issues affecting the progress of the organisation, as opposed to an arrangement where the board seldom meet, which causes accumulation of unresolved issues that may negatively affect board effectiveness and CEP. Regular board meetings provide the avenue for the board to engage on issues arising from the environmental impact of the operations of the organisation, thereby enhancing CEP (Agyemang et al., 2020). A growing number of studies have acknowledged the importance of regular board meetings as a strategy for resolving CEP issues (e.g., Agyemang et al., 2020; Harjoto & Wang, 2020; Elsayih et al, 2021; Disli et al., 2022; Kumar et al., 2022). Agyemang et al.'s (2020) study of 34 Chinese mining firms, Disli et al.'s (2022) investigation of 439 non-financial firms cutting across 20 countries, Harjoto & Wang's (2020) study of 199 non-financial UK firms listed, as well as Kumar et al.'s (2022) examination of 53 environmentally sensitive listed firms in India all conclude that holding frequent board meetings enhances CEP. Although holding board meetings may establish the prima facia case for engagement on ESG issues, if such board meetings do not focus on vital sustainability issues affecting the CEP of the organisations, board meetings may be counterproductive (Al-Shaer et al., 2021). Moreover, board members may be meeting frequently as may be statutorily required, to demonstrate that board members are performing their fiduciary duties to the organisation (Uyar et al., 2022). This may lead to negative or no significant impact of board meetings on CEP. Empirically, some studies present evidence that frequent board meetings have no significant impact on CEP (e.g., Harun et al., 2020; Tingbani et al., 2020; Al-Shaer et al., 2021). However, based on the stakeholder theory and the legitimacy theory, and in line with studies positing a positive association between frequent board meeting and CEP, the current study supports the proposition that:

H1: Frequent board meeting is positively associated with CEP.

Board Independence:

Considering that the stakeholder theory recognises that an organisation is made up of various groups interested in the affairs of the entity, appointment of independent directors can ensure that the interests of such various stakeholders are protected since independent directors are expected to be objective and should exercise balanced judgement between the interest of owners and the interest of other stakeholders (Kumar et al., 2022). Thus, having a sizeable number of NEDs/ independent directors on board strengthens board independence and bolsters

the chances of objectively looking into environmental sustainability issues relating to the organisation (Ben-Amar et al., 2017). Further, arguing from the legitimacy theory perspective, corporate entities will want to be perceived in the eyes of the public as being concerned about environmental issues by appointing independent directors who are expected to be objective in the assessment of environmental issues, thus strengthening CEP of organisations. To meet up with the expectations of the public, independent directors are likely to be more effective in monitoring the environmental activities of organisations to minimise the negative impact of business activities. Therefore, board independence would anticipatorily contribute to CEP (Masud et al., 2018; Agyemang et al., 2020; Elsayih et al, 2021). In contrast, other scholars argue that smaller boards with a lesser number of outside directors may be more effective because of the coordination and communication challenges associated with large boards (Ntim & Soobaroyen, 2013; Shamil et al., 2014). Moreover, having too many NEDs may be counter-productive, as this could give rise to social loafing whereby an outside director may put in less effort in group situations because their individual performance is not visible, in comparison to when they are working individually (Varshney, 2019). Against this backdrop, some studies have argued that board independence may not necessarily improve CEP, as increasing the number of independent board members may not guarantee enhanced board performance (Zhang et al., 2013; Correa-Garcia et al., 2020). However, based on the stakeholder theory and the legitimacy theory, and in line with studies positing a positive association between board independence and CEP, the current study supports the proposition that:

H2: Board independence is positively associated with CEP.

CEO duality:

When the office of the Chairperson of the board and the Chief Executive Officer (CEO) is combined in one person, there may be conflict of interest. Such Chairperson/ CEO performing dual role may likely exploit power to downplay the severity of environmental issues to avoid cost of preventing or cleaning up environmental pollution (Ashfaq & Rui, 2019). CEO duality also limits monitoring of the activities of executive board members (De Villiers et al., 2011), and provides opportunistic tendency for CEO to concentrate on short term financial gains by avoiding investing in environmental sustainability projects which are typically capital intensive and deliver long-term benefits. To protect the interest of owners and other stakeholders, the stakeholder theory supports the separation of the office of the CEO from the Chairperson.

Considering that organisations merging the office of the CEO with the Chairperson of the board are generally perceived to have a weak corporate governance structure owing to the possible abuse of power by combining both offices (Lu & Wang, 2021; Nuskiya et al., 2021), organisations are increasingly embracing the practice of segregating both offices as a strategy for gaining public acceptance and having a positive outlook as a legitimising strategy. Empirical evidence abound that CEO duality may be negatively associated with CEP (Ben-Amar et al., 2017; Agyemang et al., 2020). Conversely, it has also been argued that CEO duality may enhance CEP. This stems from the argument that the CEO and the board chairman are two of the most powerful individuals within a large corporation (Lu & Wang, 2021). Since CEO duality combines the responsibilities of both positions into one person, it can help to cultivate a much stronger and more unified leadership figure (Rudyanto & Veronica Siregar, 2018). This dual-purposed leader can use their greater influence of control and management to lead the company toward greater organisational performance. If the CEO is highly capable at their work, then they have the potential to improve the culture of the company and streamline everyone's activities and processes for the betterment of the organisation. Such CEO that are environmentally conscious may use their position and influence to promote environmental sustainability practice (Adel, et al., 2019). Therefore, a positive association between CEO duality and CEP may be expected. Empirically, some studies find no significant relationship between CEO duality and CEP (Michelon & Parbonetti, 2012; Adel, et al., 2019), whilst others report a positive association between CEO duality and CEP (Jizi et al., 2014). However, based on the stakeholder theory and the legitimacy theory, and in line with studies positing a negative association between CEO duality and CEP, the current study supports the proposition that:

H3: CEO duality is negatively associated with CEP.

3.2.2.2 Board Diversity

A board could be diverse in terms of gender and members' nationality, and these may affect the level of commitment to environmental issues and overall CEP.

Board Gender diversity

Gender diverse boards with adequate representation of male and female directors are perceived to have strong corporate governance mechanisms. This stems from the argument that men and women differ in their approaches and thought processes owing to their biological differences and genetic makeup (Kret & De Gelder, 2012). Literature suggests that women have higher

level of social cognition and are better at recognising facial effects, expression processing and showing emotions (Pavlova et al., 2015). Therefore, boards with adequate number of female directors may have more robust CEP, as female board members may constitute a critical mass in promoting the welfare of the society by supporting the implementation of initiatives that reduce environmental pollution and alleviate public suffering (Tingbani et al., 2020). On the other hand, board gender diversity may not drive CEP. The counter-productivity of too many female or male directors on board effectiveness in improving ESG practice may also be linked to the concept of social loafing, whereby a team member puts in less effort in a group when individual performance is not visible (Shamil et al., 2014; Varshney, 2019). Furthermore, intra-group conflict among the group of male or female directors may erode group cohesion (Harun et al., 2020), and as a result, gender diversity among board members may have a counterproductive effect on board performance and CEP outcome (Cucari et al. 2018). This supports the argument that the impact of board gender diversity on CEP may be negative or not statistically significant (Shamil et al., 2014; Cucari et al. 2018; Masud et al. 2018).

However, from the stakeholder theory perspective, shareholders/ owners will want a gender-diverse board through the appointment of more female directors to boost confidence of stakeholders that the board is well constituted, as the views of males and females on environmental sustainability issues are balanced (Lopatta, et al., 2020). Further, from the stakeholder theory perspective, stakeholders believe that female directors have greater passion for environmental and social issues, have different background from male directors, have more networking capabilities, and are more effective in monitoring environmental issues (Li et al., 2017). From the legitimacy theory perspective, organisations will want to be perceived as having adequate mix of male and female directors as a legitimising strategy, based on the general notion that a well constituted board achieves equal gender representation and diversity. In sum, gender diverse boards may promote more environmental sustainability initiatives in comparison to male-dominated boards because of difference in the thought process between men and women, and the ensuing dissimilarity in the approach to CEP issues (Al-Shaer & Harakeh, 2022). Most research show that boards with more female representation promote CEP better than male-dominated boards (Ben-Amar et al., 2017; Li et al., 2017; Tingbani et al., 2020; Lopatta, et al., 2020; Elsayih et al, 2021; Nuber & Velte, 2021), although there are other studies reporting a negative association (e.g., Shamil et al., 2014; Cucari et al. 2018; Masud et al. 2018). Therefore,

H4: Board gender diversity is positively associated with CEP.

Board Nationality diversity

Nationality diversity (also referred to as cultural diversity) may bolster CEP on the basis that multi-cultural board teams appear to outperform monoculture boards because of the benefits which diversity and inclusion bring (Agyemang et al., 2020). To protect the interest of owners and other stakeholders, the stakeholder theory supports the inclusion of directors from diverse nationalities on the board (Aguilera & Jackson, 2003). This is against the backdrop that since multi-cultural board teams arguably outperform monoculture boards (Orsini & Magnier-Watanabe, 2022), it is in the best interest of the organisation to have nationally diverse teams on board to achieve the best outcome for stakeholders. Further, in the light of globalisation, organisations are increasingly embracing the practice of having culturally diverse teams with team members cutting across national boundaries (Lo et al., 2020). This is also a legitimising strategy for gaining public acceptance because multinational organisations are expected to embrace a geocentric approach to international management (Fleischmann & Fleischmann, 2019).

However, considering on one hand that culture influences people's attitude and perception (Lo et al., 2020) and on the other hand that people from different cultural background will have different perception or worldview (Bhatia & Tuli, 2017), board Nationality diversity may negatively impact CEP. Nationality diversity on the board will influence the value system, behaviours, as well as interpersonal relationships among board members, as well as their approach to addressing environmental sustainability issues. Challenges associated with ethnic diversity such as prejudice, discrimination, and stereotyping may cause differences in the views or opinion of board members as to the approach to be adopted to address environmental sustainability issues in the organisation (Aguilera & Jackson, 2003). If the views of board members are not aligned, divergence in views, opinions or approaches to environmental may cause board conflicts and may negatively affect CEP outcomes (Orsini & Magnier-Watanabe, 2022). Thus, a negative association between board nationality diversity and CEP may be expected (Firoozi & Keddie, 2021). This notwithstanding, boards with members from diverse/multiple nationalities may have more robust ideas on addressing sustainability challenges and may commit more resources to resolving environmental sustainability issues because of the high level of exposure of members to various CEP initiatives. Nationality diversity has been shown to strengthen CEP (Bhatia & Tuli, 2017; Fernández-Temprano & Tejerina-Gaite, 2020). Hence:

H5: Board nationality diversity is positively associated with CEP.

3.2.2.3 ESG Structure

ESG-related CG factors such as existence of ESG Committee and ESG-linked compensation may also drive CEP in the following ways:

ESG Committee:

Constituting an ESG committee is an increasing strategy to improve the monitoring mechanism for implementation of CEP initiatives in line with the legitimacy theory that organisations should constantly seek for avenues to demonstrate their commitment to environmental issues in an effort to gain the approval of stakeholders (Al-Shaer et al., 2021; Barbu, et al., 2022). Furthermore, the ESG committee is emplaced by owners to satisfy the demands of stakeholders that organisations should be more deliberate about minimising negative environmental impact arising from their business activities (Uyar et al., 2022). ESG committees, usually comprising of independent directors, support organisations commitment to environmental accountability, and may be responsible for formulating environmental sustainability strategy and monitoring its successful implementation. The ESG committee positively contribute to CEP because the organisation can benefit from the specialist knowledge of committee members on environmental risk management, as well as extensive and deeper ties of committee members with relevant environmental constituencies (Dixon-Fowler et al., 2017).

Conversely, it is possible that the existence of the ESG committee may have negative or no impact on CEP for some reasons. Social loafing may set in among ESG committee members in the sense that a/some committee member(s) may be exerting less effort to achieve CEP outcomes when they work in a group than when working alone (Varshney, 2019). The ESG committee may therefore sometimes be less productive than the combined performance of their members working as individuals. In addition, ESG committee may be meeting frequently as may be statutorily required to fulfil fiduciary duties to the organisation without necessarily engaging on key ESG issues affecting the organisation (Uyar et al., 2022). Finally, if ESG committee members are not sufficiently skilled and experienced in environmental sustainability matters, the extent to which they engage on sustainability issues may be shallow and may not satisfactorily address environmental issues that will see to uplift in CEP (Barbu, et al., 2022). Based on these considerations, the constitution of the ESG committee may be

counter-productive and may not achieve its intended purpose. Although some studies report no impact/ non-positive impact (Masud et al., 2018), most studies have shown that the presence of ESG committee enhances CEP (Dixon-Fowler et al., 2017; Cancela et al., 2020; Elsayed & Ammar, 2020; Elsayih et al, 2021), and this informs the next hypothesis that:

H6: The existence of ESG Committee is positively associated with CEP

ESG-linked compensation:

Linking executive pay to ESG performance may motivate managers to commit to meeting environmental targets going by the legitimacy theory (Flammer et al., 2019). There are limited studies investigating ESG-linked compensation as a CG mechanism. The lack of popularity of ESG-based compensation may be due to its nascent nature, as limited studies have investigated its impact on CEP (e.g., Berrone & Gomez-Mejia, 2009; Eccles et al., 2014). Considering that legitimacy is purposive, intentional, and calculated (Suchman, 1995), organisations seeking opportunities to legitimise their existence and gain stakeholders' acceptance may want to link the remuneration of company executives to the achievement of environmental sustainability targets (Liu et al., 2022). The stakeholder theory also supports that executive board members should be compensated based on meeting or exceeding environmental sustainability targets, as this will motivate directors to take decisions that align with minimising negative production externalities in the interest of stakeholders (Malik & Shim, 2022). On the other hand, linking executive compensation or pay to ESG outcome may be negatively associated with CEP because such practice may promote green-washing of sustainability reports, especially if ESG-linked compensation is not appropriately linked to long-term outcomes that actually drive environmental performance (Strandberg, 2013). Heavy focus on linking executive pay to safety and environmental issues, such as spills or accidents may be too narrowly focused on mitigating risks, rather than creating value and uplifting CEP in the long run (Glass Lewis, 2016). Additionally, there have been criticisms that most metrics tend to focus on past performance, rather than focusing on metrics that reward executives for investing in improving future performance or efficiency or measures that demonstrate the overall quality of a sustainable management system (Berrone & Gomez-Mejia, 2009; Strandberg, 2013). However, ESG-linked compensation has been shown to drive accountability and progress on the sustainability agenda (Russo & Harrison, 2005; Flammer, et al., 2019; Okafor & Ujah, 2020; Lu & Wang, 2021). Therefore,

H7: ESG-linked compensation is positively associated with CEP.

3.3 Methodology

3.3.1 Research Design

The study adopts a quantitative research design, using a panel data analysis and secondary data source. The use of secondary data is considered advantageous in this study to ensure well-validated and substantiated findings (data sources provided in Table 3.1). The population of the study comprises of top 500 companies on the Forbes list operating in environmentally sensitive industries. Companies on the Forbes list represent largest business organisations in the world and are closely monitored for their commitment to environmental sustainability because of their global impact. Using this selection criterion, 245 companies emerged. After deleting one entry with no ESG report in the Refinitiv/DataStream database, the final sample is made up of 244 firms processed for analysis (Table 2). Prior studies have extensively applied the Forbes ranking as a sampling frame (Martínez-Ferrero & García-Sánchez, 2017).

3.3.2 Variable Measurement and Data Source

3.3.2.1 Dependent Variable

Corporate environmental performance (CEP) was proxied using the Refinitiv's environmental accounting performance score. The Refinitiv measures environmental accounting performance across three major themes covering resource use (20 indicators), emissions (28 indicators) and environmental innovation (20 indicators). Literature suggests that resource use efficiency, emissions control and environmental innovation are important dimensions of environmental sustainability/ environmental accounting performance (e.g., Russo & Harrison, 2005; Flammer et al., 2019; Aguilera et al., 2021). Resource use score reflects a company's performance and capacity to reduce the use of materials, energy, or water, and to find more eco-efficient solutions by improving supply chain management (Refinitiv, 2022). The emission reduction score measures a company's commitment and effectiveness towards reducing environmental emissions in its production and operational processes, while the innovation score indicates a company's capacity to reduce the environmental costs and burdens for its customers, thereby creating new market opportunities through new environmental technologies and processes, or eco-designed products (Refinitiv, 2022). The category weights are normalised to percentages ranging between 0 and 100 to generate the environmental accounting performance score, with a positive polarity of 0 (indicating lowest performance) and 100 (indicating highest

performance). Prior studies have extensively used the Refinitiv's database in environmental accounting research (e.g., Hawn & Ioannou, 2016; Seaborn et al., 2020; Gull et al., 2023).

To examine the robustness of result, the Refinitiv's environmental accounting performance letter grade was used as alternative measure of corporate environmental performance (CEP). The letter grades were converted to CEP ranking. The letter grades are in twelve categories, ranging from 'D-' (lowest) to 'A+' (highest). Numeric values were assigned based on the classification of D- (assigned 1) to A+ (assigned 12), indicating a positive polarity for CEP ranking.

3.3.2.2 Independent Variables

The seven CG variables, thematically grouped into board operations (board meeting, board independence and CEO duality), board diversity (board gender diversity and board nationality diversity), and ESG structure (ESG committee and ESG-linked compensation), were measured based on existing measures applied in prior studies (Table 3.1).

3.3.2.3 Control Variables

Other corporate governance factors that have been recurrently documented in literature as determinants of environmental performance were included as firm-level governance control variables, namely board size, cross-directorship, audit committee (AC) expertise in environmental accounting/ risk management, AC independence, AC meeting, ownership structure (in terms of government ownership), ESG audit and ESG auditor type (Yu et al., 2017; Konadu et al., 2021; Elsayih et al, 2021).

In line with prior studies, four firm attributes that affect environmental practice of organisations were included as control variables namely firm size, profitability, leverage and liquidity (Tingbani et al, 2020; Doni et al., 2021). We also control for the millennium development goals (MDGs)/ sustainable development goals (SDGs) era considering that the launching and subsequent implementation of the United Nations agenda for sustainable development 2030 may affect corporate commitment to environmental sustainability (Oyewo et al., 2022).

Considering the international nature of the study, country-level governance factors were included as control variables such as economic development, world governance indicators and national cultural orientation (Aguilera et al., 2015; Nuber & Velte, 2021). As suggested by the institutional theory (DiMaggio & Powell, 1991; Saqib et al., 2021), various country-level

control variables were included in the studies because they may affect ESG performance of companies across different countries (Scott, 2004; Lewis et al., 2019). The institutional theory posits that social, economic, and political factors constitute an institutional structure of a particular environment which provides firms with advantages for engaging in specific types of activities. Businesses tend to perform more efficiently if they receive the institutional support (DiMaggio & Powell, 1991). Therefore, multinational entities (MNEs) operating in different countries with varying institutional environments will face diverse pressures to implement ESG targets (Saqib et al., 2021). In essence, heterogeneity in country-level governance factors such as Rule of Law, Regulatory Quality, Control of Corruption, Voice & Accountability, Political Stability, Government Effectiveness in enforcement of rules may encourage or dissuade corporate entities from engaging in various ESG activities, which may impact their ESG performance. It is therefore important to control for the impact of country environmental factors on ESG performance in line with the institutional theory.

To avoid multicollinearity, the average of the 6 world governance indicators was taken and utilised in the study (Cuadrado-Ballesteros & Bisogno, 2020). As suggested by Hofstede's model, 3 dimensions of national cultural orientation which may uniquely affect commitment to environmental sustainability practice were included as control variables, notably individualism/collectivism, long-term/ short-term orientation, and indulgence/ restraint (Disli et al., 2022). Table 3.1 presents a summary of variable measurement, data source and supporting literature.

<Insert Table 3.1 here >

3.3.3 Model Specification

The regression model for the analysis is specified in Equation 3.1 as follows:

$$CEP_{it} = \beta_1 BMEET_{it} + \beta_2 BINDP_{it} + \beta_3 BDUAL_{it} + \beta_4 DVGEN_{it} + \beta_5 DVNAT_{it} + \beta_6 ESGCM_{it} + \beta_7 ESGPY_{it} + \beta_8 SIZE_{it} + \beta_9 DVCRS_{it} + \beta_{10} ACFIN_{it} + \beta_{11} ACIDP_{it} + \beta_{12} ACMET_{it} + \beta_{13} OWNST_{it} + + \beta_{14} ESGAUD_{it} + \beta_{15} ESGAUT_{it} + \beta_{16} FSIZE_{it} + \beta_{17} FPROF_{it} + \beta_{18} FLEV_{it} + \beta_{19} FLIQD_{it} + \beta_{20} YEAR_{it} + \beta_{21} ECODVT_{it} + \beta_{22} WGI_{it} + \beta_{23} NID_{it} + \beta_{24} NLG_{it} + \beta_{25} NIG_{it} + €_{it} \quad \textit{(Eq. 3.1)}$$

3.3.4 Methods for Data Analysis

Descriptive statistics was used to explore the characteristics of study variables. Correlation analysis was performed to assess multicollinearity (Tingbani et al., 2021; Oyewo et al., 2022), and panel quartile regression (PRQ) was performed to detect the nature of relationship between variables across five quantiles of 0.10. 0.30, 0.50, 0.70 and 0.90. Against the backdrop that PQR can detect non-monotonous and non-uniform impacts of the independent variables on the dependent one (Coad & Rao, 2008), its usage is considered advantageous for the purpose of assessing any possible non-linear relationship which may exist between CG and CEP. PQR provides an alternative to linear regression by allowing for the estimation of relationships across the distribution of an outcome variable (Canay, 2011). Further, PQR has three main advantages over OLS (and other similar methods of quantitative modelling that require linearity of relationship between dependent and independent variables) such as follows (Canay, 2011; Borgen, 2016): (i) PQR makes no assumption about the distribution of the dependent variable; (ii) PQR tends to adequately control for outliers; (iii) PQR optimises the analysis of curvilinear relationship between dependent and independent variables using interior-point non-linear optimisation algorithm. To check for robustness of result, hierarchical cluster analysis was applied to dichotomise companies into their levels of commitment to environmental sustainability, and binary logistic regression analysis performed to assess the predicting powers of the CG variables. To address endogeneity concerns, two-stage least squares regression (2SLS)/ instrumental variables (IV) regression and propensity score matching (PSM) regression analysis were applied.

3.4. Results and Discussion

3.4.1 Analysis of Companies by Industry Grouping, Country, and Geographical Region

Analysis of industry grouping in Table 3.2 shows that the 244 companies span across 30 environmentally sensitive industries. Country analysis reveals that the MNEs are from 31 countries and 5 geographical regions (Table 3.3). Additional analysis on the number of companies from regions and countries, as well as the number of firm-year observations per region is presented in Table 3.4.

<Insert Table 3.2 here >

<Insert Table 3.3 here >

<Insert Table 3.4 here >

3.4.2 Descriptive Analysis of Variables and Multicollinearity

Descriptive analysis of study variables is presented in Table 3.5 (Panel A) (Minimum value, maximum value, mean, standard deviation, SD, skewness, and kurtosis for continuous variables) and Table 3.5 (Panel B) (frequency analysis of categorical variables). The variables are also analysed based on the MDGs/ SDGs era and geographical regions in Table 3.6. From the result in Table 3.5 (Panel A), the mean CEP score at 63.370 on the 100-point scale implies that the environmental performance of companies is generally moderate, while the SD of 25.060 reveals that there are noticeable differences in the level of commitment of companies to environmental sustainability. Companies also differ notably in their corporate governance mechanisms in terms of board meetings with an average of about 9 meetings (M = 8.820) in a year (and a variation of 6.645 going by the SD), and board independence of 75.490% (with a variation of 23.980% based on the SD).

Whilst there are some boards with no gender diversity (i.e., all male-dominated boards without female board members), the maximum gender board diversity is at 64.000%, with an average gender diversity ratio of 16.130% among the companies under investigation. However, the SD of 12.810% reveals that companies differ remarkably in terms of the mix of male to female board members. Board nationality diversity follows a similar trend to gender diversity in which some boards have no nationality diversity, implying a concentration of board members from the nationality of the home office where MNEs are headquartered, whilst some boards have members across national boundaries as indicated by 100% nationality diversity ratio. However, the mean nationality diversity ratio of 10.780% is low and the SD of 19.990% establishes that companies differ remarkably in their board composition in terms of the nationality of board members.

The MNEs have an average board size of 12 members (and a variation of 3.572 as revealed by the SD). Also, the level of cross directorship is generally low as indicated by the mean of 1.294 and SD of 0.777. Result in Table 3.5 (Panel A) further suggests that AC is generally independent going by the high mean score of 89.300%, and somewhat low SD of 28.740%, although there are still some companies with low AC independence (i.e., minimum AC independence of 13.00%). The average AC meeting attendance was at 59.79%, and the SD of 42.51% reveals that the frequency of attending AC meetings generally varies among companies, with some companies holding no AC meetings in a year as indicated by the 0.00% minimum score.

From the result in Table 3.5 (Panel B), most companies have appreciable AC expertise (2,502, 75.3%). Further, in more than half of the companies under investigation, the CEO doubles as Chairperson (1735, 52.2%). Few of the companies have started linking executive compensation to ESG performance (1049, 31.6%), and the government has no controlling interest in almost all the companies (3114, 93.8%). In addition, most companies have an ESG Committee (2573, 77.5%). More than half of the companies produce audited ESG report (1877, 56.5%) but very few have such reports audited by the big 4 audit firms (866, 26.1%). Taken together, results in Table 3.5 (Panel A) and Table 3.5 (Panel B) reveal that firms differ in their level of commitment to environmental sustainability issues, have heterogenous CG structures and are also dissimilar in their firm-level attributes in terms of size (revenue), profitability, leverage and liquidity. These differences, combined with the differences in their geographical locations (Table 3.3), provide a robust context for examining the factors affecting CEP in an international setting.

Correlation matrix in Table 3.7 shows that multicollinearity is not a serious concern as the correlation coefficients are generally low among the variables.

<Insert Table 3.5, Panel A here >

<Insert Table 3.5, Panel B here >

<Insert Table 3.6 here >

<Insert Table 3.7 here >

3.4.3 Baseline Result on the Impact of CG on CEP (All Countries Combined)

Result from the analysis of the impact of CG variables on CEP in Table 3.8 shows that board gender diversity, board nationality diversity, and ESG committee have significant positive coefficients in at least one of the quantiles. Board independence has a significant negative coefficient in q 0.50 of CEP, whilst also evincing negative coefficients consistently across other quantiles. This informs the rejection of H2. Board meeting, CEO duality and ESG-linked compensation are not statistically significant in any of the quantiles, connoting that they have no impact on CEP. Therefore H1, H3 and H7 are rejected. Based on the effect size of the coefficients, the strongest drivers of CEP are board gender diversity and ESG Committee, as both variables exert significant impact in at least two quantiles. This result supports the full acceptance of H4 and H6 respectively. Board nationality diversity exerts significant influence in only q 0.10, as its impact dwindles and is not statistically significant in the upper quantiles

(q 0.50 to q 0.90). This supports the conclusion that the impact of board nationality diversity on CEP is weak and informs the partial acceptance of H5.

Regarding the nature of CG-CEP relationship in terms of (non) linearity, PQR shows that the relationship is curvilinear—rising, peaking, and declining across the quantiles—for most of the variables with statistically significant coefficients (Table 3.8). This implies that the impact of CG on CEP is dependent on the level of engagement with environmental sustainability projects. This trend is graphically shown in Figure 3.1. The ordinary least square (OLS) regression analysis is represented by the straight lines, with the standard errors depicted by the straight dotted lines laying above and below the linear OLS lines (Figure 3.1). The PQR graphs are represented by the undulating lines, and the PQR standard errors by the oscillating lines.

<Insert Table 3.8 about here >

<Insert Figure 3.1 about here >

3.4.4 Impact of CG on CEP in the MDGs/ SDGs Era

With respect to the impact of the MDGs/SDGs dichotomy on CEP, result in Table 3.8 shows that the coefficients are positive and statistically significant across the five quantiles, implying that CEP generally improved during the SDGs period in comparison to the MDGs era. Further analysis, using independent sample t-test, shows that the Mean CEP score in the MDGs period/ pre-SDGs (M = 59.847, n = 2,129) is lower than the Mean CEP score for the SDGs period (M = 69.688, n = 1,192), and the difference is statistically significant ($t = -11.811$, $p < 0.01$). To gain further insight into this result, additional analysis was performed by splitting the data into the MDGs and SDGs era. The result is presented in Table 3.9.

<Insert Table 3.9 about here >

In the MDGs era, board gender diversity, board nationality diversity, ESG committee and ESG-linked compensation are positively associated with CEP, with board gender diversity and ESG committee exerting more influence going by the effect size of their coefficients (Table 3.9). This is somewhat consistent with the result in Table 3.8 in which both variables emerged as notable drivers of CEP. However, the factors positively influencing CEP in the SDGs era shifted to board gender diversity, board nationality diversity and ESG committee, whilst board independence and ESG-linked compensation exert significant negative impact. The positive impact of board gender diversity, board nationality diversity and ESG committee on CEP is

consistent in both the MDGs and SDGs era. This result provides further support for the acceptance of H4, H5 and H6.

3.4.5 Results by Geographical Region on Impact of CG on CEP (Decomposed)

To undertake a more in-depth examination of the CG-CEP nexus, we split our sample into geographical regions and perform additional analysis to localise result by jurisdictions. However, regional analysis was restricted to the America, Asia Pacific and Western Europe regions respectively considering the number of countries, number of companies and quantum of data (firm-year observations) emanating from these regions (Table 3.4).

3.4.5.1 America Region

Result in Table 3.10 shows that board independence, board gender diversity, board nationality diversity, ESG committee, and ESG-linked compensation are consistently positively associated with CEP in the America region, while the impact of CEO duality is negative. However, board independence, board gender diversity, board nationality diversity and ESG committee are the strongest drivers in this region. The result, graphed in Figure 3.2, reveals a curvilinear relationship between CG variables and CEP, corroborating the result that the impact of CG mechanisms on CEP depends on the level of engagement with environmental sustainability projects.

<Insert Table 3.10 here >

<Insert Figure 3.2 here >

3.4.5.2 Asia Pacific Region

Result on the impact of CG on CEP in the Asia Pacific region is presented in Table 3.11 and graphed in Figure 3.3. Board independence, board nationality diversity and ESG committee are significant positive drivers of CEP, whilst CEO duality and board gender diversity are negatively associated with CEP. However, board nationality diversity and ESG committee emerged as the strongest drivers. The graph in Figure 3.3 reveals a non-linear relationship between the CG variables and CEP.

.

<Insert Table 3.11 here >

<Insert Figure 3.3 here >

3.4.5.3 Western Europe Region

In Table 3.12 (with result graphed in Figure 3.4), CEO duality and ESG committee are positively associated with CEP in the Western Europe Region, with the ESG committee emerging as the strongest determinant. The impact of board nationality diversity is mixed—initially having a negative impact, and thereafter evincing a positive influence as board nationality diversity becomes stronger. In essence, board nationality diversity bolsters CEP with more engagement on environmental sustainability issues by ethnically diverse board members. The graph in Figure 3.3 reveals a non-linear relationship between the CG variables and CEP, with the inflection points indicated by the coefficients of the statistically significant CG variables across q 0.10 to q 0.90 (Table 3.12).

<Insert Table 3.12 here >

<Insert Figure 3.4 here >

3.4.5.4 Comparison of Results across Geographical Regions

Comparing the baseline result for all countries combined (Table 3.8) with the disaggregated results by geographical regions (Table 3.10, Table 3.11, and Table 3.12) reveals that the impact of CG mechanisms on CEP, as well as the extent to which they affect commitment to environmental sustainability vary by jurisdiction. This supports the contention that the CG-CEP relationship is contextual (Zaman et al., 2020).

In the America region, board independence positively and strongly influences CEP (Table 3.10) possibly because of the relatively high board independence level in the region (M = 86.10%, Table 3.6). Whereas in the Asia Pacific, the impact of board independence is also positive but weak (Table 3.11), which could be explained by the relatively lower level of board independence in the region (M = 52.10%) when compared to the America region (Table 3.6). Meanwhile, at the aggregate level, the impact of board independence is negative (Table 3.8). The positive association between board independence and CEP in the America region aligns with Nadeem et al.'s (2020) study of American companies, whilst the positive impact of board independence on CEP in Asia Pacific region is consistent with Elsayih et al.'s (2021) study of Australian companies.

CEO duality exerts significant negative influence on CEP in the America (Table 3.10) and Asia Pacific (Table 3.11) regions probably because of the prevalence of combining the roles of the Chairperson and CEO in both regions as shown in Table 3.6 (America; M = 0.730; and Asia Pacific M = 0.470). The result contrasts with that of the Western Europe region in which CEO duality is positively associated with CEP (Table 3.12), perhaps because of the less popularity of CEO duality in the region (M = 0.300) as revealed by the analysis in Table 3.6. Corporate governance codes in Western Europe may have contributed to the separation of the office of the CEO from the Chairperson (Tingbani et al., 2020; Poletti-Hughes & Dimungu-Hewage, 2022), and this may be responsible for curtailing the opportunistic tendencies of CEOs acting as board Chairpersons to downplay the severity of environmental pollution. This supports the finding of Tingbani et al.'s (2020) study of UK firms that CEO duality has no significant negative impact on CEP. The significant negative association between CEO duality and CEP is consistent with prior studies conducted in the America and Asia Pacific regions (e.g., Shu & Chiang, 2020; Nuskiya et al., 2021).

Board gender diversity can positively affect CEP in the America region (Table 3.10), whereas in the Asia pacific region, the impact of board gender diversity is negative (Table 3.11). This can be explained by high level of gender diversity on corporate boards of companies in the America region (M = 20.60%; Table 3.6), whereas companies in the Asia Pacific region operate male-dominated boards (M = 6.30%; Table 3.6). The result further supports the contention that higher proportion of female directors contributes to CEP (Lopatta, et al., 2020; Elsayih et al, 2021; Nuber & Velte, 2021). In the Western Europe region, although board gender diversity can engender CEP as indicated by the positive but statistically insignificant coefficients (Table 3.12), the inability of gender diversity to significantly affect CEP may be explained by the high level of dispersion in gender diversity ratio in the region (M = 22.40%, SD = 13.90%; Table 3.6), whereas the dispersion is minimal in the America region (M = 20.60%, SD = 9.60%; Table 3.6). In essence, there is high level of disparity in board gender diversity rate among MNEs in Western Europe, and this may have whittled down the overall influence of board gender diversity in promoting CEP.

The presence of ESG committee is significant and positive in the combined (Table 3.8) and regional analysis (Table 3.10, Table 3.11, and Table 3.12). This can be explained by the prevalence of ESG committee across the regions (Table 3.6). However, ESG committee emerged as the strongest driver of CEP in the Western Europe region conceivably because of the relatively high popularity of ESG committee in the region—the Western Europe region has

the highest mean score (M= 0.890) and the lowest level of dispersion (SD = 0.313) across the three regions (Table 3.6). By comparing results across regions (Table 3.10, Table 3.11, and Table 3.12), the existence of ESG committee consistently emerged as a key driver of CEP, and this is consistent with the results of prior studies (Tamimi & Sebastianelli, 2017; Cancela et al., 2020).

Whilst ESG-linked compensation generally has no significant impact on CEP at the aggregate level (Table 3.8), it is a significant driver of CEP in the America region (Table 3.10). This could possibly be attributable to the popularity of ESG-linked compensation in the region (O'Connor, et al., 2021). On the other hand, the inability of ESG-linked compensation to exert significant influence on CEP in other regions may be due to the burgeoning nature of linking executive compensation to sustainability performance as documented in literature (Tamimi & Sebastianelli, 2017; Flammer et al., 2017).

3.5 Robustness Check

3.5.1 Robustness Check using Environmental Performance Letter Grade/ Ranking as Alternative Measure of CEP

To examine the robustness of result, the DataStream/ Refinitiv environmental sustainability performance letter grades were converted to CEP ranking and applied as an alternative measure of CEP. The Refinitiv/ DataStream letter Grades for environmental sustainability performance are in twelve categories, ranging from 'D-' (lowest) to 'A+' (highest). Numeric values were assigned based on the classification of D- (assigned 1) to A+ (assigned 12). Hierarchical cluster analysis was applied to the CEP ranking to dichotomise companies into groups of; (i) those with shallow commitment to environmental sustainability; and (ii) others with high commitment to environmental sustainability. Thereafter, binary logistic regression was performed to assess the extent to which the CG variables predicts the level of commitment to environmental sustainability using the odds ratio (*OR*) (Tauringana et al., 2017). The analysis was performed at both the aggregate (all country) and regional levels. The coefficients are also reported for the purpose of assessing the direction (positive/negative) of the CG-CEP relationship (Table 3.13).

<Insert Table 3.13 here >

Consistent with the baseline result in Table 3.8, board gender diversity and ESG committee emerged as strongest predictors of commitment to environmental sustainability in Table 3.13 for the combined/ pooled inter-country analysis. In the America region, the strongest predictors

of environmental sustainability commitments are board independence, board gender diversity, board nationality diversity and ESG Committee. This finding corroborates result in Table 3.10 with respect to the top CG mechanisms affecting CEP. For the Asia Pacific region, board nationality diversity and ESG Committee retained position as the two foremost CG drivers of CEP as previously deduced from Table 3.11. In the Western Europe region, ESG committee retained its position as the strongest predictor of environmental sustainability commitment going by the odds ratio (consistent with result of Table 3.12). Taken together, results in Tables 3.9 to 3.12 are robust to alternative measure of CEP and analysis of the CG-CEP nexus. A summary of results on the impact of CG on CEP is presented in Table 3.14.

<Insert Table 3.14 here >

3.5.2 Treatment of Endogeneity Using Two-Stage Least Squares (2SLS)/ Instrumental Variable (IV) Regression

Endogeneity problems, such as omitted variable bias and simultaneous endogeneity, may occur in the estimation of the relationship between CG and CEP (Peel, 2018). Omitted variable bias was addressed by including various governance control variables which may influence CEP as documented in literature (e.g., Ong & Djajadikerta, 2020; Elsayih et al., 2021). Other firm-level characteristics and country-level governance variables were also included in the model as control variables (Martínez-Ferrero & García-Sánchez, 2017; Cuadrado-Ballesteros & Bisogno, 2020; Lu & Wang, 2021). Simultaneous endogeneity occurs when there is bi-directional relationship between dependent and independent variables. Whereas gender diversity may affect CEP, there is the possibility that the need to bolster CEP may also affect board gender composition, thereby creating reverse causality bias. Scholars have argued that simultaneity could occur between board gender diversity and CEP (Tingbani et al, 2020; Konadu et al, 2021). Given that females are usually connected to communities by showing concern for the wellbeing of others and prioritising the good of the environment/ society over the welfare of individuals (Poletti-Hughes & Dimungu-Hewage, 2022), the need to improve CEP may influence the decision of organisations to recruit more female directors to entrench corporate legitimacy and gain stakeholders acceptance (Gull et al.,2023). In other words, the quest to enhance CEP may cause companies to headhunt competent female directors because having gender-diverse board is one of the strategies for improving environmental performance

(Poletti-Hughes & Dimungu-Hewage, 2022). This suggests that board gender diversity may affect CEP or vice versa, causing reverse causality.

To address simultaneous endogeneity, two-stage least squares (2SLS)/ Instrumental Variable (IV) regression was applied in line with prior studies (Aguilera et al., 2021; Gull et al., 2023). Based on literature, (i) executive director (ED) gender diversity [measured as ratio of female executive directors to total executive board members]; and (ii) strictly independent directors on board [measured as the ratio of independent directors to total board size] were applied as the instrument for board gender diversity (Tingbani et al, 2020; Elsayih et al, 2021; Konadu et al, 2021). Whereas non-executive directors (NEDs) may be representing major shareholders, strictly independent directors have no links with the company other than sitting on the board. They (independent directors) are, therefore, expected to exercise sound and objective judgment on board matters because they have no pecuniary interest or financial connection to the organisation. Executive director (ED) gender diversity and strictly independent directors to board size ratio were selected as the instrument for board gender diversity because these variables influence the overall composition of female board directors in relation to the total board size in the sense that; (a) the number of female executive directors ultimately contribute to the total number of female directors on board (Nadeem et al., 2020); (b) the presence of independent directors may facilitate the appointment of more female board directors given that the level of board gender diversity should be reasonable/ attain a 'critical mass' before board gender diversity can appreciably influence environmental performance (Nuber & Velte, 2021).

Both CEP score and CEP ranking were used as proxy for CEP in the 2SLS/ IV regression analysis. Under-identification test was carried out using the Anderson canonical correlation LM statistic, whilst weak identification test was conducted using Stock-Yogo weak ID test (Stock & Yogo, 2005), and overidentification test was conducted using Sargan statistic. The result of the analysis is presented in Table 3.15.

[insert Table 3.15 about here]

Based on the Anderson canon. corr. LM statistics for CEP score (353.583, $p < .01$) and CEP ranking (328.82, $p < .01$), the test establishes that the model is not under-identified since the chi-square p value < 0.01 for both measures of CEP. The weak identification test detects how strong the instrumental variables are in defining the endogenous variables, and the extent to which the instrumental variables are appropriate replacement for the endogenous variables in the regression equation. For both measures of CEP (i.e., CEP score and CEP ranking), the

Cragg Donald Wald F statistics (196.906) is greater than each of the Stock-Yogo weak ID test critical values (19.93, 11.59, 8.75, and 7.25). The result confirms that there is no weak identification problem, as the instrumental variables are valid predictors for the endogenous variable in the regression equation. Finally, the overidentification test examines if the instrumental variables are correlated with the error terms. Ordinarily, they should not be correlated with the error term to prove that they are exogenous. The Sargan statistic chi-square p value is not statistically significant at 5% for both CEP score ($p = 0.060 > 0.05$) and CEP ranking ($p = 0.056 > 0.05$). This establishes that the instruments are over-identified, as the instrumental variables treat potential endogeneity. These tests confirm the robustness of the 2SLS/ IV regression in addressing endogeneity concerns.

Result in Table 3.15 shows that board gender diversity, board nationality diversity, and ESG committee are the three strongest drivers of CEP under both CEP scores and CEP ranking as measures of CEP, whilst the impact of board independence is significant and negative. The result is consistent with the baseline result (Table 3.8) in which board gender diversity and ESG committee emerged as the strongest drivers of CEP. The result is also consistent in terms of the impact of other CG variables, firm-level factors, and country-level governance factors on CEP. Taken together, the result is robust and comparable to the baseline result after correcting for endogeneity.

3.5.3 Further Robustness Check using Propensity Score Matching

To further address simultaneous endogeneity between board gender diversity and CEP, propensity score matching (PSM) with regression analysis was employed (Aguilera et al., 2021; Gull et al., 2023). Using the median score of board gender diversity at 17.0%, firms were divided into two groups of those with high board gender diversity (the treatment group with median/ above-median score), and others with moderate/low board gender diversity (the control/ untreated group with below-median score). The propensity scores (i.e., probability of being assigned to a treatment/ control group) were generated by regressing the covariates (i.e., (i) executive director (ED) gender diversity [measured as ratio of female executive directors to total executive board members]; and (ii) strictly independent directors on the board [measured as the ratio of independent directors to total board size]) on the binary categorisation of board gender diversity (code '0' for control/ untreated group, and code '1' for treatment group). This procedure eliminates potential endogeneity issue, whilst also minimising likely model

misspecification (Tawiah et al., 2022; Gull et al., 2023). The propensity scores generated by the process were then substituted for board gender diversity, and the regression was rerun using both CEP score and CEP ranking as dependent variables. The PSM generated 1,635 observations for the treatment group and 1,686 observations for the control group. Result from the analysis is presented in Table 3.16.

[insert Table 3.16 about here]

Result in Table 3.16 shows that board gender diversity, board nationality diversity, and ESG committee are the three foremost drivers of CEP under both measures of CEP (i.e., CEP score and CEP ranking). The result is consistent with the baseline result (Table 3.8) in which board gender diversity and ESG Committee emerged as the strongest drivers of CEP. The result is also consistent with respect to the nature of relationship between other CG variables, firm-level factors and country-level governance factors and CEP. Overall, the result is robust after treating simultaneity endogeneity.

3.6 Discussion of Findings

The results, graphed in Figure 3.1, clearly shows that the relationship between CG variables and CEP is not linear as suggested in literature (Nuber & Velte, 2021; Zaman et al., 2020). For example, in Table 3.8 (Figure 3.1), the impact of board gender diversity on CEP diminishes between q 0.10 (b = 4.716) and q 0.30 (b = 3.033) but rises from q 0.30 to q 0.70 (b = 10.498), before dropping again between q 0.70 to q 0.90 (b = 5.175). The interpretation of this result is that impact of board gender diversity on CEP depends on the level of engagement with environmental sustainability projects. However, considering that gender diversity has low and statistically insignificant coefficients in the lower quantiles (q 0.10 to q 0.30), but has significant and notable coefficients in the upper quantiles (q 0.50 to 0.70), it implies that board gender diversity has greater impact on CEP at higher levels of environmental sustainability engagement. The inflection points, denoted by the beta coefficients across the quantiles, show a rising and falling trend. Furthermore, the consistently positive significant impact of board gender diversity on CEP in the upper quantiles of CEP confirms that board gender diversity enhances CEP. The positive association between board gender diversity and CEP aligns with the results of prior studies (e.g., Tingbani et al., 2020; Lopatta, et al., 2020; Elsayih et al, 2021; Nuber & Velte, 2021) confirming that gender diverse boards outperform male-dominated boards.

Relatedly, the impact of ESG committee on CEP rises between q 0.10 (b = 16.651) to q 0.50 (b = 22.688), before plummeting between q 0.70 (b = 18.997) and q 0.90 (b = 14.080). The inflection points, evinced by the beta coefficients across the quantiles, also reveal a curvilinear relationship, whereby the impact rises (q 0.10 to q 0.30), peaks at q 0.50 before falling subsequently. The interpretation of the result is that although the presence of the ESG committee can enhance CEP, the effectiveness of the committee may decline in the long run if the activities of the committee are not reviewed on a regular basis or if the membership of the committee is not reinvigorated from time to time. Also, undue tenure elongation or over-familiarity with organisational processes may cause the ESG committee members to be less rigorous in the evaluation of environmental risks over time, and this may wane the impact of ESG committee on CEP. Considering that membership of ESG committee is predominantly made up of independent directors, the tenure of committee members should be balanced in such a manner that independent directors do not over-stay their incumbency, whilst also ensuring that fresh blood is injected into the committee. There should be sufficient provision for membership rotation in ESG committee. In sum, the impact of ESG committee on CEP may be counterproductive if the activities of the committee are not subject to regular checks and balance. The positive impact of ESG committee on CEP is consistent with submission in literature (e.g., Cancela et al., 2020; Elsayed & Ammar, 2020; Elsayih et al, 2021). Result shows that board nationality diversity has a positive but weak impact on CEP (Table 3.8). This may be attributable to the generally low level of board nationality diversity as indicated by the Mean score of 10.78% (Table 3.5, Panel A). Scholars argue that nationality diversity level would have to be appreciably high before it can have a notable impact on CEP (Bhatia & Tuli, 2017; Fernández-Temprano & Tejerina-Gaite, 2020).

Although board gender diversity and ESG Committee emerged as the strongest drivers of CEP in the MDGs and SDGs era, they exert more influence in the SDGs era than in the MDGs era going by the effect size of their coefficients (Table 3.9). For example, in the MDGs era, statistically significant coefficients of board gender diversity are 18.785, 14.063 and 8.943 in q 0.10, q 0.50 and q 0.70 respectively, whereas the corresponding coefficients in the SDGs era are 20.284 (q 0.50) and 13.563 (q 0.70). Further, board gender diversity has more impact in the upper quartiles of CEP in the SDGs era in comparison to the MDGs era (in q 0.50, MDGs has 14.063, whilst SDGs has 20.284; in q 0.70, MDGs has 8.943, whilst SDGs has 13.563). The greater impact of board gender diversity on CEP in the SDGs era may be attributable to promoting more gender inclusion in both private and public sector organisations by the UN

agenda for sustainable development, as well as corporate governance codes (Jamal, 2018; Poletti-Hughes & Dimungu-Hewage, 2022). This is evidenced by the notable increase in board gender diversity rate between the MDGs (M = 13.40%) and the SDGs era (M = 20.90%) in Table 3.6. The analysis provides additional evidence that board gender diversity contributes to CEP.

Similarly, ESG committee has more impact on CEP in the SDGs era (beta coefficients in the range of 13.740 to 22.579) in comparison to the MDGs era (with significant beta coefficients in the range of 13.078 to 21.943) [Table 3.9]. The higher impact of ESG committee on CEP in the SDGs era may be linked to the growing popularity of entrenching ESG committee as an apparatus to strengthen governance quality and manage ESG risks, as organisations can benefit from the expertise of ESG committee members to improve environmental performance (Dixon-Fowler et al., 2017; Uyar et al., 2022). Empirical evidence (Table 3.6) shows growth in ESG committee popularity between the MDGs (M = 73.00%) and the SDGs era (M = 85.00%), thereby providing corroborative evidence that the presence of ESG committee enhances CEP (Elsayed & Ammar, 2020; Elsayih et al, 2021).

The impact of ESG-linked compensation on CEP shifted from positive in the MDGs era to negative in the SDGs era (Table 3.9), and this could be partly explained by the decline in the popularity of ESG-linked compensation between the MDGs (M = 33.00%) and SDGs (M = 29.00%) era (Table 3.6). The inability of ESG-linked compensation to drive CEP may also be attributable to the nascent nature of linking executive compensation to sustainability performance (Berrone & Gomez-Mejia, 2009; Eccles et al., 2014). In sum, result in both the MDGs and SDGs era (Table 3.9) reveals non-linear relationship between CG and CEP, thus corroborating the baseline result in Table 3.8.

Overall, results in Table 3.8 to Table 3.12 and graphs in Figures 3.1 to 3.4 show that the relationship between CG mechanisms and CEP is curvilinear— rising, peaking, and falling for variables positively impacting CEP. This implies that the impact of CG on CEP depends on the level of engagement with environmental sustainability projects, with greater impact created at higher levels of ESG engagement. Relatedly, negative association between cross directorship and CEP could mean that sitting on multiple boards may reduce the effectiveness of a director because of span of control issues. Similarly, the concentration of decision-making power around directors holding multiple-/cross- directorship may encourage opportunistic behaviour (Young et al., 2008).

Result shows that at the aggregate/ combined level for all countries, board gender diversity and presence of ESG committee are the strongest driver of CEP. The emergence of board gender diversity as a strong driver of CEP validates the stakeholder theory that shareholders/ owners will want a gender-diverse board through the appointment of more female directors to boost confidence of stakeholders that the board is well constituted, as the views of males and females on environmental sustainability issues are balanced (Lopatta, et al., 2020). The result also validates the legitimacy theory that organisations will want to be perceived as having adequate mix of male and female directors as a legitimising strategy, based on the general notion that a well constituted board achieves equal gender representation and diversity (Lopatta, et al., 2020; Elsayih et al, 2021; Al-Shaer & Harakeh, 2022). Relatedly, the emergence of presence of ESG committee as a notable driver of CEP provides empirical validation for the contention that constituting an ESG committee is an increasing strategy to improve the monitoring mechanism for implementation of CEP initiatives in line with the legitimacy theory—organisations should constantly seek for avenues to demonstrate their commitment to environmental issues in an effort to gain the approval of stakeholders (Al-Shaer et al., 2021; Barbu, et al., 2022). Furthermore, the result corroborates the argument that ESG committee is emplaced by owners to satisfy the demands of stakeholders that organisations should be more deliberate about minimising negative environmental impact arising from their business activities (Uyar et al., 2022).

3.7 Conclusion

This study investigates the impact of CG on CEP in environmentally sensitive industries. Result shows that at the aggregate/ combined level for all countries, board gender diversity and presence of ESG committee are the strongest driver of CEP. However, when disaggregated into geographical regions, the impact of CG mechanisms on CEP is contextual and varies across jurisdictions. In the America region, board independence, board gender diversity, board nationality diversity and ESG committee are the strongest drivers. Board nationality diversity and ESG committee emerged as the strongest drivers in the Asia Pacific region, whilst ESG committee is the strongest determinant in the Western Europe region. In the MDGs era, board gender diversity, board nationality diversity, ESG committee and ESG-linked compensation are positively associated with CEP, with board gender diversity and ESG committee exerting more influence. The factors positively influencing CEP in the SDGs era shifted to board gender diversity, board nationality diversity and ESG committee, whilst board independence and ESG-linked Compensation exert significant negative impact. Although board gender diversity and

ESG Committee emerged as the strongest drivers of CEP in the MDGs and SDGs era, they exert more influence in the SDGs era than in the MDGs era. Further, result shows that the nature of CG-CEP relationship is non-linear. Taken together, the result that gender diversity and ESG committee have greater impact on CEP in the SDGs era suggests that MNEs are now becoming more intentional about environmental sustainability, as they are strengthening CG mechanisms to achieve environmental targets to legitimise their existence and gain stakeholders' acceptance. The results provide empirical support for the legitimacy theory invoked as theoretical framework for the study that organisations will emplace CG mechanisms as a strategy for improving environmental sustainability practice to fulfil their social contract and legitimise their existence. There is evidence to support the stakeholder theory as well that organisations will leverage on their CG structures to implement environmental sustainability projects to satisfy the expectations of stakeholders.

The current study is not without limitations. The investigation focused on globally visible companies operating in environmentally sensitive industries. Results are disaggregated into regions (America, Asia Pacific, and Western Europe), whilst excluding the Europe and Central Asia (ECA) and Middle East & North Africa (MENA) regions because of limited data. Future studies may focus on these regions (ECA and MENA), as well as other regions (e.g., sub-Sahara Africa) to provide a broader view on the CG-CEP relationship. The study analysed evidence from top MNEs predominantly domiciled in countries with high carbon emissions rate. Future studies may investigate drivers of environmental performance in other countries/ regions. The study focused on environmentally sensitive industries involved in primary and secondary activities. Future studies may investigate service sectors/ providers of tertiary activities—especially financial institutions, given the popularity of standalone ESG reports in the financial service sector in recent times. Acknowledging that there are other forms of ownership aside government ownership concentration which the current study includes as a control variable, future studies may examine how ownership structures such as manager/director ownership, family ownership and foreign ownership may affect CEP. Notwithstanding these limitations, the study investigates a plethora of CG variables implicated as main determinants of CEP. The findings from this study should, therefore, provide motivation for future studies based on these gaps.

The study contributes to knowledge in several ways by addressing observed gaps in literature. First, the study adopts an international approach by analysing evidence from 244 top MNEs operating in 30 environmentally sensitive industries in 31 countries, distributed across 5

geographical regions. It exposes the CG factors affecting CEP within an international context. Second, the study presents evidence that the impact of CG mechanisms on CEP is contextual and varies across jurisdictions. It attempts to reconcile/ explain mixed results reported in prior studies on the impact of CG on CEP by presenting evidence on how the influence of CG varies by geographical regions. Third, the study adopts a longitudinal approach by decomposing the impact of CG mechanisms on CEP in the MDGs (2006-2015) and SDGs (2016-2020) era, whilst presenting evidence on how the CG apparatus impacts CEP differently across the periods. The study presents empirical evidence that the SDGs deepened the level of commitment to environmental sustainability when compared to the MDGs era. Fourth, the study makes methodological contribution by using novel techniques such as PQR, two-stage least squares regression (2SLS)/ instrumental variables (IV) regression and propensity score matching (PSM) to analyse the CG-CEP nexus. This is in response to call to use state-of-the-art regression methods to address endogeneity concerns which have not been particularly addressed in most prior studies. It deploys a novel statistical technique (PQR) to establish the case that the CG-CEP relationship is not linear—an important consideration that has not been taken to account by most prior studies, but which has partly contributed to mixed results. Finally, the study makes contribution to stakeholder theory and legitimacy theory by furnishing empirical evidence that MNEs will emplace CG mechanisms as a strategy for improving CEP to entrench corporate legitimacy and gain stakeholders' acceptance.

The study recommends that organisations should strengthen ESG committee by regularly reviewing the activities of the committee. Whilst encouraging audit of ESG report to enhance its credibility, outcomes of ESG audit could also serve as a scorecard for the performance of the ESG committee—such performance appraisals are important in strengthening the effectiveness of the ESG committee. Bearing in mind that ESG-link compensation is nascent, organisations may also consider incentivising board members by implementing ESG-based pay, drawing from the positive nexus between ESG-linked compensation and CEP in the America region. To strengthen board effectiveness and CEP, organisations may consider improving board gender diversity and board nationality diversity as well-managed multi-cultural teams arguably outperform monocultural groups. Following on from the positive impact of board gender diversity and board nationality diversity on CEP, to strengthen board effectiveness and environmental sustainability performance, board nomination committees should select or recommend for selection director nominees that strengthen gender diversity and nationality diversity.

LIST OF TABLES

Table 3.1: Variable Measurement and Data Sources

S/N	Variable Name	Definition	Measurement/	Supporting literature	Data Source (s)
1	CEP	Corporate Environmental Performance	CEP score ranging from 0 (lowest score) to 100 (highest score obtainable) as main variable. CEP ranking as alternative measure, ranging from D- (assigned 1; lowest ranking) to A+ (assigned 12; highest ranking) as alternative measure	Hawn & Ioannou, 2016; Seaborn et al., 2020	Refinitiv/ DataStream
2	**Board Structure and Operations**				
2.1	BMEET	Board Meeting	Number of Board meetings per annum	Nuskiya et al, 2021	Refinitiv/ DataStream & Annual Reports
2.2	BINDP	Board Independence	Ratio of Non-executive directors (NEDs) to board size	Erin et al., 2021; Correa-Garcia et al., 2020	
2.3	BDUAL	CEO duality	CEO/Chairperson duality, equals "1" if the same person holds CEO and the Chairperson positions, otherwise "0"	Nuskiya et al, 2021	
3	**Board Diversity**				
3.1	DVGEN	Board gender diversity	Ratio of female directors to board size	Erin et al., 2021	Refinitiv/ DataStream & Annual Reports
3.2	DVNAT	Board Nationality Diversity	Percentage of board members that have a cultural background different from the location of the corporate headquarters	Mathuva et al., 2019	
4	**ESG structure**				
4.1	ESGCM	Existence of ESG Committee	If firm has ESG committee, the code of "1" is assigned, otherwise "0"	Doni et al., 2021	
4.2	ESGPY	ESG-linked compensation	If firm links executive pay/compensation to ESG performance, the code of "1" is assigned, otherwise "0"	Lu & Wang, 2021	
5	**Corporate Governance Variables (control)**				
5.1	BSIZE	Board Size	Number of directors on the board	Erin et al., 2021	Refinitiv/ DataStream & Annual Reports
5.2	DVCRS	Cross/ Multiple Directorships	Average number of other corporate affiliations for the board member.	Ong & Djajadikerta, 2020	
5.3	ACFIN	AC Expertise in environmental accounting	If company has AC with at least three members and at least one member with expertise in environmental accounting, the	Mathuva et al., 2019	

			code of "1" is assigned, otherwise "0"		
5.4	ACIDP	AC Independence	Ratio of NEDs on AC to total number of AC members	Elsayih et al., 2021	
5.5	ACMET	AC Meeting	AC meetings attendance average	Harun, et al., 2020	
5.6	OWNST	Government Ownership/ Control	If company has more than 50% of votes or has a golden share in the company, the code of "1" is assigned, otherwise "0"	Ramdhony et al., 2021	Refinitiv/ DataStream & Annual Reports
5.7	ESGAUD	Audit of ESG Report	If ESG report is audited, the code of "1" is assigned, otherwise "0"	Giannarakis et al., 2018	
5.8	ESGAUT	ESG Auditor Type	If ESG report is audited by Big 4, the code of "1" is assigned, otherwise "0"	Mathuva et al., 2019	
6	Firm Attributes (Control Variables)				
6.1	FSIZE	Size	Turnover	Ahmad & Zabri, 2015	Refinitiv/ DataStream & Annual Reports
6.2	FPROF	Profitability	Return on Assets ratio	Elsayih et al., 2021	
6.3	FLEV	Leverage	Total Debt to Total Assets ratio	Martínez-Ferrero & García-Sánchez, 2017	
6.4	FLIQD	Liquidity	Current Assets/ Current Liabilities ratio	Mathuva, et al., 2019	
7	YEAR	Year/Era of MDGs/ SDGs	Code of "1" assigned if SDGs period (2016-2020), otherwise "0" if MDGs era (2006-2015)	Researchers' conceptualisation	
8	**Country-level Governance Factors/ Country-level control variables**				
8.1	ECODVT	Level of Economic Development	GDP per capita, purchasing power parity (PPP) (current international $)	Harun et al., 2020; Lu & Wang, 2021	World Bank
8.2	WGI	World Governance Indicators (Average or composite index)	Average or composite index of the following 6 measures (i)Voice & Accountability (WGV); (ii)Political Stability and Lack of Violence (WGP); (iii) Government Effectiveness (WGG); (iv) Regulatory Quality (WGR), (v) Rule of Law (WGL), and (vi) Control of Corruption (WGC) (applied corruption perception index as provided by Transparency International)	Cuadrado-Ballesteros & Bisogno (2020)	World Bank/ Transparency International
8.3	NID; NLG; NIG	National cultural orientation based on Hofstede Model	Hofstede Model operationalisation of: (i)Individualism (NID); (iii) long-term orientation (NLG) (iii) Indulgence (NIG)	Disli et al., 2022	https://www.hofstede-insights.com

Table 3.2: Industry Grouping of Companies

S/N	Industry Group	Number of Companies	Size (%)
1	Aerospace & Defence	9	3.69%
2	Automobiles & Auto Parts	16	6.56%
3	Beverages	7	2.87%
4	Chemicals	12	4.92%
5	Coal	1	0.41%
6	Communications & Networking	2	0.82%
7	Computers, Phones & Household Electronics	8	3.28%
8	Construction & Engineering	11	4.51%
9	Construction Materials	3	1.23%
10	Consumer Goods Conglomerates	7	2.87%
11	Diversified Industrial Goods Wholesale	5	2.05%
12	Electric Utilities & IPPs	17	6.97%
13	Electronic Equipment & Parts	1	0.41%
14	Food & Tobacco	12	4.92%
15	Healthcare Equipment & Supplies	8	3.28%
16	Healthcare Providers & Services	8	3.28%
17	Homebuilding & Construction Supplies	3	1.23%
18	Household Goods	3	1.23%
19	Leisure Products	1	0.41%
20	Machinery, Tools, Heavy Vehicles, Trains & Ships	17	6.97%
21	Metals & Mining	14	5.74%
22	Multiline Utilities	7	2.87%
23	Office Equipment	1	0.41%
24	Oil & Gas	20	8.20%
25	Oil & Gas Related Equipment and Services	3	1.23%
26	Personal & Household Products & Services	6	2.46%
27	Pharmaceuticals	17	6.97%
28	Real Estate Operations	13	5.33%
29	Semiconductors & Semiconductor Equipment	11	4.51%
30	Textiles & Apparel	1	0.41%
	Total	**244**	**100%**

Table 3.3: Country Analysis of Companies

S/N	Country	Region	Number of Companies	Weighting (%)
1	Australia	Asia Pacific	3	1.23%
2	Austria	Western Europe	1	0.41%
3	Belgium	Western Europe	1	0.41%
4	Brazil	America	2	0.82%
5	Canada	America	5	2.05%
6	China	Asia Pacific	32	13.11%
7	Denmark	Western Europe	1	0.41%
8	Finland	Western Europe	1	0.41%
9	France	Western Europe	12	4.92%
10	Germany	Western Europe	9	3.69%
11	Hong Kong	Asia Pacific	6	2.46%
12	India	Asia Pacific	2	0.82%
13	Ireland	Western Europe	3	1.23%
14	Italy	Western Europe	2	0.82%
15	Japan	Asia Pacific	26	10.66%
16	Luxembourg	Western Europe	1	0.41%
17	Mexico	America	1	0.41%
18	Netherlands	Western Europe	5	2.05%
19	Norway	Western Europe	1	0.41%
20	Portugal	Western Europe	1	0.41%
21	Russia	Europe and Central Asia	5	2.05%
22	Saudi Arabia	Middle East & North Africa	3	1.23%
23	Singapore	Asia Pacific	1	0.41%
24	South Korea	Asia Pacific	10	4.10%
25	Spain	Western Europe	1	0.41%
26	Sweden	Western Europe	2	0.82%
27	Switzerland	Western Europe	4	1.64%
28	Taiwan	Asia Pacific	2	0.82%
29	Thailand	Asia Pacific	1	0.41%
30	United Kingdom	Western Europe	11	4.51%
31	United States	America	89	36.48%
	Total		**244**	**100%**

Table 3.4: Analysis by Region

S/N	Region	Number of Countries	Number of Companies	Number of Firm-year observations	Weighting for firm-year observations (%)
1	America	4	97	1,371	41.28%
2	Asia Pacific	9	83	1,031	31.04%
3	Western Europe	16	56	818	24.63%
4	Europe and Central Asia	1	5	71	2.14%
5	Middle East & North Africa	1	3	30	0.90%
	Total	**31**	**244**	**3,321**	**100%**

Table 3.5 (Panel A): Descriptive Statistics of Variables

N = 3,321	Min.	Max.	Mean	Std. Dev.	Skewness	Kurtosis
CEP score	0.000	98.940	63.370	25.060	-.919	.041
CEP ranking	1.000	12.000	8.140	2.980	-.875	-.074
Board Meeting	2.000	104.000	8.820	6.645	5.603	59.930
Board Independence	3.000%	100.000%	75.490%	23.980%	-1.579%	1.870%
Board Gender Diversity	0.000%	64.000%	16.130%	12.810%	.433%	-.520%
Board Nationality Diversity	0.000%	100.000%	10.780%	19.990%	2.363%	5.430%
Board Size	4.000	30.000	12.140	3.572	.676	1.980
Cross Directorship	0.000	5.940	1.294	.777	1.111	2.860
AC Independence	13.000%	100.000%	89.300%	28.740%	-2.636%	5.270%
AC Meeting	0.000%	100.000%	59.790%	42.510%	-.615%	-1.470%
Revenue (Million' USD)	179.900	470,171.0	48,817.080	60,152.000	3.103	12.060
Return on Total Assets	-9.210%	41.290%	6.903%	5.951%	1.804%	4.770%
Leverage	0.000%	139.790%	26.970%	14.890%	1.235%	4.730%
Current Ratio	0.090	31.840	1.630	1.290	8.290	134.400

Table 3.5 (Panel B): Descriptive Statistics of Variables (Categorical variables)

Variable	*Category*	*Frequency*[1]	*%*
Audit Committee Expertise	Yes	2,502	75.3
	No	819	24.7
	Total	**3,321**	**100.0**
CEO/ Chairperson Duality	CEO doubles as Chairperson	1,735	52.2
	CEO different from Chairperson	1,586	47.8
	Total	**3,321**	**100.0**
ESG-linked Compensation	Yes	1,049	31.6
	No	2,272	68.4
	Total	**3,321**	**100.0**
Government Ownership	Yes (> 50%)	207	6.2
	No (≤ 50%))	3,114	93.8
	Total	**3,321**	**100.0**
ESG Committee	Yes	2,573	77.5
	No	748	22.5
	Total	**3,321**	**100.0**
Audit of ESG report	Yes	1,877	56.5
	No	1,444	43.5
	Total	**3,321**	**100.0**
ESG-report Auditor Type	Big-4	866	26.1
	Non Big-4	2,455	73.9
	Total	**3,321**	**100.0**

[1]*Frequency is measured in terms of number of firm-year observations*

Table 3.6: Descriptive Analysis of CEP and CG variables in the MDGs/ SDGs Era, America, Asia Pacific and Western Europe Regions

	MDGs Era		SDGs Era		America Region		Asia Pacific Region		Western Europe Region	
	Mean	**Std Dev.**	**Mean**	**Std Dev.**	**Mean**	**Std Dev.**	**Mean**	**Std Dev.**	**Mean**	**Std Dev.**
CEP Score	59.847	26.506	69.688	20.838	60.651	24.762	57.716	27.717	76.707	16.248
CEP Ranking	7.740	3.139	8.860	2.506	7.800	2.946	7.480	3.285	9.760	1.888
Board Meeting	8.810	7.202	8.840	5.515	8.180	3.570	8.960	5.656	8.500	4.043
Board Independence	.747	.261	.768	.195	.861	.099	.521	.251	.867	.180
CEO Duality	.540	.499	.500	.500	.730	.443	.470	.499	.300	.459
Board Gender Diversity	.134	.113	.209	.138	.206	.096	.063	.087	.224	.139
Board Nationality Diversity	.097	.187	.126	.218	.061	.130	.031	.083	.286	.278
ESG Committee	.730	.443	.850	.357	.750	.433	.740	.437	.890	.313
ESG-linked Compensation	.330	.470	.290	.455	.420	.494	.060	.243	.470	.499
Board Size	12.350	3.743	11.760	3.210	11.670	2.198	11.950	4.395	13.370	4.053
Cross Directorship	1.227	.791	1.413	.736	1.241	.624	1.110	.754	1.547	.832
AC Expertise	.750	.434	.760	.426	.940	.233	.480	.500	.840	.368
AC Independence	.834	.301	.781	.362	.984	.112	.591	.409	.843	.259
AC Meeting	.579	.425	.630	.422	.766	.252	.335	.461	.680	.428
Govt. Ownership	.050	.224	.080	.270	.010	.104	.110	.309	.070	.257
Audit ESG report	.510	.500	.670	.471	.400	.490	.550	.497	.860	.344
ESG Auditor Type	.240	.430	.290	.454	.060	.245	.210	.408	.650	.477
N	**2,129**		**1,192**		**1,371**		**1,031**		**818**	

Table 3.7: Correlation Matrix of Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Board Size (1)	1														
Board meeting (2)	.026	1													
Board independence (3)	.042*	-.080**	1												
CEO Duality (4)	.100**	-.063**	.053**	1											
Gender diversity (5)	.057**	-.012	.443**	.096**	1										
Nationality diversity (6)	-.026	-.013	.222**	-.253**	.235**	1									
Cross directorship (7)	.024	.109**	.142**	-.019	.100**	.206**	1								
AC expertise (8)	.077**	-.101**	.436**	.141**	.378**	.133**	.097**	1							
AC independence (9)	.060**	-.137**	.411**	.090**	.241**	.140**	.043*	.504**	1						
AC meeting (10)	-.028	-.025	.388**	.113**	.410**	.216**	.084**	.499**	.419**	1					
Govt. Ownership (11)	-.048**	.093**	.024	-.180**	-.126**	-.047**	-.083**	-.113**	-.070**	-.111**	1				
ESG committee (12)	.161**	.089**	.055**	.011	.158**	.146**	.049**	.016	.008	.076**	.005	1			
ESG-Linked comp. (13)	.070**	.022	.312**	.054**	.305**	.178**	.036*	.267**	.210**	.282**	-.068**	.182**	1		
Audit ESG report (14)	.146**	.051**	.027	-.111**	.112**	.255**	.151**	-.065**	-.037*	-.016	-.002	.420**	.167**	1	
ESG Auditor Type (15)	.181**	.024	.123**	-.160**	.132**	.295**	.166**	-.020	.035*	-.001	.079**	.220**	.138**	.518**	1

****Significant at 1%* ***Significant at 5%* *Significant at 10%*

Table 3.8: Panel Quantile Regression Result on Impact of CG on CEP (All Countries)

***N* = 3,321**	**Quantiles (DV = CEP score)**				
Variable	**0.10**	**0.30**	**0.50**	**0.70**	**0.90**
Board Meeting	-.060	-.022	-.038	-.034	.003
	(.120)	(.057)	(.070)	(.073)	(.049)
Board Independence	-2.866	-1.027	-4.382*	-1.508	-.425
	(3.656)	(2.758)	(2.459)	(2.706)	(2.310)
CEO Duality	-.810	.476	-.061	-.140	.698
	(1.039)	(1.270)	(.937)	(.704)	(.758)
Board Gender Diversity	4.716	3.033	10.487***	10.498***	5.175
	(5.038)	(5.326)	(3.958)	(2.365)	(3.408)
Board Nationality Diversity	12.150**	2.522	2.854	1.941	-1.047
	(5.456)	(2.396)	(2.291)	(1.514)	(1.470)
ESG Committee	16.651***	22.074***	22.688***	18.997***	14.080***
	(2.359)	(1.075)	(1.676)	(.925)	(1.124)
ESG-linked Compensation	1.841	.935	.827	.051	.028
	(1.615)	(1.109)	(.809)	(.483)	(.646)
Governance Control Var.					
Board Size	.877***	.605***	.465***	.322***	.207**
	(.193)	(.098)	(.080)	(.064)	(.104)
Cross Directorship	-1.008	-1.197**	-1.310*	-1.722***	-.659*
	(.898)	(.584)	(.706)	(.516)	(.379)
AC Expertise	-.951	-2.072	-1.272	-.486	-.966
	(2.037)	(2.085)	(1.105)	(1.054)	(.907)
AC Independence	3.771	.607	1.832	1.553	2.535*
	(2.710)	(2.341)	(2.035)	(1.248)	(1.383)
AC Meeting	-.547	-.364	-2.781*	-1.072	.914
	(1.982)	(1.288)	(1.497)	(.876)	(1.215)
Govt. Ownership	-1.642	-5.647***	-6.310**	-7.979**	-2.299
	(2.256)	(1.929)	(2.445)	(1.546)	(1.951)
Audit ESG report	22.064***	16.182***	12.354***	8.858***	5.492***
	(1.669)	(1.245)	(.916)	(.700)	(1.348)
ESG Auditor Type	-2.041	2.057	2.766***	2.433***	.845
	(1.382)	(1.375)	(.960)	(.566)	(.684)
Firm Control Var.					
Firm Size	5.273***	7.338***	7.811***	6.766***	4.708***
	(1.567)	(1.918)	(1.654)	(1.381)	(1.382)
ROTA	-.084	-.102	-.200***	-.182***	-.146*
	(.083)	(.095)	(.075)	(.050)	(.085)
Total Debt to Assets	-.111**	-.041	.013	.018	-.006
	(.043)	(.037)	(.029)	(.028)	(.025)
Current Ratio	-.279	-1.009***	-1.566***	-1.344***	-1.532***
	(.215)	(.304)	(.359)	(.155)	(.344)
Year (Pre/Post SDG)	6.991***	4.090***	3.004***	2.013***	1.305*
	(1.775)	(1.047)	(.817)	(.577)	(.727)
Country-level Gov.					
logGDP	20.454***	20.899***	11.713***	5.411	-1.112
	(3.345)	(2.985)	(2.434)	(3.389)	(3.834)
World Gov. Index (ave)	-.258***	-.195***	-.058	.013	.099**
	(.086)	(.050)	(.040)	(.035)	(.050)
National Culture					
Individualism	.029	.124**	.068**	-.025	.013
	(.071)	(.058)	(.032)	(.017)	(.033)

long-term orientation	.191*** (.070)	.272*** (.053)	.151*** (.044)	.113*** (.040)	.069** (.027)
lndulgence	.270*** (.096)	.353*** (.068)	.297*** (.049)	.273*** (.048)	.120** (.050)
Pseudo R^2	0.417	0.359	0.301	0.239	0.139
Coefficients are stated, while standard errors are reported in brackets ***Significant at 1%** **Significant at 5%* Significant at 10%*					

Table 3.9: Panel Quantile Regression Result on Impact of CG on CEP in the MDGs and SDGs Era

	MDGs Era (2006-2015)					SDGs Era (2016-2020)				
	Quantiles (DV = CEP score),					Quantiles (DV = CEP score),				
Variable	**0.10**	**0.30**	**0.50**	**0.70**	**0.90**	**0.10**	**0.30**	**0.50**	**0.70**	**0.90**
Board Meeting	-.215*	-.063	-.066	-.061	-.007	-.004	.083	.126	.088	.053
	(.119)	(.046)	(.077)	(.094)	(.070)	(.196)	(.180)	(.129)	(.104)	(.080)
Board Independence	-.241	.482	-2.650	-.536	.283	-4.378	-17.779***	-17.966**	-7.608	-1.755
	(3.962)	(2.800)	(3.045)	(1.753)	(2.249)	(8.289)	(6.702)	(4.570)	(4.704)	(4.512)
CEO Duality	-1.701	.443	1.061	-.235	1.082	3.052	.519	.204	1.445	1.277
	(1.988)	(1.221)	(1.618)	(1.013)	(.996)	(2.250)	(1.967)	(1.307)	(1.109)	(1.001)
Board Gender Diversity	18.785***	4.919	14.063**	8.943*	7.648	-.009	11.534	20.284**	13.563**	5.288
	(6.600)	(8.336)	(6.984)	(5.108)	(6.885)	(12.586)	(11.526)	(8.254)	(5.569)	(5.184)
Board Nationality Diversity	11.421*	4.578**	3.129	.942	-1.812	11.700	7.995*	6.483*	3.978	4.379
	(6.689)	(3.731)	(2.949)	(1.963)	(2.628)	(8.161)	(4.602)	(3.535)	(2.470)	(3.070)
ESG Committee	16.085***	21.077***	21.943***	19.715***	13.078***	19.713***	22.579***	22.335***	17.718***	13.740***
	(1.752)	(1.941)	(2.199)	(1.602)	(1.817)	(3.675)	(1.971)	(2.977)	(2.886)	(2.227)
ESG-linked Compensation	2.769	2.722***	2.520***	1.784**	1.102	-.506	-2.025	-1.930***	-1.386*	-.470
	(2.052)	(.899)	(.775)	(.875)	(1.017)	(2.170)	(1.369)	(.716)	(.737)	(1.241)
Other Corporate Governance Control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm-level Control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country-level Governance Control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
National Culture Control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Pseudo R^2	0.404	0.374	0.316	0.248	0.146	0.397	0.319	0.282	0.236	0.146
N	2,129	2,129	2,129	2,129	2,129	1,192	1,192	1,192	1,192	1,192

Coefficients are stated, while standard errors are reported in brackets
****Significant at 1% **Significant at 5% Significant at 10%*

Table 3.10: Panel Quantile Regression Result on Impact of CG on CEP in America Region

***N* = 1,371**	**Quantiles (DV = CEP score)**				
Variable	**0.10**	**0.30**	**0.50**	**0.70**	**0.90**
Board Meeting	.582**	.305	.351	.253	.281
	(.267)	(.277)	(.235)	(.158)	(.183)
Board Independence	12.005	40.507***	34.992**	25.441***	9.124
	(12.301)	(10.233)	(15.157)	(9.505)	(8.318)
CEO Duality	-1.887	-1.855	-4.552**	-4.111**	-.141
	(2.381)	(1.941)	(1.973)	(1.799)	(1.215)
Board Gender Diversity	28.063*	31.723***	30.263***	28.493***	26.649***
	(14.525)	(10.006)	(11.525)	(8.795)	(9.799)
Board Nationality Diversity	19.825**	25.773***	22.895***	14.907***	19.260***
	(9.152)	(7.470)	(4.759)	(4.012)	(5.155)
ESG Committee	26.685***	21.679***	20.834***	16.567***	12.048***
	(3.345)	(2.374)	(2.537)	(2.588)	(1.632)
ESG-linked Compensation	3.499**	2.637**	3.038**	2.396**	2.404**
	(1.607)	(1.338)	(1.223)	(1.055)	(1.110)
Governance Control Var.					
Board Size	1.218***	.848**	.986***	1.037***	.807**
	(.455)	(.362)	(.328)	(.287)	(.322)
Cross Directorship	.426	-2.737*	-3.170***	-1.046	.203
	(1.870)	(1.495)	(1.203)	(1.788)	(1.224)
AC Expertise	-1.619	-.323	1.238	5.871	1.925
	(3.386)	(4.148)	(4.467)	(4.071)	(3.755)
AC Independence	-2.319	2.857	4.562	1.627	-.525
	(5.807)	(5.183)	(6.405)	(5.658)	(5.335)
AC Meeting	5.144*	5.517	-3.899	-.678	.836
	(2.499)	(4.436)	(2.523)	(2.446)	(1.748)
Govt. Ownership	2.783	-15.864	-21.592***	-21.774**	4.922
	(9.859)	(12.854)	(7.931)	(9.269)	(12.376)
Audit ESG report	16.662***	11.314***	8.187***	7.311***	.851
	(3.655)	(1.438)	(1.205)	(.735)	(1.249)
ESG Auditor Type	-4.542	-4.154	-3.642	-4.727*	-.423
	(5.196)	(4.150)	(2.735)	(2.476)	(2.669)
Firm Control Var.					
Firm Size	1.292	2.992	6.979***	8.507***	7.351***
	(1.986)	(2.391)	(1.678)	(.880)	(1.176)
ROTA	.311	.158	.234*	.262**	.311***
	(.237)	(.110)	(.134)	(.113)	(.119)
Total Debt to Assets	-.020	-.066	-.001	-.020	-.022
	(.043)	(.056)	(.059)	(.058)	(.050)
Current Ratio	-.025	-1.147***	-1.618***	-1.270***	.977
	(.312)	(.240)	(.313)	(.454)	(.811)
Year (Pre/Post SDG)	6.597**	6.512**	3.089	-.068	.621
	(2.839)	(3.268)	(2.524)	(2.127)	(2.272)
Country-level Gov.					
logGDP	8.821	7.450	19.834	23.426	29.491
	(40.902)	(34.124)	(19.890)	(25.910)	(20.412)
World Gov. Index (ave)	-.573	.044	.217	.220	.292
	(.375)	(.381)	(.309)	(.349)	(.373)
National Culture					
Individualism	-.275	-1.008	-.949	-.899	-.926*

	(.783)	(.741)	(.576)	(.582)	(.512)
long-term orientation	-1.264 (1.080)	-1.921 (1.316)	-1.422 (1.147)	-1.080 (.940)	-1.322 (1.111)
Indulgence	-.140 (.759)	-.610 (.903)	-.327 (.710)	-.393 (.649)	-.912 (.691)
Pseudo R^2	0.426	0.370	0.295	0.233	0.151
Coefficients are stated, while standard errors are reported in brackets ****Significant at 1% **Significant at 5% Significant at 10%*					

Table 3.11: Panel Quantile Regression Result on Impact of CG on CEP in Asia Pacific Region

***N* = 1,031**	**Quantiles (DV = CEP score)**				
Variable	**0.10**	**0.30**	**0.50**	**0.70**	**0.90**
Board Meeting	-.236 (.201)	.025 (.157)	.084 (.142)	-.077 (.126)	-.137 (.098)
Board Independence	7.007** (3.553)	9.755** (4.124)	6.982* (4.012)	-.534 (3.686)	-2.173 (3.361)
CEO Duality	-2.916** (1.218)	-1.731 (1.310)	-.878 (1.550)	-2.295* (1.216)	-2.459* (1.274)
Board Gender Diversity	-20.387* (12.155)	-12.468* (6.643)	-18.787 (12.825)	2.366 (12.952)	7.201 (11.234)
Board Nationality Diversity	50.593*** (5.688)	37.499*** (6.762)	37.796*** (8.867)	41.518*** (12.596)	22.542 (16.388)
ESG Committee	11.569*** (2.286)	12.182*** (2.715)	16.721*** (3.607)	18.697*** (2.933)	11.679*** (2.455)
ESG-linked Compensation	.886 (6.123)	-.122 (2.655)	-.939 (2.620)	3.082 (2.935)	1.622 (2.982)
Governance Control Var.					
Board Size	.655*** (.154)	.394*** (.149)	.375** (.173)	.125 (.189)	.305** (.121)
Cross Directorship	-1.084 (1.389)	-3.502*** (1.194)	-3.808*** (1.128)	-4.493*** (1.093)	.672 (1.316)
AC Expertise	-1.728 (1.845)	1.415 (1.429)	1.412 (1.447)	3.664** (1.667)	1.417 (1.199)
AC Independence	3.283 (4.146)	-.636 (2.553)	2.578* (1.497)	2.647 (1.656)	4.296*** (1.648)
AC Meeting	2.616 (2.804)	2.218 (1.851)	.407 (2.234)	1.922 (2.351)	-.578 (2.442)
Govt. Ownership	-6.336* (3.712)	-3.023 (2.960)	-1.924 (4.584)	-2.742 (3.937)	.316 (2.932)
Audit ESG report	12.006*** (1.788)	11.026*** (2.644)	8.480*** (2.307)	7.306*** (1.969)	5.379*** (1.525)
ESG Auditor Type	3.515 (3.691)	5.004*** (1.893)	6.308*** (1.582)	5.697*** (2.095)	6.459*** (1.465)
Firm Control Var.					
Firm Size	3.876** (1.798)	7.017*** (1.809)	5.994*** (1.685)	4.042** (1.721)	3.127** (1.544)
ROTA	-.013 (.142)	-.221** (.103)	-.337** (.139)	-.554*** (.161)	-.173 (.142)
Total Debt to Assets	-.179*	-.119***	-.158***	-.072	-.050

	(.102)	(.039)	(.052)	(.056)	(.067)
Current Ratio	-3.590***	-1.464	-3.244***	-2.698***	-2.069**
	(1.148)	(1.019)	(1.063)	(1.025)	(.822)
Year (Pre/Post SDG)	9.978***	9.633***	9.621***	9.172***	4.776***
	(2.518)	(1.692)	(1.521)	(1.870)	(1.831)
Country-level Gov.					
logGDP	33.858***	41.214***	32.220***	19.822***	-4.879
	(5.963)	(5.576)	(6.196)	(7.230)	(5.571)
World Gov. Index (ave)	-1.091***	-1.252***	-1.099***	-.924***	-.435***
	(.221)	(.185)	(.157)	(.136)	(.131)
National Culture					
Individualism	.951***	1.038***	.997***	.912***	.590***
	(.109)	(.068)	(.113)	(.096)	(.100)
long-term orientation	.725***	.855***	.815***	.764***	.666***
	(.136)	(.085)	(.096)	(.078)	(.088)
Indulgence	.128	.181*	.187	-.021	.189
	(.118)	(.108)	(.098)	(.085)	(.116)
Pseudo R^2	0.503	0.504	0.433	0.357	0.256
Coefficients are stated, while standard errors are reported in brackets *** *Significant at 1%* ** *Significant at 5%* *Significant at 10%*					

Table 3.12: Panel Quantile Regression Result on Impact of CG on CEP in Western Europe Region

***N* = 818**	**Quantiles (DV = CEP score)**				
Variable	**0.10**	**0.30**	**0.50**	**0.70**	**0.90**
Board Meeting	-.369	-.236	-.263	-.001	.007
	(.310)	(.223)	(.174)	(.115)	(.095)
Board Independence	13.522	7.660	5.522	6.047	4.443
	(10.521)	(6.816)	(5.430)	(5.373)	(7.406)
CEO Duality	.748	3.918	3.465**	2.379**	1.246
	(2.672)	(2.436)	(1.742)	(.922)	(1.785)
Board Gender Diversity	8.297	5.217	6.376	.767	-2.238
	(8.931)	(7.904)	(4.588)	(2.558)	(3.184)
Board Nationality Diversity	-7.988	-7.427*	-4.064	.916	3.744**
	(5.548)	(4.029)	(3.118)	(2.721)	(1.752)
ESG Committee	5.999*	11.974***	16.957***	10.111***	4.245
	(3.403)	(1.968)	(1.708)	(3.499)	(3.077)
ESG-linked Compensation	.131	-2.480	-.769	-1.822	-.529
	(2.326)	(1.582)	(1.672)	(1.166)	(.708)
Governance Control Var.					
Board Size	-.169	-.619**	-.239	-.390	.014
	(.420)	(.284)	(.174)	(.248)	(.266)
Cross Directorship	-4.110**	-1.273	.036	-.531	-.062
	(1.912)	(1.059)	(.825)	(.639)	(.537)
AC Expertise	3.246	.557	-1.359	-1.784	-2.115**
	(4.081)	(3.247)	(1.858)	(2.175)	(.866)
AC Independence	1.476	2.454	2.403	-.977	1.781
	(13.021)	(6.957)	(8.049)	(6.642)	(5.838)

AC Meeting	4.215 (2.869)	7.515*** (2.047)	5.208*** (1.526)	4.665** (1.840)	2.804** (1.125)
Govt. Ownership	-.335 (4.157)	-2.268 (3.682)	-5.148** (2.435)	-5.250** (2.503)	-4.333 (2.872)
Audit ESG report	3.0417 (4.343)	11.359*** (3.057)	7.263*** (1.882)	7.792*** (2.032)	3.088 (2.318)
ESG Auditor Type	.167 (3.313)	-2.765 (2.936)	-2.192 (1.775)	-2.130 (1.698)	-2.421** (1.180)
Firm Control Var.					
Firm Size	23.814*** (4.114)	15.371*** (2.198)	9.885*** (1.760)	7.239*** (1.870)	3.731 (2.397)
ROTA	-.184 (.224)	-.340** (.144)	-.402*** (.082)	-.437*** (.086)	-.352*** (.080)
Total Debt to Assets	.001 (.118)	.099 (.084)	.160** (.063)	.143*** (.045)	.116*** (.044)
Current Ratio	-3.421 (2.170)	-3.562* (1.952)	-3.665** (1.419)	-2.381** (1.158)	-3.325*** (1.105)
Year (Pre/Post SDG)	2.401 (2.043)	.881 (2.333)	.668 (2.077)	.540 (1.217)	.657 (1.669)
Country-level Gov.					
logGDP	28.682** (12.977)	8.964 (9.696)	-2.349 (8.716)	-4.710 (7.075)	4.581 (12.191)
World Gov. Index (ave)	.310 (.333)	.191 (.254)	.338* (.194)	.122 (.197)	.095 (.254)
National Culture					
Individualism	-.514** (.214)	-.329*** (.105)	-.163** (.080)	-.122* (.072)	-.018 (.128)
long-term orientation	-.031 (.134)	-.049 (.063)	-.068 (.060)	-.009 (.058)	-.030 (.076)
Indulgence	.572** (.233)	.250* (.132)	.129 (.088)	.058 (.112)	-.073 (.124)
Pseudo R^2	0.273	0.266	0.210	0.175	0.131
Coefficients are stated, while standard errors are reported in brackets ****Significant at 1%*** ***Significant at 5%*** *Significant at 10%*					

Table 3.13: Binary Logistic Regression Result on Impact of CG on Commitment to Environmental Sustainability for Combined Analysis and Regions

	DV Classification (Shallow Versus High Commitment)			
Variable	**Combined**	**America Region**	**Asia Pacific**	**Western Europe**
Board Meeting	1.003 (.003)	1.043* (.042)	1.020 (.019)	.955 (-.047)
Board Independence	.670 (-.400)	20.451*** (3.018)	1.961 (.673)	.242** (-1.419)
CEO Duality	1.097 (.093)	1.158 (.146)	2.116*** (.749)	1.051 (.049)
Board Gender Diversity	2.777** (1.021)	24.578*** (3.202)	3.414 (1.228)	1.595 (.467)
Board Nationality Diversity	1.022 (.022)	12.770*** (2.547)	11.798* (2.468)	2.087 (.736)
ESG Committee	4.601*** (1.526)	3.630*** (1.289)	4.567*** (1.519)	4.963*** (1.602)
ESG-linked Compensation	1.342*** (.295)	1.757*** (.564)	1.281 (.248)	.897 (-.108)
Governance Control Var.				
Board Size	1.070*** (.067)	1.206*** (.187)	1.066*** (.064)	.944 (-.058)
Cross Directorship	.900* (-.106)	.907 (-.097)	.892 (-.114)	.903 (-.102)
AC Expertise	.758** (-.277)	1.234 (.211)	.888 (-.119)	1.067 (.065)
AC Independence	1.314 (.273)	1.996 (.691)	1.276 (.244)	5.438** (1.693)
AC Meeting	.871 (-.138)	.885 (-.122)	.873 (-.136)	1.762** (.566)
Govt. Ownership	.695* (-.364)	.193 (-1.646)	.937 (-.065)	1.312 (.272)
ESG Committee	4.601*** (1.526)	3.630*** (1.289)	4.567*** (1.519)	4.963*** (1.602)
ESG-linked Compensation	1.342*** (.295)	1.757*** (.564)	1.281 (.248)	.897 (-.108)
Audit ESG report	2.663*** (.979)	2.832*** (1.041)	1.359 (.307)	1.847* (.614)
ESG Auditor Type	1.357** (.305)	.374*** (-.984)	3.623*** (1.287)	1.239 (.214)
Firm Control Var.				
Firm Size	1.904*** (.644)	1.465** (.382)	.944 (-.058)	24.305*** (3.191)
ROTA	.971*** (-.029)	1.010 (.010)	.984 (-.016)	.906*** (-.099)
Total Debt to Assets	997 (-.003)	.990** (-.011)	.979*** (-.021)	1.011 (.011)
Current Ratio	.960 (-.041)	1.046 (.045)	.551*** (-.596)	.731 (-.313)
Year (Pre/Post SDG)	1.554*** (.441)	2.372*** (.864)	2.317*** (.840)	.657 (-.420)
Country-level Gov.				
logGDP	1.895** (.639)	.407 (-.900)	5.117*** (1.633)	84.817* (4.441)

World Gov. Index (ave)	1.010* (.009)	.981 (-.019)	.881*** (-.127)	1.171*** (.158)
National Culture				
Individualism	.998 (-.002)	.990 (-.010)	1.078*** (.075)	.996 (-.004)
long-term orientation	1.009** (.009)	.973 (-.027)	1.110*** (.104)	.940*** (-.062)
Indulgence	1.032*** (.032)	1.032 (.032)	1.078*** (.075)	.941** (-.061)
Cox & Snell R^2 / Nagelkerke R^2	0.295 / 0.394	0.300 / 0.399	0.419 / 0.559	0.264 / 0.393
Classification Ratio	74.70%	75.10%	80.30%	82.00%
N	3,321	1,371	1,031	818
Odds ratio are stated, while Coefficients are reported in brackets ****Significant at 1%* ***Significant at 5%* **Significant at 10%*				

Table 3.14: Summary of Results on Impact of CG on Corporate Environmental Performance for combined and Regional analysis

Variable	Combined	America Region	Asia Pacific	Western Europe
Board Meeting	0	+	0	0
Board Independence	-	+ /*	+	0
CEO Duality	0	-	-	+
Board Gender Diversity	+ /*	+ /*	-	0
Board Nationality Diversity	+ /*	+ /*	+ /*	+
ESG Committee	+ /*	+ /*	+ /*	+ /*
ESG-linked Compensation	0	+	0	0
Governance Control Variables				
Board Size	+	+	+	-
Cross Directorship	-	-	-	-
AC Expertise	0	0	+	-
AC Independence	+	0	+	0
AC Meeting	-	+	0	+ /*
Govt. Ownership	-	-	-	-
Audit ESG report	+ /*	+	+	+ /*
ESG Auditor Type	+	-	+	-
Year (Pre/Post SDG)	+	+	+	0
KEY: (+) = *Positive and Significant*; (-) = *Negative and Significant*; (0) = *Insignificant*; (*) = *Strong determinant*				

Table 3.15: Result of Two-stage least squares (2SLS) / IV regression on impact of CG on CEP

Variable (*N* = 3,321)	CEP Score	CEP Ranking
Board Meeting	-.004 (.050)	.001 (.006)
Board Independence	-3.403* (1.889)	-.465** (.225)
CEO Duality	.443 (.691)	.003 (.082)
Board Gender Diversity	26.535*** (9.999)	3.672*** (1.195)
Board Nationality Diversity	2.747* (2.026)	.444* (.242)
ESG Committee	19.204*** (.863)	2.274*** (.103)
ESG-linked Compensation	1.330* (.771)	.168* (.092)
Governance Control Var.		
Board Size	.557*** (.095)	.078*** (.011)
Cross Directorship	-1.202*** (.426)	-.155*** (.050)
AC Expertise	-1.991** (.981)	-.289** (.117)
AC Independence	2.139 (1.344)	.310* (.160)
AC Meeting	-1.540 (1.004)	-.194 (.120)
Govt. Ownership	-4.719*** (1.440)	-.448*** (.172)
Audit ESG report	12.215*** (.827)	1.446*** (.098)
ESG Auditor Type	1.172 (.912)	.156 (.109)
Firm Control Var.		
Firm Size	7.402*** (.834)	.889*** (.099)
ROTA	-.121** (.059)	-.015** (.007)
Total Debt to Assets	-.026 (.022)	-.002 (.002)
Current Ratio	-1.070*** (.268)	-.126*** (.032)
Year (Pre/Post SDG)	2.503** (1.104)	.223* (.132)
Country-level Gov.		
logGDP	15.239*** (2.211)	1.729*** (.264)
World Gov. Index (ave)	-.122*** (.038)	-.015*** (.004)
National Culture		
Individualism	.010 (.034)	-.003 (.004)

long-term orientation	.197*** (.030)	.019*** (.003)
lndulgence	.332** (.045)	.039*** (.005)
R^2	0.506	0.499

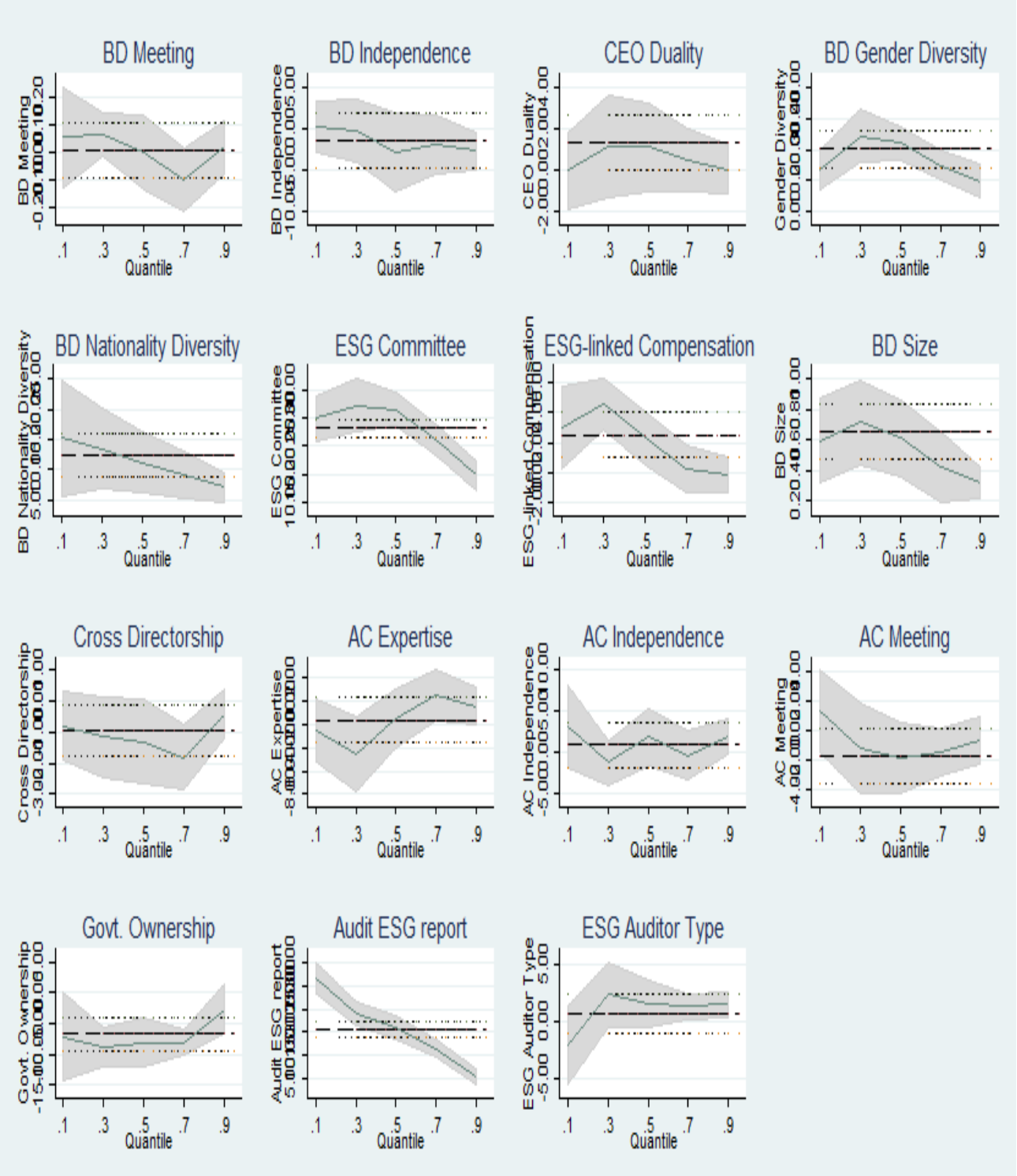
Table 3.16: Result of Propensity Score Matching regression on impact of CG on CEP

***N* = 3,321**		
Variable	CEP Score	CEP Ranking
Board Meeting	-.007 (.050)	.001 (.005)
Board Independence	-2.203 (1.730)	-.296 (.206)
CEO Duality	.390 (.690)	-.003 (.082)
Board Gender Diversity (propensity score)	6.308*** (1.617)	.848*** (.192)
Board Nationality Diversity	3.341* (1.975)	.529** (.235)
ESG Committee	19.204*** (.860)	2.274*** (.102)
ESG-linked Compensation	1.302* (.763)	.166* (.090)
Governance Control Var.		
Board Size	.623*** (.093)	.087*** (.011)
Cross Directorship	-1.363*** (.420)	-.177*** (.050)
AC Expertise	-1.881* (.969)	-.272** (.115)
AC Independence	2.125 (1.341)	.308* (.159)
AC Meeting	-1.215 (.968)	-.147 (.115)
Govt. Ownership	-4.847*** (1.432)	-.467*** (.170)
Audit ESG report	12.132*** (.825)	1.436*** (.098)
ESG Auditor Type	2.272** (.876)	.307*** (.104)
Firm Control Var.		
Firm Size	7.122*** (.819)	.850*** (.097)
ROTA	-.126** (.059)	-.016** (.007)
Total Debt to Assets	-.041* (.022)	-.004* (.002)
Current Ratio	-1.239*** (.262)	-.149*** (.031)
Year (Pre/Post SDG)	4.326*** (.722)	.477*** (.086)

Country-level Gov.		
logGDP	14.948***	1.687***
	(2.187)	(.260)
World Gov. Index (ave)	-.110***	-.013***
	(.037)	(.004)
National Culture		
Individualism	.056**	.003
	(.028)	(.003)
long-term orientation	.212***	.020***
	(.030)	(.003)
lndulgence	.324***	.038***
	(.044)	(.005)
Pseudo R^2	0.512	0.508

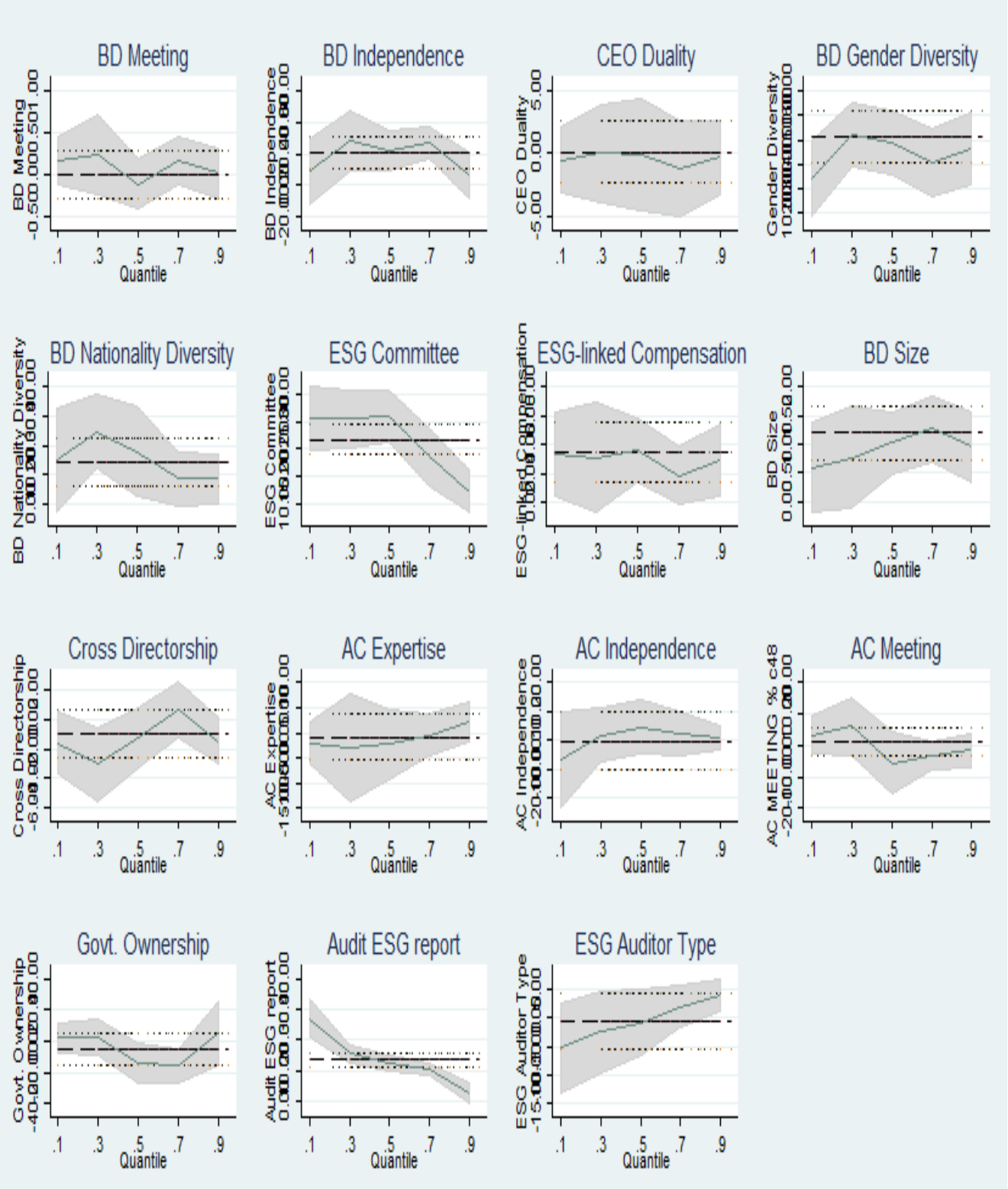
LIST OF FIGURES

Figure 3.1: PQR Graph on CG-CEP Relationship for All Countries (Combined)



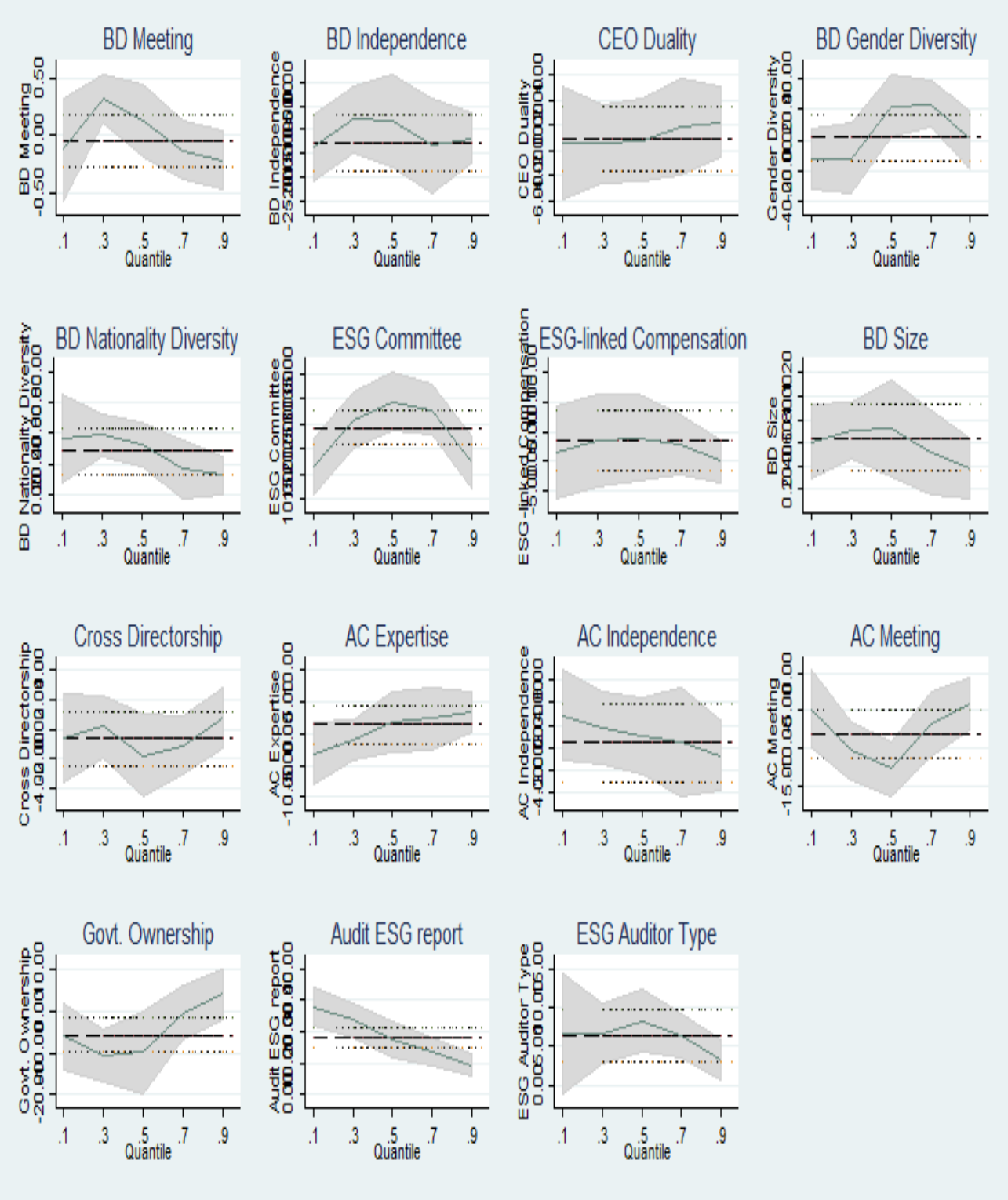
This Figure (Figure 3.1) graphically shows the relationship between corporate governance (CG) mechanisms and corporate environmental performance (CEP) at the aggregate level for the baseline result. Linear model results (OLS) are represented by the straight solid lines in the graphs, while OLS standard errors are depicted by the straight dotted lines surrounding the solid lines. The PQR graphs are represented by the undulating lines, and the PQR standard errors by the grey oscillating lines, clearly showing that the relationship between the CG variables and CEP is curvilinear.

Figure 3.2: PQR Graph on CG-CEP Relationship for America Region



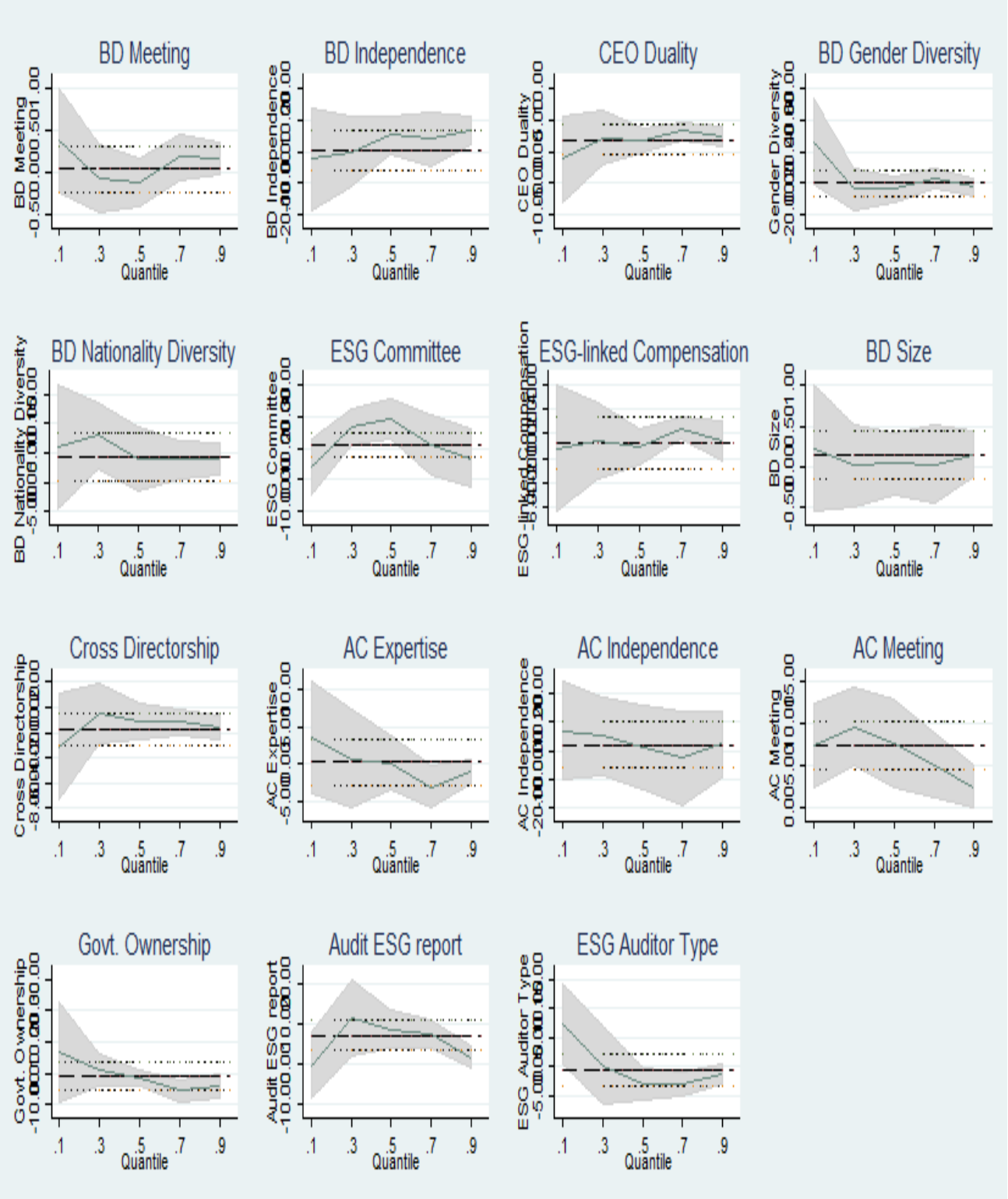
This Figure (Figure 3.2) graphically shows the relationship between corporate governance (CG) mechanisms and corporate environmental performance (CEP) for the America region. Linear model results (OLS) are represented by the straight solid lines in the graphs, while OLS standard errors are depicted by the straight dotted lines surrounding the solid lines. The PQR graphs are represented by the undulating lines, and the PQR standard errors by the grey oscillating lines, clearly showing that the relationship between the CG variables and CEP is curvilinear.

Figure 3.3: PQR Graph on CG-CEP Relationship for Asia Pacific Region



This Figure (Figure 3.3) graphically shows the relationship between corporate governance (CG) mechanisms and corporate environmental performance (CEP) for the Asia Pacific region. Linear model results (OLS) are represented by the straight solid lines in the graphs, while OLS standard errors are depicted by the straight dotted lines surrounding the solid lines. The PQR graphs are represented by the undulating lines, and the PQR standard errors by the grey oscillating lines, clearly showing that the relationship between the CG variables and CEP is curvilinear.

Figure 3.4: PQR Graph on CG-CEP Relationship for Western Europe Region



This Figure (Figure 3.4) graphically shows the relationship between corporate governance (CG) mechanisms and corporate environmental performance (CEP) for the Western Europe region. Linear model results (OLS) are represented by the straight solid lines in the graphs, while OLS standard errors are depicted by the straight dotted lines surrounding the solid lines. The PQR graphs are represented by the undulating lines, and the PQR standard errors by the grey oscillating lines, clearly showing that the relationship between the CG variables and CEP is curvilinear.

Chapter Four: Research Paper 3

Does Board Diversity Improve ESG Performance? Evidence From Top Multinational Entities in The MDGs And SDGs Era

Chapter 4: Does Board Diversity Improve ESG Performance? Evidence From Top Multinational Entities in The MDGs And SDGs Era

Abstract

This study investigates the impact of board diversity (namely board nationality diversity, board gender diversity, and board skills diversity) on ESG performance using a sample of Forbes 500 top multinational entities (MNEs), spanning 45 industries, 36 countries and 5 geographical regions, covering a 15-year period (2006-2020) of the millennium development goals (MDGs) era and sustainable development goals (SDGs) era. Fixed effect linear regression, two-stage least squares (2SLS)/ instrumental variable (IV) regression, and propensity score matching were used to analyse data. Results show that at the aggregate level, board nationality diversity, board gender diversity, and board skills diversity are positively associated with ESG performance, with board nationality diversity emerging as the foremost determinant. When disaggregated into industries, the impact of board nationality diversity and board skills diversity on ESG performance is greater in the non-financial industry, whereas the impact of board gender diversity is more in the financial industry. When assessed from the standpoint of the MDGs/SDGs era, board nationality diversity and board skills diversity have greater impact on ESG performance in the MDGs era (2006-2015), whilst the impact of board gender diversity is more in the SDGs era (2016-2020). The impact of board diversity differs by geographical regions. Whilst board gender diversity emerged as the strongest determinant of ESG performance in two regions (America and, Middle East and North Africa, MENA regions), board skills diversity is the strongest determinant in Asia Pacific and Western Europe regions. Board nationality diversity is the only notable determinant of ESG performance in the Europe and Central Asia (ECA) region. Overall, the study concludes that board diversity is an effective strategy for improving ESG performance.

Keywords: critical mass theory; ESG performance; gender diversity; nationality diversity; skills diversity; sustainable development goals (SDGs)

4.1 Introduction

The debate on improving corporate board performance, with a view towards achieving environmental, social and governance (ESG) outcomes, is yet to abate (e.g., Birkey et al., 2016; Elamer et al., 2019; Simpson et al., 2022). The clamour for strengthening corporate governance and ESG performance stems from the myriads of sustainable challenges confronting the environment and societies all over the world—expressed in the United Nations agenda for sustainable development which aims to promote peace, progress and prosperity for people and planet in the present and future (Moses & Tauringana, 2022). Noting that the sustainable development goals (SDGs) enjoin various stakeholders (including private sector organisations) to tackle sustainability issues, scholars contend that multinational entities (MNEs) as key players in the private sector have done little in the way of contributing to the achievement of the SDGs set to lapse by 2030 (Khan et al., 2021). As top perpetrators of environmental pollution and disruptors of ecosystem (Banerjee et al., 2021; Dong et al., 2022), global companies/ top MNEs have more moral burden and ethical responsibility to vigorously tackle sustainable development challenges. Although they (MNEs) are making some efforts towards tackling sustainability challenges (Erin et al., 2022), it appears such endeavours have not yielded appreciable results as to notably improve ESG performance. Thus, the debate on improving corporate board performance with a view towards upscaling ESG performance has continued to gain traction.

A gamut of studies suggests that board diversity could be an effective strategy for strengthening board effectiveness and improving corporate ESG performance (e.g., Beji et al., 2020; Chijoke-Mgbame et al., 2020; Elsayih et al., 2021; Konadu et al., 2021; Martínez-Ferrero et al., 2021; Nuber & Velte, 2021). This stems from the argument that there is strength in diversity (Arnaboldi, et al., 2020; Oradi & E-Vahdati, 2021). Heterogeneity among board members in terms of gender, nationality, experience, affiliation, skills, and education (referred to as board diversity in the current study) can improve board performance as suggested in literature (Pandey et al., 2022; Sun et al., 2022; Dah et al., 2023). This is because diversity allows for different perspectives, fresh ideas, deeper insights, and unconventional approaches to addressing issues and tackling challenges confronting the board (Ararat et al., 2015; Yang et al., 2019). Board diversity strengthens problem-solving abilities, improves board network connection, and bolsters the public image of a firm (Chijoke-Mgbame et al., 2020; Poletti-Hughes & Dimungu-Hewage, 2022). Overall, the aim of board diversity is to cultivate a broad spectrum of characteristics in the board room for the purpose of reaping benefits such as more

effective decision-making, optimal utilisation of the talent pool available to organisations, better engagement with stakeholders and enhancement of corporate reputation (Chijoke-Mgbame et al., 2020; Oradi & E-Vahdati, 2021). The issue of board diversity is an important consideration for MNEs because they operate in different countries and are strategically positioned to recruit employees/top management team members from various countries where they operate and have presence. As such, they (MNEs) should effectively manage diversity in workforce to achieve organisational objectives.

Considering the benefits which board diversity offer, there are regulatory interventions in some jurisdictions to promote diverse boards, including nationality diversity, gender diversity and skills diversity, notably; (i) imposition of quotas on corporate boards through the mandatory requirement to appoint a minimum number of directors with different attributes (Martínez-García et al., 2022). Some countries have been moving towards promoting board diversity by imposing statutory quotas on female board representation. Countries such as Germany, France, Iceland, Norway, Israel, Belgium, India, UAE, and Spain are enforcing legislation for the promotion of gender equality and the empowerment of women in top management teams (Jamal, 2018; Bongiovanni et al., 2022; Gull et al., 2023). This resonates well with SDG 5 on gender diversity, which specifies, amongst other targets, that there should be the promotion of women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life; and (ii) promoting diversity disclosures by using the 'comply or explain' approach to ensure transparency in how an organisation is achieving diversity on the board, as well as among the workforce (Mateos de Cabo et al., 2019; Poletti-Hughes & Dimungu-Hewage, 2022). Through corporate governance codes, some countries such as the UK, Australia, Germany, the Netherlands, and Hong Kong, among others, require that corporate entities incorporate diversity as a key consideration in appointing board directors (Lepore et al., 2018). Compliance or otherwise should be disclosed in corporate reports so that stakeholders can objectively assess corporate commitment to diversity.

Overall, the object of board diversity is to strengthen board performance. Meanwhile, ESG performance is one of the well-acknowledged, objective, and independent measure of board performance because it demonstrates how an organisation has been able to manage risks (Tsang et al., 2022), strategically deploy its resources to address the needs of society and environment (Orazalin et al, 2023), and effectively manage its social contract with the society (Mahadeo et al., 2011). The ESG measures de-emphasise economic/ financial performance but focuses on non-financial and long-term measure of board performance, as well as the impact of the

organisation on the environment and society (Simpson et al., 2022). Given the profit-orientated nature of private sector organisations, corporate entities will typically want to communicate economic/ financial performance for pecuniary motives (Song & Rimmel, 2021). However, the long-term orientation and non-financial focus of ESG measures are, arguably, a truer reflection of efforts organisations make to create value for society without destroying resource availability for future generations. Investors increasingly believe that companies that perform well on ESG are less risky, better positioned for the long term and better prepared for uncertainty (Bell, 2021).

4.2 Research Context

Considering on one hand that ESG performance is a key indicator of board performance (Orazalin et al, 2023; Tsang, et al., 2023), and on the other hand that board diversity contributes to board performance (Ararat et al., 2015; Arnaboldi, et al., 2020), the association between board diversity and ESG performance has been the subject of interest among researchers and policy makers going by the growing number of studies on the subject (e.g., Firoozi & Keddie, 2021; Tsang, et al., 2023). Given that board diversity could be an effective strategy for improving corporate board performance and the well-acknowledged relevance of board diversity in the ESG performance discourse, further exploration of this topic is important as the review of literature on the subject reveals some gaps.

First, in response to the call to investigate board diversity-ESG performance nexus, most studies have focused on board gender diversity (e.g., Chijoke-Mgbame et al., 2020; Tingbani et al., 2020; Nadeem et al., 2020; Konadu et al., 2021), few others on nationality diversity (e.g., Delis et al., 2017; Fernández-Temprano & Tejerina-Gaite, 2020; Firoozi & Keddie, 2021) and very limited studies on both gender diversity and nationality diversity as determinants of environmental and social sustainability performance (e.g., Brammer et al., 2007; Carter et al., 2010; Zaid et al., 2020; Fernandes et al., 2022). Meanwhile, cognitive diversity in terms of skills, education and occupational background are important dimensions of board diversity that are understudied (Ararat et al., 2015; Fernández-Temprano & Tejerina-Gaite, 2020). However, there is a need to examine board diversity elements in an integrated manner to provide more insights into board diversity-ESG performance relationship. Given the omnibus nature of board diversity, it is the combination of various elements of board diversity that may cause notable effect in improving ESG performance (Guest, 2019; Dah et al., 2023). Thus, the simultaneous investigation of both genetic diversity (i.e., nationality diversity and gender diversity) and

cognitive diversity (i.e., skills diversity) should allow for a more comprehensive analysis of how various dimensions of board diversity impact ESG performance.

Second, most studies have either focused on a single country/ region (economic or geographic), and/or industry, (e.g., Ibrahim & Hanefah, 2016; Khan, et al., 2019; Beji et al., 2020; Chijoke-Mgbame et al., 2020; Elsayih et al., 2021; Firoozi & Keddie, 2021; Konadu et al., 2021; Martínez-Ferrero et al., 2021; Nuber & Velte, 2021; Martínez-García, et al., 2022). These studies provide limited knowledge on the association between board diversity and ESG performance, thus limiting generalisability of results and evoking calls for international studies (Zaman et al., 2020; Yao, 2022; Tsang et al., 2023). Although there are few studies examining international samples (e.g., Naciti, 2019; Fernandes et al., 2022), the scope of such studies is limited to a sector/ industry. For example, Fernandes et al.'s (2022) study focused on logistics and transportation companies, limiting result generalisation to that sector. Moreover, considering that there is difference in the nature of business, corporate structures, and manner of wealth evaluation in the financial and non-financial industries (Shu & Chiang, 2020; Tingbani, et al., 2020), it is plausible that board diversity may impact corporate performance differently in financial and non-financial firms. Meanwhile, ESG issues in financial service firms is gaining huge traction, considering the prevalence of ESG reporting practice in the sector (Jizi et al., 2014; Harun et al., 2020). However, little is known on the impact of board diversity on ESG performance in the financial industry in comparison to the non-financial industry. However, most studies have focused on non-financial firms. This buttresses the need to conduct inter-industry analysis.

Third, given the growing popularity of diversity and equality in the SDGs period (Beji et al., 2020; Erin et al., 2022), little is known about the impact of board diversity on ESG performance in the MDGs era in comparison to the SDGs era. Diversity and inclusion reverberate well in the United Nations (UN) agenda for sustainable development (United Nations, 2023). Whereas SDG 5 expressly calls for gender equality and female empowerment and more women representation, SDG 10 supports the reduction of inequalities in all respect of protected characteristics, including gender, race, ethnicity, and origin. Further, SDG 10 calls for the adoption of policies and implementation of actions that progressively achieve greater gender equality. SDG 8 on decent work and economic growth supports productive employment and decent work for all women and men, reiterating the importance of gender diversity. Further, SDG 8 requires the protection of labour rights and promoting safe and secure working environments for all workers, including migrant workers, thus strengthening nationality

diversity among workforce and top management team. SDG 4 encourages global citizenship and appreciation of cultural diversity, whilst also recognising the criticalness of culture's contribution to sustainable development, thus re-emphasizing the importance of nationality diversity. In the same vein, SDG 4 calls for more access to quality education and the acquisition of relevant skills for employment, thereby re-echoing the importance of skills diversity in workplace. Given these developments, top MNEs as important stakeholders in the SDG conversation should have started implementing policies that promote equality, inclusion and diversity among workforce and top management team since the agenda for sustainable development took effect over 7 years ago in 2016. Despite the prominence given to diversity in the UN's agenda for sustainable development, there is limited research on how board diversity has impacted ESG performance differently in the MDGs era compared to the SDGs. The limited longitudinal studies spanning the MDGs (2000-2015) and SDGs (2016-till date) era did not decompose the result into these periods (e.g., Nuber & Velte, 2021; Konadu et al., 2021; Elsayih et al., 2021; Gull et al., 2023). Nevertheless, comparing the impact of board-diversity on ESG performance in the MDGs and SDGs period is important in appraising the efforts of MNEs in achieving the agenda for sustainable development.

Fourth, theoretically, studies have predominantly applied stakeholder theory, legitimacy theory and resource-based view theory to posit the influence of board diversity on ESG performance (e.g., Khan et al., 2019; Fernández-Temprano & Tejerina-Gaite, 2020), leaving out critical mass theory. Whilst not disregarding or downplaying the importance of these theories, the multi-theoretic approach to examining the board diversity-ESG performance nexus requires that alternative theories are rigorously investigated to validate applicability. Given that the critical mass theory has been under-researched, more empirical studies supporting or refuting the theory are required. In the meantime, the critical mass theory is an important theoretical consideration arguably underpinning the extent to which the level of board diversity may engender board performance and ESG practice. When a group of people adopt a common behaviour, they constitute a 'critical mass' that can influence decisions, behaviours or bring about social change because of the strength of their numbers (Pajuste et al., 2022). The critical mass theory assumes that interdependent decisions by a group of people could lead to collective actions, as critical and sizable number of people are needed to effect policy changes (Chijoke-Mgbame et al., 2020). Within the context of the current study, board diversity may have to reach certain threshold, and board members from diverse backgrounds would have to constitute a 'critical mass' before they can effect desired changes on the board as to appreciably affect

ESG performance (Oradi & E-Vahdati, 2021). Whilst limited studies have applied the critical mass theory concerning board diversity-ESG performance, the few studies have applied it within the context of board gender diversity (e.g., Chijoke-Mgbame et al., 2020; Nuber & Velte, 2021; Konadu et al., 2021; Gull et al., 2023). However, it is important to assess the validity or otherwise of the critical mass theory within the broader context of other dimensions of board diversity.

Against this backdrop, the aim of the current study is to investigate the impact of board diversity on ESG performance. We focus on three dimensions of board diversity, notably board nationality diversity, board gender diversity and board skills diversity. Their selection is informed by the consideration that they have been documented in literature as important dimensions of diversity (Guest, 2019; Konadu et al., 2021; Firoozi & Keddie, 2021; Fernández-Temprano & Tejerina-Gaite, 2020). Further, they have been stressed in the UN agenda for sustainable development as critical factors for achieving sustainable development, especially SDG 4 (quality education), SDG 5 (gender equality), SDG 8 (decent work and economic growth), and SDG 10 (reduced inequality). Finally, their selection is underpinned by their interrelatedness, as well as their comprehensiveness in capturing various dimensions of genetical and cognitive diversity (Ciavarella, 2017).

From the analysis of empirical evidence from Forbes 500 MNEs, result shows that at the aggregate level, board nationality diversity, board gender diversity, and board skills diversity are positively associated with ESG performance, with board nationality diversity emerging as the foremost determinant. When disaggregated into industries, the impact of board nationality diversity and board skills diversity on ESG performance is greater in the non-financial industry, whereas the impact of board gender diversity is more in the financial industry. When assessed from the standpoint of the MDGs/SDGs era, board nationality diversity and board skills diversity have greater impact on ESG performance in the MDGs era in comparison to the SDGs era, whilst the impact of board gender diversity is more in the SDGs era than the MDGs era. Results also show that the impact of board diversity dimensions differs by geographical regions. Whilst board gender diversity emerged as the strongest determinant of ESG performance in two regions (America and, Middle East and North Africa, MENA regions), board skills diversity is the strongest determinant in Asia Pacific and Western Europe regions. Board nationality diversity is the only notable determinant of ESG performance in the Europe and Central Asia region. In terms of the critical mass theory, a critical mass of at least two foreign directors needs to be reached to improve ESG performance, whilst a critical mass of

three female directors would have to be attained to drive ESG performance. For board skills diversity, the presence of at least one knowledgeable director improves ESG performance, although the inclusion of more numbers of knowledgeable director progressively improves ESG performance. Overall, the study concludes that board diversity is an effective strategy for improving ESG performance.

The study contributes to knowledge in several ways within the context of the research gaps. It addresses the first research gap by concurrently investigating the impact of various dimensions of board diversity (i.e., board nationality diversity, board gender diversity, and board skills diversity) on ESG performance. It specifically adds to the limited literature on the relevance of under-researched elements of board diversity (board nationality and board skills diversity) on ESG performance.

The study tackles the second research gap by investigating the subject in an international context in both financial and non-financial firms. Whereas most prior studies have been limited to a country, geographical region and or industry, the international approach adopted by analysing evidence from 481 MNEs spanning 45 industries, 36 countries and 5 geographical regions enhances the generalisability of result. Meanwhile, the simultaneous investigation of both genetic diversity (i.e., nationality diversity and gender diversity) and cognitive diversity (i.e., skills diversity) using international sample of top MNEs provide a more rigorous analysis of board diversity-ESG performance nexus.

The third research gap is addressed by using a longitudinal approach to assess the relationship between board diversity and ESG performance in the pre-SDGs/ MDGs era (2000-2015) and the SDGs era (2016- 2020). The study presents empirical evidence on (a) the extent to which various dimensions of board diversity has impacted ESG performance in the MDGs era differently from the SDGs era; (b) how MNEs are responding to the UN agenda for sustainable development in terms of strengthening diversity among top management team since the SDGs implementation took effect over 7 years ago; (c) efforts MNEs are making towards achieving the SDGs through board diversity with a view towards improving ESG performance, as upliftment in ESG practice would anticipatorily contribute to actualising agenda 2030 set to expire in less than 8 years from now.

The fourth research gap is addressed by using a multi-theoretical approach to explain the positive influence of board diversity on ESG performance on one hand (i.e., resource-based view theory), as well as the magnitude and significance of the impact of board diversity on

ESG performance (through the critical mass theory). The study, thus, makes contribution to theory. Whereas limited earlier studies have applied the critical mass theory within the context of gender diversity, the current study empirically validates the applicability of the critical mass to not only board gender diversity but extends it to nationality diversity and skills diversity.

The rest of the paper proceeds as follows; Section 4.3 covers literature review and hypotheses development. Next, the methodology is explained in Section 4.4. Analysis and results are presented in Section 4.5, followed by discussion of findings in Section 4.6. The paper is concluded in Section 4.7.

4.3 Literature Review and Hypotheses Development

4.3.1 Theoretical Framework

The study applies resource-based view theory and critical mass theory as theoretical framework. The choice of both theories is informed by their interrelatedness in explaining the impact of board diversity on ESG performance. Whereas the resource-based view theory underpins the argument that the resources of an organisation (in terms of nationality diversity, gender diversity and skills diversity) will contribute to board performance in the way of enhancing ESG practice, the critical mass theory explains the extent to which such resources can impact ESG performance. Studies have used multiple theories to explain determinants of ESG performance (e.g., Firoozi & Keddie, 2021; Martínez-García, et al., 2022; Orazalin et al., 2023). The theories are discussed in detail and contextualised to the study as follows:

4.3.1.1 Resource-based view Theory

The resource-based view theory states that organisations can use strategic resources uniquely available to them to create competitive advantage (Barney, 1991; Tauringana, 2021). Organisations can undertake resource audit or assets appraisal for the purpose of identifying internal resources/ assets, capacities or capabilities that can potentially deliver superior competitive advantage. Whilst threshold resources may not necessarily be a source of competitive advantage because they are the minimum required resources to operate or compete in an industry, tangible or intangible resources that are difficult to imitate (i.e., unique resources) are sources of long-term value and competitive advantage sustenance for organisations (Orazalin et al., 2023).

Considering that the resources that are available to firms are dissimilar or heterogeneous, it may be expected that different firms will have different strategies due to resource mix, as well

as differences in the manner resources are deployed to achieve competitive advantage. Firms not only seek to create competitive advantage but would want to sustain the competitive advantage into the foreseeable future (Barney, 2002; Oyewo, 2022). Therefore, the way organisations deploy resources available to them to both create and sustain the competitive advantage will be dissimilar.

Within the context of the current study, having a diverse board in terms of nationality, gender and skills could be a source of competitive advantage for a company because such an organisation can leverage on the exposure of directors from various ethnic backgrounds and cultural identities, the differences in the socio-psychological make up of male and female directors, as well as the skill mix among board members to improve board performance and overall quality of ESG practice (Guest, 2019; Bongiovanni et al., 2022). Multinational entities are particularly in an advantageous position to leverage on board diversity (in terms of nationality, gender, and skills) because the nature of their business operations, as well as their presence in different countries in the world require that they recruit employees and top management team from different countries to oversee their business operations in various parts of the world.

Further, the cosmopolitan nature of global companies requires that MNEs adopt a geocentric staffing method (i.e. a global outlook to requirement which requires hiring the best people/ most competent persons to fill positions without regard to where they come from) rather than an ethnocentric recruitment approach (i.e., hiring staff from parent company to fill all positions or vacancies all over the world where MNEs have a presence) or polycentric staffing approach (i.e., hiring locals to fill vacancies in a host country). The adoption of a geocentric staffing arrangement, which would require bringing foreign talent into a parent country and transferring/ relocating people to a new host country, naturally places MNEs at an advantageous position to acquire staff/ board members from diverse backgrounds in terms of nationality, gender, and skills as strategic assets. Whereas a local firm operating within national boundaries may not typically have the resources to hire staff/ directors from diverse backgrounds, MNEs are uniquely positioned to acquire human resources from heterogeneous settings because of the resources available to them.

In sum, the resource-based view theory supports the argument that MNEs may have the resources to hire staff and top management team members from diverse background, and this could be a source of competitive advantage to improve organisational performance, including

bolstering the quality of ESG practice. Therefore, a positive association between board diversity and ESG performance could be anticipated.

4.3.1.2 Critical Mass Theory

The critical mass theory posits that collective actions may be triggered by a group of people whose number is sufficiently noticeable to constitute a 'critical mass' that behaves differently from a typical group or population (Marwell & Oliver 1993; Chijoke-Mgbame et al., 2020; Nuber & Velte, 2021). The 'critical mass' terminology derives from physics, and it refers to amount of a substance needed to sustain a chain reaction (Meitner & Frisch, 1939; Johnstone et al., 2022). Within the context of business/ social sciences, the critical mass theory explains the conditions under which reciprocal behaviour is started within collective groups, and how reciprocal behaviour becomes self-sustaining (Pajuste et al., 2022). In diffusion of innovation studies, the critical mass is the level of acceptance a new idea would attain before the idea or innovation that is being promoted is self-sustaining. Group size, group member-interdependence and the level of communication among group members are important considerations that promote behaviour, actions or ideas that deviate from a norm (Yao, 2022). These ultimately determine how fast an idea is promoted and sustained, as well as the impact the 'critical mass' group can create in the society to cause desired changes (Pajuste et al., 2022).

The critical mass theory recognises that board diversity rate must reach a significant level before it can have an appreciable impact on board performance and the quality of ESG practice (Konadu et al., 2021; Gull et al., 2023). In other words, it is not the mere presence of directors from various nationalities, presence of female board members or presence of board members that are skilled in sustainability issues that will bring about improvement in ESG quality, but the diversity rate must reach a 'sufficient number' before it can appreciably bolster ESG performance.

Aside having a sufficient number of directors from diverse backgrounds in terms of nationality, gender and skills, directors should also have similar characteristics in terms of capabilities, commitment, goals, reputation, interests, and consensus, all of which impact the commonness of their decisions on sustainability issues. With respect to board nationality diversity, directors from diverse nationality are more likely to promote multi-perspective approach to addressing sustainability issues in comparison to monocultural boards. Regarding board gender diversity, female directors are likely to have a common interest in alleviating human sufferings and are likely to be more conscious of the environmental impact of the company activities because of

their genetic make-up of showing empathy (Sun et al., 2022). Further, the femininity nature and reputation of women in terms of caring for the vulnerable and weak in the society would cause female directors to show a common interest in promoting sustainability initiatives that improves the quality of lives in the society rather than seeking profit-maximisation for shareholders (Gull et al., 2023). In relation to board skills diversity, directors that are skilled on sustainability issues would have a common interest of promoting initiatives that will enhance ESG performance (Rao & Tilt, 2016). With these thoughts in mind, it may be expected that having sufficient number of directors across these characteristics (nationality, gender and skills) will promote ESG performance. To recap, the critical mass theory suggests that MNEs would have to hire a sufficient number of directors from diverse backgrounds in terms of nationality, gender and skills before board diversity can notably influence ESG performance. However, considering that global companies should have enough resources to recruit adequate number of directors from diverse background, it may be anticipated that board diversity will have a significant impact on ESG performance of MNEs.

4.3.2 Hypotheses Development

4.3.2.1 Board Nationality Diversity

Nationality diversity refers to having a range of people from various racial, ethnic, and cultural backgrounds, as well as various experiences, lifestyle, and interests. A diverse workforce can be an advantage for an organisation because differences in cultural background provide opportunity for different perspectives in solving problems and ultimately leading to more productive workforce (Naciti, 2019; Prencipe et al., 2022). Having a wider range of people among top management team brings value to the business because each director would have a different worldview/ cultural lens through which they see issues, and when such diversities are harmonised, they bring a different viewpoint to deliberations, strategies, and actions to be taken. The more culturally diverse the top management team is, the more access the organisation will have to various viewpoints and perspectives in resolving sustainable development challenges and executing sustainability strategies (Rao & Tilt, 2016; Naciti, 2019). Ethnically diverse teams can draw on their cultural experiences to generate ideas on overcoming sustainability challenges in the various parts of the world where MNEs have presence. A culturally diverse team is likely to have a broader view of the sustainability issues in various parts of the countries because of the multicultural exposure directors have. Such knowledge can be used to provide an array of solutions that are that relevant to the peculiar challenges of various countries/ geographical regions because of the knowledgeableness of

directors on various racial, ethnic, or cultural issues across the world. Studies have linked board nationality diversity to improved environmental and social sustainability performance (e.g., Martínez-Ferrero et al., 2021; Rao & Tilt, 2016; Firoozi & Keddie, 2021).

According to the resource-based view theory, nationality diversity can be a source of competitive advantage for MNEs because they have the resources to hire directors from diverse nationalities as strategic assets of the organisation. The experience, knowledge, multi-cultural awareness and multi-cultural sensitivity that directors from diverse nationality bring on board (which is an asset and a source of competitive advantage to the organisation), will improve the overall quality of sustainability investment decisions and strategies. Greater cultural awareness by board members strengthens their ability to formulate sustainability strategies are relevant to communities or take actions that specifically address challenges that are peculiar to a community, society or geographical region, thereby fosters better ESG outcomes. Nationally diverse boards have directors that are culturally aware and may be able to recommend environmental sustainability projects and social sustainability initiatives that are locally relevant in geographical regions and countries (Firoozi & Keddie, 2021). Thus, a positive association between board nationality diversity and ESG performance may be expected. However, according to the critical mass theory, directors from diverse nationalities must be of a sufficient number before they can significantly influence organisational policy and sustainability practice. In essence, whilst the resource-based view theory explains the positive association between board nationality diversity and ESG performance, the critical mass theory informs the proposition that board nationality diversity will significantly affect ESG performance. This discussion leads to the first hypothesis that:

> *H1: Board nationality diversity has a significant positive impact on ESG performance of MNEs.*

4.3.2.2 Board Gender Diversity

Gender diversity refers to having a mix of both male and female gender in a workforce, team or organisational setting. Biologically, the make-up of men is different from women, and socially the expectations of males differ from females (Gull et al., 2023). Whilst males are typically individuated and focused on power, achievement and status through competition, females are usually connected to communities by showing concern for the wellbeing of others and prioritising the good of society over the welfare of the individual (Poletti-Hughes & Dimungu-Hewage, 2022).

The individualistic nature of men would suggest that male-dominated boards are less likely to support sustainability projects because such investment would require resources—expenditure on sustainability projects would ultimately reduce profit drive and wealth-maximisation for owners. However, the collectivist nature of women would prompt them to support sustainability initiatives that reduce social challenges and address environmental pollution (Gull et al., 2023). Against this backdrop, it has been suggested that the presence of female directors can enhance board performance (Poletti-Hughes & Dimungu-Hewage, 2022), and should positively influence ESG outcomes (Martínez-García et al., 2022; Gull et al., 2023), whilst a having a sufficient number of female directors on top management team can significantly contribute to ESG performance (Konadu et al., 2021). The feminism nature common to female directors would encourage them to show concern for others and seek the benefits of the society rather than profit-maximisation by supporting CSR/ ESG projects.

Whilst masculinity, typical of the male gender, expresses preference for achievements, assertiveness and material rewards for success, the female gender exude femininity characterised by modesty, cooperation, caring for the weak and showing compassion (Konadu et al, 2021). These qualities may affect the type and level of sustainability projects that male and female board directors support, as well as the extent to which resources are deployed by corporate entities to fulfil their ethical and philanthropic obligations to the society. However, a balance between both gender among the top management team may enhance board performance and ESG outcomes because organisations would want to typically strike a balance between maximising returns for shareholders on one hand (which may align more with the masculine values of male directors), and addressing the negative environmental impact of the company, as well as reducing human sufferings in the society on the other hand (which resonates with feminine nature of female directors). A gender diverse board may, therefore, outperform a mono-gender or single gender-dominated board because of the balance of interest between masculinity (wealth maximisation) and femininity (seeking the welfare of the society and environment) [Martínez-García et al., 2022].

In line with the resource-based view theory, gender diversity can be a source of competitive advantage for MNEs as they have resources to hire competent male and female directors from diverse nationalities. The differences in perception, values, environmental awareness, and reputation that male and female directors bring on board is a strategic asset that can contribute to board performance and achievement of ESG outcomes. Female board members boost firm reputation and corporate board performance (Brammer, et al., 2009). Therefore, a positive

association between board gender diversity and ESG performance may be expected. Empirically, a growing number of studies have linked board gender diversity to improved environmental and social performance (e.g., Cabeza-García, et al., 2018; Nadeem et al., 2020; Tingbani et al., 2021; Konadu et al, 2021), although there are other studies reporting a negative association (e.g., Shamil et al., 2014; Cucari et al. 2018; Masud et al. 2018). This notwithstanding, the extent to which a gender-diverse board in terms of more female representation may influence ESG performance may depend on whether there is a sufficient number of female directors (Nuber & Velte, 2021; Konadu et al., 2021; Gull et al., 2023). The proportion of female directors on board may have to be sizable to constitute a critical mass before reciprocal behaviour of promoting sustainability projects can be started and sustained among female board members in line with the critical mass theory. In sum, whilst the resource-based view theory explains the positive association between board gender diversity and ESG performance, the critical mass theory stimulates the discussion that board gender diversity will significantly affect ESG performance. This leads to the next hypothesis that:

> *H2: Board gender diversity has a significant positive impact on ESG performance of MNEs.*

4.3.2.3 Board Skills Diversity

Skills diversity falls within the purview of cognitive diversity among workforce and top management team. Cognitive diversity can be beneficial in better solving of problems, greater innovation and more creativity (Issa et al., 2022). Intellectual reasoning is critical in making decisions regarding the manner organisational assets are deployed to create competitive advantage with respect to fulfilling ethical and philanthropic responsibilities to the society. In essence, it is not the mere possession of assets/ resources that causes competitive advantage, but the innovativeness with which such assets are allocated, deployed, or applied to achieve specified objectives. However, at the heart of the strategic deployment of the resources is skills/ cognitive abilities (Fernández-Temprano & Tejerina-Gaite, 2020). Therefore, skills availability and diversity are important considerations in the board diversity-ESG performance debate. The multidisciplinary and the multifaceted nature of sustainability cutting across multitude of environmental, social, governance and economic issues require that appropriate skills and adept knowledge are brought to bear in addressing the hydra-headed nature of the sustainability challenges. The extent to which board members may be able to effectively tackle sustainability challenges may depend on how knowledgeable board members are about sustainability issues

(Rao & Tilt, 2016). Directors skilled in managing sustainability challenges play a crucial role in, amongst other considerations: (a) alerting other board members on the importance of taking a proactive approach to managing sustainability; (b) raising awareness of the workforce and other stakeholders on the role of corporate entities in tacking sustainability challenges; (iii) assessing how ESG impacts organisation's strategies and financial resources, and (iv) formulating and implementing policies that ensure that the ESG intervention projects of corporate entities are relevant, timely and effective in contributing to the actualisation of the agenda for sustainable development.

Board skills and knowledge reflect in corporate sustainability policies, practices, strategies and actions, because the board is the highest level of decision-making in the organisation that sets the tone for the entire organisation in tackling sustainability challenges. Thus, the quality of skills and knowledge of board directors affects the direction of an organisation on ESG issues. Whilst a highly skill-diverse board with sufficiently knowledgeable board members on sustainability issues will have a robust response to sustainable development challenges, a board characterised by unknowledgeable, unaware, in-experienced, and unskilled board members would anticipatorily have shallow response to sustainability issues despite the availability of resources. Studies have empirically demonstrated a positive association between skills/education diversity and organisational performance (Rao & Tilt, 2016; Issa et al., 2022)

Considering that the board of the highest decision-making hierarchy in an organisation, skills diversity among board members sets the tone for managing sustainability issues and determine the degree to which ESG outcomes are achieved. Attracting and keeping directors that are skilled in various sustainability issues can increase the innovativeness of organisations in dealing with environmental and social issues because such directors can use their knowledge, skills, experience, and connections to formulate and implement sustainable development strategies. Skills diversity fosters more creativity, raises the awareness level of the board on sustainability issues, and enhances the robustness of corporate response to sustainability challenges. Studies have shown that board skills diversity contributes to board effectiveness and organisational performance (e.g., Ararat et al., 2015)

Whilst the skills, experience, and knowledge of directors in tackling ESG issues are strategic assets that can enhance ESG performance of organisations as suggested by the resource-based view theory, the degree to which skilled directors may be able to influence ESG policies and practice among board members, the workforce and other stakeholders may depend on how well

they constitute a 'critical mass' in terms of their numbers on the board of directors. In conclusion, whilst the resource-based view theory buttresses the argument for a positive association between board skills diversity and ESG performance, the critical mass theory reinforces the proposition that board skills diversity will significantly affect ESG performance if the number of skilled directors are substantial. Therefore:

> *H3: Board skills diversity has a significant positive impact on ESG performance of MNEs.*

4.4 Methodology

4.4.1 Design, Population and Sample

The current study adopts a panel research design. Panel studies are advantageous because they allow for the collection of data over a long period of time, whilst also overcoming the limitations of cross-sectional and time-series studies (Petersen, 2009). The use of panel data by the current study enables the researchers to collect both cross-sectional data and time-series data of several MNEs over a 15-year time frame (2006-2020), thus enhancing generalisability of result.

The population of the study is comprised of 2000 largest multinational entities (MNEs)/ international companies on the Forbes list 2021. The Forbes Global 2000 companies is a comprehensive list of the world's largest, most powerful public companies, as measured by revenues, profits, assets and market value. Companies on the list represent largest companies in the world that are globally visible and are closely monitored for their ESG performance. Sample selection based on visibility and size has been widely used in prior studies (e.g., Giannarakis et al., 2014; Ngu & Amran, 2019). Top 500 companies on the Forbes list were selected as sample for the study. Prior studies have extensively applied the Forbes ranking as a sampling frame (Martínez-Ferrero & García-Sánchez, 2017). There are 340 non-financial and 160 financial service firms making up the top 500 companies. After excluding 4 non-financial and 15 financial service firms with no ESG report, the final sample is made up of 336 non-financial firms and 145 financial service firms, making a total of 481 firms included in the studies (Appendix 4.1). The sample selection cuts across 45 industries (Appendix 4.1), 36 countries (Appendix 4.2) and 5 geographical regions (Appendix 4.3).

4.4.2 Variable Measurement and Data Source

4.4.2.1 Variable Measurement

(a) Dependent Variable

ESG performance was measured using ESG score as the main measurement of variable (Ioannou & Serafeim, 2012; Pekovic & Vogt, 2020), provided by Refinitiv/ DataStream. The Refinitiv/ DataStream database is reliability and applies a rigorous process in generating ESG scores (Ioannou & Serafeim, 2012; Pekovic & Vogt, 2020; Fernandes et al., 2022). The ESG score measures company's ESG performance based on verifiable reported data in the public domain across three areas of environmental, social and governance indicators (Refinitiv, 2022). The environmental pillar focuses on the environmental impact of the organisation in 3 categories of resource use (4 themes), emissions (4 themes) and environmental innovations (2 themes). The social pillar examines the impact of the organisation on the society from 4 categories of workforce (4 themes), human rights (1 theme), community (1 theme) and product responsibility (3 themes). The governance pillar considers the quality of governance as well as the structures emplaced to improve governance quality in 3 categories of management (2 themes), shareholders (2 themes) and corporate social responsibility (CSR) strategy (2 themes). Overall, there are 10 categories, 25 themes and 186 metrics (environmental = 68; social = 62; and governance = 56) making up the Refinitiv's ESG assessment (Refinitiv, 2022). The scores across the 186 metrics are combined to determine the ESG performance on a scale of 0 (lowest) to 100 (highest), indicating a positive polarity with lower score indicating low ESG performance and high score connoting high ESG performance. The Refinitiv ESG scores are data-driven, accounting for the most material industry metrics, with minimal company size and transparency biases (Refinitiv, 2022). The Refinitiv percentile rank scoring methodology, which eliminates hidden layers of calculations, also allows for the generation of ESG letter grades ranging from 'D-' for poor performance to 'A+' for excellent performance (Refinitiv, 2022). The ESG performance letter grades were converted to ESG ranking in the category of 1 (grade D-) to 12 (grade A+) and used as alternative measure of ESG performance in the current study. Prior studies have extensively used the Refinitiv database for ESG accounting research (e.g., Jain & Zaman, 2020; Seaborn et al., 2020; Firoozi & Keddie, 2021; Gull et al., 2023).

(b) Independent Variables

The independent variables were measured using existing proxies in literature (Table 4.1). Board nationality diversity was measured by the ratio of foreign directors to board size (Fernández-Temprano & Tejerina-Gaite, 2020; Firoozi & Keddie, 2021). Board gender diversity was measured by the ratio of female directors to board size (Nadeem et al., 2020; Tingbani et al., 2021), and board skills diversity was measured using the ratio of skilled and knowledgeable directors on sustainability/ESG issues to total board size (Khan et al. 2019; Fernández-Temprano & Tejerina-Gaite, 2020; Dah et al., 2023).

(c) Control Variables

4 broad categories of variables which may affect ESG performance were included as control variables viz (Table 4.1): (i) 6 firm governance variables, namely board tenure, multiple directorship, board independence, board meeting attendance rate, CEO duality, and ESG audit (Mangena et al., 2012; Field et al, 2013; Rao & Tilt, 2016); (ii) 5 firm characteristics/ attributes, notably revenue, market capitalisation, profitability, leverage, and enterprise value (Firoozi & Keddie, 2021; Tsang, et al., 2023); (iii) Period in terms of MDGs/ SDGs era; and (iv) Country Governance factors in the dimensions of economic development (Nuber & Velte, 2021) and World governance indicators (Cuadrado-Ballesteros & Bisogno, 2020). As suggested by the institutional theory (DiMaggio & Powell, 1991; Saqib et al., 2021), various country-level control variables were included in the studies because they may affect ESG performance of companies across different countries (Scott, 2004; Lewis et al., 2019). The institutional theory posits that social, economic, and political factors constitute an institutional structure of a particular environment which provides firms with advantages for engaging in specific types of activities. Businesses tend to perform more efficiently if they receive the institutional support (DiMaggio & Powell, 1991). Therefore, multinational entities (MNEs) operating in different countries with varying institutional environments will face diverse pressures to implement ESG targets (Saqib et al., 2021). In essence, heterogeneity in country-level governance factors such as Rule of Law, Regulatory Quality, Control of Corruption, Voice & Accountability, Political Stability, Government Effectiveness in enforcement of rules may encourage or dissuade corporate entities from engaging in various ESG activities, which may impact their ESG performance. It is therefore important to control for the impact of country environmental factors on ESG performance in line with the institutional theory.

4.4.3 Data Sources

Secondary data covering a 15-year period (2006-2020) were collected from multiple sources such as Refinitiv/ DataStream database, company annual reports, BoardEx (https://www.boardex.com), world bank database and Transparency International database (Seaborn et al., 2020; Firoozi & Keddie, 2021; Gull et al., 2023). The final sample of 481 firms resulted into 6,200 firm year observations, made up of 4,530 observations for non-financial firms and 1,670 observations for financial firms (Table 4.2). When split into the MDGs era (2006-2015) and SDGs era (2016-2020), there were 3,930 observations for the MDGs era, and 2,270 observations for the SDGs era (Table 4.3). Based on geographical regions, the firm-year observations were as follows for the respective regions: America region (2,653), Asia Pacific (1,908), Western Europe (1,480), Europe and Central Asia, ECA (84), and Middle East and North Africa, MENA (75). Summary of variable measurement, supporting literature and data source is presented in Table 4.1.

<insert Table 4.1 about here>

4.4.4 Model Specification

Consistent with prior studies (e.g., Tingbani et al., 2020; Gull et al., 2023), a panel multivariate regression analysis between the ESG performance, board diversity variables and the control variables was performed. The regression model for the study is specified as follows:

$$ESGP_{it} = \beta_0 + \beta_1 BND_{it} + \beta_2 BGD_{it} + \beta_3 BSD_{it} + \beta_4 TNR_{it} + \beta_5 MTD_{it} + \beta_6 IND_{it} + \beta_7 MTA_{it} + \beta_8 CDU_{it} + \beta_9 AUD_{it} + \beta_{10} REV_{it} + \beta_{11} MKT_{it} + \beta_{12} PRF_{it} + \beta_{13} LEV_{it} + \beta_{14} ETV_{it} + \beta_{15} ERA_{it} + \beta_{16} DEV_{it} + \beta_{17} WGI_{it} + €_{it} \quad \textit{(Eq. 4.1)}$$

Variable definitions and acronyms are defined in Table 4.1.

4.4.5 Methods for Data Analysis

Descriptive statistics was used to explore the characteristics of study variables. Independent sample t-test was applied to assess the extent to difference in ESG performance, board diversity and control variables between non-financial and financial service firms (Table 4.2), as well as the extent to which the variables differ in their descriptive attributes in the MDGs/SDGs era (Table 4.3). Analysis of Variance (ANOVA) was applied to examine extent of difference

among companies across geographical regions (Table 4.4). Correlation analysis was performed to assess multicollinearity (Table 4.5). Analysis using Hausman test establishes that a fixed effect regression model is a better fit and produces more reliable result than a random effect model. On this basis, result of fixed effect linear regression is reported. To check the robustness of result and alleviate endogeneity concerns, two-stage least squares (2SLS)/ instrumental variable (IV) regression, and propensity score matching (PSM) regression analysis were performed (Tingbani et al., 2020; Konadu et al., 2021; Gull et al., 2023).

4.5 Results and Analysis

4.5.1 Descriptive analysis and Multicollinearity Test

Descriptive analysis of variables, disaggregated into industry type, MDGs/ SDGs era and geographical regions is presented in Table 4.2, Table 4.3, and Table 4.4 respectively.

<insert Table 4.2 about here>

<insert Table 4.3 about here>

<insert Table 4.4 about here>

Result shows that firms differ in their ESG performance, board diversity level, corporate governance mechanisms and firm attributes at the industry level (Table 4.2), in the MDGs and SDGs era (Table 4.3) and across geographical regions (Table 4.4). These heterogeneities provide a robust context for examining the impact of various dimensions of board diversity on ESG performance in an international context over a long-time frame.

<insert Table 4.5 about here>

Correlation matrix in Table 4.5 shows that multicollinearity is not a serious concern as the correlation coefficients are generally low among the variables (Tingbani et al., 2020)

4.5.2 Baseline Result: Impact of Board Diversity on ESG Performance

The baseline result on the impact of board diversity variables on ESG performance, combined for both non-financial and financial firms, is presented in Table 4.6. The analysis is conducted using the main measure of ESG performance (ESG score), alternative measure of ESG

performance (ESG ranking/ letter grade) and the elements of ESG performance (i.e., environmental, social and governance).

<insert Table 4.6 about here>

Result (Table 4.6) shows that board nationality diversity, board gender diversity, and board skills diversity are positively and significantly associated with the main measurement of ESG performance (ESG score), as well as the alternative measure of ESG performance (ESG ranking). Going by the effect size of the coefficients, board nationality diversity emerged as the foremost determinant of ESG performance under the model that applied ESG score as the dependent variable. The result supports the acceptance of H1, H2 and H3. With respect to the impact of the board diversity factors on the individual components of ESG performance, board nationality diversity and board skills diversity consistently evince a positive impact across the three dimensions of environmental, social and governance, whilst the impact of board gender diversity is positive for social and governance dimensions. Taken together, the result supports the conclusion that board nationality diversity, board gender diversity, and board skills diversity enhance ESG performance. Results also show that corporate governance mechanisms, included as control variables in the study, such as board tenure, board independence, board meeting and ESG Audit are drivers of ESG performance, whereas multiple directorship and CEO duality erode ESG performance judging from the coefficients of the variables using both ESG score and ESG ranking as measures of ESG performance (Table 4.6).

Firm-level characteristics such as Revenue and Enterprise Value have a significant positive impact on ESG performance, suggesting that firm size and resource availability affect the quality/robustness of ESG initiatives implemented by companies as suggested by the resource-based view theory (Table 4.6). The significant negative impact of profitability on ESG performance could be interpreted to mean that highly profitable companies are less committed to implementing ESG initiatives, possibly because of the capital-intensive nature of ESG projects which may not generate immediate gain in terms of enhancing profitability but could erode profitability in the short tun. However, the long-term nature of ESG projects and the subsequent benefits to future generation should motivate MNEs to do more in terms of supporting sustainability initiatives. The negative impact of Leverage on ESG performance reveals that highly geared companies may be unable to extensively implement ESG projects, possibly because of high-debt servicing cost which drains the availability of financial resources

to fund ESG projects that typically require huge funding to implement. The MDGs/ SDGs dichotomy is positively associated with both the ESG score and ESG ranking (Table 4.6), implying that ESG performance generally improved in the SDGs era in comparison to the MDGs era.

4.5.3 Impact of Board Diversity on ESG performance in the Financial and Non-financial Industries

The baseline result in Table 4.6 combines the analysis for the non-financial and financial companies. To examine the extent to which the result differs based on industry type, we split our sample into non-financial and financial firms and rerun the analysis using the main measurement of ESG performance (i.e., the ESG score). The result is presented in Table 4.7.

<insert Table 4.7 about here>

From the result in Table 4.7, board nationality diversity, board gender diversity and board skills diversity are positively associated with ESG performance in both non-financial and financial firms, although board nationality diversity is not statistically significant in the financial industry. In terms of the magnitude of the impact of the board diversity variables on ESG performance, the impact of board nationality diversity and board skills diversity is greater in the non-financial industry in comparison to the financial industry, whereas the impact of board gender diversity is more in the financial industry.

With respect to the contribution of corporate governance factors in enhancing ESG performance, the impact of the positive drivers of ESG performance such as board tenure, board independence, and ESG Audit is more in the financial industry in comparison to the non-financial industry (Table 4.7). It appears, therefore, that financial institutions have generally emplaced more robust governance mechanisms to improve ESG performance in comparison to the non-financial firms as evidenced by higher board gender diversity, board independence, and board meeting attendance levels in the financial industry, as well as downplaying of CEO/Chairperson duality in the financial industry (Table 4.2). This partly explains why the coefficient of determination (R^2) in the financial industry (R^2 = 51.74%) is generally higher than the non-financial industry (R^2 = 44.75%).

The significant positive impact of Revenue and Enterprise Value in both industries corroborates the argument that resource availability affects the implementation level of ESG projects in line with the resource-based view theory. The negative impact of leverage on ESG

performance in both industries is consistent with the baseline result which suggests that highly geared companies may be constrained in implementing extensive ESG projects due to limited supply of financial resources because of high debt servicing cost. The MDGs/ SDGs dichotomy is also positively associated with ESG performance, confirming that ESG performance generally improved in the post-MDGs/ the SDGs era in both the non-financial and financial industries.

4.5.4 Impact of Board Diversity on ESG performance in the MDGs and SDGs Era

The baseline result (Table 4.6), as well as the analysis of results by industries (Table 4.7) show that the MDGs/ SDGs dichotomy is positively associated with ESG performance, confirming that ESG performance generally improved in the SDGs era in comparison to the MDGs era in both the non-financial and financial industries. This is consistent with the result in Table 4.3 with higher ESG score in the SDGs era (M = 66.95) than the MDGs era (M = 58.17). The same is true of the ESG ranking in the SDGs era (M = 8.53) when compared to the MDGs era (M = 7.50) [Table 4.3]. To closely examine the extent to which board diversity variables affect ESG performance in the MDGs and SDGs era, additional analysis was conducted, and the result reported in Table 4.8.

<insert Table 4.8 about here>

Result in Table 4.8 shows that board nationality diversity, board gender diversity, and board skills diversity have significant positive impact on ESG performance in both the MDGs and SDGs era. The result is consistent with the baseline result (Table 4.6), and the analysis of result by industries (Table 4.7), thus providing further grounds for the acceptance of H1, H2 and H3. Comparing the effect size of the coefficients of the variables reveals that board nationality diversity and board skills diversity have greater impact on ESG performance in the MDGs era in comparison to the SDGs era, whilst the impact of board gender diversity is more in the SDGs era in comparison to the MDGs era (Table 4.8). Overall, it appears MNEs have done more in strengthening board diversity to improve ESG performance in the MDGs era than in the SDGs era. This proposition is supported by the result that the coefficient of determination (R^2) is higher in the MDGs era (R^2 = 32.45%) than the SDGs era (R^2 = 25.96%). Revenue and Enterprise Value have positive impact on ESG performance, thereby confirming that firm size

and resource availability affect the commitment of MNEs to implement robust ESG projects according to the resource-based view theory.

4.5.5 Impact of Board Diversity on ESG performance based on Geographical Regions

The result on the impact of board diversity on ESG performance based on geographical regions is presented in Table 4.9.

<insert Table 4.9 about here>

Result in Table 4.9 shows that in the America region, board nationality diversity, board gender diversity and board skills diversity are positively associated with ESG performance, with board gender diversity exerting the greatest impact. However, in the Asia Pacific region, board skills diversity is positively associated with ESG performance, whilst the impact of board nationality diversity and board gender diversity is not significant. In the Western Europe Region, board nationality diversity and board skills diversity are positively associated with ESG performance, whilst board gender diversity has no impact. In Europe and Central Asia (ECA) region, board nationality diversity is the only dimension of board diversity exerting significant positive impact on ESG performance, whilst gender diversity is a notable determinant in the Middle East and North Africa (MENA) region. Overall, whilst board gender diversity emerged as the strongest determinant of ESG performance in two regions (America and MENA regions), board skills diversity is the strongest determinant in Asia Pacific and Western Europe regions. Board nationality diversity is the only determinant of ESG performance in the Europe and Central Asia region. The result establishes that the impact of board diversity differs by geographical regions.

The significant positive impact of Revenue and Enterprise Value on ESG performance in some regions corroborates the submission that bigger organisations with more resources may be able to implement more sustainability projects and achieve better ESG performance in line with the resource-based view theory. The significant negative impact of leverage on ESG performance in all regions except the America region confirms that high debt level reduces the availability of resources to invest in ESG projects, thus validating the argument that resource availability affects the capacity of MNEs to invest in ESG projects. The significant negative impact of profitability on ESG performance in the Western Europe and MENA regions establish that

MNEs may want to reduce investment in ESG projects because the resource requirements of such projects may affect profitability in the short run. In all regions except the MENA region, the MDGs/ SDGs dichotomy is positively associated with ESG performance, establishing further that ESG performance generally improved in the SDGs era in comparison to the MDGs era.

The positive impact of economic development on ESG performance in the America, Asia Pacific and Western Europe regions connotes that economically prosperous countries will have more resources to finance sustainability projects, as majority of the MNEs are based in countries within these regions that have higher level of economic development in comparison to countries located in the ECA and MENA regions (Appendix 4.2 and Appendix 4.3). The assertion that the top MNEs are in more economically prosperous countries is confirmed by the result in Table 4.3 in which firms in America region (M = USD 107,491.52 Million), and Western Europe region (M = USD 95,427.14 Million) have higher average enterprise values in comparison to firms in the ECA region (M = USD 75,304.21 Million) and MENA region (M = USD 71,844.71 Million).

4.5.6 Robustness Check

4.5.6.1 Treatment of Endogeneity using two-stage least squares (2SLS)/ instrumental variable regression with fixed effect analysis

Whereas nationality diversity may affect ESG performance, there is the possibility that the need to bolster ESG performance may also affect board nationality diversity, thereby creating reverse causality bias. The need to improve ESG performance may influence the decision of organisations to recruit competent directors from diverse nationalities on their boards to seek legitimacy from stakeholders (Pajuste et al., 2022; Gull et al.,2023). In essence, the quest to enhance organisational performance may cause companies to headhunt directors from diverse background because incorporating diverse leadership (including nationality diversity) is one of the strategies for improving organisational performance (Pajuste et al., 2022). This suggests that the presence of foreign directors on the board may affect ESG performance or vice versa, causing reverse causality.

To address potential simultaneity endogeneity bias between ESG performance and board nationality diversity, two-stage least squares (2SLS)/ instrumental variable (IV) regression was employed. Three variables were used as the instrument for board nationality diversity, namely

(i) executive director (ED) nationality diversity, measured as the ratio of executive directors from diverse nationalities to total executive board members; (ii) board size, measured as total number of board members; and (iii) strictly independent directors on the board, measured as the ratio of independent directors to total board size. These three variables were selected because they affect board nationality diversity ratio. Prior studies have used a similar approach to address endogeneity problems (Tingbani et al., 2020; Konadu et al., 2021). To assess the appropriateness and strength of the instrumental variables, we carried out diagnostics test for Under-identification using the Anderson canonical correlation LM statistic, whilst weak identification test was conducted using Stock-Yogo weak ID test (Stock and Yogo, 2005). The result of the test suggests that the model is not under-identified since the chi-square p value < 0.01 for both measures of ESG performance (i.e., ESG score and ESG ranking). For the weak identification test, the Cragg Donald Wald F statistics (65.38) is greater than each of the Stock-Yogo weak ID test critical values for both measures of ESG performance. The results confirm that the instrumental variables are valid predictors for the endogenous variables in the regression equation. The IV regression was run using the main measurement of ESG performance (ESG score) and the alternative measure (ESG ranking). The result of the analysis is presented in Table 4.10.

<insert Table 4.10 about here>

Result of the 2SLS/ IV regression in Table 4.10 is consistent with the baseline result in Table 4.6 in which board nationality diversity, board gender diversity and board skills diversity are positively associated with ESG performance, with board nationality diversity exerting the greatest impact using both measures of ESG performance (i.e., ESG score and ESG ranking) as dependent variable. This validates the acceptance of H1, H2 and H3. The impact of the corporate governance mechanisms included as control variables also follow a similar pattern to the baseline result in terms of the direction of relation and statistical significance. Similarly, firm-level characteristics such as Revenue and Enterprise Value are positively associated with ESG performance, whilst Leverage has a negative impact on ESG performance, thus confirming the criticalness of resource availability in the execution of sustainability projects in line with the resource-based view theory. The MDGs/ SDGs dichotomy is positively associated with ESG score and ESG ranking in the 2SLS/ IV regression (Table 4.10), implying that ESG performance generally improved in the SDGs era in comparison to the MDGs era as earlier revealed by the baseline result in Table 4.6.

The coefficient of determination of the model in Table 4.10 (R^2 = 43.65% for ESG score and R^2 = 30.59% for ESG ranking) also has a comparable effect size with the baseline result in Table 4.6 (R^2 = 46.09% for ESG score and R^2 = 44.53% for ESG ranking), connoting that the combination of board diversity, corporate governance variables, and other control variables jointly predict about 30.59% to 43.65% of the variation in ESG performance of MNEs. The result is therefore robust to endogeneity bias.

4.5.6.2 Treatment of Endogeneity using Propensity Score Matching Regression

To further address endogeneity concern between ESG performance and board nationality diversity, propensity score matching (PSM) regression analysis with fixed effect was employed in line with prior studies (see Peel, 2018; Tawiah et al., 2022). Using the median score of board nationality diversity at 9.44%, firms were split into two groups of those with high board nationality diversity level (the treatment group with median/ above-median board nationality diversity rate) and those with moderate/low board nationality diversity level (the control group with below-median board nationality diversity rate) (Ciavarella, 2017). Thereafter, the propensity scores (pscore) of board nationality diversity (i.e., probability of being assigned to a treatment or control group) were generated by regressing four covariates/ instruments of board nationality diversity [i.e., (i) executive director (ED) nationality diversity; (ii) board size; (iii) strictly independent directors on the board, measured as the ratio of independent directors to total board size; and (iv) presence of ESG committee] on the binary categorisation of board nationality diversity (using code '0' for control group, and code '1' for treatment group). This procedure alleviates potential endogeneity, whilst also minimising likely model misspecification (Peel, 2018; Tawiah et al., 2022). The propensity scores generated by the process were then substituted for board nationality diversity, and the regression was rerun using both ESG score and ESG ranking as measures of ESG performance. The procedure generated 1,734 cases for the treatment group and 4,466 cases for the control group. The result of the analysis is presented in Table 4.11.

<insert Table 4.11 about here>

Result of the PSM regression in Table 4.11 compares with the baseline result in Table 4.6, with the emergence of board nationality diversity, board gender diversity and board skills diversity as significant positive drivers of ESG performance. Board nationality diversity emerged as the foremost driver of ESG performance under both measures of the dependent variable (i.e., ESG

score and ESG ranking). The result supports the acceptance of H1, H2 and H3. The impact of governance mechanisms on ESG performance included as control variables (Table 4.11) is consistent with the baseline result with respect to the direction, magnitude, and statistical significance of the coefficients (Table 4.6). The positive impact of Revenue and Enterprise Value and the negative impact of leverage on ESG performance confirms that the availability of resources affect the implementation of sustainability projects according to the resource-based view theory. The negative impact of profitability on ESG performance shows that highly profitable firms may want to minimise investment in sustainability projects to maximise profit for owners. The MDGs/ SDGs dichotomy is positively associated with ESG score and ESG ranking in the PSM regression analysis (Table 4.10), implying that ESG performance generally improved in the SDGs era in comparison to the MDGs era as earlier revealed by the baseline result in Table 4.6. The coefficient of determination of the model in Table 4.11 (R^2 = 46.56% for ESG score and R^2 = 44.93% for ESG ranking) also has a comparable effect size with the baseline result in Table 4.6 (R^2 = 46.09% for ESG score and R^2 = 44.53% for ESG ranking). The result is therefore robust to endogeneity bias using the PSM regression approach.

4.5.6.3 Robustness Check using Alternative Measure of Board Diversity

To further check the robustness of result to alternative measure of variable, the Blau index for board nationality diversity was computed (Khan et al. 2019; Issa et al., 2022; Pandey et al., 2022; Gull et al., 2023). Using the median score of board nationality diversity, we split the sample into two groups (Ciavarella, 2017), and thereafter computed the Blau index of heterogeneity for board nationality diversity. The regression analysis was re-run using the Blau index of board nationality diversity with both ESG score and ESG ranking applied as measures of ESG performance. The result of the analysis is reported in Table 4.12.

<insert Table 4.12 about here>

Result of Table 4.12 is consistent with the baseline result (Table 4.6) in which board nationality diversity, board gender diversity and board skills diversity are positively and significantly associated with ESG performance using both measures of ESG performance (i.e., ESG score and ESG ranking). Furthermore, board nationality diversity has the greatest positive impact under both measures (i.e., ESG score and ESG ranking). This validates the acceptance of H1, H2 and H3, thereby corroborating the claim that the result is robust to alternative measure of variables.

4.5.6.4 Further Robustness Check: Testing the Critical Mass Theory

To conduct further robustness check on the critical mass theory, the impact of the three board diversity dimensions on ESG performance were assessed using the binary classifications of board nationality diversity, board gender diversity and board skills diversity at three levels to represent progression in critical mass.

For board nationality diversity, if there is at least one director with a foreign nationality, a code of 1 is assigned, else 0 is ascribed (this represents the first stage of the critical mass in Model 1); if there are at least two directors with foreign nationality, code 1 is assigned, else 0 (this represents the second stage of the critical mass in Model 2); if there are at least three directors with foreign nationality, code 1 is assigned, else 0 (this represents the third stage of the critical mass in Model 3). This procedure is repeated for at least one (Model 4), two (Model 5) or three (Model 6) female directors for board gender diversity. The process of iterating the critical mass is also applied for board skills diversity with at least one (Model 7), two (Model 8) or three directors (Model 9) that are knowledgeable about sustainability/ ESG issues. Prior studies have used a similar approach to assess the impact of critical mass in ESG research (e.g., Cordeiro et al., 2020; Konadu et al., 2021; Nuber & Velte, 2021). In total, we run nine regression analysis with binary variables and controls for board nationality diversity (Models 1-3), board gender diversity (Models 4-6) and board skills diversity (Models 7-9), using ESG score as the dependent variable (results presented in Table 4.13).

<insert Table 4.13 about here>

In Model 1, the coefficient of minimum/ at least one foreign director is insignificant. The coefficients in models with at least two (Model 2), and at least three foreign directors (Model 3) are positive and highly statistically significant ($p < 0.01$). This implies that a critical mass of at least two foreign directors needs to be reached to improve ESG performance. In Model 4 (Model 5), the coefficient of minimum/ at least one female director (minimum/ at least two female directors) is insignificant, whereas the coefficient of minimum/at least three female directors in Model 6 is positive and highly statistically significant ($p < 0.01$). Furthermore, the effect size of the coefficient in Model 6 is notable and economically significant in comparison to coefficients of Model 4 and Model 5. This implies that a critical mass of at least three female directors needs to be reached to improve ESG performance.

For board skills diversity, although result shows that the presence of at least one knowledgeable director significantly affects ESG performance (Model 7), each inclusion of a knowledgeable

director progressively improves ESG performance as shown in Model 8 and Model 9, thereby buttressing the argument that the extent to which the board may be able to effectively tackle sustainability challenges may depend on having sufficient number of knowledgeable board members on sustainability issues (Rao & Tilt, 2016). Overall, the result in Table 4.13 provides further support for the critical mass theory (Ben-Amar et al., 2017; Cordeiro et al., 2020; Konadu et al., 2021; Nuber & Velte, 2021).

4.6. Discussion of Findings

4.6.1 Impact of Board Diversity on ESG Performance

Results show that board nationality diversity, board gender diversity, and board skills diversity have significant positive impacts on ESG performance (Table 4.6). The positive impact of board nationality diversity on ESG performance is consistent with literature (e.g., Martínez-Ferrero et al., 2021; Rao & Tilt, 2016; Firoozi & Keddie, 2021), whilst the positive impact of board gender diversity on ESG performance supports the proposition that the inclusion of more female directors enhances board performance as documented in extant literature (e.g. Cabeza-García, et al., 2018; Yao, 2022). The positive impact of Board Skills Diversity on ESG performance aligns with prior studies that board skills diversity improves board and organisational performance (e.g., Rao & Tilt, 2016; Issa et al., 2022).

The positive impact of board nationality diversity, board gender diversity, and board skills diversity on ESG performance implies that board diversity is an effective strategy to improve ESG performance. Specifically, diversity is an asset to companies if well managed as suggested by the resource-based view theory, because having board members from various nationalities is an asset to companies to tap on their background and cultural diversity to improve ESG performance. Diversity in skills is also beneficial to companies because MNEs can harness such skills as strategic assets to improve ESG performance. Gender diversity is equally an effective strategy to improve ESG performance because female directors may be arguably more emphatic, more concerned for the society and more conscious of the environmental impact of the company's actions on the society, which may motivate them to support sustainability projects that alleviate human sufferings. The emergence of the board nationality diversity, board gender diversity and board skills diversity as significant drivers of ESG performance supports the critical mass theory invoked as theoretical framework for the study that increase in nationality diversity enhance ESG performance because board members from diverse

nationality may have to reach a critical mass/ constitute a significant number before they can effect changes on the board in terms of improving ESG performance. The significant impact of board gender diversity on ESG performance buttress the critical mass theory that significant number of female directors on board may be able to influence policy decisions on sustainability that contributes to achieving ESG outcomes. Relatedly, the significant positive impact of board skills diversity buttresses the argument that board members with diversity of skills in sustainability issues may have to constitute a critical mass before they can push agenda for sustainability on the board and effect positive changes in ESG issues.

4.6.2 Board Diversity and ESG Performance in the Non-financial and Financial Industries

Result shows that whereas board nationality diversity and board skills diversity have greater impact on ESG performance in the non-financial industry, the impact of board gender diversity is more in the financial industry when compared to the non-financial industry (Table 4.7). This could be attributable to the significantly higher level of board nationality diversity in the non-financial industry (M = 9.71%) in comparison to the financial industry (M = 8.78%) with F ratio of 3.960 ($p < 0.05$). In essence, board nationality diversity can appreciably influence ESG performance in the non-financial industry because of the higher level of board nationality diversity in comparison to the financial industry with a lower board nationality diversity rate. The inability of board nationality diversity to significantly influence ESG performance in the financial industry ($b = 2.303$, $p > 0.10$; Table 4.7) due to lower board nationality diversity level corroborates the critical mass theory that it is when directors from diverse nationalities constitute a critical mass on the board of directors that they will be able to influence policies, that enhance ESG performance. The result also supports the conclusion that higher board nationality level enhances ESG performance and achieving higher board diversity level is an effective strategy for improving ESG performance.

Board gender diversity has greater impact on ESG performance in the financial industry in comparison to the non-financial industry (Table 4.7) because of the significantly higher level of board gender diversity in the financial industry (M = 18.07%) in comparison to the non-financial industry (M = 16.90%) with F ratio of 11.368 ($p < 0.01$). In other words, board gender diversity can significantly influence ESG performance in the financial industry because of the higher level of board gender diversity in comparison to the non-financial industry with a lower board gender diversity rate. The result also supports the conclusion that higher board gender diversity level enhances ESG performance, and when female directors constitute a critical

mass, they can influence sustainability policies of organisations which improves ESG performance.

Although the level of board skills diversity in the financial industry (M = 46.31%) is higher than the non-financial industry (M = 46.22%), the difference is not significant (F = 0.017, p > 0.10). This explains why the difference in the impact of board skills diversity in both industries is not pronounced in Table 4.7. The result reiterates the argument that board skills diversity would have to attain a level that is high enough to constitute a critical mass before it can have an appreciable effect in enhancing ESG performance.

4.6.3 Board Diversity and ESG performance in the MDGs and SDGs Era

In Table 4.8, board nationality diversity and board skills diversity have greater impact on ESG performance in the MDGs era in comparison to the SDGs era, whilst the impact of board gender diversity is more in the SDGs era than in the MDGs era. Although it is commendable that board nationality diversity rate was higher in the SDGs era (M = 10.96%) in comparison to the MDGs era (M = 8.57%), the difference is not pronounced as to appreciably affect ESG performance. The result buttresses the argument of the critical mass theory that board nationality diversity level should reach a critical threshold before it can create an effect of improving board performance. However, the positive impact of board nationality diversity on ESG performance in both periods establish that board members from diverse nationalities are important assets/ resources that can bring about improved board performance in terms of boasting ESG outcomes as suggested by the resource-based view theory (Orazalin et al, 2023). Meanwhile, the higher nationality diversity level in the SDGs era may not be unconnected to the UN SDGs which promote more inclusiveness and diversity in public and private sector organisations. It is noteworthy that the UN SDGs is having an impact on the corporate governance structures of MNEs.

The impact of board gender diversity is more in the SDGs era when compared to the MDGs era because of the higher rate of board gender diversity in the SDGs era (M= 22.31%) in comparison to the MDGs era (M = 14.37%), and the difference is significant (F ratio = 639.584, p < 0.01). The result also buttresses the critical mass theory that more female representations on the board enhances ESG performance. The result corroborates the findings of prior studies that the impact of gender diversity is significant with two or more female directors (e.g., Chijoke-Mgbame et al., 2020; Nuber & Velte, 2021; Konadu et al., 2021; Gull et al., 2023), thus validating the critical mass theory that the presence of a reasonable number of female

directors on corporate boards significantly contributes to ESG performance. Increase in female directors on corporate board could be attributable to the UN SDGs 2030 campaign which clamours for more female representation and gender equality (SDG 5). Therefore, there is evidence from this study that MNEs are leveraging on gender diversity to improve board performance and ESG outcomes as suggested by extant literature (e.g., Nuber & Velte, 2021; Konadu et al., 2021; Gull et al., 2023). Countries are now passing legislations and strengthening corporate governance codes to encourage more female seats in top management position and workforce. Countries with high regulation and quota system have higher board gender diversity, as legislation has contributed to board gender diversity rate (Martínez-García et al., 2022; Poletti-Hughes & Dimungu-Hewage, 2022).

The higher impact of board skills diversity on ESG performance in the MDGs era than in the SDGs era (Table 4.8) could be linked to significantly higher board skills diversity level in the MDGs era in comparison to the SDGs era (MDGs era = 47.87%; SDGs era = 43.39%; F ratio = 52.741, $p < 0.01$; Table 4.3). The significant positive impact of board skills diversity empirically validates the resource-based view theory that board skills mix on sustainability is an asset for improving ESG performance. Relatedly, the greater impact of board skills diversity on ESG performance in the MDGs era (due to higher board skills diversity level in the MDGs era in comparison to the SDGs era) reiterates the importance of having a significant number of knowledgeable directors on sustainability in constituting a critical mass that can affect and effect policy changes on ESG issues to improve ESG performance.

Although the impact of board tenure on ESG performance is slightly higher in the SDGs era when compared to the MDGs era (Table 4.8), the difference is not pronounced because of the negligible difference in the Board Tenure rate in both periods. In the meantime, the generally low impact of board tenure on ESG performance in both the MDGs and SDGs era could be attributable to the low level of board tenure in board periods (Table 4.3). Multiple directorships have a greater negative impact on ESG performance in the SDGs era in comparison to the MDGs era (Table 4.8) because of the significantly higher level of multiple directorships in the SDGs era (M = 1.39) in comparison to the MDGs era (M = 1.27) in Table 4.3 (F ratio = 22.979, $p < 0.01$). The result supports the inference that multiple directorships erode ESG performance. Overall, it appears MNEs have done more in the way of strengthening board diversity to improve ESG performance in the MDGs era than in the SDGs era (Table 4.8).

4.6.4 Impact of Board Diversity on ESG performance in Geographical Regions

Result shows that board gender diversity is the strongest determinant of ESG performance in the America region (Table 4.9). This may be attributable to the relatively higher board gender diversity level in this region (M = 21.03%; Table 4.4). Board gender diversity is unable to exert significant impact on ESG performance in the Asia Pacific region and ECA (Europe and Central Asia) region because of the relatively low level of board gender diversity in those regions (Asia Pacific = 8.41%; ECA region = 6.49% in Table 4.4). This result provides empirical validation for the critical mass theory that gender diversity should be significantly high to assume a critical mass level before changes can be implemented in improving ESG performance (Chijoke-Mgbame et al., 2020; Nuber & Velte, 2021; Konadu et al., 2021; Gull et al., 2023). Although board gender diversity is also high in the Western Europe region (M = 24.04% in Table 4), there is high level of dispersion among companies in the region (SD = 13.53%), and this has whittled down the influence of board gender diversity as to significantly influence ESG performance ($b = 3.664$, $p > 0.10$ in Table 4.9). The high level of board nationality diversity and board gender diversity in the Western Europe region can be attributable to legislation and corporate governance codes in those jurisdictions (Lepore et al., 2018; Martínez-García et al., 2022; Gull et al., 2023). The positive but insignificant impact of board gender diversity in the Western Europe region suggests that board gender diversity has the potential to improve ESG performance. In the America region, board gender diversity can exert significant positive impact on ESG performance because of high gender diversity rate (M =21.03%) and a correspondingly low dispersion among companies (SD = 9.70%).

Board nationality diversity exerts significant impact on ESG performance in the America and ECA regions (Table 4.9) because of the relatively higher level of board nationality diversity in both regions as revealed by the analysis in Table 4 (America region = 5.68%; ECA = 10.57%). Conversely, board nationality diversity is unable to exert significantly on ESG performance in the Asia Pacific Region, and the Middle East and North Africa (MENA) region because of the low board nationality diversity rate in those regions (Asia Pacific region = 3.27%; MENA region = 3.46%). The impact of board nationality diversity on ESG performance is positive and significant in the Western Europe region, although the magnitude of impact is lower in the region in comparison to the America and ECA regions going by the effect size of the coefficients. This can be explained by the high rate of dispersion in board nationality diversity among MNEs in Western Europe region (SD = 25.03%) despite the high level of board nationality diversity in the region (M = 24.57%).

Whereas the positive impact of board nationality diversity on ESG performance in the America region, Western Europe region, ECA region and MENA region validates the resource-based view theory that diversity in nationality of board members is an asset that enhances board performance (Martínez-Ferrero et al., 2021; Rao & Tilt, 2016; Firoozi & Keddie, 2021), the significant impact of board nationality diversity on ESG performance in regions with relatively high board nationality diversity level (i.e., America, Western Europe, and ECA regions) upholds the critical mass theory that board nationality diversity would have to reach a notable threshold before directors from diverse nationalities can constitute a critical mass to influence board policies that bring about enhancement of ESG performance. The positive but insignificant coefficient of board nationality diversity on ESG performance in the MENA region ($b = 9.689$, $p > 0.10$; Table 4.9) owing to the low level of board nationality diversity ($M = 3.46\%$, $SD = 18.12\%$; Table 4.4) validates the assertion that it is not the mere presence of directors from diverse nationalities that contributes to ESG outcomes, but the decent-sized proportion of such board members constituting a critical mass is what brings about improvement in ESG performance.

Board skills diversity has significant impact on ESG performance in America, Asia Pacific, and Western Europe regions. This could be linked to the high rate of board skills diversity in those regions, notably America region with 48.61%, Asia Pacific region with 49.85% and Western Europe with 39.62% (Table 4.4). When the board skills diversity ratio reduced to 32.24% for the ECA region (Table 4.4), the impact of board skills diversity on ESG performance is still positive but not statistically significant ($b = 5.426$, $p > 0.10$). However, when the board skills diversity ratio reduced further to 17.32% for the MENA region (Table 4), the impact of board skills diversity on ESG performance became negative and not statistically significant ($b = -2.420$, $p > 0.10$). This result substantiates the critical mass theory that board skills diversity would have to reach certain threshold before it can significantly influence ESG performance. Meanwhile, the positive impact of board skills diversity on ESG performance validates the resource-based view theory that skill mixes on the board is an organisational asset that could contribute to achieving ESG outcomes.

The result that the MDGs/ SDGs dichotomy is positively associated with ESG performance in four regions (Table 4.9) suggests that MNEs in various regions are taking the agenda 2030 on board to strengthen board diversity with the objective of improving ESG performance. However, the insignificant impact of some board diversity dimensions in certain regions

signifies that MNEs need to do more to strengthen board diversity as a strategy for achieving SDGs.

4.7 Conclusion

This study investigates the impact of board diversity on ESG performance using an international sample of top MNEs on the Forbes 500 list. Three dimensions of board diversity covering genetic (board nationality diversity and board gender diversity) and cognitive diversity (board skills diversity) were investigated. From the analysis of empirical evidence from Forbes 500 MNEs, result shows that at the aggregate level, board nationality diversity, board gender diversity, and board skills diversity are positively associated with ESG performance, with board nationality diversity emerging as the foremost determinant. When disaggregated into industries, the impact of board nationality diversity and board skills diversity on ESG performance is greater in the non-financial industry in comparison to the financial industry, whereas the impact of board gender diversity is more in the financial industry. When assessed from the standpoint of the MDGs/SDGs era, board nationality diversity and board skills diversity have greater impact on ESG performance in the MDGs era in comparison to the SDGs era, whilst the impact of board gender diversity is more in the SDGs era than in the MDGs era. Result also shows that the impact of board diversity factors differs by geographical regions. In the America region, board nationality diversity, board gender diversity and board skills diversity are positively associated with ESG performance, with board gender diversity exerting the greatest impact. However, in the Asia Pacific Region, board skills diversity is positively associated with ESG performance, whilst the impact of board nationality diversity and board gender diversity is not significant. In the Western Europe Region, board nationality diversity and board skills diversity are positively associated with ESG performance, whilst board gender diversity has no impact. In Europe and Central Asia (ECA) region, board nationality diversity is the only dimension of board diversity exerting significant positive impact on ESG performance, whilst gender diversity is a notable determinant in the Middle East and North Africa (MENA) region. Whilst board gender diversity emerged as the strongest determinant of ESG performance in two regions (America and MENA regions), board skills diversity is the strongest determinant in Asia Pacific and Western Europe regions. Board nationality diversity is the only determinant of ESG performance in the Europe and Central Asia region. In terms of the critical mass theory, a critical mass of at least two foreign directors needs to be reached to improve ESG performance, whilst a critical mass of three female

directors would have to be attained to drive ESG performance. For board skills diversity, the presence of at least one knowledgeable director improves ESG performance, although the inclusion of more numbers of knowledgeable director progressively improves ESG performance. Overall, the study concludes that board diversity is an effective strategy for improving ESG performance. However, the result that board diversity generally improved in the SDGs era in comparison to the MDGs era suggests that MNEs have started responding to the call for diversity and inclusion by the UN agenda for sustainable development.

Drawing from the significant positive association between board diversity and ESG performance, the study recommends that companies should seek to diversify the composition of top management team/ directors the more. Noting that it is not the mere presence of directors from diverse nationalities, mix of male and female directors, or presence of skilled directors that bring about improvement in ESG performance (but reaching a significant diversity level is what causes appreciable improvement in ESG performance), the study recommends for the diversification of top management team to a reasonable level to reap the full benefits of board diversity. The result that diversity in top management team improves ESG performance informs the recommendation as well that diversity should not be limited to directorship or top management team only but should be extended or cascaded down to the organisational workforce to ensure maximum benefit. Although the current study focuses on MNEs and result shows that global companies may be strategically positioned to acquire diverse workforce, the result that board diversity is positively and significantly associated with ESG performance should motivate other organisations (including indigenous organisations) to diversify both their top management team and workforce. Acknowledging that such investment in diversity among board members, top management team, and workforce would require resources (and may impose requirements on particularly small and medium sized organisations), the long-term benefits which such investment could bring in the way of improving board performance and ESG outcomes should spur organisational commitment in this regard. This is important, considering that private sector organisations, no matter their size, can contribute in one way or the other to tackling sustainable development challenges. Drawing from the result that financial institutions have generally emplaced more robust governance mechanisms to improve ESG performance in comparison to the non-financial firms, the study recommends that non-financial institutions should do more to reinforce their governance mechanisms to improve ESG performance, as they have more moral burden as top environmental polluters to address sustainability challenges. Based on the result that MNEs have generally strengthened board

diversity to improve ESG performance in the MDGs era than in the SDGs era, the current study implores MNEs as key partners in agenda 2030 to do more in the SDGs era if they are to markedly contribute to achievement of SDGs set to expire in 2030).

Although the study analysed sample of international private sector entities, and empirically demonstrates that board diversity contributes to ESG performance, the finding of the study is also relevant for public sector organisations in terms of seeking strategies to improve board performance. As the United Nations agenda for sustainable development calls for actions by public and private sector entities, public sector organisations should also consider diversifying management team by allowing for more female representation, as well as foreign and skilled directors. Acknowledging that some countries have started promoting diversity and inclusion through legislation and imposition of quotas on workforce in both public and private sector organisations, other nations can also emulate this practice as one of their coordinated strategies as government for actualising agenda 2030.

The current study is not without its limitations. The investigation focused on globally visible companies on the Forbes 500 list. Future studies may investigate medium-tier and indigenous companies to provide a wider understanding and generalisability of result on how board diversity impacts corporate performance. The study also disaggregates the results into regions (America, Asia Pacific, Western Europe, Europe and Central Asia (ECA), and Middle East & North Africa (MENA) regions because of limited data. Future studies may focus on other regions (e.g., sub-Sahara Africa) to provide a broader view on the subject.

List of Tables

Table 4.1: Measurement of Variables and Data Source

	Variables/ Acronym	Measurement/ Supporting literature	Data sources
1	ESG performance (ESGP)	ESG score (main measurement of variable) as provided by Refinitiv, ranging from 0 (lowest score) to 100 (highest score) (Ioannou & Serafeim, 2012; Pekovic & Vogt, 2020)	Refinitiv/ DataStream database
		ESG ranking (alternative measure), derived by converting the ESG letter grades to numbers ranging from 'D-' (lowest) to 'A+' (highest). Numeric values were assigned based on the classification of D- (assigned 1) to A+ (assigned 12).	
2	Board Nationality Diversity (BND)	Ratio of directors from different countries to total board size (Fernández-Temprano & Tejerina-Gaite, 2020; Firoozi & Keddie, 2021; Fernandes et al., 2022). Has positive polarity; high ratio indicates high nationality diversity level	Refinitiv/ DataStream database & BoardEx
3	Board Gender Diversity (BGD)	Ratio of female directors to total board size (Nadeem et al., 2020; Tingbani et al., 2021). Has positive polarity; high ratio indicates high gender diversity level	
4	Board Skills Diversity (BSD)	Ratio of directors that are skilled and knowledgeable about sustainability/ESG issues to total board size (Fernández-Temprano & Tejerina-Gaite, 2020; Khan et al. 2019). Has positive polarity; high ratio indicates high skills diversity level	
5	Board Tenure (TNR)	Average number of years each director has been on the board (Fernández-Temprano & Tejerina-Gaite, 2020)	Refinitiv/ DataStream database & Annual Reports
6	Multiple Directorship (MTD)	Average number of other corporate affiliations for the board member (Field et al., 2013)	
7	Board Independence (IND)	Ratio of non-executive directors (NEDs) to total board size (Elsayih et al., 2021)	
8	Board Meeting Attendance (MTA)	Average rate of board meeting attendance per annum, expressed in % (Nuskiya et al, 2021)	
9	CEO duality (CDU)	If Chairperson also serve as the CEO =1, otherwise = 0 (Nuskiya et al, 2021)	
10	ESG Audit (AUD)	If ESG report is audited = 1, else =0 (Lu & Wang, 2021)	
11	Revenue (firm size), (REV)	Natural log of Revenue (Peel, 2018; Guest, 2019; Gull et al., 2023)	Refinitiv/ DataStream database & Annual Reports
12	Market capitalisation (market presence), (MKT)	Natural log of Market capitalisation (Elsayih et al, 2021)	
13	Firm Profitability (PRF)	Return on Total Assets ratio, ROTA (Mangena et al., 2012)	
14	Firm Leverage (LEV)	Ratio of Total Debt to Total Assets (Mangena et al., 2012; Gull et al., 2023)	
15	Enterprise Value (firm value), ETV	Natural log of Enterprise Value	
16	MDGs/ SDGs Era	MDGs period = 2006-2015; SDGs period = 2016-2020	
17	Economic Development (DEV)	Natural log of Gross Domestic Product (GDP) (Nuber & Velte, 2021)	World Bank
18	World Governance Indicators (Average of 6 items), WGI	Average of WGI Measures based on World bank data on (i)Voice & Accountability; (ii)Political Stability and Lack of Violence; (iii) Government Effectiveness; (iv)Regulatory Quality; (v) Rule of Law; and (vi) Control of Corruption (Cuadrado-Ballesteros & Bisogno, 2020)	

Table 4.2: Descriptive Analysis of Variables in the Non-Financial and Financial Industries

Variable	Industry Type	N	Mean	Std. Deviation	F ratio
ESG Score	Non-Financial	4,530	61.78	20.33	6.854***
	Financial	1,670	60.36	18.29	
	Total	6,200	61.36	19.76	
ESG Ranking	Non-Financial	4,530	7.93	2.45	8.963***
	Financial	1,670	7.74	2.21	
	Total	6,200	7.88	2.38	
Board Nationality Diversity	Non-Financial	4,530	9.71%	18.38%	3.960**
	Financial	1,670	8.78%	14.58%	
	Total	6,200	9.44%	17.35%	
Board Gender Diversity	Non-Financial	4,530	16.90%	12.84%	11.368***
	Financial	1,670	18.07%	12.52%	
	Total	6,200	17.25%	12.75%	
Board Skills Diversity	Non-Financial	4,530	46.22%	24.45%	0.017
	Financial	1,670	46.31%	23.09%	
	Total	6,200	46.25%	24.05%	
Board Tenure	Non-Financial	4,530	7.07 years	3.49 years	65.301***
	Financial	1,670	6.30 years	3.54 years	
	Total	6,200	6.84 years	3.52 years	
Multiple Directorship	Non-Financial	4,530	1.32	0.83	0.339
	Financial	1,670	1.31	1.17	
	Total	6,200	1.32	0.94	
Board Independence	Non-Financial	4,530	76.66%	22.88%	11.979***
	Financial	1,670	78.77%	21.26%	
	Total	6,200	77.29%	22.43%	
Board Meeting Attendance	Non-Financial	4,530	71.41%	35.67%	26.054***
	Financial	1,670	76.27%	33.67%	
	Total	6,200	72.85%	35.16%	
CEO Duality	Non-Financial	4,530	0.52	0.49	140.381***
	Financial	1,670	0.37	0.48	
	Total	6,200	0.48	0.50	
ESG Audit	Non-Financial	4,530	0.53	0.49	23.637***
	Financial	1,670	0.46	0.49	
	Total	6,200	0.51	0.50	
Revenue (Million' USD)	Non-Financial	4,530	4,8261.48	60,904.28	220.889***
	Financial	1,670	27,436.46	29,974.91	
	Total	6,200	41,719.77	54,032.90	
	Non-Financial	4,530	70,781.23	126,240.63	73.134***

Market Capitalisation (Million' USD)	Financial	1,670	45,729.68	49,589.27	
	Total	6,200	63,184.51	109,459.21	
Return on Total Assets	Non-Financial	4,530	7.25%	6.16%	1828.98***
	Financial	1,670	1.32%	1.64%	
	Total	6,200	5.42%	5.88%	
Leverage (Total Debt to Total Assets Ratio)	Non-Financial	4,530	26.45%	15.33%	819.132***
	Financial	1,670	15.06%	14.07%	
	Total	6,200	22.94%	15.85%	
Enterprise Value (Million' USD)	Non-Financial	4,530	84,040.52	124,756.02	19.201***
	Financial	1,670	99,545.16	145,397.31	
	Total	6,200	88,746.61	131,546.47	

*** $p < 0.01$; ** $p < 0.05$

Table 4.3: Descriptive Analysis of Variables based on the MDGs and SDGs Era

Variable	Industry Type	N	Mean	Std. Deviation	F ratio
ESG Score	MDGs Era	3,930	58.17	20.40	309.506***
	SDGs Era	2,270	66.95	17.23	
	Total	6,200	61.36	19.76	
ESG Ranking	MDGs Era	3,930	7.50	2.46	292.358***
	SDGs Era	2,270	8.53	2.09	
	Total	6,200	7.88	2.38	
Board Nationality Diversity	MDGs Era	3,930	8.57%	16.41%	28.712**
	SDGs Era	2,270	10.96%	18.79%	
	Total	6,200	9.44%	17.35%	
Board Gender Diversity	MDGs Era	3,930	14.37%	11.11%	639.584***
	SDGs Era	2,270	22.31%	13.84%	
	Total	6,200	17.25%	12.75%	
Board Skills Diversity	MDGs Era	3,930	4.78%	24.45%	52.741***
	SDGs Era	2,270	4.33%	23.05%	
	Total	6,200	4.62%	24.05%	
Board Tenure	MDGs Era	3,930	6.83 years	3.66 years	.120
	SDGs Era	2,270	6.86 years	3.26 years	
	Total	6,200	6.84 years	3.52 years	
Multiple Directorship	MDGs Era	3,930	1.27	1.02	22.979***
	SDGs Era	2,270	1.39	0.78	
	Total	6,200	1.32	0.94	
Board Independence	MDGs Era	3,930	76.45%	24.63%	16.035***
	SDGs Era	2,270	78.76%	17.82%	
	Total	6,200	77.29%	22.43%	
Board Meeting Attendance	MDGs Era	3,930	69.28%	36.70%	119.953***
	SDGs Era	2,270	79.13%	31.31%	
	Total	6,200	72.85%	35.16%	
CEO Duality	MDGs Era	3,930	0.50	0.50	16.639***
	SDGs Era	2,270	0.44	0.49	
	Total	6,200	0.48	0.50	
ESG Audit	MDGs Era	3,930	0.44	0.49	250.052***
	SDGs Era	2,270	0.64	0.48	
	Total	6,200	0.51	0.50	
Revenue (Million' USD)	MDGs Era	3,930	38,929.21	52,261.25	32.623***
	SDGs Era	2,270	46,803.58	56,779.21	
	Total	6,200	41,719.77	54,032.90	
Market Capitalisation	MDGs Era	3,930	51,022.11	61,375.23	146.750***
	SDGs Era	2,270	84,820.33	160,842.36	

(Million' USD)	Total	6,200	63,184.51	109,459.21	
Return on Total Assets	MDGs Era	3,930	5.45%	5.79%	.254
	SDGs Era	2,270	5.37%	6.03%	
	Total	6,200	5.42%	5.88%	
Leverage (Total Debt to Total Assets Ratio)	MDGs Era	3,930	22.24%	16.22%	23.792***
	SDGs Era	2,270	24.22%	15.06%	
	Total	6,200	22.94%	15.85%	
Enterprise Value (Million' USD)	MDGs Era	3,930	77,636.03	110,087.20	83.748***
	SDGs Era	2,270	108,501.37	161,006.46	
	Total	6,200	88,746.61	131,546.47	

*** $p < 0.01$; ** $p < 0.05$

Table 4.4: Descriptive Analysis of Variables based on Geographical Regions

Variable	Region	N	Mean	Std. Deviation	F ratio
ESG Score	America	2,653	60.60	18.76	246.626***
	Asia Pacific	1,908	55.28	20.96	
	Western Europe	1,480	72.66	13.81	
	Europe and Central Asia	84	50.05	18.14	
	Middle East and North Africa	75	37.27	14.61	
	Total	6,200	61.36	19.76	
ESG Ranking	America	2,653	7.78	2.28	261.169***
	Asia Pacific	1,908	7.12	2.51	
	Western Europe	1,480	9.28	1.62	
	Europe and Central Asia	84	6.44	2.20	
	Middle East and North Africa	75	4.94	1.73	
	Total	6,200	7.88	2.38	
Board Nationality Diversity	America	2,653	5.68%	11.09%	520.393***
	Asia Pacific	1,908	3.27%	8.34%	
	Western Europe	1,480	24.57%	25.03%	
	Europe and Central Asia	84	10.57%	10.96%	
	Middle East and North Africa	75	3.46%	18.12%	
	Total	6,200	9.44%	17.35%	
Board Gender Diversity	America	2,653	21.03%	9.70%	661.361***
	Asia Pacific	1,908	8.41%	10.01%	
	Western Europe	1,480	24.04%	13.53%	
	Europe and Central Asia	84	6.49%	7.89%	
	Middle East and North Africa	75	0.64%	2.33%	
	Total	6,200	17.25%	12.75%	
Board Skills Diversity	America	2,653	48.61%	21.72%	89.847**
	Asia Pacific	1,908	49.85%	26.19%	
	Western Europe	1,480	39.62%	22.55%	
	Europe and Central Asia	84	32.24%	20.85%	
	Middle East and North Africa	75	17.32%	21.56%	
	Total	6,200	46.25%	24.05%	
Board Tenure	America	2,653	8.63 years	3.29 years	415.341***
	Asia Pacific	1,908	5.33 years	3.38 years	
	Western Europe	1,480	6.12 years	2.54 years	
	Europe and Central Asia	84	4.84 years	2.70 years	
	Middle East and North Africa	75	2.12 years	2.50 years	
	Total	6,200	6.84 years	3.52 years	
Multiple Directorship	America	2,653	1.27	0.76	51.714***
	Asia Pacific	1,908	1.23	1.09	
	Western Europe	1,480	1.51	0.95	

	Europe and Central Asia	84	2.16	1.32	
	Middle East and North Africa	75	0.60	0.59	
	Total	6,200	1.32	0.94	
Board Independence	America	2,653	86.12%	10.55%	731.883***
	Asia Pacific	1,908	59.18%	25.91%	
	Western Europe	1,480	85.73%	17.79%	
	Europe and Central Asia	84	74.81%	20.65%	
	Middle East and North Africa	75	88.90%	19.64%	
	Total	6,200	77.29%	22.43%	
Board Meeting Attendance	America	2,653	77.39%	22.51%	89.617***
	Asia Pacific	1,908	64.17%	44.87%	
	Western Europe	1,480	79.68%	33.10%	
	Europe and Central Asia	84	47.95%	45.90%	
	Middle East and North Africa	75	41.60%	47.26%	
	Total	6,200	72.85%	35.16%	
CEO Duality	America	2,653	0.68	0.46	246.666***
	Asia Pacific	1,908	0.40	0.48	
	Western Europe	1,480	0.28	0.44	
	Europe and Central Asia	84	0.02	0.15	
	Middle East and North Africa	75	0.11	0.31	
	Total	6,200	0.48	0.50	
ESG Audit	America	2,653	0.34	0.47	255.198***
	Asia Pacific	1,908	0.52	0.50	
	Western Europe	1,480	0.80	0.39	
	Europe and Central Asia	84	0.49	0.50	
	Middle East and North Africa	75	0.17	0.37	
	Total	6,200	0.51	0.50	
Revenue (Million' USD)	America	2,653	41,355.43	57,938.56	23.316***
	Asia Pacific	1,908	36,577.82	48,215.71	
	Western Europe	1,480	49,809.11	53,638.25	
	Europe and Central Asia	84	65,592.68	49,460.42	
	Middle East and North Africa	75	19,085.57	49,570.63	
	Total	6,200	41,719.77	54,032.90	
Market Capitalisation (Million' USD)	America	2,653	81,037.68	139,639.63	37.102***
	Asia Pacific	1,908	45,003.95	61,469.60	
	Western Europe	1,480	54,854.26	47,311.38	
	Europe and Central Asia	84	60,857.63	46,999.68	
	Middle East and North Africa	75	89,490.45	337,928.44	
	Total	6,200	63,184.51	109,459.21	
Return on Total Assets	America	2,653	6.48%	6.16%	52.781**
	Asia Pacific	1,908	4.60%	5.52%	

	Western Europe	1,480	4.53%	5.43%	
	Europe and Central Asia	84	9.26%	7.13%	
	Middle East and North Africa	75	4.81%	5.08%	
	Total	6,200	5.42%	5.88%	
Leverage (Total Debt to Total Assets Ratio)	America	2,653	25.38%	17.01%	36.065**
	Asia Pacific	1,908	21.02%	15.62%	
	Western Europe	1,480	22.18%	13.58%	
	Europe and Central Asia	84	18.07%	14.81%	
	Middle East and North Africa	75	14.023%	9.61%	
	Total	6,200	22.94%	15.85%	
Enterprise Value (Million' USD)	America	2,653	107,491.52	157,886.30	39.203**
	Asia Pacific	1,908	61,239.25	82,297.29	
	Western Europe	1,480	95,427.14	118,139.79	
	Europe and Central Asia	84	75,304.21	61,577.59	
	Middle East and North Africa	75	71,844.71	258,619.66	
	Total	6,200	88,746.61	131,546.47	

*** $p < 0.01$; *** $p < 0.05$

Table 4.5: Correlation Matrix for Multicollinearity Test

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Board Nationality Diversity (1)	1															
Board Gender Diversity (2)	.241***	1														
Board Skills Diversity (3)	-.027**	-.058***	1													
Board Tenure (4)	-.052**	.160***	.154**	1												
Multiple Directorship (5)	.151***	.071***	-.027**	.048***	1											
Board Independence (6)	.195***	.417***	-.161***	.194***	.115***	1										
Board Meeting (7)	.165***	.315***	.041***	.147***	.124***	.308***	1									
CEO Duality (8)	-.191***	.027**	.079***	.317***	-.037***	.061***	-.004	1								
ESG Audit (9)	.237***	.160***	-.108***	-.135***	.058***	.006	.016	-.130***	1							
Revenue (10)	.145***	.094***	-.033***	-.027**	.020	.025**	.044***	.003	.285***	1						
Market Capitalisation (11)	.155***	.219***	-.025**	.089***	.051***	.169***	.111***	.030**	.221***	.559***	1					
Profitability (12)	.037***	.017	.057***	.171***	.011	.051***	-.021	.088***	-.039***	.022	.258***	1				

Leverage (13)	-.009	.015	-.028**	.021	.003	.008	.023	.079***	.042***	.057***	-.007	.001	1			
Enterprise Value (14)	.144***	.225***	-.033***	.036***	.051***	.170***	.110***	.005	.256***	.539***	.835***	.086***	.224***	1		
Economic Development (15)	-.374***	.022	.088***	.190***	-.167***	.025**	.032**	.311***	-.253***	.052***	.093***	.093***	.099***	.041***	1	
World Gov. Index (16)	.225***	.251***	.123***	.170***	-.003	.060***	.139***	.032***	.028**	.095***	.031**	-.043***	.068***	.085***	-.127***	1

*** p<0.01, ** p<0.05

Table 4.6: Regression Result on impact of Board Diversity on ESG performance (Combined for financial and non-financial industries)

***N* = 6,200**	**ESG score**	**ESG ranking**	**Environmental**	**Social**	**Governance**
Board Nationality Diversity	5.513***	.663***	.231	2.688*	16.406***
	(1.270)	(.157)	(1.943)	(1.527)	(2.018)
Board Gender Diversity	4.898***	.688***	-2.529	2.439	19.635***
	(1.611)	(.199)	(2.465)	(1.937)	(2.560)
Board Skills Diversity	4.704***	.599***	.858	.869	13.611***
	(.554)	(.068)	(.848)	(.666)	(.880)
Firm Governance control					
Board Tenure	.426***	.055***	.420***	.234***	.824***
	(.057)	(.007)	(.087)	(.068)	(.090)
Multiple Directorship	-.864***	-.100***	-1.383***	-.204	-1.027***
	(.153)	(.018)	(.234)	(.183)	(.243)
Board Independence	6.520***	.803***	4.302***	1.429	15.416***
	(.938)	(.117)	(1.435)	(1.128)	(1.490)
Board Meeting	3.525***	.466***	3.228***	2.888***	5.330***
	(.428)	(.053)	(.654)	(.514)	(.679)
CEO Duality	-2.428***	-.292***	-.755	-.947**	-4.886***
	(.380)	(.047)	(.581)	(.456)	(.603)
ESG Audit	4.763***	.599***	7.143***	6.103***	1.237**
	(.359)	(.044)	(.550)	(.432)	(.571)
Firm characteristics (control)					
Revenue	10.115***	1.186***	16.135***	8.734***	7.158***
	(.851)	(.105)	(1.302)	(1.023)	(1.352)
Market Capitalisation	-.252	-.068	3.220**	-.030	-.535
	(1.012)	(.126)	(1.548)	(1.216)	(1.607)
Profitability	-.064*	-.008**	-.109**	-.074*	-.056
	(.034)	(.004)	(.052)	(.041)	(.054)
Leverage	-.041***	-.004**	.006	-.032*	-.031
	(.015)	(.001)	(.024)	(.018)	(.025)
Enterprise Value	2.918***	.409***	.584	3.311***	2.982*
	(.959)	(.120)	(1.468)	(1.153)	(1.524)
Period (MDGs/ SDGs)	3.167***	.368***	-.278	5.214***	.919
	(.358)	(.044)	(.548)	(.430)	(.569)
Country Governance (control)					
Economic Development	37.792***	4.382***	57.008***	42.354***	.600
	(2.760)	(.342)	(4.222)	(3.317)	(4.383)
World Gov. Index	.009	-.001	-.084	.090	-.093
	(.05)	(.007)	(.087)	(.069)	(.091)
Firm Effect	YES	YES	YES	YES	YES
Year Effect	YES	YES	YES	YES	YES
R^2	46.09%	44.53%	32.02%	42.34%	18.35%

Standard error in parentheses

*** p < 0.01, ** p < 0.05, * p < 0.10

Table 4.7: Regression Result on impact of Board Diversity on ESG performance in the Non-financial and Financial Industries

Variables	**DV: ESG score**	
	Non-Financial	Financial
Board Nationality Diversity	7.066***	2.303
	(1.495)	(2.408)
Board Gender Diversity	3.926**	5.161*
	(1.887)	(3.111)
Board Skills Diversity	5.299***	3.531***
	(.640)	(1.109)
Firm Governance control		
Board Tenure	.371***	.664***
	(.065)	(.120)
Multiple Directorship	-1.218***	-.420*
	(.209)	(.224)
Board Independence	6.776***	7.668***
	(1.098)	(1.816)
Board Meeting	3.770***	3.376***
	(.489)	(.885)
CEO Duality	-2.249***	-3.007***
	(.438)	(.757)
ESG Audit	4.700***	4.717***
	(.432)	(.643)
Firm characteristics (control)		
Revenue	8.784***	11.714***
	(1.064)	(1.620)
Market Capitalisation	-3.251	-2.590
	(2.019)	(1.685)
Profitability	-.054	-.566**
	(.035)	(.271)
Leverage	-.036*	-.165***
	(.019)	(.038)
Enterprise Value	7.339***	2.878**
	(2.311)	(1.110)
Period (MDGs/ SDGs)	2.721***	4.490***
	(.423)	(.673)
Country Governance (control)		
Economic Development	37.656***	34.838***
	(3.319)	(4.984)
World Gov. Index	-.075	.280***
	(.069)	(.106)
Firm Effect	YES	YES
Year Effect	YES	YES
R^2	44.75%	51.74%
N	4,530	1,670

Standard error in parentheses

*** p < 0.01, ** p < 0.05, * p < 0.10

Table 4.8: Regression Result on impact of Board Diversity on ESG performance in the MDGs Era and SDGs Era

Variables	**DV: ESG score**	
	MDGs Era	SDGs Era
Board Nationality Diversity	9.090***	5.925**
	(1.528)	(2.299)
Board Gender Diversity	6.111***	12.773***
	(2.213)	(2.685)
Board Skills Diversity	6.842***	2.806***
	(.706)	(.735)
Firm Governance control		
Board Tenure	.166**	.332***
	(.070)	(.104)
Multiple Directorship	-.638***	-1.232**
	(.164)	(.523)
Board Independence	7.138***	8.439***
	(1.032)	(2.029)
Board Meeting	4.435***	3.111***
	(.584)	(.555)
CEO Duality	-1.969***	-2.524***
	(.470)	(.673)
ESG Audit	4.987***	3.661***
	(.457)	(.584)
Firm characteristics (control)		
Revenue	5.474***	8.983***
	(1.127)	(1.558)
Market Capitalisation	-2.534**	1.219
	(1.286)	(1.804)
Profitability	.003	-.070
	(.045)	(.046)
Leverage	-.017	-.021
	(.020)	(.030)
Enterprise Value	2.838**	2.230
	(1.281)	(1.727)
Country Governance (control)		
Economic Development	50.420***	58.383***
	(3.660)	(5.349)
World Gov. Index	-.345***	.104
	(.107)	(.068)
Firm Effect	YES	YES
Year Effect	YES	YES
R^2	32.45%	25.96%
N	3,930	2,270

Standard error in parentheses

*** p < 0.01, ** p < 0.05, * p < 0.10

Table 4.9: Regression Result on impact of Board Diversity on ESG performance based on Geographical Regions

	America Region	Asia Pacific Region	Western Europe Region	Europe and Central Asia	Middle East and North Africa Region
Board Nationality Diversity	14.971***	-.966	6.654***	53.799***	9.689
	(3.140)	(3.487)	(1.312)	(14.212)	(14.252)
Board Gender Diversity	19.194***	.693	3.664	-.522	18.455***
	(2.909)	(3.426)	(2.266)	(19.575)	(6.206)
Board Skills Diversity	4.661***	3.816***	7.415***	5.426	-2.420
	(.973)	(.906)	(.994)	(5.238)	(8.767)
Firm Governance control					
Board Tenure	.547***	.369***	.256**	.876	1.241
	(.092)	(.091)	(.116)	(.669)	(.871)
Multiple Directorship	-1.676***	-.553**	-.999***	2.378*	-1.063
	(.327)	(.238)	(.244)	(1.402)	(2.664)
Board Independence	11.170***	2.829*	5.605***	-4.079	-2.493
	(1.943)	(1.691)	(1.260)	(7.564)	(6.057)
Board Meeting	7.906***	2.007***	2.968***	4.812	5.974**
	(1.037)	(.614)	(.679)	(3.096)	(2.954)
CEO Duality	-4.324***	-.920	-1.757**	-3.748	-7.193
	(.681)	(.562)	(.695)	(6.026)	(5.479)
ESG Audit	3.318***	6.737***	3.606***	1.953	9.561**
	(.554)	(.629)	(.717)	(3.083)	(3.973)
Firm characteristics (control)					
Revenue	9.336***	6.489***	8.787***	-9.251	14.455
	(1.590)	(1.401)	(1.459)	(10.158)	(17.016)
Market Capitalisation	1.108	.628	-4.620***	-40.630***	2.203
	(2.138)	(1.594)	(1.651)	(14.591)	(14.002)
Profitability	.030	-.027	-.263***	.150	-.962*
	(.050)	(.072)	(.064)	(.184)	(.506)
Leverage	.003	-.096***	-.054*	-.539***	-.611**
	(.024)	(.030)	(.031)	(.147)	(.286)
Enterprise Value	.810	2.945**	2.449*	24.959**	-1.378
	(2.139)	(1.418)	(1.458)	(11.534)	(11.755)
Period (MDGs/ SDGs)	1.753***	4.670***	1.895***	9.099***	3.527
	(.649)	(.591)	(.655)	(2.896)	(2.843)
Country Governance (control)					
Economic Development	45.794***	41.411***	21.953***	-60.331**	-23.938
	(6.432)	(4.428)	(5.098)	(30.139)	(36.591)
World Gov. Index	-.063	.107	-.384***	1.430	1.152*
	(.104)	(.140)	(.141)	(1.136)	(.628)
Firm Effect	YES	YES	YES	YES	YES
Year Effect	YES	YES	YES	YES	YES
R^2	47.38%	55.69%	39.46%	69.93%	23.41%
N	2,653	1,908	1,480	84	75

Standard error in parentheses

*** p < 0.01, ** p < 0.05, * p < 0.10

Table 4.10: 2SLS/ IV Regression Result on impact of Board Diversity on ESG performance (Combined for financial and non-financial industries)

***N* = 6,200**	**DV = ESG score**	**DV = ESG ranking**
Board Nationality Diversity	25.927***	56.991***
	(6.209)	(17.740)
Board Gender Diversity	2.418*	1.354*
	(1.805)	(2.821)
Board Skills Diversity	4.054***	3.065***
	(.599)	(.844)
Firm Governance control		
Board Tenure	.446***	.478***
	(.058)	(.067)
Multiple Directorship	-.815***	-.740***
	(.157)	(.178)
Board Gender Diversity	2.418*	1.354*
	(1.805)	(2.821)
Board Independence	6.298***	5.961***
	(.961)	(1.082)
Board Meeting	3.143***	2.562***
	(.452)	(.587)
CEO Duality	-2.544***	-2.720***
	(.390)	(.442)
ESG Audit	4.632***	4.433***
	(.369)	(.423)
Firm characteristics (control)		
Revenue	10.028***	9.895***
	(.871)	(.969)
Market Capitalisation	-.943	-1.994
	(1.055)	(1.295)
Profitability	-.043	-.011
	(.035)	(.043)
Leverage	-.045***	-.050***
	(.016)	(.018)
Enterprise Value	3.602***	4.643***
	(1.002)	(1.240)
Period (MDGs/ SDGs)	3.374***	3.687***
	(.371)	(.444)
Country Governance (control)		
Economic Development	33.103***	25.967***
	(3.147)	(5.128)
World Gov. Index	.025	.050
	(.059)	(.066)
Firm Effect	YES	YES
Year Effect	YES	YES
$\mathbf{R^2}$	43.65%	30.59%

Standard error in parentheses

*** p < 0.01, ** p < 0.05, * p < 0.10

Table 4.11: PSM Regression Result on impact of Board Diversity on ESG performance (Combined for financial and non-financial industries)

***N* = 6,200**	**DV = ESG score**	**DV = ESG ranking**
Board Nationality Diversity (pscore)	7.655*** (.916)	.874*** (.113)
Board Gender Diversity	4.981*** (1.599)	.701*** (.198)
Board Skills Diversity	4.707*** (.551)	.601*** (.068)
Firm Governance control		
Board Tenure	.396*** (.057)	.052*** (.007)
Multiple Directorship	-.859*** (.152)	-.099*** (.018)
Board Independence	6.025*** (.936)	.749*** (.117)
Board Meeting	3.477*** (.425)	.462*** (.052)
CEO Duality	-2.419*** (.378)	-.290*** (.046)
ESG Audit	4.744*** (.358)	.597*** (.044)
Firm characteristics (control)		
Revenue	9.894*** (.848)	1.160*** (.105)
Market Capitalisation	-.062 (1.007)	-.046 (.125)
Profitability	-.076** (.034)	-.009** (.004)
Leverage	-.043*** (.015)	-.004** (.001)
Enterprise Value	2.923*** (.955)	.410*** (.119)
Period (MDGs/ SDGs)	3.029*** (.356)	.352*** (.044)
Country Governance (control)		
Economic Development	38.421*** (2.733)	4.462*** (.339)
World Gov. Index	.023 (.057)	-.001 (.007)
Firm Effect	YES	YES
Year Effect	YES	YES
R^2	46.56%	44.93%

Standard error in parentheses

*** p < 0.01, ** p < 0.05, * p < 0.10

Table 4.12: Regression Result on impact of Board Diversity on ESG performance using alternative measure of board nationality diversity

***N* = 6,200**	**DV = ESG score**	**DV = ESG ranking**
Board Nationality Diversity (blau index)	23.576*** (3.216)	2.902*** (.386)
Board Gender Diversity	18.109*** (1.886)	2.368*** (.226)
Board Skills Diversity	2.431*** (.811)	.286*** (.097)
Firm Governance control		
Board Tenure	.272*** (.058)	.033*** (.007)
Multiple Directorship	-.519*** (.199)	-.060** (.023)
Board Independence	5.748*** (1.019)	.741*** (.123)
Board Meeting	-.040 (.571)	.013 (.068)
CEO Duality	-.722* (.400)	-.047 (.048)
ESG Audit	17.259*** (.416)	2.080*** (.050)
Firm characteristics (control)		
Revenue	5.966*** (.503)	.706*** (.060)
Market Capitalisation	3.266*** (1.052)	.544*** (.126)
Profitability	.016 (.034)	-.001 (.004)
Leverage	.001 (.013)	.001 (.001)
Enterprise Value	3.666*** (.941)	.307*** (.113)
Period (MDGs/ SDGs)	2.604*** (.429)	.284*** (.051)
Country Governance (control)		
Economic Development	-2.573*** (.369)	-.373*** (.044)
World Gov. Index	.112*** (.016)	.012*** (.002)
Industry Control	YES	YES
R^2	47.27%	47.78%

Standard error in parentheses

*** p < 0.01, ** p < 0.05, * p < 0.10

Table 4.13: Robustness Check for the Critical Mass Theory

	Board Nationality diversity			Board Gender diversity			Board Skills diversity		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Nationality Div.									
Min. 1 Nationality	.132 (.550)								
Min. 2 Nationality		1.764*** (.505)							
Min. 3 Nationality			1.778*** (.415)						
Gender Div.									
Min. 1 Female				.178 (.404)					
Min. 2 Females					.539 (.494)				
Min. 3 Females						2.402*** (.429)			
Skills Div.									
Min. 1 Skilled							2.127*** (.433)		
Min. 2 Skilled								2.540*** (.409)	
Min. 3 Skilled									2.878*** (.371)
Board Nationality Diversity				4.948*** (1.357)	5.108*** (1.338)	5.258*** (1.376)	5.490*** (1.280)	5.435*** (1.302)	4.532*** (1.328)
Board Gender Diversity	5.567*** (1.669)	4.974*** (1.700)	5.152*** (1.686)				4.931*** (1.628)	4.446*** (1.645)	5.342*** (1.698)
Board Skills Diversity	4.916*** (.569)	4.734*** (.581)	4.810*** (.577)	5.161*** (.604)	4.472*** (.585)	5.021*** (.609)			
Firm Governance control	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm characteristics (control)	YES	YES	YES	YES	YES	YES	YES	YES	YES
Period (MDGs/ SDGs) control	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country Governance (control)	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES
R^2	46.21%	45.97%	46.60%	46.41%	44.85%	46.30%	45.78%	45.97%	45.84%
N	**6,200**	**6,200**	**6,200**	**6,200**	**6,200**	**6,200**	**6,200**	**6,200**	**6,200**

Standard error in parentheses

*** p < 0.01

Appendices

Appendix 4.1: Industry Grouping of Companies

S/N	Industry Group	Number of Companies	Size (%)
	Non-Financial		
1	Aerospace & Defence	9	2.68%
2	Automobiles & Auto Parts	16	4.76%
3	Beverages	7	2.08%
4	Chemicals	12	3.57%
5	Coal	1	0.30%
6	Communications & Networking	2	0.60%
7	Computers, Phones & Household Electronics	8	2.38%
8	Construction & Engineering	11	3.27%
9	Construction Materials	3	0.89%
10	Consumer Goods Conglomerates	7	2.08%
11	Diversified Industrial Goods Wholesale	5	1.49%
12	Diversified Retail	7	2.08%
13	Electric Utilities & IPPs	17	5.06%
14	Electronic Equipment & Parts	1	0.30%
15	Financial Technology & Infrastructure	1	0.30%
16	Food & Drug Retailing	9	2.68%
17	Food & Tobacco	12	3.57%
18	Freight & Logistics Services	10	2.98%
19	Healthcare Equipment & Supplies	8	2.38%
20	Healthcare Providers & Services	8	2.38%
21	Homebuilding & Construction Supplies	3	0.89%
22	Hotels & Entertainment Services	3	0.89%
23	Household Goods	3	0.89%
24	Investment Holding Companies	2	0.60%
25	Leisure Products	1	0.30%
26	Machinery, Tools, Heavy Vehicles, Trains & Ships	17	5.06%
27	Media & Publishing	5	1.49%
28	Metals & Mining	14	4.17%
29	Multiline Utilities	7	2.08%
30	Office Equipment	1	0.30%
31	Oil & Gas	20	5.95%
32	Oil & Gas Related Equipment and Services	3	0.89%
33	Personal & Household Products & Services	6	1.79%
34	Pharmaceuticals	17	5.06%
35	Professional & Commercial Services	3	0.89%
36	Real Estate Operations	13	3.87%
37	Residential & Commercial REITs	1	0.30%
38	Semiconductors & Semiconductor Equipment	11	3.27%
39	Software & IT Services	25	7.44%
40	Specialty Retailers	6	1.79%
41	Telecommunications Services	20	5.95%
42	Textiles & Apparel	1	0.30%
	Sub-Total for Non-financial	**336**	**100%**
	Financial		

43	Banks	90	62.07%
44	Insurance	40	27.59%
45	Investment Banking & Investment Services	15	10.34%
	Sub-Total for Financial	**145**	**100%**
	Grand Total (Non-Financial & Financial)	**481**	

Appendix 4.2: Country Analysis of Companies

S/N	Country	Region	No. of Companies (non-financial)	No. of Companies (financial)	Total	Weighting (%)
1	Australia	Asia Pacific	6	5	11	2.29
2	Austria	Western Europe	1	0	1	0.21
3	Belgium	Western Europe	1	1	2	0.42
4	Bermuda	America	0	1	1	0.21
5	Brazil	America	2	2	4	0.83
6	Canada	America	7	10	17	3.53
7	China	Asia Pacific	42	24	66	13.72
8	Denmark	Western Europe	2	1	3	0.62
9	Finland	Western Europe	1	1	2	0.42
10	France	Western Europe	17	4	21	4.37
11	Germany	Western Europe	12	4	16	3.33
12	Hong Kong	Asia Pacific	9	2	11	2.29
13	India	Asia Pacific	4	5	9	1.87
14	Indonesia	Asia Pacific	0	2	2	0.42
15	Ireland	Western Europe	4	1	5	1.04
16	Italy	Western Europe	4	2	6	1.25
17	Japan	Asia Pacific	33	10	43	8.94
18	Luxembourg	Western Europe	1	0	1	0.21
19	Malaysia	Asia Pacific	0	1	1	0.21
20	Mexico	America	1	1	2	0.42
21	Netherlands	Western Europe	6	1	7	1.46
22	Norway	Western Europe	2	0	2	0.42
23	Portugal	Western Europe	1	0	1	0.21
24	Russia	Europe and Central Asia	5	1	6	1.25
25	Saudi Arabia	Middle East & North Africa	4	2	6	1.25
26	Singapore	Asia Pacific	1	3	4	0.83
27	South Korea	Asia Pacific	11	4	15	3.12

28	Spain	Western Europe	2	3	5	1.04
29	Sweden	Western Europe	3	2	5	1.04
30	Switzerland	Western Europe	4	5	9	1.87
31	Taiwan	Asia Pacific	2	3	5	1.04
32	Thailand	Asia Pacific	1	0	1	0.21
33	United Arab Emirates	Asia Pacific	1	2	3	0.62
34	United Kingdom	Western Europe	14	7	21	4.37
35	United States	America	132	34	166	34.51
36	Venezuela	America	0	1	1	0.21
	Total		**336**	**145**	**481**	**100.00**

Appendix 4.3: Analysis by Geographical Region

S/N	Region	Number of Countries	Number of Companies	Number of Firm-year observations	Weighting for firm-year observations (%)
1	America	6	191	2,653	42.79%
2	Asia Pacific	12	171	1,908	30.77%
3	Western Europe	16	107	1,480	23.87%
4	Europe and Central Asia	1	6	84	1.35%
5	Middle East & North Africa	1	6	75	1.21%
	Total	**36**	**481**	**6,200**	**100%**

Chapter Five: Summary and Conclusion

Chapter 5: Summary and Conclusion

5.1 Summary of Findings

Paper 1 examines investigates the association between board composition and ESG performance by analysing cross-country evidence from top global companies. We investigate five elements of board leadership composition, namely board independence, CEO duality, board gender diversity, interlocking directorship, and ESG committee (as board oversight mechanism for sustainability/ ESG matters). Whereas results from linear models (such as fixed effect OLS, discriminant analysis, two-stage least squares, and propensity score matching regression) show that board independence, board gender diversity, and existence of ESG committee are positively associated with ESG performance, PQR reveals that the relationship is curvilinear. Linear models show that CEO duality has no significant impact on ESG performance, but PQR reveals that sustained CEO duality erodes ESG performance. Furthermore, whilst linear models show that interlocking directorship has negative but no statistically significant impact on ESG performance, PQR reveals that interlocking directors with vast cross-directorship experience enhance ESG performance. Whilst the impact of board composition on ESG performance follows a similar trajectory in the MDGs and SDGs eras, board independence and board gender diversity have greater impact on ESG performance in the SDGs era in comparison to the MDGs era because of the injection of more NEDs and female directors in the SDGs era. Existence of ESG committee, and board gender diversity emerged as strong determinants of ESG performance. The study also concludes that the relationship between Board composition and ESG performance is curvilinear.

Paper 2 investigates the impact of CG on CEP in environmentally sensitive industries. Result shows that at the aggregate/ combined level for all countries, board gender diversity and presence of ESG committee are the strongest driver of CEP. However, when disaggregated into geographical regions, the impact of CG mechanisms on CEP is contextual and varies across jurisdictions. In the America region, board independence, board gender diversity, board nationality diversity and ESG committee are the strongest drivers. Board nationality diversity and ESG committee emerged as the strongest drivers in the Asia Pacific region, whilst ESG committee is the strongest determinant in the Western Europe region. In the MDGs era, board gender diversity, board nationality diversity, ESG committee and ESG-linked compensation are positively associated with CEP, with board gender diversity and ESG committee exerting more influence. The factors positively influencing CEP in the SDGs era shifted to board gender

diversity, board nationality diversity and ESG committee, whilst board independence and ESG-linked Compensation exert significant negative impact. Although board gender diversity and ESG Committee emerged as the strongest drivers of CEP in the MDGs and SDGs era, they exert more influence in the SDGs era than in the MDGs era. Further, result shows that the nature of CG-CEP relationship is non-linear. Taken together, the result that gender diversity and ESG committee have greater impact on CEP in the SDGs era suggests that MNEs are now becoming more intentional about environmental sustainability, as they are strengthening CG mechanisms to achieve environmental targets to legitimise their existence and gain stakeholders' acceptance. The results provide empirical support for the legitimacy theory invoked as theoretical framework for the study that organisations will emplace CG mechanisms as a strategy for improving environmental sustainability practice to fulfil their social contract and legitimise their existence. There is evidence to support the stakeholder theory as well that organisations will leverage on their CG structures to implement environmental sustainability projects to satisfy the expectations of stakeholders.

Paper 3 examines the impact of board diversity on ESG performance using an international sample of top MNEs on the Forbes 500 list. Three dimensions of board diversity covering genetic (board nationality diversity and board gender diversity) and cognitive diversity (board skills diversity) were investigated. From the analysis of empirical evidence from Forbes 500 MNEs, result shows that at the aggregate level, board nationality diversity, board gender diversity, and board skills diversity are positively associated with ESG performance, with board nationality diversity emerging as the foremost determinant. When disaggregated into industries, the impact of board nationality diversity and board skills diversity on ESG performance is greater in the non-financial industry in comparison to the financial industry, whereas the impact of board gender diversity is more in the financial industry. When assessed from the standpoint of the MDGs/SDGs era, board nationality diversity and board skills diversity have greater impact on ESG performance in the MDGs era in comparison to the SDGs era, whilst the impact of board gender diversity is more in the SDGs era than in the MDGs era. Result also shows that the impact of board diversity factors differs by geographical regions. In the America region, board nationality diversity, board gender diversity and board skills diversity are positively associated with ESG performance, with board gender diversity exerting the greatest impact. However, in the Asia Pacific Region, board skills diversity is positively associated with ESG performance, whilst the impact of board nationality diversity and board gender diversity is not significant. In the Western Europe Region, board nationality diversity

and board skills diversity are positively associated with ESG performance, whilst board gender diversity has no impact. In Europe and Central Asia (ECA) region, board nationality diversity is the only dimension of board diversity exerting significant positive impact on ESG performance, whilst gender diversity is a notable determinant in the Middle East and North Africa (MENA) region. Whilst board gender diversity emerged as the strongest determinant of ESG performance in two regions (America and MENA regions), board skills diversity is the strongest determinant in Asia Pacific and Western Europe regions. Board nationality diversity is the only determinant of ESG performance in the Europe and Central Asia region. In terms of the critical mass theory, a critical mass of at least two foreign directors needs to be reached to improve ESG performance, whilst a critical mass of three female directors would have to be attained to drive ESG performance. For board skills diversity, the presence of at least one knowledgeable director improves ESG performance, although the inclusion of more numbers of knowledgeable director progressively improves ESG performance. Overall, the study concludes that board diversity is an effective strategy for improving ESG performance. However, the result that board diversity generally improved in the SDGs era in comparison to the MDGs era suggests that MNEs have started responding to the call for diversity and inclusion by the UN agenda for sustainable development.

5.2 Contributions to Knowledge

5.2.1 Contributions to Knowledge in Paper 1

The current study contributes to literature by advancing our knowledge on the corporate governance determinants of ESG performance from four perspectives. First, we contribute to the limited international studies on the interaction between board composition and ESG performance (e.g., Jensen & Meckling, 1976; Aguilera & Jackson, 2003; De Villiers et al., 2011; Mangena et al., 2012; Zhang et al., 2013; Mangena et al., 2020) by analysing empirical evidence covering a 15-year period (2006-2020) from 336 top MNEs from 32 countries and 42 non-financial industries. The longitudinal research design and international approach adopted by the current study in investigating the subject allows for more generalisability of results.

Second, we contribute to methodology by applying a novel method (PQR)—which could detect both linear and non-linear relationships between dependent and independent variables— to analyse the influence of board composition on ESG performance. Such a methodologically rigorous approach is useful in (i) partly addressing mixed result reported in literature on the

nature of relationship between study variables; and (ii) demonstrating that results of linear models applied in prior studies could be misleading. Whilst linear models show that board leadership attributes such as board independence, gender diversity and ESG committee enhances ESG performance thereby confirming the result of prior studies (e.g., Jensen & Meckling, 1976; Aguilera & Jackson, 2003; De Villiers et al., 2011; Mangena et al., 2012; Zhang et al., 2013; Mangena et al., 2020), PQR reveals that board composition elements impact ESG performance differently across the quantiles, showing that the relationship is curvilinear. The current study, thus, empirically demonstrates that the impact of board composition on ESG performance depends on the level of engagement with ESG projects. The consistently positive significant impact of board independence on ESG performance in the upper quantiles of ESG performance confirms that board independence enhances ESG performance. PQR shows that whilst combining the role of CEO and Chairperson may not initially appear to affect ESG performance, the persistence of CEO duality erodes ESG performance. This extends discussion in extant literature that when board members continue to serve in the dual capacity of CEOs and board Chairpersons, abuse of power may be inevitable, and this may erode ESG performance (Ashfaq & Rui, 2019; Buallay & Al-Ajmi, 2020). Board gender diversity has a significant positive impact on ESG performance under the OLS technique. However, PQR reveals that the impact of board gender diversity on ESG performance depends on the level of engagement with ESG projects, showing that the relationship is non-linear. The consistently positive significant impact of board gender diversity on ESG performance in the upper quantiles of ESG performance confirms that board gender diversity enhances ESG performance in line with prior studies (e.g., Nuber & Velte, 2021; Konadu et al., 2021; Gull et al., 2023; Liu et al., 2023). Furthermore, linear model reveals that interlocking directorship erodes ESG performance; PQR reveals that whereas the presence of interlocking directors with limited cross directorship experience may erode ESG performance, the presence of interlocking directors with vast cross directorship experiences strengthens ESG performance.

Third, we present evidence on how board composition impacts ESG performance differently in the MDGs and SDGs eras, thus contributing to the debate on efforts MNEs are making in addressing sustainable development challenges through board leadership. Finally, our study contributes to the stakeholder theory and RBV theory by providing empirical validation that outside directors, gender diversity on corporate boards, presence of interlocking directors and existence of ESG committee are strategic assets that can be deployed to improve ESG performance of organisations as suggested by the RBV theory (Saqib et al., 2021; Malik &

Shim, 2022). The study also contributes to the stakeholder theory by showing that the appointment of independent directors/ NEDs, separation of the role of board Chairperson from company CEO, allowing for more female directors on the board, appointment of interlocking directors, and constituting an ESG committee are effective corporate governance strategies for strengthening board performance and addressing sustainable development challenges in the interest of stakeholders.

5.2.2 Contributions to Knowledge in Paper 2

The study contributes to knowledge in several ways by addressing observed gaps in literature. First, the study adopts an international approach by analysing evidence from 244 top MNEs operating in 30 environmentally sensitive industries in 31 countries, distributed across 5 geographical regions. It exposes the CG factors affecting CEP within an international context. Second, the study presents evidence that the impact of CG mechanisms on CEP is contextual and varies across jurisdictions, thereby confirming the submission of prior studies (e.g., Mangena et al., 2012; Chithambo & Tauringana, 2017; Zaman et al., 2020; Pandey et al., 2022). It attempts to reconcile/ explain mixed results reported in prior studies on the impact of CG on CEP by presenting evidence on how the influence of CG varies by geographical regions.

Third, the study makes methodological contribution by using novel techniques such as PQR, to analyse the CG-CEP nexus. This is in response to call to use state-of-the-art regression methods to ensure well validated results which have not been particularly addressed in most prior studies. It deploys a novel statistical technique (PQR) to establish the case that the CG-CEP relationship is not linear—an important consideration that has not been taken to account by most prior studies, but which has partly contributed to mixed results. PQR reveals that the impact of CG on CEP is dependent on the level of engagement with environmental sustainability projects. Considering that gender diversity has low and statistically insignificant coefficients in the lower quantiles (q 0.10 to q 0.30), but has significant and notable coefficients in the upper quantiles (q 0.50 to 0.70), it implies that board gender diversity has greater impact on CEP at higher levels of environmental sustainability engagement, thereby confirming the result of prior studies on the positive impact of board gender diversity on environmental performance (e.g., Tingbani et al., 2020; Lopatta, et al., 2020; Elsayih et al, 2021; Nuber & Velte, 2021). PQR also shows that although the presence of the ESG committee can enhance CEP, the effectiveness of the committee may decline in the long run if the activities of the

committee are not reviewed on a regular basis or if the membership of the committee is not reinvigorated from time to time.

Fourth, the study adopts a longitudinal approach by decomposing the impact of CG mechanisms on CEP in the MDGs (2006-2015) and SDGs (2016-2020) era, whilst presenting evidence on how the CG apparatus impacts CEP differently across the periods. The study presents empirical evidence that the SDGs deepened the level of commitment to environmental sustainability when compared to the MDGs era. Finally, the study makes contribution to stakeholder theory and legitimacy theory by furnishing empirical evidence that MNEs will emplace CG mechanisms as a strategy for improving CEP to entrench corporate legitimacy and gain stakeholders' acceptance, thereby confirming the validity of the theories (Jensen & Meckling, 1976; Suchman, 1995; Agyemang et al., 2020; Disli et al., 2022).

5.2.3 Contributions to Knowledge in Paper 3

The study contributes to knowledge within the context of the research gaps. It addresses the first research gap by concurrently investigating the impact of various dimensions of board diversity (i.e., board nationality diversity, board gender diversity, and board skills diversity) on ESG performance, thereby confirming the result of prior studies that board diversity enhances ESG performance (e.g., Tingbani et al., 2020; Konadu et al., 2021; Gull et al., 2023). It specifically adds to the limited literature on the relevance of under-researched elements of board diversity (board nationality and board skills diversity) on ESG performance.

The study tackles the second research gap by investigating the subject in an international context in both financial and non-financial firms. Whereas most prior studies have been limited to a country, geographical region and or industry, the international approach adopted by analysing evidence from 481 MNEs spanning 45 industries, 36 countries and 5 geographical regions enhances the generalisability of result. Meanwhile, the simultaneous investigation of both genetic diversity (i.e., nationality diversity and gender diversity) and cognitive diversity (i.e., skills diversity) using international sample of top MNEs provide a more rigorous analysis of board diversity-ESG performance nexus.

The third research gap is addressed by using a longitudinal approach to assess the relationship between board diversity and ESG performance in the pre-SDGs/ MDGs era (2000-2015) and the SDGs era (2016- 2020). The study presents empirical evidence on (a) the extent to which various dimensions of board diversity has impacted ESG performance in the MDGs era

differently from the SDGs era; (b) how MNEs are responding to the UN agenda for sustainable development in terms of strengthening diversity among top management team since the SDGs implementation took effect over 7 years ago; (c) efforts MNEs are making towards achieving the SDGs through board diversity with a view towards improving ESG performance, as upliftment in ESG practice would anticipatorily contribute to actualising agenda 2030 set to expire in less than 8 years from now.

The fourth research gap is addressed by using a multi-theoretical approach to explain the positive influence of board diversity on ESG performance on one hand (i.e., resource-based view theory), as well as the magnitude and significance of the impact of board diversity on ESG performance (through the critical mass theory). The study, thus, makes contribution to theory. Whereas limited earlier studies have applied the critical mass theory within the context of gender diversity, the current study empirically validates and confirms the applicability of the critical mass to not only board gender diversity but extends it to nationality diversity and skills diversity (Tingbani et al., 2020; Nuber & Velte, 2021).

Finally, the study contributes to knowledge by empirically demonstrating that board diversity impacts ESG performance differently in the non-financial and financial Industries. Whereas board nationality diversity and board skills diversity have greater impact on ESG performance in the non-financial industry, the impact of board gender diversity is more in the financial industry when compared to the non-financial industry. This could be attributable to the significantly higher level of board nationality diversity in the non-financial industry in comparison to the financial industry. On the other hand, board gender diversity has greater impact on ESG performance in the financial industry in comparison to the non-financial industry because of the significantly higher level of board gender diversity in the financial industry in comparison to the non-financial industry. Overall, the result supports the conclusion that board diversity enhances ESG performance and achieving higher board diversity level is an effective strategy for improving ESG performance.

5.3 Recommendations

PQR result reveals that the impact of board independence on ESG performance depends on the level of engagement with ESG projects (Paper 1), with greater impact created at higher levels of ESG engagement. Furthermore, the consistently positive significant impact of board independence on ESG performance in the upper quantiles of ESG performance confirms that board independence enhances ESG performance. Drawing from this result that board independence creates greater impact at higher levels of ESG performance, the study recommends that the presence of independent directors should be maximised to ensure productive engagement on ESG issues. Whilst combining the role of CEO and Chairperson may not initially appear to affect ESG performance, the persistence of CEO duality erodes ESG performance. This informs the recommendation that there should be separation of the office of Chairperson from that of the CEO to avoid abuse of power. The consistently positive significant impact of board gender diversity on ESG performance in the upper quantiles of ESG performance as revealed by PQR informs the recommendation that corporate boards should seek to diversify the gender composition of board members to improve ESG performance. Curvilinear relationship between ESG committee and ESG performance underpins the recommendation that the activities and membership of ESG committee would need to be reviewed on a regular basis to reinvigorate ESG committee effectiveness.

Following on from the findings in Paper 2, the study recommends that organisations should strengthen ESG committee by regularly reviewing the activities of the committee. Whilst encouraging audit of ESG report to enhance its credibility, outcomes of ESG audit could also serve as a scorecard for the performance of the ESG committee—such performance appraisals are important in strengthening the effectiveness of the ESG committee. Bearing in mind that ESG-link compensation is nascent, organisations may also look into incentivising board members by implementing ESG-based pay, drawing from the positive nexus between ESG-linked compensation and CEP in the America region. To strengthen board effectiveness and CEP, organisations may consider improving board gender diversity and board nationality diversity as well-managed multi-cultural teams arguably outperform monocultural groups. Following on from the positive impact of board gender diversity and board nationality diversity on CEP, to strengthen board effectiveness and environmental sustainability performance, board nomination committees should select or recommend for selection director nominees that strengthen gender diversity and nationality diversity.

Drawing from the significant positive association between board diversity and ESG performance in Paper 3, the study recommends that companies should seek to diversify the composition of top management team/ directors the more. Noting that it is not the mere presence of directors from diverse nationalities, mix of male and female directors, or presence of skilled directors that bring about improvement in ESG performance (but reaching a significant diversity level is what causes appreciable improvement in ESG performance), the study recommends for the diversification of top management team to a reasonable level to reap the full benefits of board diversity. The result that diversity in top management team improves ESG performance informs the recommendation as well that diversity should not be limited to directorship or top management team only but should be extended or cascaded down to the organisational workforce to ensure maximum benefit. Although the current study focuses on MNEs and result shows that global companies may be strategically positioned to acquire diverse workforce, the result that board diversity is positively and significantly associated with ESG performance should motivate other organisations (including indigenous organisations) to diversify both their top management team and workforce. Acknowledging that such investment in diversity among board members, top management team, and workforce would require resources (and may impose requirements on particularly small and medium sized organisations), the long-term benefits which such investment could bring in the way of improving board performance and ESG outcomes should spur organisational commitment in this regard. This is important, considering that private sector organisations, no matter their size, can contribute in one way or the other to tackling sustainable development challenges. Drawing from the result that financial institutions have generally emplaced more robust governance mechanisms to improve ESG performance in comparison to the non-financial firms, the study recommends that non-financial institutions should do more to reinforce their governance mechanisms to improve ESG performance, as they have more moral burden as top environmental polluters to address sustainability challenges. Based on the result that MNEs have generally strengthened board diversity to improve ESG performance in the MDGs era than in the SDGs era, the current study implores MNEs as key partners in agenda 2030 to do more in the SDGs era if they are to markedly contribute to achievement of SDGs set to expire in 2030).

5.4 Research Limitations and Future Research Direction

In Paper 2, the study focuses on globally visible companies operating in environmentally sensitive industries. Results are disaggregated into regions (America, Asia Pacific, and Western Europe), whilst excluding the Europe and Central Asia (ECA) and Middle East & North Africa (MENA) regions because of limited data. Future studies may focus on these regions (ECA and MENA), as well as other regions (e.g., sub-Sahara Africa) to provide a broader view on the CG-CEP relationship. The study analysed evidence from top MNEs predominantly domiciled in countries with high carbon emissions rate. Future studies may investigate drivers of environmental performance in other countries/ regions. The study focused on environmentally sensitive industries involved in primary and secondary activities. Future studies may investigate service sectors/ providers of tertiary activities—especially financial institutions, given the popularity of standalone ESG reports in the financial service sector in recent times. Acknowledging that there are other forms of ownership aside government ownership concentration which the current study includes as a control variable, future studies may examine how ownership structures such as manager/director ownership, family ownership and foreign ownership may affect CEP. Notwithstanding these limitations, the study investigates a plethora of CG variables implicated as main determinants of CEP. The findings from this study should, therefore, provide motivation for future studies based on these gaps.

The investigation in Paper 3 focused on globally visible companies on the Forbes 500 list. Future studies may investigate medium-tier and indigenous companies to provide a wider understanding and generalisability of result on how board diversity impacts corporate performance. The study also disaggregates the results into regions (America, Asia Pacific, Western Europe, Europe and Central Asia (ECA), and Middle East & North Africa (MENA) regions because of limited data. Future studies may focus on other regions (e.g., sub-Sahara Africa) to provide a broader view on the subject. Although the study in Paper 3 analysed sample of international private sector entities, and empirically demonstrates that board diversity contributes to ESG performance, the finding of the study is also relevant for public sector organisations in terms of seeking strategies to improve board performance. As the United Nations agenda for sustainable development calls for actions by public and private sector entities, public sector organisations should also consider diversifying management team by allowing for more female representation, as well as foreign and skilled directors. Acknowledging that some countries have started promoting diversity and inclusion through legislation and imposition of quotas on workforce in both public and private sector

organisations, other nations can also emulate this practice as one of their coordinated strategies as government for actualising agenda 2030. Future studies may investigate the impact of board diversity on ESG outcomes in public sector organisations.

References

Abdullah, S. N. & Ismail, K. (2017). Gender, Ethnic and Age Diversity of the Boards of Large Malaysian Firms and Performance. *Jurnal Pengurusan, 38*, 27-40.

Adel, C., Hussain, M.M., Mohamed, E.K.A., & Basuony, M.A.K. (2019). Is corporate governance relevant to the quality of corporate social responsibility disclosure in large European companies? *International Journal of Accounting & Information Management, 27* (2), 301-332. https://doi.org/10.1108/IJAIM-10-2017-0118

Aguilera R. V., & Jackson G. (2003). The cross-national diversity of corporate governance: Dimensions and determinants. *Academy of Management Review*, 28: 447-465

Aguilera R. V., Marano V., & Haxhi I. (2019). International corporate governance: A review and future research directions. *Journal of International Business Studies*, 50: 457-498.

Aguilera, R. V., Desender, K., Bednar, M. K., & Lee, J. H. (2015). Connecting the dots: Bringing external corporate governance into the corporate governance puzzle. *Academy of Management Annals, 9*: 483-573.

Aguilera, R. V., J. A. Aragon-Correa, V. Marano, & 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

Agyemang, A.O., Yusheng, K., & Ayamba, E.C. (2020) Impact of board characteristics on environmental disclosures for listed mining companies in China. *Environmental Science and Pollution Research, 27*, 21188–21201. https://doi.org/10.1007/s11356-020-08599-2

Ahmad, K., & Zabri, S.M. (2015). Factors explaining the use of management accounting practices in Malaysian medium-sized firms. *Journal of Small Business and Enterprise Development, 22* (4), 762-781.

Akhtaruddin, M. & Haron, H. (2010). Board ownership, audit committees' effectiveness and corporate voluntary disclosures. *Asian Review of Accounting, 18* (1), 68-82. https://doi.org/10.1108/13217341011046015

Al Amosh, H. & Khatib, S.F.A. (2021). Ownership structure and environmental, social and governance performance disclosure: the moderating role of the board independence. *Journal of Business and Socio-economic Development*. https://doi.org/10.1108/JBSED-07-2021-0094

Albers, C., & Günther, T. (2011). Disclose or not disclose : determinants of social reporting for STOXX Europe 600 firms. *Journal of Management Control, 21* (1) 323–347. https://doi.org/10.1007/s00187-010-0113-4

Ali, W., Frynas, J.G., & Mahmood, A. (2017), "Determinants of corporate social responsibility (CSR) disclosure in developed and developing countries: a literature review", Corporate Social Responsibility and Environmental Management, Vol. 24, pp. 273-294.

Allegrini, M., & Greco, G. (2013). Corporate boards, audit committees and voluntary disclosure: Evidence from Italian Listed Companies. *Journal of Management and Governance, 17*(1), 187–216. https://doi.org/10.1007/s10997-011-9168-3

Al-Shaer, H., & Harakeh, M. (2022). Gender Differences in Executive Compensation on British Corporate Boards: the Role of Conditional Conservatism. *The International Journal of Accounting, 55 (1*), https://doi.org/10.1142/S109440602050002X

Al-Shaer, H., & Zaman, M. (2016). Board gender diversity and sustainability reporting quality. *Journal of Contemporary Accounting and Economics, 12* (3), 210-222. https://doi.org/10.1016/j.jcae.2016.09.001

Al-Shaer, H., Albitar, K., & Hussainey, K. (2021). Creating sustainability reports that matter: an investigation of factors behind the narratives. *Journal of Applied Accounting Research* https://doi.org/10.1108/JAAR-05-2021-0136

Amran, A., Lee, S. P., & Devi, S. S. (2014). The influence of governance structure and strategic corporate social responsibility toward sustainability reporting quality. *Business Strategy and the Environment, 23*(4), 217–235. https://doi.org/ 10.1002/bse.1767

Andrikopoulos, A., Samitas, A., & Bekiaris, M. (2014). Corporate social responsibility reporting in financial institutions: Evidence from Euronext. *Research in International Business and Finance, 32*, 27–35. https://doi.org/ 10.1016/j.ribaf.2014.02.001

Aragón-Correa J. A., Marcus A., & Hurtado-Torres N. (2016). The natural environmental strategies of international firms: Old controversies and new evidence on performance and disclosure. *Academy of Management Perspectives*, 30, 24-39.

Ararat, M., Aksu, M., & Cetin, A. (2015). How board diversity affects firm performance in emerging markets: evidence on channels in controlled firms. *Corporate Governance: An International Review, 23* (2), 83-103. https://doi.org/10.1111/corg.12103

Aras, G. & Crowther, D. (2008). Governance and sustainability: An investigation into the relationship between corporate governance and corporate sustainability. *Management Decision, 46* (3), 433-448. https://doi.org/10.1108/00251740810863870

Arcay , M.R., & Vazquez, M.F. (2005). Corporate Characteristics, Governance Rules and the Extent of Voluntary Disclosure in Spain. *Advances in Accounting, 21*, 299-331. https://doi.org/10.1016/S0882-6110(05)21013-1

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, 21* (3), 497-514. https://doi.org/10.1108/CG-06-2020-0243

Arnaboldi, F., Casu, B., Kalotychou, E., & Sarkisyan, A. (2020). Board diversity reforms: do they matter for EU bank performance? *European Financial Management, 26* (2), 416-454. https://doi.org/10.1111/eufm.12238

Ashfaq, K. & Rui, Z. (2019). Revisiting the relationship between corporate governance and corporate social and environmental disclosure practices in Pakistan. *Social Responsibility Journal, 15*(1), 90-119. https://doi.org/10.1108/SRJ-01-2017-0001

Ashfaq, K. & Rui, Z. (2019). Revisiting the relationship between corporate governance and corporate social and environmental disclosure practices in Pakistan. *Social Responsibility Journal, 15* (1), 90-119. https://doi.org/10.1108/SRJ-01-2017-0001

Baboukardos, D. (2017) Market valuation of greenhouse gas emissions under a mandatory reporting regime: Evidence from the UK. *Accounting Forum, 41* (3), 221-233. https://doi.org/10.1016/j.accfor.2017.02.003

Baje, K. B., Yemenu, K. A., & Surur, S. A. (2020). Elucidative motives of social and environmental reporting in Ethiopian companies. *African Journal of Business Management, 14*(1), 1-8. https://doi.org/10.5897/AJBM2019.8917

Banerjee, S., Khan, M.A., & Husnain, M. (2021). Searching appropriate system boundary for accounting India's emission inventory for the responsibility to reduce carbon emissions. *Journal of Environmental Management, 295.* https://doi.org/10.1016/j.jenvman.2021.112907

Barakat, F. S., Pérez, M. V. L., & Ariza, L. R. (2015). Corporate social responsibility disclosure (CSRD) determinants of listed companies in Palestine (PXE) and Jordan (ASE). *Review of Managerial Science*, *9*(4), 681-702.

Barbu, E.M., Ionescu-Feleagă, L., & Ferrat, Y. (2022). The Evolution of Environmental Reporting in Europe: The Role of Financial and Non-Financial Regulation. *The International Journal of Accounting, 57* (2), 1-25 https://doi.org/10.1142/S1094406022500081

Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*, 99–120

Barney, J. B. (2002). *Gaining and sustaining competitive advantage*. 2nd ed. NJ: Prentice-Hall

Beji, R., Yousfi, O., Loukil, N., & Omri, A. (2020). Board diversity and corporate social responsibility: empirical evidence from France. *Journal of Business Ethics, 173*, 133-155.

Bell, M. (2021). Why ESG performance is growing in importance for investors. https://www.ey.com/en_uk/assurance/why-esg-performance-is-growing-in-importance-for-investors

Ben-Amar, W., Chang, M., & Mcllkenny, P. (2017). Board gender diversity and corporate response to sustainability initiatives: evidence from carbon disclosure project. *Journal of business ethics, 142*, 369-383. https://doi.org/10.1007/s10551-015-2759-1

Berrone P., & Gomez-Mejia L. R. (2009). Environmental performance and executive compensation: An integrated agency-institutional perspective. *Academy of Management Journal*, 52 (1),103-126.

Bewley, K. & Li, Y. (2000). Disclosure of Environmental Information by Canadian Manufacturing Companies: A Voluntary Disclosure Perspective. *Advances in Environmental Accounting and Management, 1,* 201-226. http://dx.doi.org/10.1016/S1479-3598(00)01011-6

Bhatia, A., & Tuli, S. (2017). Corporate attributes affecting sustainability reporting: an Indian perspective. *International Journal of Law and Management, 59* (3), 322-340. https://doi.org/10.1108/IJLMA-11-2015-0057

Birkey, R.N., Michelon, G., Patten, D.M., &Jomo Sankara, J. (2016). Does assurance on CSR reporting enhance environmental reputation? An examination in the U.S. context. *Accounting Forum, 40* (3), 143-152. https://doi.org/10.1016/j.accfor.2016.07.001

Black, B., & Kim, W. (2012). The effect of board structure on firm value: A multiple identification strategies approach using Korean data. Journal of Financial Economics, 104 (1), 203-226. https://doi.org/10.1016/j.jfineco.2011.08.001

Boateng, R.N., Tawiah, V. & Tackie, G. (2022). Corporate governance and voluntary disclosures in annual reports: a post-International Financial Reporting Standard adoption evidence from an emerging capital market. *International Journal of Accounting & Information Management*. https://doi.org/10.1108/IJAIM-10-2021-0220

Bongiovanni, A., P. Vincentiis, A. Guariglia, E. Isaia, & Rossi, M. (2022). Do Board Gender Quotas Generate Horizontal Spillovers?. *British Journal of Management*. https://doi.org/10.1111/1467-8551.12667

Bongiovanni, A., Vincentiis, P., Guariglia, A., Isaia, E., & Rossi, M. (2022). Do Board Gender Quotas Generate Horizontal Spillovers? *British Journal of Management*. https://doi.org/10.1111/1467-8551.12667

Borgen, N. T. (2016). Fixed Effects in Unconditional Quantile Regression. *Stata Journal,16* (2), 403-415

Borgen, N. T. (2016). Fixed Effects in Unconditional Quantile Regression. *Stata Journal,16* (2), 403-15

Braam, G., Weerd, L. Uit De, Hauck, M., & Huijbregts, M. (2016). Determinants of corporate environmental reporting: the importance of environmental performance and assurance. *Journal of Cleaner Production, 129*, 724-734. https://doi.org/10.1016/j.jclepro.2016.03.039

Brammer, S., Millington, A., & Pavelin, S. (2009). Corporate Reputation and Women on the Board. *British Journal of Management, 20* (1), 17-29. https://doi.org/10.1111/j.1467-8551.2008.00600.x

Brammer, S., & Pavelin, S. (2008). Factors influencing the quality of corporate environmental disclosure. *Business Strategy and the Environment, 17*(2), 120–136. https://doi.org/10.1002/bse.506

Brammer, S., Millington, A., & Pavelin, S. (2007). Gender and ethnic diversity among UK corporate boards. *Corporate Governance: An International Review, 15* (2), 393-403, https://doi.org/10.1111/j.1467-8683.2007.00569.x.

Brammer, S.,& Pavelin, S. (2004). Building a Good Reputation. *European Management Journal, 22* (6), 704-713. https://doi.org/10.1016/j.emj.2004.09.033

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. https://doi.org/10.1108/JAAR-06-2018-0085

Cabeza-García, L., Fernández-Gago, R., & Nieto, M. (2018). Do Board Gender Diversity and Director Typology Impact CSR Reporting? *European Management Review, 15* (4), 559-575. https://doi.org/10.1111/emre.12143

Canay, I. A. (2011). A Simple Approach to Quantile Regression for Panel Data. *The Econometrics Journal 14*(3), 368-86. https://doi.org/10.1111/j.1368-423X.2011.00349.x.

Cancela, B.L., Neves, M.E.D., Rodrigues, L.L. & Gomes Dias, A.C. (2020). The influence of corporate governance on corporate sustainability: new evidence using panel data in the Iberian macroeconomic environment. *International Journal of Accounting & Information Management, 28* (4), 785-806. https://doi.org/10.1108/IJAIM-05-2020-0068

Carroll, A. B., Lipartito, K. J., Post, J. E., Werhane, P. H., & Goodpaster, K. E. (Eds.). (2012). *Corporate responsibility: the American Experience*. Cambridge: Cambridge University Press.

Carroll, A.B. (2016). Carroll's pyramid of CSR: taking another look. *International Journal of Corporate Social Responsibility*. https://doi.org/10.1186/s40991-016-0004-6

Carter, D.A., D'Souza, F., Simkins, B.J. & Simpson, W.G. (2010). The gender and ethnic diversity of US boards and board committees and firm financial performance, *Corporate Governance: An International Review, 18* (5), 396-414. https://doi.org/ 10.1111/j.1467-8683.2010.00809.x.

Centre for Research on the Epidemiology of Disasters, CRED (2022). *2021 disasters in numbers*. https://reliefweb.int/report/world/2021-disasters-numbers

Chakraborty, A. (2019). Which internal factors drive companies to social reporting? An empirical study from a developing. *Asian Journal of Accounting Perspectives, 12*(1), 109–127. https://doi.org/10.22452/AJAP.vol12no1.5

Chernozhukov, V., & Hansen, C. (2006). Instrumental quantile regression inference for structural and treatment effect models. *Journal of Economics, 132* (2),491-525. https://doi.org/10.1016/j.jeconom.2005.02.009

Chijoke-Mgbame, A.M., Boateng, A., & Mgbame, C.O. (2020). Board gender diversity, audit committee and financial performance: evidence from Nigeria. *Accounting Forum, 44* (3), 262-286 https://www.tandfonline.com/doi/full/10.1080/01559982.2020.1766280

Chithambo, L. & Tauringana, V. (2017). Corporate governance and greenhouse gas disclosure: A mixed-methods approach. *Corporate Governance, 17 (*4), 678-699. https://doi.org/10.1108/CG-10-2016-0202

Chiu, T-K., Wang, Y-H., (2014). Determinants of social disclosure quality in Taiwan: an application of stakeholder theory. *Journal of Business. Ethics, 129* (2), 379-398.

Chong, L.-L., Ong, H.-B. & Tan, S.-H. (2018). Corporate risk-taking and performance in Malaysia: the effect of board composition, political connections, and sustainability practices. *Corporate Governance, 18* (4), 635-654. https://doi.org/10.1108/CG-05-2017-0095

Christensen, D.M., Serafeim, G., & Sikochi, A. (2022). Why is corporate virtue in the eye of the beholder? The case of ESG ratings. *The Accounting Review*, 97(1),147-175.

Ciavarella, A. (2017) Board Diversity and Firm Performance Across Europe. CONSOB Working Papers No. 85, Available at SSRN: https://ssrn.com/abstract=3084114 or http://dx.doi.org/10.2139/ssrn.3084114

Clarkson, P. M., Overell, M. B., & Chapple, L. (2011). Environmental Reporting and its Relation to Corporate Environmental Performance. Abacus, 47(1), 27–60. https://doi.org/10.1111/j.1467-6281.2011.00330.x

Clarkson, P., Li, Y., Richardson, G., & Tsang, A. (2019). Causes and consequences of voluntary assurance of CSR reports: International evidence involving Dow Jones Sustainability Index Inclusion and Firm Valuation. *Accounting, Auditing & Accountability Journal, 32* (8), 2451-2474. https://doi.org/10.1108/AAAJ-03-2018-3424

Coad, A., & Rao, R. (2008). Innovation and Firm Growth in High-Tech Sectors: A Quantile Regression Approach. *Research Policy, 37* (4), 633-648. https://doi.org/10.1016/j.respol.2008.01.003

Cong, Y., & Freedman, M. (2011). Corporate governance and environmental performance and disclosures. *Advances in Accounting, incorporating Advances in International Accounting, 27*(2), 223–232. https://doi.org/10.1016/j.adiac.2011.05.005

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, 1127–1144. https://doi.org/10.1002/bse.2421

Cormier, D., & Magnan, M. (2003). Environmental reporting management: A continental European perspective. *Journal of Accounting and Public Policy, 22* (1), 43–62. https://doi.org/10.1016/S0278-4254 (02)00085-6

Cormier, D., Gordon, I. M., & Magnan, M. (2004). Corporate Environmental Disclosure: Contrasting Management 's Perceptions with Reality. *Journal of Business ethics*, 49, 143–165.

Cormier, D., Magnan, M., & Van Velthoven, B. (2005). Environmental disclosure quality in large German companies: Economic incentives, public pressures or institutional conditions? *European Accounting Review, 14*(1), 3–39. https://doi.org/10.1080/0963818042000339617

Correa-Garcia, J.A., Garcia-Benau, M.A., & Garcia-Meca, E. (2020). Corporate governance and its implications for sustainability reporting quality in Latin American business groups. *Journal of Cleaner Production*, 260 https://doi.org/10.1016/j.jclepro.2020.121142

Coulmont, M., Loomis, S., Berthelot, S., & Gangi, F. (2016). *Determinants and Impacts of Sustainability Disclosure*. Sustainability Disclosure: State of the Art and New Directions (Studies in Managerial and Financial Accounting, Vol. 30), Emerald Group Publishing Limited, Bingley, pp. 25-79. https://doi.org/10.1108/S1479-351220150000030002

Crisóstomo, V.L., Freire, F.d.S. & Freitas, M.R.D.O. (2020). Determinants of corporate sustainability performance – evidence from Brazilian panel data. *Social Responsibility Journal, 16* (8),1053-1072. https://doi.org/10.1108/SRJ-04-2018-0102

Cuadrado-Ballesteros, B., & Bisogno, M. (2020). Public sector accounting reforms and the quality of governance. *Public Money & Management*, *41*(2), 107–117. https://doi.org/10.1080/09540962.2020.1724665

Cuadrado-Ballesteros, B., & Bisogno, M. (2020). Public sector accounting reforms and the quality of governance. *Public Money & Management*, *41*(2), 107–117. https://doi.org/10.1080/09540962.2020.1724665

Cuadrado-Ballesteros, B., & Bisogno, M. (2020). Public sector accounting reforms and the quality of governance. *Public Money & Management*, *41*(2), 107–117. https://doi.org/10.1080/09540962.2020.1724665

Cucari, N., Esposito De Falco, S., & Orlando, B. (2018). Diversity of Board of Directors and Environmental Social Governance: Evidence from Italian Listed Companies. *Corporate Social Responsibility and Environmental Management, 25*, 250-266. https://doi.org/ 10.1002/csr.1452.

Da Silva Monteiro, S.M., & Aibar-Guzmán, B. (2010). Determinants of environmental disclosure in the annual reports of large companies operating in Portugal. *Corporate social responsibility and environmental management, 17* (4), 185–204. https://doi.org/10.1002/csr.197

Daft, R. (1983). *Organization Theory and Design*. West, New York.

Dah, B.A., Dah, M.A., & Frye, M.B. (2023). Board Refreshment: Like a Breath of Fresh Air. *British Journal of Management*. https://doi.org/10.1111/1467-8551.12718

Daniliuc, S., Li, L., & Wee, M. (2021). Busy directors and firm performance: a replication and extension of Hauser (2018). *Accounting & Finance, 61* (1), 1415–1423. https://doi.org/10.1111/acfi.12631

Daniliuc, S.O., Li, L. and Wee, M. (2020). Busy directors and firm performance: Evidence from Australian mergers. *Pacific-Basin Finance Journal*, *64*, 101434. https://doi.org/10.1016/j.pacfin.2020.101434

De Villiers, C., Naiker, V., & Van Staden, C. J. (2011). The effect of board characteristics on firm environmental performance. Journal of Management, 37: 1636-1663

Delis, M.D., Gaganis, C., Hasan, I., & Pasiouras, F. (2017). The effect of board directors from countries with different genetic diversity levels on corporate performance. *Management Science, 63*(1), 231-249.

DiMaggio, P.J., & Powell, W.W. (1991). Introduction. In: DiMaggio PJ, Powell WW (eds) *The New Institutionalism in Organizational Analysis*. Chicago, IL: University of Chicago Press, 1–38.

Disli, M., Yilmaz, M.K. & Mohamed, F.F.M. (2022). Board characteristics and sustainability performance: empirical evidence from emerging markets. *Sustainability Accounting, Management and Policy Journal*. https://doi.org/10.1108/SAMPJ-09-2020-0313

Dixon-Fowler H. R., Ellstrand A. E., Johnson J. L. (2017). The role of board environmental committees in corporate environmental performance. *Journal of Business Ethics*, 140: 423-438

Dong, Y., Zhao, Y., Zhang, J., & Liu, P. (2022). Development of a framework of carbon accounting and management on the township level in China. *Journal of Environmental Management*, 318, https://doi.org/10.1016/j.jenvman.2022.115609

Doni, F., Corvino, A., & Martini, S.B. (2021). Corporate governance model, stakeholder engagement and social issues evidence from European oil and gas industry. *Social Responsibility Journal*, https://doi/10.1108/SRJ-08-2020-0336

Dowell, G., Shackell, M., & Stuart, N. (2011). Boards, CEOs, and surviving a financial crisis: Evidence from the internet shakeout. *Strategic Management Journal, 32* (10), 1025-1045. https://doi.org/10.1002/smj.923

Dragoa, C., Millo, F., Ricciuti, R., & Santella, P. (2015). Corporate governance reforms, interlocking directorship and company performance in Italy. International Review of Law and Economics, 41, 38-49. http://dx.doi.org/10.1016/j.irle.2014.09.003

Du Rietz, S. (2018). Information vs knowledge: Corporate accountability in environmental, social, and governance issues. *Accounting, Auditing & Accountability Journal, 31* (2), 586-607. https://doi.org/10.1108/AAAJ-01-2013-1198

Dyduch, J., & Krasodomska, J. (2017). Determinants of corporate social responsibility disclosure: An empirical study of Polish listed companies. *Sustainability, 9*(11), 19–34. https://doi.org/10.3390/su911193

Ebiringa, O. T., Yadirichukwu, E., Chigbu, E. E., & Ogochukwu, O. J. (2013). Effect of Firm Size and Profitability on Corporate Social Disclosures: The Nigerian Oil and Gas sector in Focus. *British Journal of Economics, Management & Trade, 3*(4),563–574.

Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. Management Science, 60: 2835-2857.

Elamer, A.A., Ntim, C.G., Abdou, H.A., Zalata, A.M., & Elmagrhi, M. (2019). The impact of multi-layer governance on bank risk disclosure in emerging markets: the case of Middle East and North Africa. *Accounting Forum, 43* (2), 246-281. https://www.tandfonline.com/doi/full/10.1080/01559982.2019.1576577

Elsayed, N. & Ammar, S. (2020). Sustainability governance and legitimisation processes: Gulf of Mexico oil spill. *Sustainability Accounting, Management and Policy Journal, 11* (1), 253-278. https://doi.org/10.1108/SAMPJ-09-2018-0242

Elsayih, J., Datt, R.. & Tang, Q. (2021) Corporate governance and carbon emissions performance: empirical evidence from Australia, *Australasian Journal of Environmental Management*, *28* (4), 433-459, https://doi/10.1080/14486563.2021.1989066

Erin, O., Adegboye, A. & Bamigboye, O.A. (2021). Corporate governance and sustainability reporting quality: Evidence from Nigeria. *Sustainability Accounting, Management and Policy Journal*. https://doi.org/10.1108/SAMPJ-06-2020-0185

Erin, O.A., Bamigboye, O.A. & Oyewo, B. (2022). Sustainable development goals (SDG) reporting: An analysis of disclosure. *Journal of Accounting in Emerging Economies*. https://doi.org/10.1108/JAEE-02-2020-0037

Fahad P., & Nidheesh K. (2021). Determinants of CSR disclosure: an evidence from India. *Journal of Indian Business Research, 13* (1), 110-133. https://doi.org/10.1108/JIBR-06-2018-0171

Fama, E.F. & Jensen, M.C. (1983). Agency problems and residual claims. *The Journal of Law and Economics, 26* (2), 327-349.

Farooq, M.B., Zaman, R., Sarraj, D. and Khalid, F. (2021). Examining the extent of and drivers for materiality assessment disclosures in sustainability reports. *Sustainability Accounting, Management and Policy Journal*, *12* (5), 965-1002. https://doi.org/10.1108/SAMPJ-04-2020-0113

Farrukh, N., Kashif, K.M., & Muhammad, S.(2015). Factors affecting the corporate governance disclosure: An analysis of manufacturing firms in Pakistan. *International Journal of Management, IT and Engineering, 5* (11), 16-33. http://indianjournals.com/ijor.aspx?target=ijor%3Aijmie&volume=5&issue=11&article=002&utm_source=TrendMD&utm_medium=cpc&utm_campaign=International_Journal_of_Management_IT_and_Engineering_TrendMD_1

Fernandes, V., Kuzey, C., Uyar, A., & Karaman, A.S. (2022). Board structure policy, board diversity and social sustainability in the logistics and transportation sector. *International Journal of Physical Distribution & Logistics Management*, https://doi.org/10.1108/IJPDLM-09-2021-0415

Fernández-Temprano, M.A. and Tejerina-Gaite, F. (2020). Types of director, board diversity and firm performance", Corporate Governance, 20 (2), 324-342. https://doi.org/10.1108/CG-03-2019-0096

Fernández-Temprano, M.A., & Tejerina-Gaite, F. (2020). Types of director, board diversity and firm performance. *Corporate Governance, 20* (2), 324-342. https://doi.org/10.1108/CG-03-2019-0096

Field, L., M. Lowry, & A. Mkrtchyan (2013). Are busy boards detrimental? *Journal of Financial Economics,109*, 63–82

Firoozi, M., & Keddie, L. (2021). Geographical diversity among directors and corporate social responsibility. *British Journal of management*. https://doi.org/10.1111/1467-8551.12481

Flammer, C., Hong, B., & Minor, D. 2019. Corporate governance and the rise of integrating corporate social responsibility criteria in executive compensation: Effectiveness and implications for firm outcomes. *Strategic Management Journal, 40*: 1097-1122.

Galani, D., Gravas, E., & Stavropoulos, A. (2012) Company characteristics and environmental policy. *Business Strategy and the Environment, 21* (2012), 236-247. https://doi.org/10.1002/bse.731

Ganesan, Y., Nasional, U. T., Shah, M., & Hashim, F. (2017). Corporate Governance and Sustainability Reporting Practices: The Moderating Role of Internal Audit Function. *Global Business and Management Research: An International Journal, 9*(4), 159-180.

García-Sánchez, I., Suárez-Fernández, O., & Martínez-Ferrero, J. (2019). Female directors and impression management in sustainability reporting. *International Business Review*, 28, 359–374. https://doi.org/10.1016/j.ibusrev

Ghazali, N. A. M. (2007). Ownership structure and corporate social responsibility disclosure: some Malaysian evidence. *Corporate Governance, 7*(3), 251–266. https://doi.org /10.1108/14720700710756535

Giannarakis, G., Konteos, G. & Sariannidis, N. (2014). Financial, governance and environmental determinants of corporate social responsible disclosure. *Management Decision, 52* (10), 1928-1951. https://doi.org/10.1108/MD-05-2014-0296

Giannarakis, G., Zafeiriou, E., Arabatzis, G., & Partalidou, X. (2018). Determinants of Corporate Climate Change Disclosure for European Firms. *Corporate Social Responsibility and Environmental Management*, 25, 281–294. https://doi.org/10.1002/csr.1461

Girella, L., Zambon, S. and Rossi, P. (2021). Board characteristics and the choice between sustainability and integrated reporting: a European analysis. *Meditari Accountancy Research*.https://doi.org/10.1108/MEDAR-11-2020-1111

Girón, A., Kazemikhasragh, A., Cicchiello, A.F., & Panetti, E. (2021). Sustainability Reporting and Firms' Economic Performance: Evidence from Asia and Africa. *Journal of the Knowledge Economy,* **12,** 1741–1759 (2021). https://doi.org/10.1007/s13132-020-00693-7

Glass Lewis (2016). In depth: Linking compensation to sustainability. https://www.glasslewis.com/wp-content/uploads/2016/03/2016-In-Depth-Report-LINKING-COMPENSATION-TO-SUSTAINABILITY.pdf

Gómez, N.A., & García, S.M. (2020). Governance and Type of Industry as Determinants of Corporate Social Responsibility Disclosures in Latin America, *Latin American Business Review, 21*:1, 1-35, DOI: 10.1080/10978526.2019.1697185

Guest, P.M. (2019). Does Board Ethnic Diversity Impact Board Monitoring Outcomes?. *British Journal of Management, 30* (1), 53-74. https://doi.org/10.1111/1467-8551.12299

Gull, A.A., Atif, M., & Hussain, N. (2023). Board gender composition and waste management: Cross-country evidence. *The British Accounting Review, 55* (1), https://doi.org/10.1016/j.bar.2022.101097

Gurol, B., & Lagasio, V. (2022). Women board members' impact on ESG disclosure with environment and social dimensions: evidence from the European banking sector. *Social Responsibility Journal*. https://doi.org/10.1108/SRJ-08-2020-0308

Haji, A. & Anifowose, M. (2016). Audit committee and integrated reporting practice: does internal assurance matter? *Managerial Auditing Journal, 31* (8/9), 1-44.

Haniffa, R. M., & Cooke, T. E. (2005). The impact of culture and governance on corporate social reporting. *Journal of Accounting and Public Policy, 24*(5), 391–430. https://doi.org/10.1016/j.jaccpubpol.2005.06.001

Harjoto, M.A. & Wang, Y. (2020). Board of directors network centrality and environmental, social and governance (ESG) performance. *Corporate Governance, 20* (6), 965-985. https://doi.org/10.1108/CG-10-2019-0306

Harun, M., Hussainey, K., Kharuddin, K., & Farooque, O. (2020). CSR disclosure, corporate governance and firm value: A study on GCC Islamic Banks. *International Journal of Accounting & Information Management, 28* (4), 607-638. https://doi.org/10.1108/IJAIM-08-2019-0103

Hasseldine, J., Salama, A. I., & Toms, J. S. (2005). Quantity versus quality: the impact of environmental disclosures on the reputations of UK Plcs. *The British Accounting Review, 37* (2), 231–248. https://doi.org/10.1016/j.bar.2004.10.003

Hawn O., & Ioannou I. (2016). Mind the gap: The interplay between external and internal actions in the case of corporate social responsibility. *Strategic Management Journal*, *37*, 2569-2588. https://doi.org/10.1002/smj.2464

Huafang, X., & Jianguo, Y. (2007). Ownership structure, board composition and corporate voluntary disclosure: Evidence from listed companies in China. *Managerial Auditing Journal, 22*(6), 604–619. https://doi.org/10. 1108/02686900710759406

Huang, C., & Kung, F. (2010). Drivers of Environmental Disclosure and Stakeholder Expectation: Evidence from Taiwan. *Journal of Business Ethics, 96* (3), 435–451. https://doi.org/10.1007/s 10551-010-0476-3

Huang, T., Pepper, M., & Bowrey, G. (2014). Implementing a sustainability balanced scorecard to contribute to the process of organisational legitimacy assessment. *Australasian Accounting, Business and Finance Journal*, *8*(2), 15-34.

Hussain, N., Rigoni, U., & Orij, R. P. (2018). Corporate governance and sustainability performance: Analysis of triple bottom line performance. *Journal of Business Ethics, 149*(2), 411-432. https://doi.org/10.1007/s10551-016-3099-5

Ibrahim, A.H., & Hanefah, M.M. (2016). Board diversity and corporate social responsibility in Jordan. *Journal of Financial Reporting and Accounting, 14* (2), 279-298.

Ioannou, I. & Serafeim, G. (2012). What drives corporate social performance? International evidence from social, environmental and governance scores. *Journal of International Business Studies, 43* (9), 834-864.

Isa, M. A. (2014). Sustainability Reporting among Nigeria Food and Beverages Firms. International *Journal of Agriculture and Economic Development, 2*(1), 1-9.

Issa, A., Zaid, M.A.A., Hanaysha, J.R. & Gull, A.A. (2022). An examination of board diversity and corporate social responsibility disclosure: evidence from banking sector in the Arabian Gulf countries. *International Journal of Accounting & Information Management, 30* (1), 22-46. https://doi.org/10.1108/IJAIM-07-2021-0137

Jain, T. & Zaman, R. (2020). When boards matter: the case of corporate social irresponsibility. *British Journal of Management, 31*, 365–386

Jamal, N. (2018). Women in the boardroom. Dawn, The Business and Finance Weekly. https://www.dawn.com/news/1388822

Jamil, A., Mohd Ghazali, N.A. & Puat Nelson, S. (2021). The influence of corporate governance structure on sustainability reporting in Malaysia. *Social Responsibility Journal, 17* (8), 1251-1278. https://doi.org/10.1108/SRJ-08-2020-0310

Jensen, M.C., & Meckling, W.H. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305-360, https://doi.org 10.1016/0304-405X(76)90026-X.

Jizi, M. I., Salama, A., Dixon, R., & Stratling, R. (2014). Corporate Governance and Corporate Social Responsibility Disclosure: Evidence from the US Banking Sector. *Journal of Business Ethics, 125(*4), 601–615. https://doi.org/10.1007/s 1 0551-013-1929-2

Johnson, G., Whittington, R., Scholes, K., Angwin, D, & Regnér, P. (2017). *Exploring strategy: Text and Cases* (11th ed.). Essex: Pearson Education Limited

Johnstone, E.V., Mayordomo, N. & Mausolf, E.J. (2022). Discovery, nuclear properties, synthesis and applications of technetium-101. *Communications Chemistry, 5*, 131 (2022). https://doi.org/10.1038/s42004-022-00746-9

Joshi, G.,S., & Hyderabad, R. L. (2019). Determinants of Corporate Social Responsibility Reporting in India. *Journal of Management, 6*(1), 1-10.

Kamarudin, K.A., Ariff, A.M. & Wan Ismail, W.A. (2021). Product market competition, board gender diversity and corporate sustainability performance: international evidence., *Journal of Financial Reporting and Accounting*, https://doi.org/10.1108/JFRA-01-2021-0020

Kansal, M., Joshi, M., & Singh, G. (2014). Determinants of corporate social responsibility disclosures: Evidence from India. *Advances in Accounting, 30* (1), 217-229. https://doi.org/10.1016/j.adiac.2014.03.009

Karaman, A.S., Kilic, M., & Uyar, A. (2020). Green logistics performance and sustainability reporting practices of the logistics sector: The moderating effect of corporate governance. *Journal of Cleaner Production*, 258 (1), https://doi.org/10.1016/j.jclepro.2020.120718 0959-6526

Kassinis, G., & Vafeas, N. (2002). Corporate boards and outside stakeholders as determinants of environmental litigation. *Strategic Management Journal, 23* (5), 399-415. https://doi.org/10.1002/smj.230

Kend, M. (2015). Governance, firm-level characteristics and their impact on the client's voluntary sustainability disclosures and assurance decisions. *Sustainability Accounting, Management and Policy Journal, 6* (1), 54-78. https://doi.org/10.1108/SAMPJ-12-2013-0061

Khan, H. (2010). The effect of corporate governance elements on corporate social responsibility (CSR) reporting: Empirical evidence from private commercial banks of Bangladesh. *International Journal of Law and Management, 52*(2), 82–109. https://doi.org/10.1108/17542431011029406

Khan, H.Z., Bose, S., Mollik, A.T., & Harun, H. (2021). "“Green washing” or “authentic effort”? An empirical investigation of the quality of sustainability reporting by banks. *Accounting, Auditing & Accountability Journal, 34* (2), 338-369. https://doi.org/10.1108/AAAJ-01-2018-3330

Khan, I., Khan, I. & Senturk, I. (2019). Board diversity and quality of CSR disclosure: evidence from Pakistan. *Corporate Governance: The International Journal of Business in Society, 19* (6), 1187-1203. https://doi.org/10.1108/CG-12-2018-0371

Khasharmeh, H., & Suwaidan, M. (2010). Social responsibility disclosure in corporate annual reports: evidence from the Gulf Cooperation Council countries. *International Journal of Accounting Auditing and Performance Evaluation, 6(*4), 327-345.

Klein, A. (2002), Audit Committee, Board of Director Characteristics, and Earnings Management. *Journal of Accounting and Economics, 33* (3), 375-400. https://doi.org/10.1016/S0165-4101(02)00059-9

Konadu, R., Ahinful, G.A., Boakye, D.J., & Elbardan, H. (2021). Board gender diversity, environmental innovation and corporate carbon emissions. *Technological forecasting and social change*. https://doi.org/10.1016/j.techfore.2021.121279

Kret, M.E., & De Gelder, B. (2012). A review on sex differences in processing emotional signals. *Neuropsychologia. 50* (7), 1211–21. https://doi.org/10.1016/j.neuropsychologia.2011.12.022

Kühn, A. L., Stiglbauer, M., & Fifka, M. S. (2018). Contents and Determinants of Corporate Social Responsibility Website Reporting in Sub-Saharan Africa: A Seven-Country Study. *Business and Society, 57* (3), 437-480 https://doi.org/10.1177/0007650315614234

Kumar, K., Kumari, R., Nandy, M., Sarim, M. & Kumar, R. (2022). Do ownership structures and governance attributes matter for corporate sustainability reporting? An examination in the Indian context. *Management of Environmental Quality*. https://doi.org/10.1108/MEQ-08-2021-0196

Kuzey, C., & Uyar, A. (2017). Determinants of sustainability reporting and its impact on firm value: Evidence from the emerging market of Turkey. *Journal of Cleaner Production*, 143 (1), 27-39 https://doi.org/10.1016/j.jclepro.2016.12.153

Laux, C. & Laux, V. (2009). Board Committees, CEO Compensation, and Earnings Management. The Accounting Review, 84 (3), 869-891.

Lee, S. (2007). Endogeneity in quantile regression models: A control function approach. *Journal of Economics, 141* (2),1131-1158. https://doi.org/10.1016/j.jeconom.2007.01.014

Lee, M.-D. P. (2008). A review of the theories of corporate social responsibility: its evolutionary path and the road ahead. *International Journal of Management Reviews, 10*(1), 53–73.

Leka, L. (2022). Board Oversight of Sustainability and ESG. International Federation of Accountants. https://www.ifac.org/knowledge-gateway/supporting-international-standards/discussion/board-oversight-sustainability-and-esg

Lepore, L., Pisano, S., Di Vaio, A. & Alvino, F. (2018). The myth of the "good governance code": an analysis of the relationship between ownership structure and the comply-or-explain disclosure. *Corporate Governance, 18* (5), 809-838. https://doi.org/10.1108/CG-08-2017-0197

Lewis, A.C., Cardy, R.L., & Huang, L.S.R (2019). Institutional theory and HRM: a new look. *Human Resource Management Review 29*(3), 316–335.

Li J., Zhao F., Chen S., Jiang W., Liu T., Shi S. (2017). Gender diversity on boards and firms' environmental policy. *Business Strategy and the Environment*, 26: 306-315.

Li, Y., Zhang, J., & Foo, C. T. (2013). Towards a theory of social responsibility reporting: Empirical analysis of 613 CSR reports by listed corporations in China. *Chinese Management Studies*, 7(4), 519–534. https://doi.org/10.1108/ CMS-09-2013-0167

Liu, M., Peng, L., Huang, R., Liu, H., Duan, Y., & Lin, S. (2022). Independent director-CEO friendliness and sustainable growth capability in enterprises: the moderating role of CSR and executive compensation. *Cross Cultural & Strategic Management*. https://doi.org/10.1108/CCSM-12-2021-0225

Liu, S., Wang, K.T, & Walpola, S. (2023). Female board representation and the adoption of corporate social responsibility criteria in executive compensation contracts: International evidence. Journal of International Financial Markets Institutions and Money, 82, https://doi.org/10.1016/j.intfin.2022.101685

Liu, X., & Anbumozhi, V. (2009). Determinant factors of corporate environmental information disclosure: an empirical study of Chinese listed companies. *Journal of Cleaner Production, 17* (6), 593-600. https://doi.org/10.1016/j.jclepro.2008.10.001

Lo, F.-Y., Wang, Y., & Zhan, W. (2020). Does TMT cultural diversity contribute to firm performance and do socialisation and tenure matter? A test of two competing perspectives. *Personnel Review, 49* (1), 324-348. https://doi.org/10.1108/PR-11-2018-0468

Lopatta, K., Böttcher, K., Lodhia, S.K., & Tideman, S.A. (2020). The Relationship Between Gender Diversity and Employee Representation at the Board Level and Non-Financial

Performance: A Cross-Country Study. *The International Journal of Accounting, 55* (1), https://doi.org/10.1142/S1094406020500018

Lu, J., & Wang, J. (2021). Corporate governance, law, culture, environmental performance and CSR disclosure: A global perspective. *Journal of International Financial Markets, Institutions & Money, 70.* https://doi.org/10.1016/j.intfin.2020.101264

Luo, L., & Tang, Q. (2016). Determinants of the Quality of Corporate Carbon Management Systems: An International Study. *The International Journal of Accounting, 51* (2), 275-305. https://doi.org/10.1016/j.intacc.2016.04.007

Maali, K., Rakia, R. & Khaireddine, M. (2021). How corporate social responsibility mediates the relationship between corporate governance and sustainability performance in UK: a multiple mediator analysis. *Society and Business Review, 16* (2), 201-217. https://doi.org/10.1108/SBR-12-2020-0143

Magness, V. (2006). Strategic posture, financial performance and environmental disclosure: an empirical test of legitimacy theory, *Accounting, Auditing and Accountability Journal, 19*(4), 540–563. http://dx.doi.org/10.1108/09513570610679128

Mahadeo, J.D., Oogarah-Hanuman, V. & Soobaroyen, T. (2011). Changes in social and environmental reporting practices in an emerging economy (2004–2007): exploring the relevance of stakeholder and legitimacy theories. *Accounting Forum, 35* (3), 158-175.

Malhotra, N.K., & Birks, D.F. (2007). *Marketing research: An applied approach*, (3rd ed.). Harlow, England: Financial Times Prentice Hall

Malik, M., & Shim, E.D. (2022). Empirical examination of the direct and moderating role of corporate social responsibility in top executive compensation. *Pacific Accounting Review, 34* (5), 708-727. https://doi.org/10.1108/PAR-09-2021-0162

Mangena, M., Tauringana, V., & Chamisa, E. (2012). Corporate Boards, Ownership Structure and Firm Performance in an Environment of Severe Political and Economic Crisis. *British Journal of Management, 23* (1), 23-41. https://doi.org/10.1111/j.1467-8551.2011.00804.x

Mangena, M., Priego, A.M., & Manzaneque, M. (2020). Bank power, block ownership, boards and financial distress likelihood: an investigation of Spanish listed firms. *Journal of Corporate Finance,64*.https://doi.org/10.1016/j.jcorpfin.2020.101636

Maroun, W. (2019). Does external assurance contribute to higher quality integrated reports?", *Journal of Accounting and Public Policy, 38* (4), 106-120

Martínez-Ferrero, J., & García-Sánchez, I. (2017). Coercive, normative and mimetic isomorphism as determinants of the voluntary assurance of sustainability reports. *International Business Review, 26*, 102-118. http://dx.doi.org/10.1016/j.ibusrev.2016.05.009

Martínez-Ferrero, J., Lozano, M.B. & Vivas, M. (2021). The impact of board cultural diversity on a firm's commitment toward the sustainability issues of emerging countries: the mediating effect of a CSR committee. *Corporate Social Responsibility and Environmental Management, 28* (2), 675-685.

Martínez-García, I., Terjesen, S.,& Gómez-Ansón, S. (2022). Board Gender Diversity Codes, Quotas and Threats of Supranational Legislation: Impact on Director Characteristics and Corporate Outcomes. *British Journal of Management, 33* (2), 753-783. https://doi.org/10.1111/1467-8551.12517

Marwell, G. & Oliver, P. (1993). *The Critical Mass in Collective Action*. Cambridge University Press.

Masud MAK, Nurunnabi M, & Bae SM (2018) The effects of corporate governance on environmental sustainability reporting: empirical evidence from south Asian countries. Asian *Journal of Sustainability and Social Responsibility, 3(*1), 21-26 https://doi.org/10.1186/ s41180-018-0019-x

Mateos de Cabo, R., S. Terjesen, L. Escot and R. Gimeno (2019). Do "soft law" board gender quotas work? Evidence from a natural experiment. *European Management Journal, 37*, 611–624. https://doi.org/10.1016/j.emj.2019.01.004

Mathuva, D. M., Tauringana, V., & Owino, F. J. O. (2019). Corporate governance and the timeliness of audited financial statements: the case of Kenyan listed firms. *Journal of Accounting in Emerging Economies, 9* (4),473-501. https://doi.org/10.1108/JAEE-05-2018-0053

Meitner, L., & Frisch, O.R. (1939). Disintegration of Uranium by Neutrons: a New Type of Nuclear Reaction. *Nature,* 143, 239–240. https://doi.org/10.1038/143239a0

Merton, R. K. (1968). The Matthew Effect in science. *Science 159* (3810), 56–63.

Michelon, G., & Parbonetti, A. (2012). The effect of corporate governance on sustainability disclosure. *Journal of Management and Governance, 16*, 477–509. https://doi.org/10.1007/s10997-010-9160-3

Moses, O. & Tauringana, V., (2022). Environmental Sustainability and the Progress towards Agenda 2030. *Advances in Environmental Accounting and Management*. https://doi.org/10.1108/S1479-359820220000010001

Moses, O., & Tauringana, V. (2022). Environmental Sustainability and the Progress towards Agenda 2030, Tauringana, V. and Moses, O. (Ed.) Environmental Sustainability and Agenda 2030 (Advances in Environmental Accounting & Management, Vol. 10), https://doi.org/10.1108/S1479-359820220000010001

Mudiyanselage, N.C.S.R. (2018). Board involvement in corporate sustainability reporting: evidence from Sri Lanka. *Corporate Governance: The International Journal of Business in Society, 18* (6), 1042-1056.

Muniandy, B. (2009). The association between corporate governance attributes and voluntary disclosure: evidence from Malaysia. *Journal of Accounting & Organizational Change, 5* (4). https://doi.org/10.1108/jaoc.2009.31505dad.002

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.

Nadeem, M., Bahadar, S., Gull, A., & Iqbal., U. (2020). Are women eco-friendly? Board gender diversity and environmental innovation. Business Strategy and the environment, 29 (8), 3146-3161. https://doi.org/10.1002/bse.2563

Ngu, S.B. & Amran, A. (2019). The impact of sustainable board capital on sustainability reporting. Strategic Direction, 35 (12), 8-11. https://doi.org/10.1108/SD-05-2019-0098

Nicolò, G., Zampone, G., Sannino, G. & De Iorio, S. (2022). Sustainable corporate governance and non-financial disclosure in Europe: does the gender diversity matter? *Journal of Applied Accounting Research, 23* (1), 227-249. https://doi.org/10.1108/JAAR-04-2021-0100

Nuber, C., & Velte. P (2021). Board Gender Diversity and Carbon Emissions: European Evidence on Curvilinear Relationships and Critical Mass. *Business Strategy and the Environment, 30* (4), 1958–1992.

Nuskiya, M.N.F., Ekanayake, A., Beddewela, E., & Gerged, A.M. (2021). Determinants of corporate environmental disclosures in Sri Lanka: the role of corporate governance. *Journal of Accounting in Emerging Economies*, 11 (3), 367-394

O'Connor, P., Harris, L., & Gosling, T. (2021). *Linking executive pay to ESG goals*. https://www.pwc.com/gx/en/issues/esg/exec-pay-and-esg.html

Oh, W. Y., Chang, Y. K. & Z. Cheng (2016). When CEO career horizon problems matter for corporate social responsibility: the moderating roles of industry-level discretion and block-holder ownership. *Journal of Business Ethics,133* (2), 279–291

Okafor, C.E., & Ujah, N.U. (2020). Executive compensation and corporate social responsibility: does a golden parachute matter? *International Journal of Managerial Finance, 16* (5), 575-598. https://doi.org/10.1108/IJMF-12-2018-0379

Oliver, C. (1991). Strategic responses to institutional processes. *The Academy of Management Review, 16* (1), 145-179.

Ong, T. & Djajadikerta, H.G. (2020). Corporate governance and sustainability reporting in the Australian resources industry: an empirical analysis. *Social Responsibility Journal*, *16* (1), 1-14. https://doi.org/10.1108/SRJ-06-2018-0135

Oradi, J., & E-Vahdati, S. (2021). Female directors on audit committees, the gender of financial experts, and internal control weaknesses: evidence from Iran. *Accounting forum, 45* (3),273-306. https://doi.org/10.1080/01559982.2021.1920127

Orazalin, N., & Mahmood, M. (2018). Economic, environmental, and social performance indicators of sustainability reporting: Evidence from the Russian oil and gas industry. *Energy Policy*, 121, 70-79.

Orazalin, N., & Mahmood, M. (2019). Determinants of GRI-based sustainability reporting: evidence from an emerging economy. *Journal of Accounting in emerging Economies, 10* (1), 140-164. https://doi.org/10.1108/J AEE-12-2018-0137

Orazalin, N.S., Ntim, C.G., & Malagila, J.K. (2023). Board Sustainability Committees, Climate Change Initiatives, Carbon Performance, and Market Value. *British Journal of management*. https://doi.org/10.1111/1467-8551.12715

Orsini, P., & Magnier-Watanabe, R. (2022). Foreign co-worker nationality, cultural distance, and perception of cultural diversity in the workplace. *Journal of Asia Business Studies* https://doi.org/10.1108/JABS-10-2021-0413

Ortiz-de-Mandojana, N., Aguilera-Caracuel, J., & Morales-Raya, M. (2016). Corporate governance and environmental sustainability: The moderating role of the national institutional context. *Corporate Social Responsibility and Environmental Management, 23*(3), 150-164

Oyewo, B. (2022). Contextual factors moderating the impact of strategic management accounting on competitive advantage. *Journal of Applied Accounting Research, 23* (5), 921-949. https://doi.org/10.1108/JAAR-04-2021-0108

Oyewo, B., & Isa, R. (2017). Improving corporate sustainability reporting through the adoption of integrated reporting: a study of Nigerian and South African firms. *African Accounting and Finance Journal, 1* (1),52-65.

Oyewo, B., Tawiah, V., & Zakari, A. (2022). Actualising Agenda 2030 through Sustainability Accounting: Evidence from the Nigerian Manufacturing Sector, Tauringana, V. and Moses, O. (Ed.) Environmental Sustainability and Agenda 2030 (Advances in Environmental Accounting & Management, Vol. 10), Emerald Publishing Limited, Bingley, pp. 105-133. https://doi.org/10.1108/S1479-359820220000010006

Pandey, N., Baker, H.K., Kumar, S., Gupta, P., & Ali, S. (2022). Board Diversity and Firm Performance: The Role of Contextual Variables. *British Journal of Management*https://doi.org/10.1111/1467-8551.12675

Parsa, S., & Kouhy, R. (2008). Social reporting by companies listed on the alternative investment market. *Journal of Business Ethics, 79*(3), 345–360. https://doi.org/ 10.1007/s10551-007-9402-8

Pavlova, M.A., Sokolov, A.N., & Bidet-Ildei, C. (2015). Sex Differences in the Neuromagnetic Cortical Response to Biological Motion. *Cerebral Cortex, 25* (10), 3468–3474. https://doi.org/10.1093/cercor/bhu175.

Peel, M.J. (2018). Addressing unobserved selection bias in accounting studies: the bias minimisation method. *European Accounting Review, 27* (1), 173-183. https://doi.org/10.1080/09638180.2016.1220322

Pekovic, S., & Vogt, S. (2020). The fit between corporate social responsibility and corporate governance: the impact on a firm's financial performance. *Review of Managerial Science, 15* (4), 1-31. https://doi.org/10.1007/s11846-020-00389-x

Petersen, M.A. (2009). Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches, *The Review of Financial Studies*, *22* (1), 435–480, https://doi.org/10.1093/rfs/hhn053

Pinnuck, M., Ranasinghe, A., Soderstrom, N., & Zhou, J. (2021). Restatement of CSR reports: Frequency, magnitude, and determinants. *Contemporary Accounting Research*, 38(3), 2376-2416.

Poletti-Hughes, J., & Dimungu-Hewage, D. (2022). The Effectiveness of Gender Diversity Reforms and the Impact of a Familial Culture: A Spillover Effect on Board Independence. *British Journal of Management*. https://doi.org/10.1111/1467-8551.12660

Post, C., Rahman, N., & Rubow, E. (2011). Green governance: Boards of directors' composition and environmental corporate social responsibility. *Business and Society, 50* (1), 189-223. https://doi.org/10.1177/0007650310394642

Prencipe, A., Boffa, D., Papa, A., Corsi, C. & Mueller, J. (2022). Unmasking intellectual capital from gender and nationality diversity on university spin-offs' boards: a study on non-linear effects upon firm innovation. *Journal of Intellectual Capital* https://doi.org/10.1108/JIC-08-2021-0207

Radhakrishnan, S., Tsang, A. & Liu, R. (2018). A corporate social responsibility framework for accounting research. *The International Journal of Accounting*, 53(4), 274-294. https://doi.org/10.1016/j.intacc.2018.11.002

Ramdhony,D., Rashid, A., Gow, J., & Soobaroyen, T. (2021). The influence of corporate governance and corporate foundations on corporate social responsibility (CSR) Reporting Practices, *Journal of African Business* https://doi.org/10.1080/15228916.2021.1952521

Rao, K. & Tilt, C. (2016). Board composition and corporate social responsibility: the role of diversity, gender, strategy and decision making. *Journal of Business Ethics,* 138, 327–347

Refinitiv (2022). Environmental, Social and Governance Scores from Refinitiv. https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodology/refinitiv-esg-scores-methodology.pdf

Rudyanto, A. & Veronica Siregar, S. (2018). The effect of stakeholder pressure and corporate governance on the sustainability report quality. *International Journal of Ethics and Systems, 34* (2), 233-249. https://doi.org/10.1108/IJOES-05-2017-0071

Russo, M. V., & Harrison, N. S. 2005. Organizational design and environmental performance: Clues from the electronics industry. *Academy of Management Journal, 48*: 582-593.

Ryou, J.W., Tsang, A., & Wang, K.T., (2022). Product market competition and voluntary corporate social responsibility disclosures. *Contemporary Accounting Research*, 39(2), pp.1215-1259.

Saha, A. K., & Akter, S. (2013). Corporate Governance and Voluntary Disclosure Practices of Financial and Non-Financial Sector Companies in Bangladesh. *Journal of Applied Management Accounting Research*, 11(2), 45–61.

Said, R., Abdul Rahim, A.A. & Hassan, R. (2018). Exploring the effects of corporate governance and human governance on management commentary disclosure. *Social Responsibility Journal, Vol. 14* (4), 843-858. https://doi.org/10.1108/SRJ-06-2017-0099

Said, R., Zainuddin, Y., & Haron, H. (2009). The relationship between corporate social responsibility disclosure and corporate governance characteristics in Malaysian public listed companies. *Social Responsibility Journal*, 5(2), 212–226. https://doi.org/10.1108/17471110910964496

Saqib, S.I, Allen, M.M.C, & Wood, G. (2021). Lordly Management and its Discontents: 'Human Resource Management' in Pakistan. *Work, Employment and Society, 36* (3), 465-484. https://doi.org/10.1177/0950017021997369

Scott, W. R. (2004). *Institutional theory.* Encyclopedia of Social Theory, George Ritzer, ed. Thousand Oaks, CA: Sage.

Seaborn, P., Olsen, T. D. & Howell, J. (2020). Is insider control good for environmental performance? Evidence from dual-class firms. *Business & Society, 59*, 716–748. https://doi.org/10.1177/0007650317749221

Sellami, Y. M., Dammak, N., & Hlima, B. (2018). An empirical investigation of determinants of sustainability report assurance in France. *Journal of Financial Reporting and Accounting, 17* (2), 320-342. https://doi.org/10.1 108/ JF RA- 02-2018-0019

Shamil, M. M., Shaikh, J. M., Ho, P. L., & Krishnan, A. (2014). The influence of board characteristics on sustainability reporting Empirical evidence from Sri Lankan firms. *Asian Review of Accounting, 22*(2), 78–97. https://doi.org/1 0.1108 /ARA-09-2013-0060

Shu, P., & Chiang, S. (2020). The impact of corporate governance on corporate social performance: Cases from listed firms in Taiwan. *Pacific-Basin Finance Journal*, 61, https://doi.org/10.1016/j.pacfin.2020.101332

Simnett, R., Vanstraelen, A. & Chua, W.F. (2009). Assurance on sustainability reports: an international comparison. *The Accounting Review, 84* (3), 937-967

Simpson, S.N.W., Aboagye-Otchere, F., & Ahadzie, R. (2022). Assurance of environmental, social and governance disclosures in a developing country: perspectives of regulators and quasi-regulators. *Accounting Forum, 46* (2), 109-133. https://doi.org/10.1080/01559982.2021.1927481

Siregar, S. V., & Bachtiar, Y. (2010). Corporate social reporting : empirical evidence from Indonesia Stock Exchange. *International Journal of Islamic and Middle Eastern Finance and Management, 3*(3), 241–252. https://doi.org/10.1108/17538391011072435

Smith, W. J., Wokutch, R. E., Harrington, K. V., & Dennis, B. S. (2001). An examination of the influence of diversity and stakeholder role on corporate social orientation. *Business and Society, 40*(3), 266–94.

Song, H., & Rimmel, G. (2021). Heterogeneity in CSR activities: is CSR investment monotonically associated with earnings quality? *Accounting Forum, 45* (1), 1-29. https://doi.org/10.1080/01559982.2020.1810428

Sotorrío, L. L., & Sánchez, J. L. F. (2010). Corporate social reporting for different audiences: The case of multinational corporations in Spain. *Corporate Social Responsibility and Environmental Management, 17*(5), 272–283. https://doi.org/ 10.1002/csr.215

Spence, L. (2016). Small business social responsibility: expanding core CSR theory. *Business and Society, 55*(1), 23–55.

Spence, L., & Rinaldi, L. (2014). Governmentality in accounting and accountability: a case of embedding sustainability in a supply chain. *Accounting, Organization and Society*, 39 (6), 433-453

Stanny, E., & Ely, K. (2008). Corporate environmental disclosure about the Effects of Climate Change. *Corporate social responsibility and environmental management, 15*, 338-348. https://doi.org/10.1002/csr.175

Stock, J., & Yogo, M. (2005). Testing for Weak Instruments in Linear IV Regression. In: Andrews DWK Identification and Inference for Econometric Models. New York: Cambridge University Press pp. 80-108

Strandberg, C. (2013). Sustainable Pay Should be Linked to Creating Value Not Just Protecting It. The Guardian. June 26. http://www.theguardian.com/sustainable-business/sustainable-pay-creating-value

Suchman, M. (1995). Managing legitimacy: strategic and institutional approaches. *The Academy of Management Review, 20* (3), 571-610

Sulaiman, M., Abdullah, N., & Fatima, A. H. (2014). Determinants of Environmental Reporting quality in Malaysia. *International Journal of Economics, Management and Accounting, 22*(1),63-90 https://journals.iium.edu.my/enmjournal/index.php/enmj/article/view/253

Sun, W., Xu, X., & Govind, R. (2022). Firm Governance and Functional Strengths: The Impact of Board Diversity on Firm Marketing Capability. *British Journal of Management, 33* (4), 1950-1968. https://doi.org/10.1111/1467-8551.12561

Tamimi, N., & Sebastianelli, R. (2017). Transparency among S&P 500 companies: an analysis of ESG disclosure scores. *Management Decision, 55* (8), 1660-1680. https://doi.org/10.1108/MD-01-2017-0018

Tang, P., Yang, S., & Yang, S. (2020). How to design corporate governance structures to enhance corporate social responsibility in China's mining state-owned enterprises? *Resources Policy.* https://doi.org/10.1016/j.resourpol.2020.101619

Tauringana, V. & Chithambo, L. (2015). The effect of DEFRA guidance on greenhouse gas disclosure. *The British Accounting Review, 47* (4), 425-444.

Tauringana, V. (2021). Sustainability reporting adoption in developing countries: Managerial perception-based determinants evidence from Uganda. *Journal of Accounting in Emerging Economies, 11* (2), 149-175. https://doi.org/10.1108/JAEE-07-2020-0184

Tauringana, V., & Moses, O. (2021). Greenhouse Gas Emissions Reporting and Management in Global Top Emitting Countries and Companies. *Special issue call for papers for Advances in Environmental Accounting and Management*.

https://books.emeraldinsight.com/resources/docs/AEAM%20Vol_%2011%20CFP%202022_Final.pdf

Tauringana, V., Radicic, D., Kirkpatrick, A., & Konadu, R. (2017). Corporate boards and environmental offence conviction: evidence from the United Kingdom. *Corporate Governance, 17* (2), 341-362. https://doi.org/10.1108/CG-05-2016-0105

Tawiah, V., Nadarajah, S., Alam, M.S., & Allen, T. (2022). Do partisan politics influence domestic credit? *Journal of Institutional Economics*. https://doi.org/10.1017/S1744137422000182

Tingbani, I., Chithambo, L., Tauringana, V., & Papanikolaou, N. (2020). Board gender diversity, environmental committee and greenhouse gas voluntary disclosures. *Business strategy and the Environment, 29* (6), 2194-2210. https://doi.org/10.1002/bse.2495

Tsang, A., Frost, T., & Cao, H. (2023). Environmental, Social, and Governance (ESG) disclosure: A literature review. *The British Accounting Review*, 55 (1), https://doi.org/10.1016/j.bar.2022.101149

Tsang, A., Wang, K.T., Wu, Y., & Lee, J., (2022). Nonfinancial corporate social responsibility reporting and firm value: International evidence on the role of financial analysts. *European Accounting Review.* https://doi.org/10.1080/09638180.2022.2094435

Ullah, S., Zaefarian, G., & Ullah, F., 2021. How to use instrumental variables in addressing endogeneity? A step-by-step procedure for non-specialists. *Industrial Marketing Management*. https://doi.org/10.1016/j.indmarman.2020.03.006

United Nations (2023). United Nations Sustainable Development Goals 2030. https://www.un.org/development/desa/disabilities/envision2030.html

Uyar, A., Elbardan, H., Kuzey, C., & Karaman, A.S. (2022). Audit and CSR committees: are they complements or substitutes in CSR reporting, assurance and GRI framework adoption? *International Journal of Accounting & Information Management*. https://doi.org/10.1108/IJAIM-04-2022-0086

Vafeas, N. (2002). The Determinants of Compensation Committee Membership. *Corporate Governance: An international review, 8* (4), 356-366. https://doi.org/10.1111/1467-8683.00214

Vig, S., & Datta, M. (2021): The impact of corporate governance on sustainable value creation: A case of selected Indian firms, *Journal of Sustainable Finance & Investment*. https://doi.org/10.1080/20430795.2021.1923337

Vogt, M., Hein, N., da Rosa, F.S., & Degenhart, L. (2017). Relationship between determinant factors of disclosure of information on environmental impacts of Brazilian companies. *Estudios Gerenciales, 33*, 24-38

Waheed, A., Hussain, S., Hanif, H., Mahmood, H., & Malik, Q.A. (2021). Corporate social responsibility and firm performance: The moderation of investment horizon and corporate governance, *Cogent Business & Management*, 8 (1), 1938349. https://doi.org/10.1080/23311975.2021.1938349

Wang, K.T., & Shailer, G. (2022). Multiple performance criteria for government-controlled firms. *International Review of Economics and Finance, 79*, 75-96. https://doi.org/10.1016/j.iref.2022.01.012

Wang, T., & Li, L. (2023). Special Issue on ESG: Accounting and Reporting. *The International of Accounting*. https://www.worldscientific.com/page/tija/callforpapers04

Welbeck, E. E., Matthew, G., Owusu, Y., Bekoe, R. A., & Kusi, J. A. (2017). Determinants of environmental disclosures of listed firms in Ghana. 2017. https://doi.org/10.1186/s40991-017-0023-y

Wooldridge, Jeffrey M. (2013). Introductory Econometrics: A Modern Approach (Fifth international ed.). Australia: South-Western.

Yang, P., Riepe, J., Moser, K., Pull, K. & Terjesen, S. (2019). Women directors, firm performance and firm risk: a causal perspective. The Leadership Quarterly, 30 (5), 101297. https://doi.org/ 10.1016/j.leaqua.2019.05.004

Yao, T. (2022). Antecedents of top management team and board gender diversity: A review and an agenda for research. *Corporate Governance: An International Review, 31 (1),* 227-248. https://doi.org/10.1111/corg.12495

Young, M.N., Peng, M.W., Ahlstrom, D., Bruton, G.D., & Jiang, Y. (2008). Corporate governance in emerging economies: a review of the principal–principal perspective. *Journal of Management Studies, 45* (1),196-220.

Yu, J., Lo, C. W. H., & Li, P. H. Y. (2017). Organizational visibility, stakeholder environmental pressure and corporate environmental responsiveness in China. *Business Strategy and the Environment, 26*: 371-338

Zahid, M., Rahman, H.U., Ali, W., Khan, M., Alharthi, M., Qureshi, M.I., & Jan, A. (2020). Boardroom gender diversity: Implications for corporate sustainability disclosures in Malaysia. *Journal of Cleaner Production.* https://doi.org/10.1016/j.jclepro.2019.118683

Zaid, M.A., Wang, M., Adib, M., Sahyouni, A. & Abuhijleh, S.T. (2020). Boardroom nationality and gender diversity: implications for corporate sustainability performance. *Journal of Cleaner Production, 251*, 119652. https://doi.org/10.1016/j.jclepro.2019.119652

Zaman, R., Jain, T., Samara, G., & Jamali, D. (2020). Corporate governance meets corporate social responsibility: Mapping the interface. *Business & Society*. https://journals.sagepub.com/doi/10.1177/0007650320973415

Zhang, D., Zhang, Z.,Ji, Q., Lucey, B., & Liu, J. (2021). Board characteristics, external governance and the use of renewable energy: International evidence. *Journal of International Financial Markets, Institutions & Money, 72.* https://doi.org/10.1016/j.intfin.2021.101317

Zhang, J. Q., Zhu, H., & Ding, H. B. (2013). Board composition and corporate social responsibility: An empirical investigation in the post Sarbanes-Oxley Era. *Journal of*

Business Ethics, 114, 381–392. https://link.springer.com/article/10.1007/s10551-015-2759-1

Zhou, C. (2019). Effects of corporate governance on the decision to voluntarily disclose corporate social responsibility reports: evidence from China, *Applied Economics*, 51:55, 5900-5910. https://doi.org/10.1080/00036846.2019.1631440

Zhu, M., Singh, S. & Wang, H. (2019). Perceptions of social loafing during the process of group development. *International Journal of Organization Theory & Behaviour, 22* (4), 350-368. https://doi.org/10.1108/IJOTB-04-2018-0049

Appendix: Summary of Related Studies

Authors/ Year	Country	Sample Size/ period covered	Theory	Method of Analysis	Main Findings
Adel, et al. (2019)	Europe	S&P Europe 350 firms across European countries covering a single period (2016)	Agency and stakeholder	content analysis/tobit regression analysis	Board Size (0) Board independence (-) CEO duality (0) Gender Diversity (0) Ownership concentration (0) Foreign Ownership (0) Director Ownership (+) Firm size (+) Profitability (0) Leverage (0) Auditor Type (0) Industry Type (+) ESG committee (+)
Al-Shaer et al. (2021)	UK	sample of UK firms' (FTSE 100) covering 2014 to 2018	Agency and stakeholder	content analysis using computational linguistic technique (own measures developed)/ generalized least squares regression	Board size (0) Board meeting (0) Board independence (-) Gender Diversity (0) Ownership concentration (+) Firm size (-) Profitability (+) Leverage (-) Cross listing (+) ESG committee (-)
Buallay & Al-Ajmi (2020)	Gulf Cooperation Council	a cross-sectional and time series analysis of 59 banks from 2013 to	agency/legitimacy/resource dependence/stakeholder	regression	AC financial expertise (-) AC independence (+) AC meeting (+) AC size (+) Firm size (+)

	(GCC) countries	2017 in Gulf Cooperation Council (Saudi, Bahrain, Kuwait, UAE, Qatar and Oman)			Firm age (+) Auditor Type (+)
Correa-Garcia et al (2020)	Latin American countries	Latin American countries (Chile, Colombia, Mexico and Peru) covering 2011 to 2015		Logistic regression	Board size (+) Board independence (0) Institutional Ownership (-) Foreign Ownership (+) Firm size (+) Firm age (+) Leverage (-) Industry Type (0)
Doni (2021)	Europe	sample of 42 large European-listed companies belonging to the oil and gas industry cutting across 15 countries	legitimacy/stakeholder/resource-based view theory	fixed effects regression models analysis	Board size (+) Profitability (0) Leverage (0) ESG committee (+)
Elsayih et al (2021)	Australia	sample of all Australian firms that have participated in the Carbon Disclosure Project	stakeholder/legitimacy	/fixed-effects panel OLS	Board size (-) Board meeting (+) Board independence (+) Gender Diversity (+) AC independence (0) Institutional Ownership (0) Firm size (+) Profitability (0) Leverage (-) ESG committee (+)

Erin et al (2021)	Nigeria	120 listed firms in Nigeria covering 6 years (2013–2018)	stakeholder/legitimacy	logistic regression	Board size (+) Board independence (0) Gender Diversity (+) AC financial expertise (+) AC meeting (+) AC size (+) Profitability (+) Leverage (0)
Farooq et al (2021)	Gulf Cooperation Council (GCC) countries	GCC companies during a 5-year period from 2013 to 2017 namely Abu Dhabi, Bahrain, Dubai, Kuwait, Oman,Qatar & KSA	legitimacy theory	fixed effect ordered logic regression	Board independence (+) Firm size (0) Profitability (+) Leverage (-) GDP (-)
García-Sánchez et al (2019)	International	international sample of 273 firm-year observations from 2006 to 2014	stakeholder theory	Logistic regression & GMM	Board size (0) Gender Diversity (+) Firm size (+) Profitability (+)
Girella et al (2021)	Europe	sample of companies listed on the Eurostoxx600 that adopt integrated or sustainability reporting or both of them for the period 2015–2018	agency/stakeholder/signalling	multinomial regression	Board size (+) Board meeting (0) Board independence (+) Firm size (+) Profitability (0) Leverage (0) GDP (0)

Girón et al (2021)	Asia and Africa	sample of 366 large Asian and African companies		Binary Regression	Gender Diversity (+) Firm size (+) Profitability (0) Leverage (0) Industry Type (+)
Gómez & García (2020)	Chile, Colombia and Mexico	covers listed companies in Chile (39), Colombia (27), and Mexico (35)		OLS & Mann-Whitney non-parametric test	Board independence (0) Firm size (+) Profitability (0) Industry Type (+)
Harun et al (2020)	Gulf Cooperation Council (GCC) countries	6 Gulf Cooperation Council countries covering Bahrain, Qatar, Kuwait, KSA, Oman & UAE for 2010-2014	agency/stakeholder /signalling	unweighted content analysis/OLS regression	Board size (+) Board meeting (0) Board independence (0) CEO duality (-) Gender Diversity (0) Cross/ Multiple directorship (0) AC meeting (0) AC size (-) Institutional Ownership (0) Foreign Ownership (0) Firm size (0) Firm age (0) Profitability (0) Liquidity (0) Leverage (0) GDP (+) Corruption rate (0)
Jamil et al. (2021)	Malaysia	126 firms' annual reports for the year ended 2010 and 2014 of Malaysian firms	agency/resource dependence	OLS regression	Board independence (0) Firm size (+) Profitability (+) Leverage (0) Industry (+) ESG committee (+)

Kamarudin et al.(2021)	International	23,137 firm-year observations from 37 countries	gender socialisation theory/resource dependence theory	OLS regression	Board size (+) Board independence (+) Gender Diversity (+) Firm size (+) Firm age (0) Profitability (+) Liquidity (+) Leverage (-) Industry Type (+) National culture orientation (0)
Karaman et al. (2020)	International	Study of 117 countries covering 2007 to 2016	signalling theory	logistic regression	Board independence (+) GDP (+)
Konadu et al.(2021)	International	companies listed on the Standards & Poor's 500 index from 2002 to 2018 (251 firm studies)	Upper Echelon / resource dependence	two-stage least squares regression	Board size (0) Gender Diversity (-) Firm size (+) Profitability (0) Liquidity (-)
Kuzey & Uyar (2017)	Turkey	sample of 297 Turkish publicly traded companies covering 2011 to 2013	legitimacy/agency/ signalling	OLS	Board size (0) Board independence (0) Firm size (-) Profitability (0) Liquidity (0) Leverage (+) Industry type (0)
Lu & Wang (2021)	International	12,218 observations (1,870 unique firms) from 25 countries over the period of 2010 and 2017	voluntary/legitimacy/Agency	3-stage least square	Board size (+) Board independence (+) CEO duality (-) Gender diversity (+) Profitability (+) Liquidity (0) Leverage (+) Cross-listing (+)

					National culture orientation (+) GDP (-) ESG committee (+) ESG executive compensation (+)
Martínez-Ferrero & García-Sánchez (2017)	International	International sample of 696 companies for the period 2007–2014 taken from Forbes top 2000 ranking cutting across 16 countries	legitimacy theory	logistic regression	Board size (0) Board independence (0) Firm size (+) Leverage (-) Industry Type (+) National culture orientation (+)
Nuskiya et al (2021)	Sri Lanka	Sri Lanka listed firms covering 2015 to 2019 (41 firms)	agency/legitimacy/ stakeholder	panel quantile regression	Board size (+) Board meeting (+) Board independence (+) CEO duality (-) Firm size (+) Profitability (+) Industry Type (+)
Ong et al (2020)	Australia	listed Australian resources industry	stakeholder theory	OLS Regression	Board independence (+) Gender diversity (+) Cross directorship (+)
Orazalin & Mahmood (2018)	Russia	sample of 50 largest public oil and gas companies in Russia covering the period 2012 to 2016		multivariate regression analysis	Board size (0) Board independence (0) Firm size (0) Firm age (+) Profitability (0) Leverage (0) Auditor Type (+)

Ramdhony et al. (2021)	Mauritius	41 Mauritian listed companies for the period of 2007–2014	stakeholder theory	multivariate regression	Board size (+) Board independence (+) Government Ownership (-) Director Ownership (0) Firm size (+) Profitability (0) Industry Type (0)
Rudyanto & Veronica Siregar (2018)	Indonesia	123 listed firms on Indonesia Stock Exchange in 2010-2014	legitimacy/stakeholder theory	OLS regression	CEO duality (0) Foreign ownership (0) Family ownership (0) Firm size (+) Profitability (+) Leverage (-) Industry type (+)
Shu & Chiang (2020)	Taiwan	listed firms on Taiwan Stock Exchange in the period of 2008–2015	Agency theory	OLS assessing fixed effect	Board size (+) Board independence (-) CEO duality (-) Gender diversity (+) Institutional ownership (+) Foreign ownership (+) Family ownership (-) Director share ownership (-) Firm size (+) Firm age (+) Profitability (+)
Tang et al. (2020)	China	214 firm-year listed mining state-owned enterprises (SOEs) in China from 2008 to 2016	agency/stakeholder	fuzzy-set/qualitative comparative analysis	Board independence (+) CEO duality (-) Gender diversity (+) Institutional ownership (+) Firm size (+) Profitability (+) Leverage (+)

Tingbani et al. (2020)	UK	215 listed firms on the London stock Exchange from 2011 to 2014	stakeholder/legitimacy/resource dependence	logistic regression	Board size (0) Board meeting (0) Board independence (0) CEO duality (0) Gender diversity (+) Firm size (+) Firm age (-) Profitability (0) Liquidity (0) Leverage (-) Industry type (+)
Vig & Datta (2021)	India	sample of companies listed on the Bombay Stock Exchange (BSE) Carbon index for 2015–2019 in India (39 companies)	stakeholder theory	OLS regression	Board size (0) Board meeting (0) Firm size (+) Leverage (0)
Waheed,et al. (2021)	Pakistan	sample of 327 non-financial firms listed on the Pakistan stock exchange (PSX) covering 2007-2018	stakeholder/agency / corporate citizenship theories	OLS assessing fixed effect	Board size (+) Board independence (+) CEO duality (-) Board meeting (+) Institutional ownership (+) Firm size (-) Firm age (+) Leverage (0)
Zahid et al.(2020)	Malaysia	878 public listed companies in Malaysia covering 3 year (2011 to 2013)	stakeholder/ gender socialisation theory	OLS regression	Board size (0) Board independence (0) Gender diversity (+) Firm size (+) Firm age (0) Profitability (+) Industry type (+)

Zhang et al (2021)	International	1,027 listed companies in 47 countries/regions	theory of law and finance	OLS regression	Board size (+) Board independence (+) CEO duality (-) Gender diversity (+) Firm size (-) Profitability (0) Liquidity (+) Leverage (+) GDP growth rate (-) Country Corruption rate (+)
Zhou (2019)	China	longitude data set of Chinese publicly traded manufacturing firms from 2010 to 2016 (1779 firm year observation)	agency theory	Probit regression	Board size (+) Board independence (0) CEO duality (-) Institutional ownership (+) Director share ownership (+) Firm size (+) Profitability (+) Leverage (-) Industry type (0)
Albers & Günther (2011)	17 European countries	600 Large Firms	Legitimacy/ Stakeholder	Binary logistic regression	Profitability (+) Company size (+) Media visibility (0) Legal system (0) Country/ national factors (+) Ownership (+) Industry Type (+) Leverage (-)
Allegrini & Greco (2011)	Italy	177 Large Firms covering 1 year (2007)	Agency	Multiple regression	Board independence (0) Board Size (+) CEO duality (-) Board Meetings (+) AC meeting (+)

Al-Shaer & Zaman (2016)	UK	333 Large Firms		Multivariate regression	Gender diversity (+) Firm size (+) Leverage (+) Profitability (+) Industry Type (+)
Abdullah & Ismail (2017)	Malaysia	260 Large Firms	Agency/ Legitimacy	OLS	Gender diversity (+) Director ownership (0) family ownership (0) Institutional ownership (0) Industry Type (+) Firm size (0) Profitability (0)
Amran et al. (2014)	International	113 Large Firms across 12 countries	Legitimacy/ Resource-based-view	OLS regression	Board size (0) Board independence (0) Gender diversity (0) Firm mission & vision (+) ESG committee (+) NGO collaboration (+) Firm size (0) National culture (0) Industry Type (0)
Andrikopoulos & Kriklani (2011)	Denmark	137 financial institutions		Multivariate regression	Firm Size (+) Profitability (-) Leverage (-) Mkt to book (+)
Arcay & Va´zquez (2005)	Spain	91 Large Firms	Agency		Board independence (+) Director ownership (+) CEO duality (0) Board size (0) AC presence (+)
Chithambo & Tauringana (2017)	UK	62 firms listed on FTSE	Stakeholder theory	OLS regression	Board size (0) Board independence (0) Ownership concentration (-) Director share ownership (-)

					Firm size (+) Profitability (0) Gearing (0) Liquidity (+)
Baje et al. (2020)	Ethiopia	262 Large Firms covering a 1 -year period (2018)	Agency/ Legitimacy/ Stakeholder	OLS	Board size (+) Firm age (+) Firm Size (+) Profitability (+) Industry Type/ sensitivity (+) Leverage (-)
Bewley & Li (2000)	Canada	188 Large Firms	Voluntary disclosure		Media coverage (+) Environmental exposure (+) Industry type/ Pollution Propensity (+) Political exposure (+)
Bhatia & Tuli (2017)	India and China	17 companies from BSE-30 (India) and 19 companies from SSE 50 (China),covering the period 2006–2007 to 2010–2011		Independent sample t-test; Kruskal–Wallis H test	Board size (0) Board independence (0) Firm Size (+) Firm Age (+) Profitability (-) Leverage (-) Firm Growth (-) Advertising intensity (-) Listing category (0) Industry type (0) Nationality/national culture (+)
Braam et al. (2016)	Netherland	100 dutch Firms for the period 2009-2011	Legitimacy, Voluntary disclosure, Signalling	Descriptive statistics/ multiple regression	Audit/External assurance (+) GHG emission (+) Water consumption (+) Waste production (0)
Brammer & Pavelin (2004)	UK	150 Large Firms		Multivariate regression	Firm Size (+) Industry Type (+) Media visibility (+) Social performance (+)

Ben-Amar et al., (2017)	Canada	Top 86 Publicly-listed firms covering 2008 to 2014	Critical mass theory	Instrumental Variable Probit regression	Gender diversity (+) Board independence (+) CEO duality (-) Firm size (+) Profitability (0) Leverage (-) Industry type (0)
Brammer & Pavelin (2008)	UK	447 Large firms for a 1-year period (2000)	Stakeholders	Binary logistic	Board independence (-) Firm Size (+) Industry Type (+) Media exposure (0) Leverage (0) Profitability (0) Environnemental fines (0) Ownership concentration (-)
Chakraborty (2019	Bangladesh	30 Large banking firms in the period from 2011 to 2015.	Resource dependency	multivariate (OLS) regression analysis	Board size (0) Board meetings (+) Board expertise (+) Company network (0) Market category (0) Leverage (0) Firm size (-) Credit rating (-)
Chiu & Wang (2014)	Taiwan	246 Large firms covering 2 years	Stakeholder	OLS	Ownership concentration (+) Strategic posture (+) Profitability (+) Leverage (-) Capital mkt (+)
Clarkson et al. (2011)	Australia	51 Large Firms reporting pollutant emission in both 2001/2002 and 2005/2006	Voluntary disclosure,	OLS/ multiple regression	Firm size (+) Industry type (+) Capital intensity (+) Profitability (0) Asset newness (0) Leverage (0)

Cong & Freedman (2011)	USA	top 50 volume metric releasers (firms) of toxic covering the period 2003 to 2005	Legitimacy, Stakeholder, Voluntary Disclosure	OLS (multivariate) regression	Governance score/ index(+) Firm size (-)
Cormier & Magnan (2003)	France	50 Firms covering a 6-year period (1992 to 1997)	Stakeholder theory	pooled cross-sectional OLS	Firm Size (+) Media visibility (+) Ownership (+) Fixed asset age (+) Leverage (-) Profitability (+)
Cormier et al. (2004)	International	195 large-sized Firms cutting across Canada Germany France for a 1-year period using survey method	Legitimacy, Stakeholder	Exploratory Factor analysis/ Tobit regression/OLS	Firm Size (+) Country national culture (+) Media exposure (+) Managerial attitudes (+) Age of fixed assets (0) Profitability (0)
Cormier et al. (2005)	Germany	55 Large Firms covering a 7-year period (1992 to 1998)	Institutional	OLS regression and a pooled time-series cross-sectional fixed-effects regression	Firm Size (+) Profitability (0) Leverage (0) Fixed asset age (+) Risk (+) Ownership concentration (+) Media exposure (+)
Coulmont et al. (2016)	International	620 Large Firms from Global 40 Countries	Legitimacy		Power distance (-) Individualism (-) Indulgence (-) Masculinity (0) Uncertainty avoidance (0) Long-term orientation (0) Firm size (+) Profitability (-) Asset newness (+) Legal system (-) Industry type (-)

da Silva Monteiro & Aibar-Guzmán (2010)	Portugal	109 Large Firms	Stakeholder/ Legitimacy	Stepwise regression	Firm size (+) Stock mkt quotation (+) Environ certification (0) Industry type (0) Profitability (0) Foreign ownership (0)
Dyduch & Krasodomska (2017)	Poland	60 Large Firms	Legitimacy	OLS	Board size (0) Gender diversity (0) Firm size (+) Profitability (0) Leverage (0) Industry type (+) Firm Reputation (+)
Ebiringa et al. (2013)	Nigeria	20 Large-sized oil and gas firms covering 1-year (2011)	Stakeholder	OLS	Firm size (0) Profitability (+) Country/ national culture (0)
Galani et al, (2012)	Greece	34 Firms		multiple regression (OLS)	Firm size (+), Industry type (+), GRI reporting (+), Profitability (0), Listing status (0
Ganesan et al. (2017)	Malaysia	120 consumer products and industrial products firms. Study cover 1-year (2015)	Agency	structural equation modelling using partial least squares (PLS)	CEO duality (-) Board size (0) Board independence (0)
Ghazali (2007)	Malaysia	87 non-financial Firms	Legitimacy/ Political cost	OLS (multivariate analysis) regression	Firm Size (+) Profitability (0) Industry type (0) Market Capitalization (+), Director ownership (+) Government Ownership concentration (+) Shareholder ownership (0)

Giannarakis et al. (2018)	European countries	215 Large Firms from 18 European Countries for 1-year (2014)	Legitimacy/ Stakeholder/ Agency	Ordered Logit Regression	Board size (+) Government ownership (+) ESG Audit (+) Profitability (+) Firm size (+) Climate change policy (-)
Haniffa & Cooke (2005)	Malaysia	160 non-financial listed Firms based on 1 year (1996)	Social contracting, Legitimacy, Accountability, Decision usefulness	OLS	Board independence (-) Multiple directorship (+) Firm Size (+) Industry type (+) Profitability (+) Multiple listing (+) Governance structures (+) Foreign shareholders (+) Leverage (0)
Hasseldine et al. (2005)	UK	139 Large Firms with reputation for environmental sustainability for 1 year (2000)	Resource-based View/ Signalling	OLS	Research & development expenditure (+) Corporate diversification (+) Profitability (0) Firm size (+)
Huafang & Jianguo (2007)	China	559 Large firms for a 1 year period (2002)	Agency/ Signalling	OLS regression	CEO duality (-) Block-holder ownership (+) Foreign listing/ownership (+) Director share ownership (0) State ownership (0) Legal-person ownership (0)
Huang & Kung (2010)	Taiwan	759 Large Firms covering 3 years (2003 to 2005)	Stakeholder, Political economy, Legitimacy	OLS	Fines/penalties (+) Firm size (+) Leverage (+) Advertising fee (+) Market share (+) Shareholder concentration/ Block ownership (-) Industry type (+) Auditor type/ Audit firm (+)

Isa (2014)	Nigeria	6 Large Firms covering 1 year	Stakeholder/ agency	OLS	Firm size (-) Profitability (0)
Liu & Anbumozhi (2009)	China	175 Large Firms covering 1 year (2006)	Stakeholder theory	OLS (multivariate regression)	Shareholder power (0) Firm Size (+) Profitability (+) Location (+) Leverage (0) Government power (+)
Jizi et al. (2014)	USA	107 financial service Firms for the period 2009–2011	Agency	Tobit regression and linear panel regression	CEO duality (+) Board size (+) Board independence (+) AC activity (+) Profitability (+) Leverage (0) Firm size (0
Joshi & Hyderabad (2019)	India	199 Large Firms		OLS	Board size (+) Firm size (+) Firm age (+) Leverage (0) Profitability (0)
Kansal et al. (2014)	India	100 Large firms covering 2 years (2009-2010)		OLS	Profitability (+) Industry Type (+) Risk (0) Firm Size (+) Firm Age (+) Firm Reputation (+)
Khan (2010)	Bangladesh	30 large financial institutions (banks) covering 2 years (2007-2008) of study	Legitimacy	OLS (multivariate) regression	Board independence (+) Board diversity (+) Gender diversity (0) Firm Size (+) Profitability (+) Leverage (0)
Khasharmeh & Suwaidan (2010)	International	60 manufacturing Firms from Saudi Arabia, Kuwait,		OLS	Auditor/ audit firm type (+) Firm size (+) Profitability (0)

		Oman, Qatar, United Arab Emirates, Bahrain for 1 year (2006)			Leverage (0) Government ownership (0)
Kühn et al. (2018)	International (African countries)	211 Large Firms from Kenya, Botswana, Ghana, Tanzania, Uganda, Nigeria, Zambia.	Institutional/ Legitimacy	Logistic regression	Firm size (+) Industry type (+) Degree of internationalisation (0) GDP (+) Life expectancy (0) Corruption index (+) National cultural orientation (+)
Li et al. (2013)	China	613 firms across various sectors covering 2009/2010	Agency theory	OLS	Board Independence (-) Firm Size (+) Shareholder/ Ownership concentration (+) Leverage (+) Economic zoning (+) Profitability (0) Government ownership (0) Industry Type (-)
Lim et al. (2008)	Malaysia	743 Large Firms	Agency,		CEO/Chair duality (-) Board independence in terms of non-executive directors (+) Board independence in terms of independent directors (0) External auditors (0) Govt. linked firm (+)
Masud et al. (2018)	International	88 firms from Afghanistan, Bangladesh,	Agency/ Resource Dependency/ Stakeholder/ Legitimacy,	OLS (multivariate regression)	Board size (+) Gender diversity (-) Board independence (+) ESG committee (0) Foreign share ownership (+)

		India, Pakistan covering 8 years (2009-2016)			Institutional share (+) Director share ownership (-) Profitability (+) Leverage (-) Firm size (0)
Michelon & Parbonetti (2012)	International	114 Firms from USA and 10 European Countries for 1 year (2003)	Stakeholder/ Agency/ Legitimacy	Multiple regression of OLS and 3-stage regression	CEO duality (0) Community influence (+) ESG committee (+) Board independence (0) National culture/ Country of origin (+) Firm size (+) Industry Type (+) Leverage (0) Market risk (0) Profitability (0) Listing status (0)
Luo & Tang (2016)	Australia	Firms participating in the Carbon Disclosure Project in 2011 and 2012	Institutional theory	OLS/ multiple regression	emission trading scheme (+) competitor pressure (+) Legal system (+) Carbon exposure (+)
Oh et al. (2016)	Korea	118 Large firms covering 2004–2009	Agency/ Resources dependence	multi-level regression analyses, including hierarchical (stepwise regression)	Institutional ownership (+), Foreign ownership (+) Director ownership (-)
Orazalin & Mahmood (2019)	Kazakhstan	53 Large Firms covering 2013 to 2015	Agency/ Legitimacy/ Signalling theory	OLS	Leverage (-) Profitability (+) Firm age (0) Firm size (+) Auditor type (+) Stand-alone ESG reporting (+)

Parsa & Kouhy (2008)	UK	90 listed SMEs covering a 3-year study period of 2001 to 2003	Stakeholder, Signalling	Descriptive statistics/ Kruskal–Wallis	Firm age (0) Firm size (+) Leverage (+) Industry type (+)
Post et al. (2011)	USA	78 Large Firms covering 2006 and 2007	Agency	OLS	Board independence (+) Gender diversity (0) Board Competence (0)
Prencipe (2004)	Italy	64 Large firms focusing on 1 year (1997)		OLS	Firm age (+) Industry type (+) Profitability (0) Firm size (0) Ownership spread (+) Leverage (+) Firm Growth rate (0)
Saha & Akter (2013)	Bangladesh	40 Large Firms	Agency theory	OLS	Board Size (0) Board Independence (0) AC activities (-) Director share Ownership (-)
Said et al. (2009)	Malaysia	150 Large Firms covering 1 year (2006)	Agency theory	Hierarchical regression analysis	Board Size (+) Board independence (0) CEO duality (0) AC activities (+)
Sellami et al. (2018)	France	250 firms, with study covering the period 2010-2012.	Stakeholder/ Legitimacy/ Agency	Logistic regression	Ownership concentration (0) Institutional ownership (+) ESG committee (+) Customer proximity (+) Industry type (+) Firm age (+) Leverage (0) Profitability (0)
Shamil et al. (2014)	Sri Lanka	148 listed firms covering 1 year (2012)	Agency Legitimacy	hierarchical binary logistic regression	Board Size (+) Board ethnic diversity (0) Board independence (0) Dual Leadership (+) Firm Size (+)

					Firm Growth (+) Gender diversity (-) Firm Age (-)
Siregar & Bachtiar (2010)	Indonesia	87 Large firms focusing on 1-year (2003)	Agency theory	OLS regression	Board size (+) Foreign ownership (0) Firm size (+) Profitability (0) Leverage (0)
Sotorrío & Sánchez (2010)	Spain	26 Large Firms covering the period 2004-2007	Slack resources theory	Descriptive statistics; test of difference using McNemar test	Firm Size (+) Profitability (-) Leverage (-) Region (0) Impact (0) Media exposure (+) Reputation (+)
Stanny & Ely (2008)	USA	494 Large Firms		Binary logistic regression	Firm Size (+) Foreign sales (+) Industry type (0) Profitability (0) Leverage (0) Institutional ownership (0) Asset age (-)
Sulaiman et al. (2014)	Malaysia	164 Large Firms. 1-year study focus (2009)	Legitimacy/ Resource based view theory	OLS	Firm size (+) Leverage (+) Ownership (0) Profitability (0)
Welbeck et al. (2017)	Ghana	17 Large firms	Legitimacy	OLS	Industry type (+) Firm Size (+) Firm Age (+) Profitability (0) Foreign ownership (0) Auditor type (0)
Agyemang et al. (2020)	China	34 mining companies (2000-2018)		Multiple regression	Board size (+) Board independence (+)

					CEO duality (-) Board meeting (+) Gender Diversity (-) Nationality diversity (0)
Akhtaruddin & Haron (2010)	Malaysia	124 publicly listed companies	Agency theory	Hierarchical regression analysis	Executive shr. ownership (-) AC independence (+) AC competence (+) Auditor type, big 4 (0) Firm size (+) Leverage (0) Liquidity (0) Profitability (+)
Al Amosh & Khatib (2021)	Jordan	51 companies (2012-2019)	Stakeholder/legitimacy		Board independence (+) Foreign ownership (+) Government ownership (+) Director Ownership (0) Share concentration / block-holder ownership (-) Family share ownership (0) Firm size (+) Firm age (0)
Aras & Crowther (2008)	UK	FTSE100 companies (100 firms)			Governance index (+)
Arif et al., (2021)	Australia	24 Energy firms (2009-2018)	Agency/ Legitimacy	pooled ordinary least square (OLS) regression/ two-stage least squares approach (to address endogeneity)	AC meeting (+) AC independence (+) Leverage (0) Firm size (+) Firm profitability (+)
Ashfaq & Rui (2019)	Pakistan	120 firms listed on Pakistan Stock Exchange (2013 to 2015)	Legitimacy/ stakeholder	multiple regression analysis	CEO duality (0) Board diversity (+) Board independence (+) AC independence (+) ESG committee (+)

					Foreign ownership (0) Institutional ownership (0) Government ownership (0) Foreign listing (0) Industry Type (Foreign activity (0) Firm size (+)
Boateng et al. (2022)	Ghana	22 listed non-financial firms	Legitimacy/ political economy theory/Agency	generalized ordinary least squares regression model	Board size (+) CEO duality (-) Board independence (0) Auditor Type (0) Firm size (+) Profitability (0) Leverage (0)
Cancela et al (2020)	Iberian Peninsula	99 non-financial firms (32 companies from Euronext Lisbon, and 67 from Madrid Stock Exchange) covering 2013-2017		generalized method of moments (GMM) estimation method	Board size (+) Board independence (0) Gender diversity (0) AC presence (0) ESG committee (+) Leverage (+) Firm Age (-) GDP (0)
Chong et al., (2018)	Malaysia	58 firms covering 2010 to 2014	agency	OLS regression	Board independence (+) Gender diversity (+)
Crisóstomo et al. (2020)	Brazil	327 firms (2006 to 2015)	Stakeholder	Logit regression/ logistic regression model	Ownership concentration (-) Major shareholder/block ownership (-) Industry type (+) Firm profitability (0) Firm size (+) Firm growth (+) Leverage (0)

Disli et al., (2022)	International (emerging markets)	439 publicly listed non-financial firms covering 2010-2019 covering 20 countries	Institutional theory/ legitimacy/ resource dependence	two-step system generalized method of moments estimator	Board independence (+) Gender diversity (+) Board size (0) Board meeting (+) Profitability (0) Firm size (-) Global presence (0) Corruption (0) GDP (-) Power distance (-) Individualism/collectivism (0)
Doni et al., (2022)	Europe	42 large European-listed firms in the oil and gas industry	multi-theoretical framework of legitimacy/ stakeholder/ the resource-based view (RBV) theory	fixed effects regression models	ESG committee (+) ESG reporting (+) Audit team (+) Profitability (+) Leverage (0) GDP (0)
Elsayed & Ammar (2020)	Companies operating in Gulf of Mexico	2008 to 2017	legitimacy	Thematic analysis	Corporate governance factors including meeting, ESG committee, (+)
Fahad & Nidheesh(2021)	India	386 listed companies in Bollywood stock exchange (BSE) 500 index for a period of 10 years from 2007 to 2016	Agency cost/signalling/ legitimacy	OLS Panel data regression method	Firm age (+) Leverage (+) Firm size (+) Foreign ownership (+) Family/Promoter ownership (-) Export performance (0) Innovation (0) Firm popularity (0)
Farrukh et al., (2015)	Pakistan	50 manufacturing firms for 1 year (2014)		OLS regression	board independence (+) foreign ownership (+), Block holding ownership (+) audit firm type/ status (+) Director ownership (0)

Giannarakis et al., (2014)	US	100 firms listed on Standard & Poor's 500 Index for the period 2009-2012	political cost theory/ legitimacy	least squares dummy variable model (LSDV)/ fixed effect analysis	CEO duality (0) Gender Diversity (0) greenhouse gas (GHG) emissions (+) emission reduction initiatives (+) Leverage (0) Industry type/profile (0)
Gurol & Lagasio (2022)	Europe	35 European banks listed on EUROSTOXX 600	Agency/ Resource dependence theory	OLS regression	board size (+) Gender diversity (+) Board independence (+) Profitability (+) Firm size (+) Leverage (+)
Harjoto & Wang (2020)	UK	199 non-financial firms listed in the UK FTSE 350 index from 2007 to 2018	social network theory	Linear regression/ 2SLS regressions	board networks (+) Board independence (+) CEO tenure (-) CEO age (+) CEO education (+) CEO gender (+) Board meeting (+) Board size (+) product market concentration (+) Gender diversity (+) Institutional ownership (-) Profitability (-) Leverage (0)
Jamil et al (2021)	Malaysia	126 firms, covering 2 years (2010 and 2014)	Agency/ resource Dependence theory	multiple regression analyses	Board independence (+) sustainability-related training attended by the board of directors (+) Board members experienced in ESG (+) Firm size (+) Industry type (+)

					Profitability (+) Leverage (0)
Kend (2015)	International (Australia and UK)	220 listed firms listed in FTSE and ASX covering 1-year (2010)	stakeholder theory	sequential logit analysis	AC meeting (0) AC independence (+) Board meeting (0) Auditor type (+) ESG committee existence (+) Firm size (+) Profitability (+) Firm growth (+)
Kumar et al., (2022)	India	53 environmentally-sensitive firms listed on NIFTY100 index covering 2015-2019	Legitimacy and agency	Panel data regression	Board meeting (+) Board size (0) Government ownership (+) Auditor Type (0)
Maali et al. (2021)	UK	300 UK firms covering the period 2005-2017	Stakeholder theory	Structural equation modelling	Corporate governance index (+) Firm size (+) Leverage (0) Profitability (+)
Muniandy (2009)	Malaysia	500 Non-finance publicly listed firms for 1 year (2001) on the Kuala Lumpur Stock Exchange	Agency theory	Multiple regression analysis	CEO duality (-) Board independence (+) AC independence (+) Ethic diversity (0) Government ownership (0) Share ownership concentration (0) Director share ownership (-)
Cucari et al. (2018)	Italy	54 listed Italian firms covering 2011-2014	Stakeholder/ resource dependence	OLS	gender diversity (-) ESG committees (+) board size (0) Board independence (+) Board age (0) Firm size (+)

Rudyanto & Veronica Siregar, S. (2018)	Indonesia	37 firms listed on Indonesia Stock Exchange covering 2010-2014	theory of justice and utilitarianism	OLS	Environmental pressure (+) Consumer pressure (+) Employee pressure(0) Shareholder pressure(0) Family ownership (0) Firm size (+) Leverage (+) Industry type (+)
Said et al. (2018)	Malaysia	150 Malaysian Publicly Listed firms covering 1 year (2014)	Agency theory	Structural equation modelling	Board size (+) Board Independence (+) Foreign ownership (0) Manager Educational background (0) Firm size (+)
Zhang et al (2013)	US	516 firms based on Fortune magazine publication/ ranking of companies covering 1 year (2008)		logistic regression	Gender diversity (+) Board independence (+) Director ownership (0) Profitability (0) Leverage (0)
Vogt et al. (2017)	Brazil	97 firms covering 2010 to 2013		Multiple linear regression	Corporate governance (+) Firm size (+) Environmental Audit (+) Profitability, ROA (0) Profitability, ROE (0)

Nicolò et al., 2022)	Europe	1,392 European firms covering 6 years (2014-2019)	Stakeholder/ resource dependence	OLS with fixed effect	Gender diversity (+) Board size (-) Board meeting (0) Board independence (+) Firm size (+) Profitability (0) Leverage (0) EU directive (+)

KEY: (+) = Positive and Significant, (-) = Negative and Significant (0) =Insignificant