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Board structure and sustainability performance

By

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Thesis for the degree of Doctor of Philosophy

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ABSTRACT

This study examines the effect of board structure (BS) on the three dimensions (Triple Bottom Line) of sustainability performance (SP) on listed companies globally. The study has one main objective and one subsidiary objective. The main objective is to examine the impact of BS (board size, board independence, sustainability committee, board expertise, CEO duality and board gender diversity) on SP (financial, social, and environmental) based on stakeholder-agency theory and complementing with resource dependency, resource-based view, legitimacy, and stewardship theories. The subsidiary objective is to determine whether the impact of BS on SP differs among financial and non-financial firms. The study sample consists of 7,024 listed companies from 70 countries (both developed and developing) between 2015 and 2020. The Generalised Method of Moment (GMM) dynamic panel regression model is employed to run the regression analysis. The study also performed additional tests for a possible difference between financial and non-financial firms in the board structure and sustainability performance relationship.

The findings for the main objective indicate that the sustainability committee and the presence of CEO duality positively impact financial, social, and environmental performance. Also, board size has an inverse relationship with financial and environmental performance but a positive relationship with social performance. Board expertise improves the financial and environmental dimensions of sustainability performance, but it has a negative effect on social performance. However, board independence and board gender diversity have an insignificant effect on financial and environmental performance and a positive significant effect on social performance. On the second objective, the GMM regression results confirm that most board structure variables' impact on sustainability performance differs among financial and non-financial firms. Coefficient tests' finding also indicate differences between financial and non-financial firms. Differences between financial and non-financial firms were found in the effect of board size, board independence, board expertise, CSR committee, CEO duality, and board gender diversity on the various dimensions comprising financial, social, and environmental performance.

The finding that a sustainability committee enhances all three dimensions of sustainability performance supports the theoretical assertions by the stakeholder-agency theory and the resource dependency theory that the board of directors can serve as the firm's valuable resources to provide advisory and monitoring services to control management activities in favour of the extended

stakeholders. However, the finding that CEO duality promotes financial, social, and environmental performance confirms the stewardship theory's assertion that the unity of command, reduced chain of command and quick decision-making on important issues by CEOs who double as board chairs can increase corporate sustainability performance.

In addition, the findings for the subsidiary objective contribute to the theoretical assertion that the operations of financial firms, the strict regulations of regulatory agencies and the extensive oversights of the government on financial firms are strong enough to create differences between financial and non-financial firms in the board structure-sustainability performance nexus. The most important implication for practitioners lies in supporting the differences between the two industries as it contributes to improving standards for board structure and corporate governance, which is essential for sustainable development.

DEDICATION

TO MY FAMILY

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LIST OF ABBREVIATIONS

ABMs	Accounting-Based Measures
AR	Arellano–Bond estimator
BGD	Board Gender Diversity
BoD	Board of Directors
BS	Board Structure
CEO	Chief Executive Officer
CEP	Corporate Environmental Performance
CG	Corporate Governance
COO	Chief Operating Officer/Director
CSR	Corporate Social Responsibility
CSP	Corporate Sustainability Performance
ESG	Environmental Social and Governance
EKC	Environmental Kuznets Curve
FE	Fixed Effect
GRI	Global Reporting Initiative
GDP	Gross Domestic Product
GMM	Generalised Method of Moment
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
RBV	Resource Based-View
RE	Random Effect
RDT	Resource Dependency Theory
ROA	Return on Assets
ROE	Return on Equity
ROCE	Return on Capital Employed
SAT	Stakeholder-Agency Theory
SBL	Single Bottom Line
SC	Sustainability Committee
SCA	Sustainable Competitive Advantage

SDG	Sustainable Development Goals
SGMM	System Generalised Method of Moment
SME	Small and Medium-sized Enterprises
SOX	Sarbanes-Oxley Act
SP	Sustainability Performance
S&P	Standard & Poor's
TBL	Triple Bottom Line
TQ	Tobin's Q
UN	United Nations
USA	United States of America
UCLA	University of California
VIF	Variance Inflation Factor
WGI	Worldwide Governance Indicators

CHAPTER ONE

INTRODUCTION AND OVERVIEW OF THE STUDY

1.1 Introduction

The board of directors (BoDs) play important roles in corporate sustainability performance considering their importance in corporate governance. Hussain, Rigoni and Orij (2018) noted that the effective governance of the board determines corporate sustainability behaviour and corporate sustainability performance. This is because the board institutes relevant strategies, policies, and regulations and consider different initiatives that ensure that best management practices are implemented to satisfy the demand of numerous corporate stakeholders (AlJaberi, Hussain, and Drake, 2020). Since the board controls, monitors and steers the affairs of companies, it can be argued that the firm's performance in sustainable activities is the outcome of the board's decisions (Uyar et al., 2021). Accordingly, the institutional framework in corporate governance attaches importance to board structure (Barka and Legendre, 2017) since how the board is structured is critical to the improvement of sustainability performance (Uyar et al., 2021). Consequently, prior studies in governance literature have attempted to investigate whether corporate board structure affects the various dimensions of sustainability performance (financial, social, and environmental). For instance, Ozbek and Boyd (2020) analysed the link between board size and CEO duality and financial performance and concluded that larger boards and the presence of duality leadership increase financial performance. Also, in examining whether board characteristics drive firm performance, Pucheta-Martínez and Gallego-Álvarez (2020) found that board size, CEO duality, board gender diversity and independence promote financial performance. However, Khan, Al-Jabri, and Saif (2021) indicate that board structure variables (board size and CEO duality) harm financial performance. Though scanty, scholars have similarly tried to analyse the effect of board structure on social performance. For example, Beji et al. (2021) explained that board size, board independence and board gender diversity improve social performance, however, they indicate a negative effect of CEO duality on social performance. In support, Veltri et al. (2021) suggested a positive relationship between board independence and social performance. Nevertheless, they indicate that board gender diversity has an insignificant effect on social performance. Some scholars have also examined the relationship between board structure variables and environmental

performance (See, Nguyen and Thanh 2021; Lu and Wang 2021; Uyar et al., 2021). Furthermore, Hussain, Rigoni and Orij (2018), Cancela et al. (2020) and Kouaib, Mhiri and Jarboui (2020) have investigated the relationship between some board characteristics and all three dimensions of sustainability (economic, social and environmental) performance simultaneously by mostly focusing on specific geographical regions.

Prior studies, as indicated above, shown that the effect of board structure on sustainability performance may differ among sectors (Haniffa and Cooke, 2005), hence, conducted sector-based research into the relationship. Extant literature evidences that most existing studies focus on non-financial firms due to special regulatory guidelines and specialities in the activities of financial firms (Chithambo and Tauringana, 2014). Notwithstanding, some studies have analysed this nexus from financial industry perspective. For instance, Arnaboldi et al. (2020) analysed the influence of some board characteristics on financial performance among commercial banks in the European Union countries. Also, Abdel-Azim and Soliman (2020) examined board of director characteristics and bank financial performance, Birindelli et al. (2019) investigated how board gender diversity affect environmental performance in the banking industries. Some studies have looked at board structure and sustainability performance relationship in both financial and non-financial industries. Erhardt, Werbel and, Shrader (2003) and Qureshi et al. (2020) studied board characteristics effect on financial performance. Ferrero-Ferrero et al (2015) and Beji et al. (2021) examined the relationship in both industries from social performance perspective and Shaukat et al. (2016) studied the link between financial and financial firms considering both social and environmental performance. Notably, none of the existing studies which has investigated financial companies together with non-financial companies has looked at the relationship from the angle of financial, social and environmental dimensions simultaneously.

Furthermore, a review of literature indicate that most studies on this topic took place in single countries or related countries with similar institutional and governance characteristics. Hussain, Rigoni and Orij (2018) discussing the corporate governance-sustainability nexus focused on the high performance companies in the USA. Kouaib, Mhiri and Jarboui (2020) studied firms in the Tunisian sub-regions. The sample size for Cancela et al. (2020) consisted of non-financial companies of the Iberian Peninsula and Nguyen, Doan, and Frömmel (2020) looked at three emerging East Asian countries, thus, China, South Korea, and Taiwan. Admittedly, review of prior studies depicts studies conducted in multi-country level including studies that have covered a

considerable number of continents in their analyses (See, Shahbaz et al 2020; Martín and Herrero 2020; Dato et al 2020; Pucheta-Martínez and Gallego-Álvarez 2020; Naciti, 2019). However, it must be emphasised that none of these studies have investigated board characteristics effect on the three dimensions of sustainability performance concurrently.

Moreover, from prior studies, the review of board structure-sustainability performance has been drawn from theoretical insights which result in ambiguity evidence. Academic research examining the link between various board characteristics and sustainability performance have adopted diverse theoretical approaches in discussing the relationship with a great number of studies adopting the agency theory (Bouteska, 2020; Mohammadi et al., 2020; Endo 2020). However, a number of studies have realised the relationship among corporation and stakeholders and have investigated the relationship from the stakeholder-agency theory perspective as it addresses the divergence of interests between stakeholders and management, with the BoDs playing an oversight role over management (Shahzad et al., 2016; Veltri et al., 2021). Other studies adopt various theoretical models such as resource dependency theory, institutional theory, legitimacy theory, the upper echelon theory in emphasising the role of the board in ensuring an effective sustainable development. However, from some theoretical perspective, for example the stewardship theory, the BODs may not be very significant in promoting sustainability performance compared to the executive directors (Christensen, Kent, and Stewart, 2010; Menyah, 2013; Kyere and Ausloos, 2019).

1.2 Motivation for the study

The first motivation emanates from the fact that there is dearth of study on the relationship between board structure and all three dimensions of sustainability performance which is very crucial to SDGs (United Nations, 2015). It has become very important to fully understand how the board is structured to effectively direct the company to contribute to sustainable development goals. Considering that the firm is one of the key stakeholders in this global agenda (United Nations, 2015; Naciti, 2019) and the board is the policy initiators and the controllers of firm activities (Assenga, Aly and Hussainey, 2018; Homroy and Slechten, 2019; Martín and Herrero; 2020). Understanding of board structure's relationship with sustainability performance demands a detailed investigation into true sustainability (Aras and Crowther, 2008) which consists of economic, social, and environmental dimensions (Lozano, 2008). Notwithstanding, an attempt made by most

prior studies on this important agenda dwells on a single or two dimensions (Guney et al., 2020; Zubeltzu-Jaka et al 2020; Orazalin and Baydauletov 2020; Endo 2020). Only a few have explored all the three sustainability dimensions (Hussain, Rigoni and Orij, 2018; Cancela et al., 2020; Kouaib, Mhiri and Jarboui, 2020; Nguyen, Doan and Frömmel, 2020) and this creates a gap in literature. It is, therefore, important to conduct further studies to increase knowledge on board structure effect on all three dimensions of sustainability performance (financial, social, and environmental). The findings of this study contribute to the literature such that it extends the limited studies on board structure and sustainability performance relationship. This is useful because it facilitates a full understanding of such an important relationship needed for policy implementations and regulatory reforms to enhance sustainable development towards the attainment of SDGs.

The second motivation comes from the fact that existing studies have not explored the possible significance difference between financial and non-financial firms in board structure and sustainability performance relationship. The United Nation's agenda 2030 relies on the active involvement of all relevant stakeholders including both financial and non-financial firms to make the SDGs a reality (Zanten and Tulder, 2021). Since the outline for the SDGs calls for the involvement of all businesses to partake in this agenda by applying their creativity and innovation in sustainable activities (UN, 2015) indicate that both businesses in the financial and non-financial sectors are expected to play their role in promoting sustainable performances. Drawing on the theory of investor optimism, Prashar and Gupta (2020) conclude that the activities in the financial industry which permits them to access and control monies from outside investors is strong enough to create differences between financial and non-financial firms regarding their influence on board structure and sustainability performance relationship. Besides, though some corporate governance practices may not affect performance in financial firms, these practices could improve performances in companies in the non-financial sector (Walker, 2009) due to the activities of regulatory agencies and the extensive oversights of the government which may hinder the role of board in financial firms (Prashar and Gupta, 2020). Against this backdrop, it is important to understand board structure in both financial and non-financial companies and their impact on sustainability performance and ascertain if there are differences between them. These possible differences may be useful to important decision-makers and policymakers in that it may facilitate the formulation of relevant policies which might satisfy the board needs of each sector. This will

likely strengthen board effective monitoring, controlling and advisory services (Fama and Jensen, 1983; Hillman, Withers, and Collins, 2009) such that it may help achieve the SDGs. Despite its significance, existing studies have not explored the possible differences between financial and non-financial firms in the board structure and sustainability performance discourse which has created a gap in literature. Hence, the motivation to conduct further studies to add to literature the possible differences between these two sectors in terms of board structure effect on sustainability performance.

The third motivation comes from the need to conduct an international study to improve the generalisability of findings relating to board structure and sustainability performance relationship. The target of SDGs is new global target on sustainability (Naciti, 2019). It is expected that businesses around the world play significant role by indulging in sustainable practices. Hence, to fully understand and appreciate the relationship between board structure and sustainability performance, it is important to include companies in countries with different institutional environments since differences in culture, environment, institution, and governance have a major influence on sustainable activities (Claessens and Yurtoglu, 2013; Pucheta-Martinez and Gallego-Alvarez, 2020). Again, it is important to investigate issues relating to sustainability from a multi-country perspective because presenting data from a global perspective helps to develop a better approach to analysing global corporate performance that will provide transparent, systematic, and comparable economic, social, and environmental information which is useful for establishing a benchmark for a better measure of stakeholders' claims (Palmer et al., 2010). However, despite the significant of taking sustainability development issues from the global perspective, the available evidence on board structure and sustainability relationship are conducted in a single country (Hussain, Rigoni and Orij, 2018; Kouaib, Mhiri and Jarboui, 2020), two cross-border countries (Cancela et al., 2020) or three cross-border countries (Nguyen, Doan, and Frömmel, 2020) which have similar institutional characterises which limits the generalisability of results. Existing knowledge then creates a gap that requires further exploration by limiting the sample to specific continents.

The final motivation comes from the conflicting theoretical debate in the board structure and sustainability performance relationship. On one hand, the stakeholder-agency theory argues that for effective sustainability performance, firms need to involve outside directors in the form of independent directors and a large board size while practicing the CEO non-duality leadership style

(Hill and Jones, 1992; Kock, Santaló and Diestre, 2012; Shahzad et al., 2016; Squires and Elnahla, 2020). The theory arguing in favour of board independence explain that considering sustainable issues are long-term issues, it demands that directors without affiliation with the firm who represent the interests of the larger stakeholders monitor and control the activities of managers who are interested in short-term projects to ensure they conduct their duties in favour of the larger stakeholders (Bachiller, Giorgino and Paternostro, 2015). Also, the stakeholder-agency theory elucidates that bringing more directors on board increases the firm's chances of accessing skills and knowledge from diverse opinions to increase sustainability performance (Kock, Santaló and Diestre, 2012). Moreover, more directors can translate to more control and supervision over management activities (Fama and Jensen, 1983; Hill and Jones, 1992). Lastly, from the theory's perspective, CEO duality leads to CEO entrenchment, obscures monitoring, can lead to abuse of power, and can cause CEO-stakeholder conflicts to the detriment of sustainability performance (Kyere and Ausloos, 2019; Hsu et al., 2021)

On the other hand, the stewardship theory argues in favour of a small board size on the basis that executive directors are good stewards who are motivated to work to enhance performance when they allowed to work independently under minimise supervision (Donaldson 1990; Donaldson and Davis 1991; Kalsie and Shrivastav, 2016). Accordingly, executive directors demand a small number of directors for advisory purposes (Davis et al., 1997; Jaskiewicz and Klein, 2007). Also, the theory asserts that insider directors have more firm-specific knowledge to oversee corporate affairs than the independent directors who have limited knowledge of the firm (Christensen, Kent, and Stewart, 2010; Menyah, 2013). Hence, the firm is likely to perform better when affairs are left in the hands of executive directors who have firm-specific knowledge. The stewardship theory argues for CEO duality leadership to enhance performance because it is associated with unified leadership, unity of command and reduced chain of command which from the theory's perspective promotes quick relevant decisions to enhance performance (Zhang, 2012; Cheng, 2013). The conflicting views of these theories create theoretical ambiguities that call for further empirical analysis.

1.2.1 Aim and objective of the research

This study aims to investigate the relationship between board structure and corporate sustainability performance. It analyses the extent to which board structure variables impact the three dimensions

of sustainability performance (economic, social, and environmental) in a global context. The research objectives that guide the study are as follows:

1. To examine the impact of board structure (board size, board independence, board expertise, sustainability committee, CEO duality and board gender diversity) on corporate sustainability performance (financial, social, and environmental)
2. To determine whether the impact of board structure (board size, board independence, board expertise, sustainability committee, CEO duality and board gender diversity) on the corporate sustainability performance (financial, social, and environmental) differs between financial and non-financial firms.

1.2.2 Research questions

The study intends to specifically answer the following questions:

1. What is the impact of board structure (board size, board independence, board expertise, sustainability committee, CEO duality and board gender diversity) on corporate sustainability performance (financial, social, and environmental)?
2. How does the impact of board structure (board size, board independence, board expertise, sustainability committee, CEO duality and board gender diversity) on corporate sustainability performance (financial, social, and environmental) differ between financial and non-financial firms?

1.3 The overview of the research methods

This study adopts the fundamental philosophies of positivism and quantitative methodology to find answers to the research questions. The study sample was collected from the Refinitiv database and the world bank indicators using the secondary data. The initial data sample consisted of 9,882 international companies. However, after excluding countries and companies with missing data, the final sample for analyses arrived at 7,024 companies from six different geographical regions spanning from 2015 to 2020. The dependent variables employed for the studies are financial performance, social performance, and environmental performance. The study selected these six board structure variables as independent variables: board size, board independence, board expertise, sustainability committee, CEO duality and board gender diversity. The control variables consist of both firm and country level control variables, and these are firm size, firm age, leverage,

sustainability reporting, capital intensity, gross domestic product, inflation, and country specific governance indicators. All statistical analysis and data management was done using the STATA 17.0 statistical package. Initially, the study considered the fixed effect (FE) estimation method as the baseline estimation model and the GMM estimation model was to be for endogeneity and robustness. However, the results that the FE model provided became significantly different from the results produced by the GMM models. Considering the GMM model is known to control for possible sources of endogeneity and reverse causality (Wintoki, Linck and Netter, 2012), the GMM model results were chosen as baseline inferences for all analyses and discussions.

1.4 Summary of Results

The findings are that there is a negative relationship between board size and financial and environmental performance but a positive relationship between board size and social performance. Board independence has no impact on financial and environmental performance but improves social performance. Also, there is a positive relationship between the sustainability committee, CEO duality and all three dimensions of sustainability performance. Board expertise improves financial and environmental performance but decreases social performance. Finally, Board gender diversity has insignificant relationship with financial and environmental performance but has a positive significant impact on social performance.

Regarding the subsidiary objective, the study found that financial firms differ from non-financial firms in terms of how board structure affects sustainability performance. The findings from the coefficient test indicate that industry has significant effect on board size and sustainability (financial, social, and environmental) performance relationship. Significant difference exists between board independence and financial and social performance and an insignificant difference between board independence and environmental performance. Likewise, testing the coefficients highlights significant difference between financial and non-financial firms regarding how board expertise affects financial, social, and environmental performance. Though board expertise exhibits similar effect on financial performance among industries, differences exist in how board expertise affect social and environmental performance. Sustainability committee's effect on financial and environmental performance differ among industries, however, this effect is insignificant in social performance. Furthermore, there is a significant effect on the relationship between CEO duality and financial, social, and environmental performance. Regarding gender

diversity, testing for industrial effect indicate that significant difference exists in the effect of board gender diversity on financial and environmental performance.

From literature the differences between financial and non-financial firms regarding how the various board structure affect sustainability performance have been linked to differences in business activities, regulatory demands, and resources available to each sector. To enhance performance, Becht, Bolton, Roell, (2011) explain that the opacity in the activities of financial firms may require a smaller board size as it is known to prevent social loafing for effective board monitoring and supervision. It is also expected that non-financial firms would promote sustainability performance with more independence board than financial firms due to regulatory demands. Because financial companies' supervisors give greater prominence to independent judgement instead of independent backgrounds of directors (Hopt, 2021). Compared to non-financial firms where a larger percentage of independent directors are required for management oversight duties, independent directors for financial firms are selected based on expertise and competencies (Hopt., 2013).

1.5 Contribution of the study

To strengthen the goals of sustainable development makes it important to ascertain how the board drive companies to achieve economic, social, and environmental performance (Nguyen, Doan, and Frömmel, 2020). This is important because true sustainability consists of economic, social, and environmental dimensions and these dimensions are indivisible, equal, and balanced (United Nations, 2015). Yet, evidence regarding board structure and three dimensions of sustainability is scanty in literature. This study contributes to literature such that it adds to the limited studies on board structure impact on economic, social, and environmental performance. The findings from this study indicate that sustainability committee and CEO duality influence economic, social, and environmental performance. The results are of importance to researchers who are keen to conduct in depth study into the board structure and sustainability relationship. Also, the findings add to the paucity literature on corporate governance regarding board structure and sustainability performance. Furthermore, the findings indicate that good board structure would commit to sustainable developments by strengthening all three dimensions of sustainability performance, especially, through formation of sustainability committee and practicing CEO duality. The

findings also have implication for practitioners as they may, through this study, put great effort into corporate sustainable development.

Secondly, the study provides insight into the differences between financial and non-financial firms in the board structure-sustainability performance relationship (Di'az, Rebeca Garcí'a-Ramos, and Di'ez, 2018). To a larger extent, the findings from the GMM results indicate that board structure effect on financial, social, and environmental performance differ among financial and non-financial firms. Similarly, the additional tests on the coefficients indicate that significant differences exist between the two sectors in terms of board structure effect on sustainability performance, which prior studies have not considered. Prior studies excluding financial firms from their analysis might not give the full pictorial view of how board structure affect corporate sustainability performance which is crucial for sustainable development (Cancela et al., 2020). Therefore, for the purpose of SDGs, there is the need to test for board structure effect on sustainability performance in both financial and non-financial firms to ensure appropriate policy formulations. The study investigating board structure effect on sustainability performance in both financial and non-financial firms thereby contribute to the literature and increases the complete understanding of board structure and corporate sustainability performance.

Thirdly, this study is unique for its comprehensive examination of the link between board structure and sustainability performance across multiple countries. The definition the United Nations have given to SGDs indicate that sustainability development and international cooperation are intertwine (United Nations, 2015). In the case of sustainable development, while nations recognise, understand, and experience the changes in economic, social, and environmental at the local level, it is important to recognise the changes in other parts of the world too (Naciti, 2019). This can help international co-operations such as the Organisation for Economic Co-operation and Development (OECD) and the United Nations to initiate policies and strategies at the international level to enhance sustainable development (Liberatore, 2022). Against this backdrop, it is of great importance that the relationship between board structure and sustainability performance is examined on the global level. However, the few studies on this relationship were conducted in only a few countries. Specifically, one or few cross-border countries which limits the generalisability of findings. In view of this, this study extends the knowledge on board structure and sustainability performance argument by following Pucheta-Martínez and Gallego-Álvarez (2020) and investigating the effect of board structure on sustainability performance from

companies from seventy (70) countries across six different geographical regions which have different institutional, culture and governance backgrounds. This is useful for establishing a benchmark for a better measure of stakeholders' claims (Palmer et al., 2010) which is important in enhancing sustainable performance. Also, the findings could help international cooperation to introduce international agenda on sustainable development to improve the SDGs.

Lastly, the study contributes to the theoretical debate between stakeholder-agency and the stewardship theories. The theoretical viewpoints of stakeholder-agency regarding the effect of board size, board independence and CEO duality on sustainability performance conflicts with the views of the stewardship theory. Considering these board structure variables, the research findings support the stewardship theory's arguments more than the stakeholder-agency's views. The results indicate that financial and environmental performance improve with a smaller board size. Also, board independence has insignificant impact on financial and environmental performance. Moreover, CEO duality leadership increase financial, social, and environmental performance. As the findings only found a positive relationship between board size, board independence and social performance, it can be concluded that the study upholds the stewardship theory argument that companies are better off with executive directors to enhance sustainability performance.

1.6 Structure of thesis

This study has been categorised into seven chapters and has been organised as follows: Chapter one gives overview of the research by giving introduction to the study, the motivation for the study, research objectives and research questions, overview of the methods applied in the research, research contribution and explaining the general structure of the entire research.

Chapter two reviews the extant literature on the board structure and sustainability (financial, social, and environmental) performance relationship. This chapter identifies the prior studies on the board structure variables identified for the study and how they are linked to the TBL dimensions. The chapter then identifies the gaps in literature which warrants the need for further studies.

Chapter three analysis the theoretical frameworks which helps to explain the board structure-sustainability performance relationship. The theories which underpin this study are stakeholder-agency theory (main theory for the study), resource-based view theory, resource

dependency theory, stewardship theory and legitimacy theory. The chapter discusses the theories assumptions, their merits, and criticisms.

Chapter four discusses the formulated hypotheses for the study. The chapter discusses the hypotheses to be tested in this quantitative study based on the extant literature reviewed and the theories for the study. Based on prior literature reviewed, explanation from theories, dependent and independent variables adopted, this study formulated eighteen hypotheses.

Chapter five discusses the research methodology. In this chapter, the research philosophies underpinning the study is discussed. Also, the research methods to be applied, the sources of data, mode of collecting the data, the research population and sample, the statistical methods to be employed, regression models to be used in testing hypothesis are all explained in this chapter.

Chapter six presents the results and discusses the empirical findings of the study. The chapter gives details of the parameters of datasets, the chapter presents and discusses descriptive statistics, correlation analysis, the empirical findings and additional tests conducted. This chapter also discusses the sensitivity analysis conducted and how the robustness of baseline results was checked.

Chapter seven summarises the entire study by placing emphasise on the study objectives, methodology, results, contribution of the study, limitations, recommendations, and conclusion of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The review of prior literature, in this study, concentrates on the relationship between board structure and sustainability performance. Sustainability develops through bottom-line dimensions consisting of economic, social, and environmental performance. These dimensions which give equal value to financial, social, and environmental dimensions are collectively called sustainability or the triple bottom-line performance (Elkington, 1997). Though scanty, there is evidence of some existing studies that have looked at the effect of some corporate governance mechanisms and the dimensions of sustainability performance (Hussain, Rigoni and Orij, 2018; Kouaib, Mhiri and Jarboui, 2020). This study extends the literature by investigating the influence of the board of directors' structure on sustainability performance with the definition of sustainability performance as in the GRI framework which comprises the various dimensions of sustainability (economic, social, and environmental dimensions). The economic dimension could be aligned with the improvement in the economic standard of living or based on the firm-centric financial performance or both (Sheth, Sethia and Srinivas, 2011). Following the studies of Cancela et al. (2020), we define the economic dimension in this study by using the financial performance of the firm. In the nutshell, this study investigates board structure (board size, board independence, board committee, board expertise, CEO duality, and board diversity) and sustainability performance (financial, social, and environmental performance) relationship. The remainder of the chapter is organised as follows: Sections 2.2 through 2.7 explain the concept of board structure and corporate sustainability performance. 2.8 summarises the previous research and 2.9 concludes the chapter.

2.2. Board size

Various arguments have been developed on how board size affects the various dimensions of sustainability performance. Regarding financial performance, Jackling, and Johl (2009) find a strong positive significant relationship between board size and financial performance of companies listed on Indian stock exchange. The study supports the resource dependency view that a larger board opens an avenue for more detailed intellectual abilities to enhance financial performance. However, the findings from this study could be affected by its smaller sample and be limited in

generalisability for focusing mainly on Indian companies. In support, Belkhir (2009) employs a panel data set of 174 bank and savings-and-loan holding companies to attest that banks with larger board sizes get higher market value and increase return on assets. Christensen, Kent and Stewart (2010) studied corporate governance and company financial performance in Australia in 2004. Their study found a positive link between board size and Tobin's Q indicating how the market puts a higher perception on a larger board. Thus, the market sees a larger board as a good instrument for monitoring and the ability to transfer skills to enhance corporate financial performance. However, it has been argued that the study duration and frequency of measurement can have huge impact on the research findings (Feely et al., 2020). Hence, the single time period for this study can affect the test results.

Based on the assumptions under the agency theory, Grove et al (2011) examine the influence that board structure has on financial performance among US commercial banks amidst the financial crisis in 2007. The study reports a concave association between firm, financial performance and board size. The results show that the positive effect of more members on the corporate board is effective to a certain threshold, after which the effect declines and becomes harmful to financial performance. Nevertheless, the findings could be altered by the effect of the global financial crisis. Moreover, Al-Najjar (2014) identifies that a larger board size allows for more significant deliberations on issues during board meetings leading to a positive impact on financial performance. Arora and Sharma (2016) find a weak but positive significant association between board size and financial performance. In justification, the authors argued that the larger the board size, the greater depth of intellectual knowledge to improve performance. Mishra and Kapil (2017) agree that having a larger board size can exert a positive influence on financial performance. Wang et al (2018) found that board size has an optimum value effect on the performance of hotel industries in Taiwan. The first revelation of the results supports the resource dependency theory where a larger board size exhibits a positive influence on performance. However, a higher number beyond the ideal value, which is ten in this study, becomes harmful to the firm performance as has been stipulated by the agency theory. However, like most studies on board structure and financial performance, these studies focus on a single country.

Nawaz (2019) confirmed a positive significant effect of larger board size on financial performance. The author emphasised the effective control and monitoring role associated with a larger board size. With a sample of 24 financial listed firms from Oman, Al-Matari (2019) also

finds larger boards to have a positive influence on financial performance. The reason is that larger boards are efficient in controlling management activities and an effective mechanism to curb financial fraud. With evidence from 452 listed firms in Thailand, Al Farooque, Buachoom and Sun (2020) found a larger board size significantly positive to financial performance. They believe that firms in emerging countries like Thailand require more directors with the needed experience and diverse skills to monitor the activities of management to solve problems that may hinder the improvement of financial performance. The study, however, employed only marketing performance measures to assess the financial performance of the firms. Though, there may be criticisms about the use of accounting measures as the study mentioned, using both accounting and marketing financial indicators give wholistic conclusions. Other studies also found a positive relationship between board size and corporate financial performance (see, Abor and Biekpe, 2007; Elsayed, 2011; Adams and Mehran, 2012; Meyer and de Wet, 2013; Prashar and Gupta, 2020)

Conversely, some studies found board size detrimental to corporate financial performance. Bonn, Yoshikawa and Phan (2004) investigate a sample of 273 Japanese and Australian manufacturing firms between 1998 and 1999. The regression analysis for Japanese firms shows an inverse relationship between board size and firm financial performance. From the authors' perspective, it is generally difficult to harmonise a larger board size. It is even more difficult to get all members get fully involved in decision making. Especially, in Japanese companies where directors are chosen based on relationships rather than an inherent contribution to firm progress. However, the study was only based on a two-year data and thus, it is recommended that a study that is explicitly longitudinal is likely to be more beneficial. Staikouras, Staikouras and Agoraki (2007) provide support to this assertion as their study finds an inverse relationship between board size and financial performance. In Mashayekhi and Bazaz (2008), regression results confirmed the inverse relationship between board size and financial performance as the study predicted. The drawing on listed firms in Iran concluded that smaller board size is more effective in executing the controlling functions of board directors. Guest (2009) examines 2746 UK listed firms between 1981 and 2002. The study finds a strong negative influence of board size on profitability. The author opines that smaller boards encourage good communication and effective decision making. Afrifa and Tauringana (2015) investigate small and medium enterprises (SMEs) in the UK to find that a larger board harms financial performance. This is because the financial resources of SMEs are limited, and their activities are less demanding. Hence, having a larger board put additional

stress on the already limited resources which then impacts performance negatively. The authors suggested to SMEs reduce to their board size to the optimum level. Taking evidence from Japanese listed banks, Sakawa and Watanabel (2018) found support for an inverse relationship between larger board size and financial performance. They posit that large boards are associated with coordination problems which contribute to weaker financial performance. Nevertheless, the smaller sample chosen for this study could bias the results.

Of direct relevance to this study and employing sample from non-financial companies in the Iberian Peninsula, Cancela et al (2020) investigated how corporate governance affects the three dimensions of sustainability. The regression results show a negative significant relationship between board size and return on asset (ROA). They attribute the findings to the communication problems associated with larger board sizes. From their report, a larger board concentrate on the welfare of workers most especially on wages increment and this lessens profitability. However, the conclusions are drawn from non-financial firms within two-cross border countries with similar institutional characteristics which limits the generalisability of findings. According to Hideto Dato, Hudon and Mersland (2020), increasing board size in profit-making companies could add cost to the firm. The study however does not focus on some of the pertinent issues affecting for-profit firms which could make larger boards beneficial. Khan (2021) analyse the association between board structure and firm performance in a sample of 226 listed firms in Malaysia. The study records an inverse relationship between firm performance and board size. The result supports the agency theory that due to communication-related issues, social loafing, and uneasiness in making decisions, a smaller board size is more desirable for a firm's financial improvement. Yermack (1996); Eisenberg, Sundgren and Wells (1998); O'Connell and Cramer (2010), Kao, Hodgkinson and Jaafar (2019); Daadaa (2020) and others agree with the assertion that due to the communication problem and other issues related to larger board size, firms are more likely to increase their financial performance with smaller board size.

However, other researchers do not find evidence to elucidate the significant relationship between the number of directors on corporate boards and the firm's financial performance. In research conducted by Bonn (2004) between 1999 and 2004, it was evident that the size of the board does not have a significant impact on financial performance, especially, in Australian listed firms. According to the author, board composition in terms of outside directors and the proportion of females on the board are more influential to the firms' value than just the number of board

directors. Similarly, Selekler-Goksen and Karatas (2008) find no relationship between board size and financial performance with a sample of 102 listed firms taken from the Turkish stock exchange. From the researchers' analysis, the additional members added to the board may not bring new expertise nor provide access to resources as this may be available to the board already. Also, boards in Turkey may only be playing a ceremonial role. The study only centres on firms belonging to a specific business group. Furthermore, Ujunwa (2012) uses panel data to analyse the influence of board characteristics on Nigerian firms. The study records an insignificant effect in the board size-performance nexus. Similar evidence has been provided by Bouaziz and Triki (2012) where an insignificant relationship between board size and financial performance has been confirmed. The authors elucidate that the insignificant relationship may be caused by the mandatory inclusion of outside independent directors on Tunisian boards. Asante-Darko et al (2018) investigating the governance structure on the Ghana stock exchange also find no significant link between board size and financial performance. Likewise, Wang et al. (2019) reveal an insignificant relationship between board size and financial performance in their study on corporate governance mechanisms and firm performance. Lizares (2020) affirm that board size does not influence firm performance. A study by Musallam (2020) on a sample of 31 non-financial firms in Palestine also recorded an insignificant relationship between board size and financial performance indicating that the size of the board does not necessarily affect the financial performance of the firm. A more recent study by Roffia, Simón-Moya and Sendra García (2021) also found no influence of board size on SMEs' financial performance. Nonetheless, most of these studies use small sample size, results are more related to non-financial firms and are mostly country specific.

Studies on board structures' influence on social performance have been limited compared to those on financial performance. For example, Bai (2013) studies the influence of board size on the social performance of for-profit and not-for-profit organisations. The study samples 363 for-profit and not-for-profit hospitals in California. The author reports that a larger board size improves the social performance of not-for-profit firms since the larger number of directors link the firms to the needed resources in promoting charitable missions. Moreover, the monitoring services the experts on the board offer the hospitals outweigh the adversities that come with it. Biswas, Mansi and Pandey (2018) also found a significant positive effect of board size on social performance of Australian non-financial firms. Similarly, Cancela et al. (2020) affirm the stakeholder theory that an increase in board size leads to an increase in the social performance of firms. Meta-analysis of

studies conducted by Zubeltzu-Jaka, Álvarez-Etxeberria and Ortas (2020) on how board size influences social performance in the global economy shows a positive significant relationship. Consistent with stakeholder theory, the study argues that more directors create opportunity for diverse opinions and interests to align with the interest, aims and objectives of stakeholders. Thus, these directors help inculcate social strategies into the firm's policies to enhance social performance. Similar evidence has been presented by Nguyen et al (2020) in their 6-year-study among three emerging east Asian countries. The authors explain that a firm with more board of directors is likely to have access to a considerable number of human resources, and extensive outside connections to equip the firm with the needed expertise, monitoring and advisory services which help them to tackle social issues effectively. This study investigates how board structure impact financial, social, and environmental performance; however, the results are more inclined to non-financial firms in Asian countries. Moreover, studies have proved the need to control for many variables which may affect the internal validity of results (Beji et., 2021). This study is likely to have more confounding variables influencing the results since the controlled variables are relatively small.

Nonetheless, Bai (2013) found board size inversely related to social performance in for-profit firms. The study used hospital spending on community gains as a proxy for social performance. They explained that for-profit firms, executives depend on short term profits for their compensation. Management, therefore, considers activities to enhance short term profit-making at the expense of social activities. As bigger board size is associated with governance deficiency, management is less monitored contributing to the negative effect on social performance. However, the study is based on a hospital setting, therefore, social performance in other settings may be different. Also, Uyar et al (2021) portray that among the non-financial firms in the US, a larger board is detrimental to the success of social performance.

Some scholars find little or no effect of board size on social performance. Hafsi and Turgut (2013) perform a single-year study with 95 non-financial companies in the US. The study finds no significant relationship between board size and social performance. They attributed the unexpected results to the small sample size used for the study. Also, they emphasised that board structural variables alone, in their opinion cannot make any significant impact on corporate social performance. In Hussain, Righi and Orij (2018), it is argued that board size has no significant relationship with the social dimension of sustainability performance. The study employs the

performance in human rights, society, product responsibility and labour as a proxy for social performance measures. Likewise, Kouaib, Mhiri and Jarboui (2020) find no significant relationship between board size and social performance in non-financial firms in Tunisia. They believe the disagreement among members associated with larger board sizes contributed to the insignificant results.

Concerning existing literature on board structure and corporate environmental performance (CEP), de Villiers, Naiker and van Staden (2011) examine the effect of board characteristics on environmental performance among non-financial companies in the US and found a positive effect of board size on environmental performance. From resource dependence theory perspective, the authors elucidate that a larger board size enhances board diversity which increases likelihood of attracting members with knowledge, skills, and experiences on environmental issues to provide the board with the relevant knowledge and advice on opportunities and strategies to handle environmental problems. However, like most board structure studies, the findings are mainly related to non-financial companies in a developed economy. In a study conducted with 90 non-financial firms from Japan, Endo (2020) also record a positive significant relationship between board size and CEP. From the resource dependence theory perspective, they conclude that a larger board size makes it relatively easier for the firm to access people who are rich with related knowledge, and expertise and to connect the firm to the needed networks to align the interest of stakeholders to the objectives of the firm.

Nguyen et al (2020) also recorded that a larger board size leads to better environmental and social performance of the firm. This is because, with a larger board, the firm is connected to a wider social network. Also, substantial human resources become accessible which gives the motivation to understand and deal with social and environmental issues effectively. Nguyen and Thanh (2021) researched manufacturing industries in East Asian countries focusing on the interlinkages between board characteristics and environmental performance. The study concluded that a larger board would initially provide the expected monitoring and advisory services to enhance environmental responsibilities. However, a continual growing of the board will create problems to weaken their effectiveness despite all the resources provided. Thus, a larger board with an ideal number of directors can improve corporate environmental performance.

However, Walls, Berrone and Phan (2012) investigated a sample of 313 non-financial firms in the USA to record an inverse link between board size and environmental performance. The

study uses environmental concerns and environmental strength as two components for environmental performance. This study finds board size positive to environmental concerns. The authors believe that the lack of governance controls for environmental management as has been instituted for financial management could contribute to the obtained results. García Martín and Herrero (2018) found board size as significant to the use of recycled waste only, indicating an inverse relationship between board size and environmental performance. This argument has been supported by Cancela et al (2020) as they examine the influence of corporate governance on sustainability performance. The study finds that a higher board size leads to a higher corporate environmental expense. The study explains that due to the economic depression after the global financial crisis, the firms focused on activities that will boost the economy rather than on the environment, and hence the negative results.

Hussain, Rigoni and Orij's (2018) analysis into corporate governance and the triple bottom line found an insignificant relationship between board size and CEP. However, as the authors indicated that the GRI reporting framework proxied for sustainability performance was still underdeveloped, it could have impacted the research findings. Likewise, Kouaib, Mhiri and Jarboui (2020) revealed an insignificant relationship between board size and CEP. The authors believe that the communication problems associated with larger board size might have reduced its significant effects. Nevertheless, the study was only based on an eight-month data and thus, it is recommended that a study that is explicitly longitudinal is likely to be more beneficial.

2.3 Board independence

About how board independence affects the financial dimension of sustainability performance, Abor and Biekpe (2007) analyse 120 small and medium size companies in Ghana to record a positive association between board independence and financial performance. The authors argue that outside non-executive directors have rich financial and legal experiences from the external environment which enable them to provide the needed advice to management. They also have expertise and external networks to link firms to relevant resources to enhance financial performance. Similarly, Mashayekhi and Bazaz (2008) draw on the agency theory to explain that the presence of outside directors is a source of good monitoring of management activities on behalf of shareholders and other relevant stakeholders. Jackling and Johl (2009) employ a sample from Indian top companies to investigate how board structure affects corporate financial performance.

The study also found a positive significant relationship between outside directors and financial performance. According to Duchin, Matsusaka and Ozbas (2010), board independence has a positive impact on financial performance, most especially in companies where information costs are relatively low. In support, Ameer, Ramli and Zakaria, (2010) assert that introducing outside directors to an inside director dominated board could help address the agency conflict problems. This conclusion was drawn after investigating listed companies in Malaysia. Black and Kim (2012) find a positive impact of board independence on financial performance after analysing a panel data set from Korea listed companies between 1996 and 2004. Similarly, Liang, Xu and Jiraporn (2013) found a positive association between the independent board and financial performance of Chinese banks. After investigating the board characteristics of Middle Eastern countries, Al-Najjar (2014) also found a positive significant effect of board independence on financial performance. The study opines that outside directors bring their experiences and provide networks to strengthen the financial performance of the firm.

Liu et al (2015) examine 2057 listed firms in China and reported a positive significant relationship between board independence and firm financial performance. This positive result is due to the independent directors' ability to avert inside dealings and boost efficient dealings in Chinese companies. In the authors perspective, the effect of independent directors on performance is more pronounced in government-controlled firms and firms with a lower cost of information. Merendino and Melville (2019) in Italy found that when there are outside directors on a firm board, the performance of the firm increases. The study argues from the viewpoint of agency theory that introducing optimal number of independent directors to the board assures investors of good governance which boost investors' confidence to enhance corporate value. Considering that the sample of this study consists of only non-financial firms, it creates a gap as to how independent directors influence financial performance of both financial and non-financial firms. Khan, Al-Jabri and Saif (2019) investigate a sample of 226 firms in Malaysia to find that board independence has a positive effect on financial performance. From the agency theory's perspective, the study concludes that outside non-executive directors can perform their monitoring and controlling functions judiciously to improve the financial performance of the firm. Moreover, as indicated by the resource dependency theory, external directors provide useful resources in the form of different skills, experience, expertise, and also connect the firm to relevant external resources.

Souther (2021) employs 682 closed-end funds to probe into how board independence affects the value of the firm. The author identifies two major significances of independent directors on the board; Thus, increasing firm value and providing better board monitoring services to control management activities. Some other studies have also found a positive effect of board independence on financial performance (See Yasser, Mamun and Rodrigs, 2017; Haldar et al., 2018; Al-Matari, 2019; Kao, Hodgkinson and Jaafar, 2019).

On the other hand, some studies have an opposing view on the board independence-financial performance association. According to Shao (2010), the firm requires a higher number of representatives from various stakeholders to enhance its financial performance. The study accentuates that including more representation of people with a stake in the firm to make decisions is better than including more outside directors with little or no interest in the organisation. The study concludes that companies including more outside directors in the pursuance of good governance might be in the wrong direction. Christensen, Kent and Stewart (2010) sampled 1039 companies from Australia to find that outside director on the board is detrimental to financial performance. In support of the stewardship theory, the study asserts that the company needs to include on the board inside directors who are reliable stewards of corporate valuable resources, with much intensive knowledge of the firm to increase the organisation's performance instead of outside directors with little or no knowledge about the business.

Mangena, Tauringana and Chamisa (2012) examine how board structure affects firm performance in a severe political and economic crises environment to report a significant negative relationship between independent outside directors and financial performance. The finding was mainly attributed to the political crises at the time which might have minimised the controlling function of independent directors. In Cavaco et al (2016) the negative impact of board independence on financial performance was mainly linked to directors' information gap and inexperience. This argument is supported by Arora and Sharma (2016) who accentuates that some independent directors could have close affiliations with the company and the management. Hence their appointment might have been influenced by management and could prevent them from serving as true independent corporate directors. Furthermore, Abdel-Azim and Soliman (2020) investigated a sample of 21 banks in Egypt to record a significant negative impact of independent directors on corporate financial performance. The study in favour of more insider directors to direct corporate affairs argues that compared with outside directors, inside directors are good custodians

who preserve the resources of the company to enhance the firm performance. Some researchers similarly agree to the reasons against more outside directors on the board on the basis of lack of business knowledge and directors not being truly independent to be more efficient in executing their duties to increase shareholders' wealth and financial performance. (See Pathan and Faff, 2013; Gaur, Bathula and Singh, 2015; Volonté, 2015)

Nonetheless, Santiago-Castro and Baek (2004) study nine Latin American countries and found no significant relationship between outside independent directors and financial performance. Ehikioya (2009) found an insignificant relationship between independent directors and financial performance. The results show that corporate boards with family members create hindrances to check and balances. This creates loopholes for members to manipulate the system which renders the significance of independent members. Zulkafli, Amran and Samad (2010) contrary to the agency theory's predictions found that independent directors do not protect the interest of shareholders, nor perform their monitoring and supervisory as expected. Afrifa and Tauringana (2015) found that non-executive directors do not have any influence on the performances of listed SMEs.

Mishra and Kapil's (2017) research on listed firms in India and found an insignificant influence of board independence on financial performance. This study shares the view that the ownership structure management in Indian firms could prevent independent directors to have a voice on the board. Similarly, Hussain, Rigoni and Orij (2018) find no relationship between board independence and the economic dimension of sustainability performance in their study which samples 100 US firms. Likewise, Nguyen, Doan and Frömmel, (2020) do not find any significant relationship between board independence and financial performance. Roffia, Simón-Moya and Sendra García (2021) use the panel data for 184 Italian small and medium-sized enterprises to conclude that there is little or no relationship between board independence and firm performance. They conclude that comparatively; outside directors are not better than inside directors as far as the protection of shareholders' interests is concerned. Most of the above studies were conducted in single or countries with similar institutional and cultural characteristics which limits the generalisability of research findings. Therefore, it calls for the need to investigate the relationship from international perspective to improve the generalisability of findings regarding board independence effect on financial performance.

Regarding how board independence affects the social dimension of sustainability

performance, Dunn and Sainty (2009) posit that board independence has a positive significant relationship with corporate social performance. The study was taken from 104 Canadian firms. The results affirm that firms with a higher proportion of external directors behave positively toward social activities and social performance. Zhang (2012) found a positive significant relationship between outside non-executive directors and social performance. After investigating a sample of 475 fortune 500 firms, the study affirms that technical and institutional stakeholders perceive the presence of outside directors on the board as a positive sign of recouping the lost social reputation. Likewise, Ducassy and Montandrou (2015) emphasise that board independence has a positive significant relationship with social performance. This is because a greater proportion of independent directors implies the board's conflict of interest is reduced and this enables the firm to incorporate the social objectives into its financial objectives, which then creates value for the stakeholders leading to an enhancement of social performance. Shaukat, Qiu and Trojanowski, (2016) relying on the resource-based view and the resource dependency theories assert that the higher the proportion of independent directors on the board, the more the firm is proactive towards its CSR strategy, and the more pronounced it is in its social performance.

Biswas, Mansi and Pandey (2018) similarly report a positive significant relationship between board independence and social performance. Arguing from the stakeholder perspective, the study emphasise that independent directors are accountable to different stakeholders, hence, they are more inclined to satisfying the needs of stakeholders which includes providing strategies and ideas to enhance corporate social performance. According to Hussain, Rigoni and Orij (2018), external directors are responsible to a broader range of stakeholders as suggested by the stakeholder theory. Hence, their oversight duties are strictly to ensure management activities favour relevant stakeholders. Similarly, Nguyen et al (2020) reiterated the positive connection between independence and social performance by explaining that with a greater proportion of outside directors, the firm has access to enough resources to help in rendering the expected services to solve social issues effectively. This positive relationship has also been recorded by Uyar et al (2021) and Veltri, Mazzotta and Rubino (2021).

In a departure, Naciti (2019) uses a global sample of 365 industrial firms to record a negative but significant link between board independence and social performance. This study relied on stakeholder and the agency theories in justifying its findings. The conclusion drawn from

this study indicates that since independent directors depend on the information provided by management to make decisions and initiate strategies, any alteration in the information provided by management to the independent directors could affect the advisory and supervisory serves directors would provide and have an adverse effect on social performance. Though Naciti's study employs international sample from 46 different countries, it focuses on non-financial companies. Besides, dependent variables consist of social and environmental sustainability variables only which violates the definition of true sustainability as given by Aras and Crowther (2008). Shu and Chiang (2020) also found an inverse relationship between board independence and social performance with a sample of 1563 listed non-financial firms from Taiwan listed firms.

Hafsi and Turgut (2013) on the other hand find no significant relationship between board independence and social performance. The possible reason offered was that executive directors can influence some major decisions of independent directors in a situation where their beliefs and values align. Lau, Lu and Liang (2016) emphasise that the presence of outside directors alone is not enough to stir changes on the board after investigating board independence effect on corporate social responsibility in China. Cuadrado-Ballesteros, Martínez-Ferrero and García-Sánchez (2017) conclude that boards do not rely on a single attribute to take decisions regarding social performance. But rather, a combination of various attributes takes precedence in board decisions. Uyar et al (2020) also found that board independence has very limited significant effect on corporate social issues.

On board independence and CEP, de Villiers, Naiker and van Staden (2011) the stance of agency theory indicates that a higher proportion of independent directors strengthens board monitoring duties to increase environmental strength. Also, the firm gets connections that provide it with environmental opportunities with a higher percentage of independent directors. However, after a certain threshold, board independence could be harmful to environmental performance. Post, Rahman and McQuillen (2015) further highlight the importance of that board independence in the oil and gas firms in the US. The authors assert that independent directors represent the interests of stakeholders. Hence, to satisfy the demands of stakeholders, these directors can possibly establish a sustainability-themed alliance to increase on environmental performance. Similarly, Shaukat, Qiu and Trojanowski (2016) have asserted that that the higher the proportion of independent directors on the board, the more the firm is proactive towards its CSR strategy and the more pronounced it is in its environmental performance. Biswas, Mansi and Pandey (2018),

Hussain, Rigoni and Orij (2018), Endo (2020), and Nguyen and Thanh, (2021) also found a positive significant relationship between board independence and environmental performance of non-financial firms.

Walls, Berrone and Phan (2012) on the other hand record a negative significant link between board independence and CEP. The study employs an environmental performance dataset from Kinder, Lydenberg, and Domini's. They report that, independent directors perform their monitoring duties judiciously on financial performance at the expense of environmental performance which could be the cause of the inverse relationship.

Crifo, Escrig-Olmedo and Mottis (2019) employ a sample of 120 French companies for the year 2013 to investigate the link between corporate governance and sustainability performance. They found no significant relationship between independent directors and CEP. Parallel to this is the works of Naciti (2019), Uyar et al (2020) and Kouaib, Mhiri and Jarboui (2020) as they also recorded an insignificant relationship between board independence and the environmental performance of non-financial firms.

2.4 Board sustainability committee

The board of directors can execute their functions through the entire board or can delegate their authority to a standing committee who are responsible to the board as instituted in an article of incorporations and by-laws (Klein, 1998; Tricker, 1994; Zhang, Zhu and Ding, 2013). To ensure efficiency, some tasks are delegated to smaller groups, thus, committees are grounded on the expertise and interest of members (Christensen, Kent and Stewart, 2010). Singh et al. (2018) argued that board committees increase organisational performance in that a larger increase in board oversights, boosts public confidence towards effective and independent decision making. Following prior studies, the board committee in this study is focused on the sustainability/CSR committee (Christensen, Kent and Stewart, 2010; Hussian et al., 2018; Cancela et al., 2020).

The main task of the sustainability committee (same as the CSR committee in this study) is to ensure that the sustainable development goals of the company become a reality. Li et al. (2016) studied 434 out of the top 500 publicly traded companies in the USA for the period 2012 and 2013 to understand how green initiatives and green performance affect financial performance. The study finds that sustainability committee has a positive effect on financial performance in some sectors of the economy. The study argues that companies adopt sustainability committees as

a winning strategy which can assist the firm to obtain a higher profit. Again, such committees help the firms to avoid litigations which help in cost savings and thereby increases the firm's profit. In support, Lopez-Arceiz and Río (2021) posit that firms with sustainability committees on the corporate board enhance their financial sustainability performance. With this study grounded on stakeholder theory, the authors argue that the CSR committee encourages the board to integrate stakeholders' needs into the strategic policies of the firm to address the needs of the entire stakeholders to improve the firm legitimacy levels and hence, increase sustainability performance including financial sustainability. However, Hussian et al. (2018) and Cancela et al. (2020) find that the sustainability committee has no significant impact on financial performance.

Regarding the effect of CSR responsibility committees on social performance, Biswas, Mansi and Pandey (2018) with a sample of 407 non-financial companies listed on the Australian Securities Exchange posit that companies that have sustainability committees on their boards perform better in terms of social score than their counterparts without such a committee. From the perspective of stakeholder theory, the authors elucidate that having a sustainability committee symbolises the adherence of the firm to the needs and demands of its stakeholders. In support, (Orazalin, 2020a) argues that in the UK context, firms with sustainability committees enhance their CSR strategies to improve the social performance of the company. According to (Uyar et al., 2020) when companies set committees such as CSR committees to deal with issues related to social responsibility, it equips the firm to implement varieties of strategies, programs and activities to better attend to stakeholder needs and to efficiently deal with social issues. Through the lens of resource dependency theory, the study concludes that a CSR committee could be the firm's valuable human capital resource to monitor various issues on social responsibility activities to improve social performance among the hospitality and tourism industries around the globe. Similarly, Cancela et al. (2020) elucidate that the presence of a sustainability committee increases a firm's social concerns as has been suggested by the stakeholder theory hence, increases the values of social sustainability performance. In a study conducted by Shahbaz et al. (2020), the results from both the OLS regression and the Fixed Effects regression analysis confirm that the presence of the CSR committee impacts social performance positively. Elmaghrabi (2021) also confirms that companies with sustainability committees exhibit better corporate social strategy and performance and lesser corporate social controversies than firms which do not have sustainability committees.

Nonetheless, Burke, Hoitash and Hoitash (2019) have argued that though the sustainability committee can use their expertise to generate value through the pursuit of sustainability-related opportunities, such committees may not be efficient in mitigating sustainability-related risks.

Concerning environmental performance, Hussain, Rigoni and Orij (2018) found that CSR committee positively affect a firm environmental performance. The authors find evidence to support the argument of the stakeholder theory that the presence of a sustainability committee is an indication of the firm's commitment towards effective stakeholder management. In support, (Biswas, Mansi and Pandey, 2018) indicate that the existence of a CSR committee helps the firm to have a systematic plan, and implement and review environmental sustainability policies. The authors believe considering the committee members are experts in issues relating to sustainability including environmental issues, the committee can help the firm to design strategies to improve environmental performance. Similarly, García Martín and Herrero (2018) investigating a sample of companies within the European Union countries covering the period of 16 years conclude that companies with sustainability committees commit to sustainable development to improve the environmental performance of the firm. Orazalin and Mahmood (2021) and Uyar et al. (2021) also confirm a positive significant relationship between CSR/sustainability committee and corporate environmental performance. However, Cancela et al. (2020) find that the presence of a sustainability committee is detrimental to environmental performance since the presence of this committee is linked to higher environmental expenses.

To sum up on existng studies regarding board committee and sustianability performance relationship, very scanty studies exist on how board committee affect finanical, social and environmental performance. Some schloars have even called for more research in this direction to enrich corporate governance and sustianability literature (Orazalin and Mahmood, 2021). Besides, it is difficult to make inferences from the scanty evidence to affect all industrial and economic sectors since they are mostly related to non-finanical companies confined to specific countries.

2.5 Board expertise

Ehikioya (2009) proxied board expertise with directors' degree and professional qualifications of together with an accredited programme they have attended and found the presence of these directors beneficial to firm financial performance. Ujunwa (2012) reiterate that firms in Nigeria perform better when the board has members with PhD qualifications. Thus, these directors can create a linkage between the firm and various external resources based on their knowledge and expertise besides their abilities and competencies that permit them to provide good advisory services to management. In support, Bouteska (2020) argues that financial experts increase the firm's performance as they strengthen the decision-making of the board due to their experience, knowledge, and expertise. Other studies have found a positive relationship between board expertise and a firm financial performance (See, Gaur, Bathula and Singh, 2015; Musallam, 2020; Roffia, Simón-Moya and Sandra García, 2021)

Conversely, Kallamu and Saat (2015) argue that board expertise has a negative significant effect on financial performance after studying directors with finance industry experience on an audit committee board in Malaysian firms. They explain that the relevance of expertise on the board depends on the size of the firm. Gray and Nowland (2017) posit that the magnitude of expert diversity depends on the industry type, the firm location, and the size of the board. Thus, though the presence of expertise in accounting, banking, consulting, and an expert CEO is beneficial to shareholders, their positive influence is up to a certain limit after which it begins to hurt the financial performance. Krause, Semadeni and Cannella (2014) explain that the need for an expert on the board depends on the situation at the time. The board will need an expert if their experience and expertise are needed. For instance, a firm with improving efficiency does not require the expertise of the chief operating officer (COO) of another firm and their presence on the board will not be beneficial to the firm in increasing its financial performance. Nonetheless, their services may strengthen a firm with declining efficiency. However, Abor and Biekpe (2007) find that a directors' expertise is insignificant to financial performance.

In analysing the influence of board expertise on social performance, Bai (2013) found that board expertise, thus, the physicians on the hospital boards have a positive influence on the social performance of for-profit organisations. Bai (2013) explains that physicians have acquired professional beliefs and norms through their training, and this prevents them from focusing solely

on profit maximising at the expense of social performance. Therefore, their presence on the board put pressure on management to also focus on social activities. Furthermore, the study opines that board expertise may not affect the social performance of not-for-profit firms as their interests of providing social services eliminates conflict of interest. Harjoto, Laksmana and Yang (2019) investigate 874 USA firms to conclude that director expertise improves social performance. The authors emphasized that well-educated directors are more likely to ensure community and social goods, hence would encourage the firm to formulate more strategies to enhance social performance. Hafsi and Turgut (2013) found an insignificant relationship between board expertise and social performance. They believe this is because directors are more inclined to the monitoring of management to reduce agency costs to enhance financial performance and are less concerned about social performance. With board expertise and CEP, de Villiers, Naiker and van Staden (2011) find environmental performance higher in firms with more legal experts directors. This is because they provide legal expertise, act swiftly on sensitive issues including those related to environmental performance and also have access to outside connections due to their qualification. Crifo, Escrig-Olmedo and Mottis (2019) however, posit that a higher proportion of sectoral experts on the board of the French biggest firms are negatively related to performance.

2.6 CEO duality

Some studies have found a positive impact of CEO duality on financial performance. Zulkafli, Amran and Samad (2010) analyse a sample of 107 listed banks in nine Asian countries to find that companies perform better with duality leadership structure. This is because CEO duality is linked to unity of command. This promotes quick decisions leading to a better corporate management. Ramdani and Witteloostuijn (2010) employ a quantile regression model to investigate how CEO duality impacts firm performance. The study confirms the stewardship theory argument that CEO duality enhances firm performance, especially in mediocre firms. The study attributed the findings to the unity of command and the clear leadership role linked to CEO duality structure. García-Ramos and García-Olalla (2011) found that CEO duality increases financial performance, especially in family firms where the family exerts much control over the business. The study, however, considers only the financial dimension of sustainability performance. Similarly, in a bilateral study of 20 years, Yang and Zhao (2014) recorded a positive effect of CEO duality on financial performance. The study opines that as the chairman obtains company-specific

information alongside his daily activities as CEO, costs associated with acquiring, transmitting, and processing information are reduced. Also, duality reduces the extra chain of command, and in a competitive market, duality leadership acts quickly towards new information compared to firms with non-duality leadership. The positive and significant relationship between CEO duality and financial performance has also been supported by Rubino, Tenuta and Cambrea (2017), Ahmadi, Nakaa and Bouri (2018), and Bouteska (2020). Most of these studies speak in favour of the unified leadership structure and less chain of command characteristics which are associated with CEO duality. Stewardship theorists explain that firms that practice a unified leadership structure reduce information costs, solve strategic issues effectively and obtain better coordination leading to the effectiveness of operations. With 10,314 international firm-year observations from 43 countries, Pucheta-Martínez and Gallego-Álvarez (2020) also find a positive and significant impact of CEO duality on firm performance as a result of unified power and control provided by the duality role.

In contrast, Judge, Naoumova and Koutzevol (2003) have averred that even though the Russian governance regulations prohibit the CEO duality function if a firm informally practices it, it is likely to harm financial performance. Their result suggests the predictions of agency theory that CEO duality causes conflict of interest and harms the financial performance. Grove et al (2011) study on 126 commercial banks in the US supports the CEO non-duality argument. Moreover, Christensen, Kent and Stewart (2010) support the negative impact of CEO duality on financial performance. Syriopoulos and Tsatsaronis (2012) employ a sample of 43 shipping firms listed on USA stock exchanges in analysing how duality affects the financial performance. The researchers rely on agency theory to affirm that duality in leadership structure hurts financial performance. The authors suggest to firms separate the two roles so that the CEO can efficiently run the fishing firms while the chairman continues to enhance the shareholders' interest by evaluating and monitoring the management activities. This study is, however, centred on a specific industry in a specific country so may not apply to other business sectors. A sample size of 50 Chinese banks was observed for 8 years by Liang, Xu and Jiraporn (2013) to ascertain how board characteristics affect banks. The conclusion of the study was drawn in favour of CEO non-duality. In addition, Duru, Iyengar and Zampelli, (2016) find support for the inverse relationship between duality and performance. The study which is modelled on agency, stewardship and resource dependency theories argues that the negative effect of CEO duality is even more intense when there are fewer independent members on the board. Guetat, Jarboui and Boujelbene (2015)

conducted a stochastic frontier analysis on a sample of 65 Tunisian hotels. The results from the study indicate that the separation of CEO/chairmanship positions enhances financial performance.

Tang (2017) provides evidence in support of separating the board chair and the CEO roles. They conclude that the positive influence of non-duality leadership is noticeable when the CEO is more powerful than the other members of the top management team. The study was however limited to a shorter time series. Similarly, Dang et al. (2018) examined listed companies in Vietnam for a period of two years to record an inverse relationship between CEO duality and financial performance. This has also been supported by Lew, Yu and Park (2018) as they find a negative impact of CEO duality on performance. Their results are consistent with agency theory from which they argue that a non-duality reduces the decision-making authority given to one person and the non-executive directors get the opportunity to oversee the affairs of management to protect the interest of shareholders. Kouaib, Mhiri and Jarboui (2020) also find a negative significant relationship between CEO duality and the financial dimension of sustainability performance.

Some existing studies found no relationship between the duality role and financial performance. Findings documented by Santiago-Castro and Baek (2004) confirm that the choice of leadership structure yields no significant influence on the firm's performance. The study, however, examines the relationship of board characteristics for only one year, this may affect the results as board characteristics have a long-term effect on performance. Elsayed (2007) finds no relationship between duality and the financial performance of Egyptian public limited firms. This is because many firms in Egypt are controlled by families and individuals which makes it difficult for management to be objective, flexible, and independent. With a sample of 84 family-controlled firms, Braun and Sharma (2007) also provide support for the insignificant impact of CEO duality on financial performance. A similar study conducted by Jackling and Johl (2009) on Indian firms record an insignificant effect of CEO duality on firm performance. Al-Saidi and Al-Shammari (2013) based on the agency theory viewpoint to examine the link between board composition and firm performance in Kuwait. The results indicate that duality is not influential in Kuwait's bank financial performance.

Similarly, a study by Arora and Sharma (2016) find no significant relation between CEO duality and financial performance. Mutlu et al (2018) also found no impact of duality on financial performance in their meta-analysis study. Merendino and Melville (2019) researched a sample of 65 listed companies in Italy and realised that CEO duality/non-duality play an insignificant role in

the performance of Italian firms. The authors interpreted the results to mean that the leadership style adapts the unique characteristics of a company to exhibit its benefits. Likewise, Kyere and Ausloos, (2020) could not find any influence of duality leadership style on a firm's financial performance. Nguyen et al (2020) find no relationship between duality and financial performance. The reason is that corporate governance systems in East Asian countries are based on close relationships, therefore even if the roles are given to two people, it will be two people with close allied or are family members.

Regarding how CEO duality affects the social performance of the firm, various scholars have expressed diverse opinions, therefore, the literature regarding CEO duality and social performance is mixed and conflicting. According to Zhang (2012), CEO duality is positive towards social strength ratings because the unity of command in a duality role makes it easier for CEOs to take prompt decisions to favour stakeholders' concerns. However, Shu and Chiang (2020) examine the impact of corporate governance on social performance with a sample of 1563 non-financial listed firms in Taiwan to report that CEO duality hurts social performance. Their explanation places emphasis on management entrenchment which is the main setback of CEO duality. This entrenchment makes leaders less prepared to partake in social responsibility activities which then hampers the growth of the firm's social performance. According to Biswas, Mansi and Pandey (2018), powerful CEOs can ruin the commitment the firm has towards corporate social responsibilities. Therefore, when the CEO is also the board chair, it affects social performance negatively.

On the other hand, Hafsi and Turgut (2013) do not find any significant influence of CEO duality on social performance. From their explanation, this could be because most governance codes and reforms are focused on financial performance which makes the boards interested in controlling the discretions of management, and these restrictions could limit their initiatives towards performance. Hussain, Rigoni and Orij (2018) likewise find no evidence for CEO duality influence on social performance in US firms. Similarly, the study conducted by Naciti (2019) in 365 industrial firms in 46 countries proves that CEO duality does not affect social performance. In Kouaib, Mhiri and Jarbou's (2020), CEO duality is insignificant towards social performance. Nguyen, Doan and Frömmel (2020) also insignificant relationship between the separation of the CEO and the board chair role and the social performance of firms in emerging East Asian

countries. These studies exclude financial institutions from their analysis which makes the study findings relatable to non-financial firms at the expense of financial companies.

On environmental issues, there is also conflicting evidence as to how the leadership structure affects the environmental performance of the firm. For instance, Hussain, Rigoni and Orij (2018) indicate that duality has a deleterious effect on environmental performance. The study draws on agency theory to explain that when the CEO and board chairmanship roles are combined, it hinders the ability to monitor management decisions. This has been supported by Naciti (2019) who also found a positive significant relationship between CEO non-duality and CEP. They also emphasised that separating the CEO and the board chair positions enables the board to monitor the CEO's actions as has been suggested by the agency theory. García Martín and Herrero (2020) observed a significant effect of duality on recycled waste. Indicating that firms with CEO duality leadership structure are more likely to affect environmental performance negatively. In the authors' opinion, this is due to the collective power in the hands of one person which creates agency problems because of information asymmetry. CEOs are more likely to invest in short-term financial projects as opposed to long-term environmental objectives. Uyar et al (2021) also assert that due to the entrenchment position associated with a duality leadership structure, adopting it hinders the growth of environmental performance. Based on 1,870 European and Asian companies from 2010 to 2017, Lu and Wang (2021) conclude that the separation of CEO and board chair positions is one of the best corporate governance practices to improve environmental performance.

Nevertheless, de Villiers, Naiker and van Staden (2011) find an insignificant relationship between firm leadership structure and CEP. Likewise, among non-financial firms in Tunisia, Kouaib, Mhiri and Jarboui (2020) do not find any significant relationship between CEO duality and firm environmental performance. Nguyen, Doan and Frömmel (2020) conclude that CEO duality has no influence on firms in emerging economies and this is because both roles are given to people who have personal relationships or are family members of the company. Nguyen and Thanh (2021) also found an insignificant relationship between CEO duality and CEP.

2.7 Board diversity

Erhardt, Werbel and Shrader (2003) proxied diversity with ethnicity and gender to study the influence that diversity has on financial performance in US companies. Their findings indicate that diversity on corporate boards has a positive effect on financial performance because diversity

promotes proper oversight responsibility. Moreover, in the outbreak of conflicts, diversity allows for a wider range of opinions for contemplation. Bonn, Yoshikawa and Phan (2004) explain that due to the unique skills and knowledge that female directors bring to the board, their presence contributes to greater financial performance. From Miller and Del Carmen Triana (2009), a diversified board in the form of race and gender give a signal that the firm understands the diverse environment it operates and this enhances corporate reputation. Similar evidence has been provided by Mahadeo, Soobaroyen and Hanuman (2012) in examining Fortune 500 firms. The study found a positive significant relationship with gender diversity and financial performance. Vafaei, Ahmed and Mather (2015) support the argument based on evidence gathered after investigating 500 listed firms in Australia. Their findings indicate that female representation on the board impacts the firms' performance positively. Sarhan, Ntim and Al-Najjar (2019) provide support to this assertion as they study a sample of 100 firms from the Middle East. Consistent with the resource dependency theory, they accentuate that diversity helps with the monitoring function and strengthens the board's independence, this helps the firm to perform better financially. Uyar et al (2020) conduct cross-country research in the hospitality and tourism industries to understand how diversity affect performance. The results show that the presence of women on board influence the financial performance. This is because women see things from different perspectives and bring to the board unique experience and competencies. Likewise, Cancela et al. (2020) find that female directors have a positive influence on financial performance.

In contrast, Ujunwa (2012) argues that diversity is detrimental to a firm's financial performance. The authors put forward this argument after recording a negative significant relationship between the presence of female directors and financial performance in Nigerian quoted companies. The study concludes that diversity only increases agency cost and slow down the board's decision-making. Also, Wellalage and Locke (2013) with a sample of 198 Sri Lankan firms found a negative effect of gender diversity on financial performance. According to this study, due to high uncertainties in the Sri Lankan environment, gender diversity cannot be a determinant factor for a Sri Lankan firm's performance. Yeh and Trejos (2015) have documented similar results after studying traded firms in Taiwan. They found in contrast to the prediction of the resource dependency theory, a negative relationship between board gender diversity and financial performance. The study posits that this is due to the tenure of the female representative on the board being shorter than their male counterparts, which does not allow the women much

influence on the board as the male directors hence their impact on the board is restricted. Frijns, Dodd and Cimerova (2016) conclude that cultural diversity attenuates financial performance in UK large firms. They explain that the inverse relationship may be due to an inherited cost and misunderstanding among members due to cultural differences. However, the study is based on large companies in the UK only. Similar research conducted by Roudaki (2018) on the proportion of females on UK SME boards reveals that diversity is detrimental to a firm financial performance. Pavić Kramarić, Aleksic and Pejic-Bach (2018) investigate insurance companies in Croatia to report a negative significant link between board gender diversity and financial performance. The study reports that diversity can cause conflicts, slow down decision-making and impedes firm growth.

On the contrary, Rubino, Tenuta and Cambrea (2017) investigate Italian-listed firms from 2003 to 2013 to elucidate that the proportion of female directors on the board does not affect the firm value. However, the study concentrates on the influence of diversity on family businesses, therefore, many details about other forms of businesses are not revealed. Kagzi and Guha (2018) sample 126 firm-year observations to show that gender and tenure diversities do not have any influence on firm performance. The study shares the opinion that the underrepresentation of females on corporate boards hinders the voice of women directors. In addition, members who have been on the board for a long time might have built some acquaintances with some managers and might easily succumb to their decisions. In the research conducted by Unite, Sullivan and Shi (2019), board diversity is measured by a greater proportion of females on the board. It was found that diversity was insignificant to financial performance. The authors draw on tokenism to explain that the proportion of women on the Philippines' corporate board was a token to respond to pressure from society. However, the study is country-specific inferring that situations in other parts of the world might be different. According to Khan and Subhan (2019), the mere presence of females on the board is insignificant to financial performance. Arnaboldi et al (2020) examine the effect of board heterogeneity on performance by using the diversity index. The results prove that board diversity does not influence a firm financial performance. The study argues that without the voice of minority reaching a stipulated threshold, diversity is irrelevant. Hussain, Rigoni and Orij (2018) and Kouaib, Mhiri and Jarboui (2020) both find no significant influence of women on board and financial dimension of performance.

Assessing how board diversity influences social performance, Zhang (2012) documents a

positive significant relationship between gender, racial diversities and social performance. The study uses corporate social performance strength and weakness ratings as measures of performance. The study draws on resource dependence to explain that per the philanthropic and socially oriented nature of women, the presence of females on the board provides advice and creates connections to strengthen the firm's relationship with important stakeholders. Also, the presence of women and minorities on the board creates a good image in the sight of institutional stakeholders which affects social performance positively. Building on the findings of Zhang (2012), Zhang, Zhu and Ding (2013) found board diversity positive to social performance. Hafsi and Turgut (2013) assert that boardroom diversity represented by gender and age has a positive influence on social performance. Based on the finding, the study asserts that the influence that each member exerts on the board is inherent in their demographic dissimilarities. The separate makeup of members results in the advice and criticisms they give influence the strategic process. All these together with the channel of information they provide due to their networking have an impact on social performance.

With a sample of 1,489 non-financial firms from the US, Harjoto, Laksmana and Lee (2015) use seven different diversity indices to examine the effect of board diversity on social performance. The results as given by the regression analysis find board diversity positive to CSR strength and negative to CSR concerns. This is in line with the stakeholder theory and the predictions of the study. The study concludes that diversity enhances the board's ability to identify and provide for the needs of each stakeholder group while at the same time resolving issues with the larger stakeholders. Uyar et al (2020) conducted cross-country research on the hospitality and tourism industries to understand how some board characteristics including diversity affect social performance. Diversity, as proxied by female representation on the board, validates the necessity of board diversity on corporate boards. The results show that the presence of females on the board influences social performance positively because of women altruistic and community driven bring more ideas from their experience and expertise to the board to enhance social activities and performance.

On the other hand, Olthuis and van den Oeve (2020) found board diversity detrimental to social performance. The study finds that a higher level of ideological diversity harms the firm's corporate social responsibility performance. The four-year study from a sample of 372 Dutch municipality boards relies on the upper echelons theory to explain that the board's differential

views and ideologies lead to distinctive views on societal issues, therefore, impacting social performance negatively. However, according to the work of Cancela et al. (2020), board gender diversity does not affect social performance. Kouaib, Mhiri and Jarboui (2020) also found an insignificant relationship between board diversity and social performance. The results were closely linked to the lower percentage of females on the board. The study concludes that the gender imbalance declines teamwork due to ineffective communication and negative conflicts. Similarly, Veltri, Mazzotta and Rubino (2021) found an insignificant relationship between board diversity and social performance.

Regarding board diversity-environmental performance relationship. The analysis of Walls, Berrone and Phan's (2012) show that board diversity is negatively associated with environmental concerns. Indicating that board diversity favours environmental performance. Post, Rahman and McQuillen (2015) proxied women directors for diversity. In their 5-year study and taking samples from the oil and gas industries, the study found that a greater proportion of women on the board affect relevant strategic behaviours which goes a long way to influence environmental performance positively. With a large sample from Australian listed firms, Biswas, Mansi and Pandey (2018) posit that as women are more altruistic and open to newer ideas, more of them on the board can enhance environmental performance. Birindelli, Iannuzzi and Savioli (2019) scrutinised 96 listed banks in Europe, the Middle East and Africa from 2011 to 2016. The study relies on the critical mass theory and homophily perspective to analyse how board gender diversity affects a bank's environmental performance. The study found a non-linear relationship between gender diversity and CEP. The study argues that introducing women to the board exerts a positive influence to a certain limit and begin to decline after the number of female directors reaches critical mass. Naciti (2019) also found a positive effect of board diversity on environmental performance. The study posits that women are more concerned about social and environmental issues, Comparatively, they respond quickly to the needs of others and have the ability to build relationships easily. Consequently, diversity helps the firm to advise and monitor management on environmental objectives. Uyar et al. (2020) affirm the positive relationship between diversity and CEP. The authors emphasise on altruistic and community-driven nature of women. They continued that women see things from different perspectives and bring unique experiences and competencies to the board.

Others have argued that the diversity of the board does not influence the performance of the firm. Alazzani, Hassanein and Aljanadi (2017) used firms listed on the Malaysian stock exchange in 2009 to assess the impact of female diversity on environmental performance. The study controls for firm size, leverage, profitability, board size and others to record an insignificant relationship between diversity and environmental performance. The conclusion drawn in this study was that, due to the cultural influence in Malaysia, women focus more on social related issues than environmental issues. Also, the over-domineering of male directors may override the voice of women on environmental issues. Hussain, Rigoni and Orij (2018) and Cancela et al (2020) both found no relationship between women on board and environmental performance. Kouaib, Mhiri and Jarboui (2020) also found an insignificant relationship between board gender diversity and CEP and assign the blame to the under-representation of women on Tunisian boards.

2.7 Summary of existing literature

Table 2.1 below summarises the outcomes of studies on board structure and financial, social, and environmental dimensions of sustainability performance by previous researchers relevant to this study. The table is divided into ten (10) columns with the details of the author (s) name and publication year, the sample size used in the research, the country of study, the nature of the companies, i.e., whether financial or non-financial, the data set, the performance measures indicating the dimension measured, the theories applied in the study, and the key findings respectively.

TABLE 2.1 SUMMARY OF KEY STUDIES ON BOARD STRUCTURE AND SUSTAINABILITY PERFORMANCE

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/Non-Financial companies</i>	<i>Linear/ Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>Theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Uyar et al 2021	2638 firm year observation for the period 2011 and 2018 8-year period	US	Non-financial	Linear	Thomson Reuters Eikon	Social Environmental	Stakeholder theory Agency Resource dependency Complexity theory	BGD: sig(+) Soc, Env Independence: sig(+) Soc Board size: sig(-) Soc CEO duality: sig(-)	None
Konadu et al 2021	278 companies listed on the S&P 500 from 2002 to 2017 6-year period	US	Nonfinancial	Linear	S&P 500 stock exchange DataStream- Financial sustainability ASSET4 ESG- social and environmental sustainability data Thomson Reuters	Financial Social environmental	Stakeholder and agency theories.	social sustainability performance: sig(+)	board structure: on environmental sustainability performance: insig(+) board structure: on financial sustainability performance: sig(-)
Nguyen et al 2020	1596 firm-year observations during the period of 2011–2016. 6-year period	China, South Korea, and Taiwan (emerging East Asia)	Non-financial	Linear	Thomson Reuters ESG ratings: sustainability performance	Economic environmental and social	Agency theory and stakeholder theory	Board size: sig(+) (En), (S) independent directors: sig(+) (En) (S) CEO duality: sig(-) (En)	independent directors: Insig(E), Board size: insig(+) (E), CEO duality: insig(+) (E) (S)

TABLE 2.1 CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/Non-Financial companies</i>	<i>Linear/ Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>Theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Kouaib et al 2020	152 companies from January to August 2018 8-months period	Tunisia	Non-financial	Linear	Survey (questionnaires) conducted with the CEO/CFO/HR of Tunisian companies	Economic, social, and environmental	Stakeholder Legitimacy theories	Board of director effectiveness (index): sig(+) Board size: sig(+)(Econ) Frequency of board meetings: sig(+) CEO duality: sig(-)(Econ) Non-executive directors: sig(+)(Soc & envt)	Presence of female directors: insig Outsider directors: insig Board size: insig(S,E)
Cancela et al 2020	99 non-financial companies of the Iberian Peninsula, during the 2013–2017 period. (from Euronext Lisbon& Madrid Stock Exchange) 5-year period	Iberian Peninsula (Portugal & Spain)	Non-financial	Linear	Analysis System of Iberian Balances database (SABI): economic, social and environmental data, plus firm-specific characteristics The company's annual reports: CG data Eurostat: microeconomic data(PD)	Economic Social environmental	Stakeholder theory	Board Size: Sig(-) E, S, Env Gender diversity: sig(+)E, Audit committee: sig(+) E Corporate social responsibility committee: sig(+)S, E	Gender diversity: insig(S, Env) Audit committee: insig(S, Env)

TABLE 2.1 CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/ Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>Theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Orazalin and Baydauletov 2020	2,624 firm-year observations from listed companies from 2010–2016 7-year period	10 European countries	Non-financial	Linear	Thomson Reuters Asset4 database: CG& sustainability performance indicators Worldscope database: financial data Worldwide Governance Indicators database: national governance quality	Social Environmental	Upper echelons Resource dependency theories	Board gender diversity: sig(+)	
Naciti 2019	362 industrial firms in 46 different countries across the globe 4-year period	46 different countries across the globe	Non-financial	Linear	The Sustainalytics Platform database: both dependent and independent variables	Environmental and social (sustainability performance)	Agency theory and stakeholder theory.	Independent directors: sig(-)S Board diversity: sig(+) CEO Non duality :sig(+E)	CEO duality: insig-S
Kyaw et al 2017	754 firms in Europe From 2002 to 2013	Europe	Non-financial	Linear	Europe from Thomson Reuters ASSET4: ESG Datastream: Financial Worldscope: accounting	Social Environmental	Resource dependence theory Neo-institutional theory	BGD: Sig(+env, soc and CSP	None
Hussain et al 2018	100 US companies from 2007 to 2011. 5-year period	USA	Non-financial	Linear	Global Fortune 2013 list: study sample Corporateregister.com website: sustainability reports manual content analysis: measure SP	Economic Social Environmental (Sustainability performance)	Agency theory and stakeholder theory	Board independence: sig(+) CEO duality: sig(-)Env Women on board: sig(+) Board activity/meeting Sustainability: sig(+) committee: sig(+)	Board size: insig(soc)

TABLE 2.1 CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/Non-Financial companies</i>	<i>Linear/ Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>Theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Biswas et al 2018	407 individual firms listed on Australian Securities Exchange from 2004 to 2015 12-year period	Australia	Non-financial firms	Linear	Australian Securities Exchange The ASSET4: social & environmental	Social and environmental	Stakeholder theory	Board gender diversity: sig(+) Board independence: sig(+) Sustainability committee: sig(+)	None
Shaukat et al 2016	2,028 firm-year observations of UK listed companies, covering the period 2002–2010. 9-year period	UK	Non-financial	Linear	Asset4: environmental, social, and governance (ESG) data Datastream universe: financial data.	Environmental Social	Resource based view Resource dependence theory	Board independence: sig(+) Board diversity: sig(+) Audit committee expertise: sig(+)	None

2.8 Summary and conclusion

This chapter has covered an adequate review of the studies on board structure and the three dimensions of sustainability performance as defined by the GRI framework and Elkington (1997). The chapter focused on identifying the effect of board structure on financial, social and environmental dimensions of the sustainability performance of financial and non-financial companies in multiple countries. This review has helped to identify gaps in prior studies which call for the need for the current study to investigate.

The major gaps identified from prior literature are that there is limited study on board structure effect on financial, social, and environmental performance. Corporations around the world have realised that social and environmental goals must be in a harmonious blend with the economic performance of the firm for sustainable development (Hussain, Rigoni and Orij, 2018; Konadu et al., 2021). Sustainability develops through equal and balanced bottom line dimensions of economic, social, and environmental performance. The importance of sustainability development goals demands that an in-depth analysis be conducted in sustainability performance which is very scanty in literature. Also, most of the existing studies pay attention to the non-financial institutions at the expense of financial institutions which has led to limited studies in the board structure-sustainability performance literature. Hence, this study finds gaps conduct further analysis to contribute to the literature on this important global agenda.

CHAPTER THREE

THEORETICAL FRAMEWORK

3.1 Introduction

Prior literature on corporate governance and performance nexus has adopted various theories including agency theory (de Villiers, Naiker and van Staden, 2011; Ozbek and Boyd, 2020; Konadu et al., 2021), stakeholder theory (Kouaib, Mhiri and Jarboui, 2020), resource dependency (Ujunwa, 2012), stewardship theory (Guillet et al., 2013). Because this study aims to analyse firm performance using a multidimensional approach, the study applies the stakeholder-agency, resource-based view, resource dependency, legitimacy, and stewardship, theories to explain the relationship between board structure and firm sustainability performance. Sustainability performance in this study is defined by Elkington (1998) as the triple bottom line comprising economic, social, and environmental sustainability performance.

Walls, Berrone and Phan (2012) acknowledge the need for a multi-theoretical framework to explain extensively the link between corporate governance and firm performance. They explained that this is essential to address critical issues relating to directors' motivation and behaviour, societal norms, and moral commitments. Furthermore, one theory alone cannot cover all dimensions of board structure and firm performance relationship. Hussain, Rigoni and Orij (2018) agree that one theory, on its own, cannot explain how to inculcate the goals of shareholders and stakeholders into management goals. They express the importance of including relevant theories which will complement each other to fully explain the relationship. Moreover, Cullen, Kirwan and Brennan (2006) recognise that individual theories have distinct purposes, hence with different validity criteria and implications. Following prior studies on multiple theories, this study applies the stakeholder-agency theory (SAT) as its fundamental theory and attempts to position the resource-based view theory (RBV), resource dependency theory (RDT), legitimacy theory and stewardship theory alongside the fundamental ones in explaining this important phenomenon.

The chapter begins with a discussion of the stakeholder-agency theory followed then by the resource-based view theory, resources dependency theory, legitimacy theory, and stewardship theory. The sections give details about these theories, their applications to the board structure-

corporate sustainability performance nexus and criticism of each theory. The chapter ends with a summary and conclusion.

3.2 Stakeholder-agency theory

The stakeholder-agency theory (SAT) integrates the agency theory, which is traditionally used in assessing the effect that the board structure has on corporate financial performance (Kao, Hodgkinson and Jaafar, 2019), with the stakeholder theory which is more suitable for analysing the social and environmental dimensions of the firm (Cancela et al., 2020).

In the spheres of corporate governance, agency theory has been the most predominant theory applied in governance and corporate performance studies (Daily, Dalton and Cannella, 2003; Musallam, 2020). The classical agency theory describes a relationship between shareholders (principals) and management (agents). This principal-agency relationship is formed when the principal(s) authorise the agents to perform some services on their behalf (Jensen and Meckling, 1976). Due to the separation of ownership, agency problems are likely to arise in such relationships. The concept of agency problems was first identified by Adams Smith (1776), who predicted that managers who are in the custody of monies that are not their own are very likely to be less careful in executing their duties. From the perspective of large, public corporations, Berle and Means (1932) reiterated that due to the separation of ownership and control, it was doubtful that agents of corporations will control such enterprises under their care in the interests of their owners. They noted that the degree to which the agents will control the affairs of the corporations depends on their own self-interest. This has warranted the definition of Eisenhardt (1989) that agency theory is a union of a principal and an agent due to a common behaviour but with different goals.

According to Eisenhardt (1989), the source of the agency problem can be traced to the risk-sharing problem as identified by Wilson (1968). Thus, the agency theory widens risk-sharing literature by incorporating into it the agency problem that arises due to the divergence of goals between the parties involved (Eisenhardt, 1989). The reason for the agency problem is what Simon Herbert (1959) pointed out and has been cited by Bonazzi and Islam (2007) that agents are more “satisfiers” than “maximisers.” Thus, they are more interested in fulfilling their interest than maximising the value of the shareholders. Therefore, their decisions are made towards an acceptable level of growth to their benefit and not in the sole interest of shareholders as expected.

From the definition of Arrow (1984), the actions of the agent affect both the agent and the principal. However, the principal sets in advance the fee to be paid for the actions of the agent. In the opinion of Eisenhardt (1989), the agency theory aims to resolve the agency problem that arises due to first, the conflict of interest between the principal and the agent and secondly, the different risk attitudes of the two parties. Saam (2007) added that the agency problem arises due to information asymmetry. This is because mostly the agent has access to more information than the principal through which they may mislead, distort, or cheat the principal to their advantage.

Berle and Means (1932) mentioned that investors of corporations would attain full economic benefit from their investments should they manage them on their own. However, the delegation of authority becomes important when the principal may not have the prerequisite knowledge and experience to manage the affairs of the organisation (Pratt and Zeckhauser, 1986) or both the principal and the agent have the capabilities of executing the task but the latter can do so at a lower cost (Saam, 2007). It must be emphasised that the delegation of authority comes with a lot of uncertainties due to the behaviour of agents (Arrow, 1984; Worsham and Eisner, 1997). These uncertainties mostly generate agency costs which have been classified as monitoring, bonding, and residual costs (Jensen and Meckling, 1976). To reduce these costs and protect the interest of shareholders, agency theory has suggested diverse mechanisms to monitor and control the activities of the agents and among these are the use of ownership structure, optimal contracts, and utilising monitoring mechanisms such as the board of directors (Jensen and Meckling, 1976; Fama, 1980; Fama and Jensen, 1983; Eisenhardt, 1989).

Agency theory has been used extensively by scholars in various disciplines (Eisenhardt, 1989) and has been commended by its advocates as one of the fundamental theories that incorporate governance, together with creating the awareness of the existence of information asymmetry and goal conflicts leading to agency problems in corporations. An exploration into agency problems reveals hidden issues which could contribute to opportunism in companies. According to Kivistö (2008), investigating agency problems broadens the spectrum of the dimension of agency relationships which leads to an appreciation of possible opportunism in companies. However, its critics have argued that the theory is dehumanising, one-sided, and still underdeveloped (Kahneman, Tversky and Tversky, 1979; Eisenhardt, 1989; Wiseman and Gomez-Mejia, 1998). Though the classical agency theory's recommendations to use optimal contracts and stock options-utilities to protect the interest of shareholders have been a good call,

concerns have been raised in recent times on the effect of those activities on the wide range of non-shareholder stakeholders (Galbreath, 2011). In modern times, it has been recognised that firms are not just responsible to the shareholders but to a wider group of stakeholders (Elkington, 1997).

With this notion, Ansoff (1965) originated the concept of stakeholder theory as he represented stakeholders as those groups of people who support the firm's survival. Later, Freeman published his landmark book: *strategic management, a stakeholder approach* in 1984 and since then a variety of scholars have used the concept to examine the firm's relationship with various constituents in society. Freeman (1984) defined the stakeholder(s) as "any group or individual who can affect or is affected by the achievement of the organisation's objectives." (p 46). From the definition by Carroll (1996, p. 74), a stakeholder is 'any individual or group who can affect or is affected by the actions, decisions, policies, practices, or goals of the organisation.' There may be different versions of the stakeholder definition, however, the basic underlying concept is that corporations should have the need and interests of those individuals and groups who get affected by their actions, and whose actions influence the corporation's performance at heart. Stakeholder theory expects the firm to have a broader perception of who its stakeholders are. From this perspective, Freeman (1994) strengthens the managerial capitalism concept as he replaces the idea of management fiduciary duty to shareholders with management fiduciary duty to stakeholders. In his submission, Freeman (1994) explains that just as shareholders, corporate stakeholders also have the right to claim and demand some actions from management. Stakeholders benefit from the positive contributions of the firm as well as get their rights and respect violated by the negative actions of the firm (Freeman, 1993). Stakeholders have a stake in the company's affairs and they can impact the firm's performance (Atkinson, Anthony et al., 1997).

In strategic stakeholder literature, stakeholders are classified as either primary or secondary (Clarkson, 1995). The primary stakeholders have a direct stake in the company as their actions have a major impact on the firm, and their non-existence in the company may cause its demise. Secondary stakeholders, however, have an indirect stake in the firm. Though they are hugely influential and can affect the firm's reputation, their discontinuity does not have a critical impact on the firm's survival. Carroll and Buchholtz (2015), however, realised that in modern times, the stakeholder concept has progressed from the managerial perception that the firm holds a relationship with only major fragmental groups into creating a multilateral relationship with the

firm and its stakeholder groups. They, therefore, added social and non-social to the primary and secondary stakeholder classification.

The activities of the firm are likely to generate some externalities which may affect stakeholders (Freeman, 1984). Society enforces some control mechanisms to reduce negative externalities (Agle et al., 2008). To make it less difficult for management to identify corporate stakeholders in order of their importance, Mitchell, Agle and Wood (1997) coined the term the theory of stakeholder salient and the order of importance is based on stakeholder attributes. These attributes, (power, legitimacy, and urgency), are to assist corporations to serve the needs of their stakeholders accordingly. Due to the complexity and expansion of stakeholder theory as a result of constant business evolution, Driscoll and Starik (2004) suggested the natural environment be classified as a primary stakeholder and thus added proximity as the fourth attribute. Carroll and Buchholtz (2015) explain that proximity emphasises that stakeholders who have close relations by sharing physical space mostly affect one another. Stakeholders can also share the same opinions, actions, and ideas and if this happens, they can be said to be proximate to each other in terms of concepts. The activities of the firm may cause the depletion of local environmental systems and affect the firm's environment. It can therefore be concluded that the firm shares proximity with the environment making the environment also a stakeholder of the firm (Driscoll and Starik, 2004).

The stakeholder theory is clearly explained based on three forms namely descriptive, instrumental, and normative. However, normative is considered the most important to stakeholder theory (Donaldson and Preston, 1995). Descriptive explains specific conducts and attributes and the nature of firms. Descriptive stakeholder theory is sustainably oriented because it is concerned with the perpetual survival of the firm. The instrumental stakeholder theory in conjunction with the descriptive can be employed to ascertain the relationship between management and the corporation's financial goals. This theory is interested in how the firm can use the values of stakeholders as a mechanism to achieve efficiency. The conclusion drawn here is that firms can reach their profit maximisation point if they fulfil stakeholder interests and cling to stakeholder values and principles (Barton et al., 1989; Kotter and Heskett, 1992; Letza et al., 2004). The normative aspect entreats the firm to conduct its duties in a way that protects the rights of stakeholders. Here, the relationship between the firm and stakeholders must be built on fairness and legitimacy. The firm must involve stakeholders in its future directions as they are regarded as an end instead of a means to an end (Evan and Freeman, 1988; Deegan and Samkin, 2009).

Whatever the position of the stakeholders, their rights must be respected, and the firm should aspire to meet the minimum stakeholder rights requirements. To meet the minimum requirement of stakeholder rights, the theory supports the social contract as it has a responsibility to inform the stakeholders of actions it takes to help fulfil the ethical branch of the stakeholder concept. This aspect is more concerned with morality than the decision-making of the firm.

Stakeholder theorists want to bring to the attention of corporations the value of their stakeholders who deserve the same attention as the shareholders. Modern firms have moved from the traditional corporate objective which is profitability to more complex strategies in fulfilling all the needs and interests of relevant stakeholders. Since the beginning of the twenty-first century, the interest of stakeholders has moved gradually to social issues increasing media attention and even regulation dynamisms (Walls, Berrone and Phan, 2012). It has now been recognised that the fundamentals of a firm's performance and its sustainability depend on its ability to integrate into its governance agenda sustainability responsibilities (Bacon, 2007; Blesener et al., 2009). The firm cannot continue as a going concern if the driving force behind the strategies to meet the demands of stakeholders is not efficient enough. The theory, therefore, recommends the board of directors, as the ultimate decision-making body of the firm, to monitor and control the behaviour of management and establish a good relationship between the firm and its relevant stakeholders as well as create wealth and value for these stakeholders (Hendry and Kiel, 2004).

Despite its contribution towards the development of business practices, the validity of the stakeholder model has been questioned. There has been an argument that stakeholders within a subgroup are dissimilar, but the model pays no attention to the intra-stakeholder heterogeneity. Winn (2001) argues that members within the stakeholder groups and the sub-groups may have numerous roles and interests. However, the model assumes a broad range of stakeholders in a sub-group have a common stake and classify them together in a group, but these sub-groups have different objectives. For example, private and institutional investors, employees of a blue colour job and those of a white colour job may not share common objectives. These groups have conflicting interests and may pursue different agendas. Critiques have suggested that the positions of shareholders should be analysed and arranged according to the specific role they play at any given time (Fassin, 2008).

Frooman (1999) also hinted at how the stakeholder model places emphasis on the individuals in the relationship and ignores the actual relationship. The usefulness of Donaldson's

normative stakeholder model of separating questions of business and questions of ethics has been also questioned (Agle et al., 2008). The theory is less useful as it does not infuse the normative part of the business together with other parts of ethics. Critiques are of the view that it is less useful to build normative ideals without understanding values and ethics. The theory is incomplete and less relevant if businesses practice ethics without values and trading with one another (Agle et al., 2008).

To strengthen the prepositions of agency theory and stakeholder theory, Hill and Jones (1992) propose a new paradigm called the stakeholder-agency theory (SAT) which merges both agency and stakeholder theories in such a manner that it discusses the implicit and explicit relationships between all stakeholders of the firm. The stakeholder-agency theory, therefore, integrates both stakeholder and agency theories to explain the extent that firms use implicit and explicit contracts to control divergent interests between stakeholders in a corporation (Hill and Jones, 1992; Lamont, Kennelly and Weiler, 2018). The firm has different stakeholders who supply different types of resources to the firm, hence, they have different expectations in return for the resources they provide. Similar to the stakeholder theory, the SAT recognise that all stakeholders, irrespective of the value of their stake in the corporation, are embodied in the contractual relationship of the firm (Collier, 2008). However, SAT views managers as stakeholders with unique characteristics because they are the only category of stakeholders to have a contractual relationship with all other stakeholders (Hill and Jones, 1992). Corporate managers, according to this theory, are the only set of stakeholders to enter into contracts with all stakeholders and also to have influence and control over firm decision-making (Cantrell et al., 2008). Since managers are agents of all stakeholders, Hill and Jones (1992) coined the term stakeholder-agency theory instead of the principal-agency terminology from the classical agency theory. It is therefore expected that the managers will make strategic decisions and allocate corporate resources to meet the claims of the other stakeholder groups. Although both the stakeholder-agency relationship and the principal-agency relationship have implicit and explicit contracts, the latter is primarily concerned with a contractual relationship between the shareholders and the managers and a very few stakeholders on some rare occasions. It can therefore be concluded that the principal-agent relationship can be classified as a group within the larger umbrella of the stakeholder-agency contractual relationship (Lamont, Kennelly and Weiler, 2018).

The main assumption in this theory is regarding market efficiency and equilibrium (Hill and Jones, 1992). The theory assumes that there are short to medium inefficiencies in the market which leads to power differentials and that the efficient market hypothesis proposed by the financial agency theory is rejected. From the resource dependency theory (Pfeffer and Salincik, 1978), it has been reported that firm interconnectivity is based on a set of power alliances that depends on resources. The market inefficiencies are because the organisation faces uncertainties in getting the needed resources. Given this, competitive pressure determines the qualitative and quantitative of a firm's acquisition of resources and its transaction costs. The managers of the firm, to control these environmental uncertainties, use the concept of power to have control over vital resources (Ulrich and Barney, 1984). An organisation with more needed resources obtain favourable power differentials over others who require the possessed resources (Hillman, Withers and Collins, 2009). From the SAT perspective, these power differentials influence the contract between principals and agents and the structure of governance mechanisms policing those contracts (Hill and Jones, 1992). Though the theory admits that market efficient equilibrium will be re-established in the long run, there is an argument on frictions including barriers preventing agents and principals to have the freedom of entry and exit from contractual relationships. Organisational inertia, and advantages managers may be deriving from disequilibrium may encourage disequilibrium to persist in the market for a remarkable period of time before the re-establishment of equilibrium (Hill and Jones, 1992).

Due to these market inefficiencies, management may attempt to design strategies to cause diffusion of control of stakeholder groups over critical resources to decrease the concentration of stakeholder power while increasing their concentration of power (Hill and Jones, 1992). For example, in a situation where alternative sources of supply are available, management, to reduce supplier power, can develop alternative sources of supply. Management undertakes an array of strategies to increase the proportion of resources under their control not to maximise efficiency but to enhance their power. Hill and Jones (1992) think that the intention of managements strive for power is to loosen the imposed stakeholder restrictions to allow them to exert their discretionary control over corporate resources. As a result, the stakeholder-agency theory (Hill and Jones, 1992) requests for institutional structures known as "monitoring structures" such as the board of directors to be instituted by stakeholders to monitor management activities to counter the

management pursuit strategies to increase power (Fama and Jensen, 1983; Squires and Elnahla, 2020).

In addition, the stakeholder-agency theory assumes the presence of information asymmetry between managers and stakeholders (Hill and Jones, 1992). This is because managers being insiders have a significant level of control over critical information. Their control over critical information can make the agency's problem more complicated as their position as managers can cause them to filter or distort the information they give to other stakeholders. It is very difficult, especially in larger corporations, for stakeholders to ensure managers act in their interests as stakeholders are diffused. The best option for stakeholders would have been to gather and analyse management information to undertake the monitoring of management performance on their own. However, the cost involved in embarking on such activities would be too much for stakeholders to bear. This issue of information asymmetry has given management a lot of control over how the firm's resources are used and this causes an increase in the residual loss to the stakeholders (Fama and Jensen, 1983; Hill and Jones, 1992).

Hill and Jones (1992) also mention an assumption of agency conflict between the managers and other stakeholder groups because just like the managers, the other stakeholder groups have their interest to be satisfied. For instance, employees are interested in salary increments, suppliers look forward to higher prices, while society and the general public are interested in lower pollution and good quality of life. Satisfying the interests of these other stakeholders reduces the resources the managers will have at their disposal to fulfil their own interests with the pursuance of firm growth through diversification (Hill and Jones, 1992). The differences in interest between managers and other stakeholders can affect the firm's allocation of resources leading to *utility loss*. To reduce the magnitude of utility loss, Hill and Jones (1992) suggest for the function of incentive, monitoring and enforcement structures to be instituted. Furthermore, as stakeholders channel resources to strengthen incentive, monitoring, and enforcement structures, together with any remaining residual loss, they incur *contracting costs* in the process. Managers, on the other hand, incur ex-ante *bonding costs* as a demonstration of their commitment to satisfying the interest of stakeholders. An example of an ex-ante bonding cost is the introduction of a warranty on an item sold to a consumer. This warranty is a bonding medium to communicate to the consumer how management is committed to a certain standard of quality. The main aim of instituting these

mechanisms is to align closely the interest of other stakeholder groups to that of managers and to create a mutual dependency between them (Hill and Jones, 1992).

Employing SAT in analysing the board structure- sustainability performance nexus, Velte (2017) explains that introducing a board of directors is an effective mechanism to mitigate an agency's cost and to enhance sustainable development. He explains that the board functions as an agent of various stakeholders and as a principal of the management with the likely conflict of interest. Therefore, the presence of the board will mitigate conflict of interest and information asymmetry between management and the various stakeholder groups to enhance stakeholder attraction and sustainable development. In addition, the directors are capable of directing the firm towards an improved performance based on their experience, expertise and an individualised set of contacts (Hillman, Withers and Collins, 2009). The board which plays an intermediary role between the firm and all of its stakeholders must regulate the corporate affairs in such a way that all stakeholders of the firm will benefit from the important role played by the managers (Endo, 2020).

Corporate sustainability performance has become particularly important as it can meet the demands of various stakeholders who are increasingly demanding that firms enhance their sustainability performance (Nguyen and Thanh, 2021). As far as the development of sustainability is concerned, the board can serve as a useful control mechanism (monitoring structure) in monitoring management activities. Zattoni et al. (2017) assert that directors help prevent the divergence of corporate resources via self-dealing transactions. Also, the board monitoring duties ensure that the interest of controlling shareholders is aligned with that of the full-time executives and the firm which then influences financial performance positively. Hussain, Rigoni and Orij (2018) conclude that the board of directors are effective means through which management decisions are properly monitored to enhance social and environmental performance. Moreover, the directors are aware that they represent and are accountable to an array of stakeholder groups which makes them very sensitive towards societal needs and corporate ethical values (Veltri, Mazzotta and Rubino, 2021). Furthermore, Alqatan, Chbib and Hussainey (2019) explain that the directors serve the interest of a wider range of stakeholders, and their efforts create a competitive advantage for the firm. Hence, effective use of their expertise, skills, interest, and experience increases the firm's financial performance.

3.2.1 Criticisms of stakeholder-agency theory

Though the stakeholder-agency model has contributed immensely towards the development of management literature and business practices, the theory has been criticised for various reasons. There has been an argument that the model ignores the conflicts that the claims of different stakeholder groups create (Hill and Jones, 1992). The claims of each stakeholder group differ from one another. For instance, the shareholders have a demand for greater dividends which conflicts with the employee's demand for higher wages. However, the model considers the general level perspective of stakeholder claims indicating the stake of each group in the firm's continued existence. It is worth noting that in a situation where there is an open conflict of each stakeholder group expressing different opinions on where the resources of the firm should be allocated, the consequences can be deadly to the firm and its associates. For instance, such conflicts can lead to strikes on the part of employees and product boycotts by consumers (Hill and Jones, 1992).

Buck, Filatotchev and Wright (1998) also stress the ambiguous position of the model. From the theory's perspective, the efficient market hypothesis argument suggested by the traditional agency theory is not realistic and should be rejected. The SAT asserts that parties to contracts are sometimes disadvantaged due to market disequilibrium would be corrected in the long run. However, critics have questioned the explicit definition of the "long run" for which the market processes will work to bring out the most inefficient forms of organisations. This is because as the position of the theory is ambivalent, it is not known when governance is supposed to promptly correct managers over "dysfunctional" decisions.

Concerns have also been raised about the fulcrum of SAT. Though it is the board's function to prioritise stakeholders' claims and to be accountable to stakeholders (Collier, 2008), the theory has argued that the decision-making apparatus is controlled by the managers (Hill and Jones, 1992). However, in an organisation setting, the directors can delegate the day-to-day running of the firm's activities to managers, but as the board of directors are accountable to stakeholders, they cannot delegate the accountability role to managers. Because of this, governance ought to be the fulcrum of the SAT rather than the managers. To have a detailed understanding of the governance role in stakeholder accountability, Collier (2008) suggested that the theory should incorporate various dimensions of stakeholder theory into this existing theory.

Notwithstanding the opinions shared by critics on the theory, its contribution towards the awareness of power differentials between managers and stakeholders which the traditional agency

theory ignores has been well noted (Cantrell et al., 2008). In addition, from the agency theory literature, the interest of the firm has been focused on creating value for shareholders and practically ignoring the needs of the other stakeholders. With the inception of the SAT, corporate attention has been drawn to diffusing the managerial power for the betterment of all other stakeholders and this is a valuable contribution to business literature (Buck, Filatotchev and Wright, 1998). It has further been noted that SAT, as far as governance is concerned, is more open-minded and consistent with real-life observation (Buck, Filatotchev and Wright, 1998). Finally, taking a critical look at the suggestions from the SAT indicates that stakeholders are much interested in sustainability management strategies (Nuber, Velte and Hörisch, 2020) making a huge impact in assisting businesses to formulate strategies that inculcate the interest of stakeholders for competitive advantage and firm value.

3.3 Resource-based view (RBV) theory

The resource-based view theory (RBV) was developed by researchers in strategic management trying to explain how firms increase their performance through internal factors. This theory describes firms as a bunch of tangible and intangible resources that strategically select resources through a careful assessment (Barney, 1991). The theory is primarily about how firms interpret and analyse their possessed resources to improve their performance and to gain a competitive advantage (Danso et al., 2019; Roffia, Simón-Moya and Sendra García, 2021). It aims to identify the firms' internal sources of sustained competitive advantage and explain the reason for differences in the performance of firms in the same industry (Kraaijenbrink, 2010). The idea of understanding the firm and its resources can be traced to the seminal work of Penrose (1959) with her argument that effective management of resources available to firms contributes immensely to the firm's growth. However, Wernerfelt (1984) was the first to coin the term "resource-based view of the firm." The author defines firm resources as all physical, human, and organisational capital resources that help the firm to formulate strategies to improve its effectiveness and efficiencies, enhance customer satisfaction and or help reduce costs (Barney, 1986; Bogner and Thomas, 1994). In the nutshell, RBV defines strategic and valuable resources as those that help the firm to boost performance over its competitors (Madhani, 2010).

The RBV theory dwells on two main assumptions: Firstly, firms within an industry are heterogeneous with resources and strategies and secondly, resources are perfectly immobile across

firms (Priem and Butler, 2001). The theory assumes that the firm's resources and capabilities determine its sources of competitive advantage and that the firm's strategic resources have immobility and heterogeneity as their distinctive characteristics (Barney, 1991; Madhani, 2010). Impliedly, firms cannot obtain a competitive advantage with the same kind of physical, human, and organisational capital as companies in the same industry. Moreover, firms are unable to gain sustained competitive advantage with resources that are highly mobile and evenly distributed across firms in the same industry (Barney, 1991).

According to RBV, the definition of resources includes assets, firm attributes, organisational processes, or information. These include skilled employees, brand names, technological abilities and efficient procedures (Wernerfelt, 1984; Barney, 1991; Madhani, 2010) and these resources can be classified as physical, human and organizational capital resources (Ahinful et al., 2021). Russo and Fouts (1997) classify resources into tangible, intangible and personal-based under the RBV theory. The authors cite examples of tangible resources as financial reserves and physical resources. Intangible resources include reputation, technology and human resources while some personnel-based resources are culture, employee's training and expertise, and employees' loyal and commitment. Galbreath (2005) also grouped resources into tangible and intangible. He describes tangible assets as the balance sheet factors with physical or financial value and intangible resources as those factors which are rarely found on the balance sheet with no financial or physical value. Wernerfelt (1984) describes a firm's tangible and intangible assets such as brand names, skilled personnel and machinery attached to it. Barney (1991) also defines corporate resources as all assets, capabilities, information and knowledge that contribute to corporate development. intangible resources can further be categorised into assets and skills (capabilities) (Galbreath, 2005).

RBV argues that unique characteristics of resources can help the firm to achieve a sustainable competitive advantage (SCA) because strategically, the strength of the firm is inherent in the resources it controls (Ahinful et al., 2021). According to Barney (1991) resources must be valuable, rare, non-substitutable and imperfectly imitable to have the potential of sustained competitive advantage. He opines that, resources are said to be valuable when it plays a significant role to help firms implement strategies that exploit the firm's opportunities or neutralise its threats. Also, resources are considered rare if such resources are difficult to transfer or trade and the strategies required to implement such resources have not been exploited by multiple firms in the

industry. The rareness of the resources is inherent in the premium and competitive superiority it provides the firm over its competitors and how specific it is to the firm. In addition, such resources are difficult to copy as they are tacit, causally ambiguous or socially complex (Hart, 1995).

The submissions of Hart (1995) indicate that hard-to-copy resources are the most important to the firm. Because such resources are tacit, skilled-based and people-intensive, they are acquired through experience and polished by practice, they depend on a significant number of people engaged in a synchronised action which makes them highly difficult to replicate. Galbreath (2005) confirms that firms are only able to achieve SCA and outperform their competitors if they possess resources with all these sets of unique characteristics (Barney, 1991) since not all resources are key drivers of performance (Galbreath and Galvin, 2008). Notably, studies have proven that intangible resources, most especially capabilities, contribute significantly towards a firm's success than tangible assets (Galbreath, 2005; Galbreath and Galvin, 2008). For instance, Galbreath and Galvin (2008) found in a study conducted on Australian firms that intangible resources and capabilities have a positive significant impact on performance rather than tangible resources.

Hart (1995) extends the RBV literature by inculcating the environment into the RBV theory. He opines that as an ecological issue has taken the centre stage in our world today, firms will need to create new concepts of strategies inconclusive of environmental management capabilities as a basis to gain competitive advantage. Hart's (1995) assertion coincides with the argument put forward by Porter and van der Linde (1995) that it is possible to get innovation from properly designed environmental standards. Hence, natural environment constraints are among the key drivers of new resources and capability development. Therefore, the RBV excluding the natural environment from its submissions renders the theory incomplete. Hart (1995) introduced three connected strategies (pollution prevention, product stewardship and sustainable development) as means by which the environment can help firms create a competitive advantage. Hart (1995) indicates that firms can control or eliminate emissions, effluents and waste from their activities to lower costs and increase their cash flow and profitability. Porter and van der Linde (1995) affirm that resources are used more productively when pollution is reduced. Product stewardship serves as a guide for firms to select raw materials and design their products to conform to specific standards to help reduce the environmental impact of product systems. Hart (1995) indicates that through the influence of external stakeholders, firms are encouraged to reduce the life-cycle costs of their products, increase stakeholder involvement, and avoid competition. With

a sustainable development strategy, firms can disconnect the negative association between the environment and economic activity.

Identifying how unique resources can affect the board structure-sustainability performance relationship, RBV considers resources with special characteristics as a basis for competitive advantage to firms but these resources will not be heterogeneous and perfectly immovable without proper management and supervision (Barney, Wright and Ketchen, 2001). Proper management is linked to good corporate governance which is considered one of the firm's critical instruments in assessing the performance and sustainability of the firm. Firms require the role of the board of directors as a driving force of institutional best practices to help implement the strategies required to achieve SCA (James and Joseph, 2015). According to Madhani (2019), the board performs four basic roles namely the control role, the strategic role, the service or resource provision role, advice and counsel role. The resource provision role focuses mainly on the set of resources that each director presents to the board to enhance corporate performance. From the RBV perspective, directors are resources to the firm because they supply a wide range of information external to the firm and mitigate environmental dependency (Hillman, Cannella and Paetzold, 2000) which make each board distinct. The diversified form of resources in the form of experience, abilities, information, and knowledge that the directors bring on board indicate that the resources are heterogeneously distributed across firms. The board structure becomes very important because it underlines the role each director can play to bring unique resources to the firm in determining how the firm achieves its SCA. In support, Roffia, Simón-Moya and Sendra García (2021) documented that a board with directors with adequate skills and competence becomes a crucial resource to the firm as they can contribute to firm decisions to enhance corporate financial performance. In a survey conducted by Roffia, Simón-Moya and Sendra García (2021), the authors concluded that the directors can serve as a source of competitive advantage to the firm because, with their experience, skills, knowledge and competencies, the corporate board becomes distinct and inimitable. James and Joseph (2015) reiterated that a board structured with a good proportion of independent directors can serve as a unique resource to the firm as the outside directors who have the opportunity of accessing private-owned information of other companies, are likely to share such relevant data with the firm to influence board decisions positively. Moreover, directors have experiences and knowledge to help contribute ideas to board decisions and eventually help the firm boost its financial performance.

Shaukat, Qiu and Trojanowski (2016) have cited instances where RBV can be applied to influence the board structure and sustainability performance positively. They first indicated that corporate social responsibility (CSR) oriented board becomes firm-specific unique resources and a source of unique human competencies to create SCA for the firm. This is in consonant with Hart's (1995) argument that firms need to continuously develop their internal human and organisational competencies and resources to achieve SCA. CSR-oriented board of directors including independent directors, women directors and experts help the board to build more proactive and comprehensive CSR strategies to sustain the firm's competitive advantage in CSR. Their influence also assists the firm to keep developing its CSR strengths to attain superior social and environmental performance. Secondly, Shaukat, Qiu and Trojanowski (2016) highlight that the board of directors are also a source for the firm to sustain its actions for creating and prolonging pro-environmental internal capabilities and external reputation to enhance social and environmental performance. In line with the predictions of Hart (1995), proactive investment in environmental strategies can bring to the firm both environmental, social and economic benefits. Hence, there is a need for firms to effectively communicate proactive environmental strategies to stakeholders because the eternal social legitimacy needs to complement internal competitive strength for firms to achieve SCA. With their unique, tacit, internal and socially complex competitive resources, the board and its composition can aid in the firm's communication, implementation and development of CSR strategies to promote quality environmental and social performance (Shaukat, Qiu and Trojanowski, 2016). Ameer, Ramli and Zakaria (2010) have also proven that RBV supports the board structure and sustainability performance relationship. Their study indicates that firms need directors to help deal with uncertainties to ensure the survival of the firm. They further explain that such uncertainty mitigation requires directors with a unique set of human and capital assets such as skills, expertise, education, and networks. In line with the RBV, the study confirms that directors have a unique set of human and social capital assets together which complements their individualised set of contacts to provide the firm with key resources to partially deal with uncertainties and to increase performance.

3.3.1 Criticisms of RBV

The theory, despite its contributions, has received some criticism. Collis (1994) argues that RBV and its organisational capabilities add to a full understanding of tangible resources, however, the

predictions it makes about SCA and the explanation into it entail infinite regress. Collis (1994) indicate that at the appropriate time, firms with superior capability to build structures that innovate product more effectively will exceed firms with the best product innovation capability at present. Given this and from the stance of RBV, firms strive to build developing structures that better innovate products (Second-order capability) more than product innovation (first-order capability) which leads firms to an infinite search for forever superior order capability. In defence, Kraaijenbrink, Spender and Groen (2010) responded that infinite regress is only a problem if one considers management science as a positive quest for certainty. The endless regress critique becomes baseless if economic or management science is seen as a practical engagement and open-endless.

The second criticism is about the generalisability of the theory. From extant literature, external validity and generalisability are essential requirements in research to allow for findings in one study to be valid in another (Johnson and Onwuegbuzie, 2004; Saunders, Lewis and Thornhill, 2019). Hence, Gibbert (2006) opines that RBV theory, with its assumption that firm resources that serve as a source of sustained competitive advantage are unique refutes the generalisability assertion. It implies that the RBV idiosyncratic which indicates the distinctive nature of resources is breached if a research finding in regards to firm resources is generalisable. Miller (2003) has also criticised the generalisability aspect of the RBV from a “sustainability-attainability” perspective. In his view, the Valuable, inimitable, sustainable resources which serve as a source of competitive advantage to firms are already only available to companies with RBV idiosyncratic criteria. These resources are valuable and have a sustainable advantage because they are not accessible to others. Only imitable and attainable resources are available to competitors but these attainable resources are not sustainable as they risk being competed away as soon as they become available. Miller (2003) critique is hence based on the fact that only companies that already have valuable, rare, inimitable and non-substitutable can obtain and apply additional resources.

Critics have also argued against the assumption that SCA is achievable. In the opinion of Fiol (2001), resources, skills and dynamic capabilities in today’s world lack permanence. Irrespective of how inimitable the sources of a company’s competitive advantage are, it is difficult to attain a sustainable advantage based on a distinct set of core competencies because the organisational process of using both skills and resources keeps changing. In his view, companies should rather use their temporary position of strength to build on another strength to attain

renewable competitive advantage instead of seeking a once-desired SCA. Though Kraaijenbrink, Spender and Groen (2010) agree that no SCA is dateless, they believe that SCA remains a powerful strategic concept in the short run. Priem and Butler (2001) have also argued that RBV does not fully represent the theory of the firm because the fundamental literature for RBV including Wernerfelt (1984) and Barney (1991) does not address some important issues which are explained in theories of the firms. Conner (1991) has affirmed that RBV is indeed seeking to be a theory of the firm. However, Kraaijenbrink, Spender and Groen (2010) have disputed that RBV might not be a theory of the firm, yet, it does not in any way cause a problem being a theory of SCA and rents.

3.4 Resource dependency theory

Empirical literature depicts that resource dependency theory (RDT) is the leading outstanding theory to understand the firm-environmental nexus (Drees and Heugens, 2013). The theory became one of the influential theories after Pfeffer and Salancik (1978) published their article titled *The External Control of Organizations: A Resource Dependence Perspective*. The pivot of RDT is that the organisation depends on the external environment for its critical resources and this relationship is reciprocal (Drees and Heugens, 2013). Thus, the organisation is an open system that depends on the external environment for its survival (Pfeffer and Salancik, 1978; Hillman, Withers and Collins, 2009). The basis for the theory as explained by Fink et al. (2006) is that firms build relationships to build up their commitment, information exchanges and legitimacy to manage their dependencies against the uncertainties in the environment. There is dynamism in the business world; the perception of stakeholders about what constitutes a firm's legitimacy keeps changing. For the firm to meet the needs of its relevant stakeholders and continue as a going concern, it needs to limit its dependency on others to obtain the needed resources. Central to this is the concept of power; The external environment depends on each one for its valuable resources. However, the firm becomes powerful by gaining the ability to reduce its dependency on others and increase others' dependency on it (Ulrich and Barney, 1984). In reference to Pfeffer and Salancik's (1978) exemplary definition of resource dependency, Ulrich and Barney (1984) outlined the underlying assumptions under which corporations get power.

The first assumption is that firms are made up of internal and external alliances. Organisational success depends on its power maximisation because, with power, the firm has

control over its important resources (Ulrich and Barney, 1984). To exert more power and control, corporations would want their benefits to outweigh their costs, so they form linkages with inside and outside influential persons to exert influence and control (Ulrich and Barne, 1984). Firms also need to build strategies to reduce the power that other firms have over them while they try to exert power over others (Hillman, Withers and Collins, 2009). Organisational power and longevity centre on its ability to mobilise critical resources from the external environment and this can be achieved by building linkage with the external environment (Boyd, 1990; Piskorski and Casciaro, 2005). If a firm builds interdependencies to deal with environmental uncertainties, it tends to reduce its costs while increasing its benefits. This helps the firm gain power to perform better (Hillman, Shropshire and Cannella, 2007). It can be concluded that the higher the firm's dependency on external resources, the greater it forms alliances with the external environment because the need for linkage depends on the type and level of dependency a firm requires at a particular time (Boyd, 1990; Hillman, Cannella and Paetzold, 2000).

The second assumption is that the environment is uncertain, and it contains the scarce valued resources that the firm needs for survival. The means through which a focal firm can acquire resources from other organisations are mostly not certain and it is frequently variable. Firms can however reduce these environmental uncertainties and dependencies by being powerful (Hillman, Withers and Collins, 2009). The third underlying assumption is that firms work towards the achievement of two objectives; they strive to have control over resources, so they do not have to depend so much on other organisations but at the same time try to increase other organisations' dependence on them.

The firm's need for linkage will depend on its level of dependence on the environment. The characteristics of the firm's operating environment are essential in depicting organisational resource dependency. RDT predicts that the origination of a firm's behaviour is grounded on its environmental factors. The dimensions which explain the nature of resources and how these resources are distributed have been classified by Dess and Beard (1984) as *munificence*, *dynamism* and *complexity*. *Munificence* is the level of the availability of resources in the environment which is a determinant of organisational sustainable growth. The level of environmental munificence is a major determinant of organisational behaviour. For instance, it is highly unlikely for firms competing in a greater munificence environment to commit illegal activities. *Dynamism* is about environmental uncertainties. It is the degree of environmental stability-instability, and it is

determined by the changes in growth rate. The firm's level of uncertainty depends on environmental volatility because the higher the environmental volatility, the greater the level of the firm's uncertainty (Boyd, 1990). The third dimension is *complexity* which is about environmental heterogeneity and the concentration of resources.

According to Pfeffer and Salancik (1978), as cited by Hillman, Withers and Collins (2009), one of the actions the firm can take to reduce its environmental dependences is through the board of directors. The board of directors are said to be the fundamental mechanism for linking the firm to its sources of external dependency (Hillman, Shropshire and Cannella, 2007). The proponents of RDT have suggested that the directors provide advice and counselling service to the management of the firm. They also serve as an informational link between the firm and environmental contingencies. Also, they bring special access to resources and finally provide firm legitimacy (Pfeffer and Salancik, 1978). RDT represents the service role which is one of the fundamental roles of the board (Hillman and Dalziel, 2003; Al-Shaer and Zaman, 2018). The service role function is eminent when the board gets the ability to bring to the firm valuable human capital resources in the form of experience, skills, expertise, knowledge, and connections to reduce the firm's dependency and increase the firm's valuable resources (Hillman, Shropshire and Cannella, 2007). A well-structured board can formulate more CSR strategies, it will be proactive towards CSR activities to help the firm achieve its sustainable objectives and enhance sustainability performance (Shaukat, Qiu and Trojanowski, 2016). The board must formulate policies for strategic decision makings. They have the responsibility of formulating strategies and objectives towards the CSP agenda and encouraging management to work towards achieving the set objectives. The board should be involved in all strategic processes from initiation, throughout the phases of development till the set objectives are achieved (Hillman, 2007; Li et al., 2010). Prior literature confirms that the board provides the firm with valuable advice and counsel (Hillman, Withers and Collins, 2009; Song, Yoon and Kang, 2020) The parameters within which the firm's legitimacy is assured are also the function of the board (Suchman, 1995).

Discussing the relationship between the directors as the firm's resource dependency and sustainability performance, Endo (2020) has documented that the board functions as a source of knowledge and guidance and are considered as the boundary spanner to link the firm to external sources of information and bring relevant expertise to the firm. He explains that directors coming together in the form of a larger board can serve as a source of collective intelligence to the firm

and can be considered as the firm's attempt to incorporate stakeholders. Also, with the appropriate proportion of outside independent directors with the needed professional backgrounds, expertise, and experience, it is likely for the board to widen its thinking and understanding of the interest of various stakeholders and provide positive responses to their needs. Harjoto, Laksmana and Yang (2019) demonstrated that the board of directors link the firm to the external environment which emphasises community and social goods to increase corporate sustainability performance.

Miller and Del Carmen Triana (2009) and Ariff et al. (2017) also affirm that directors, as indicated by the RDT, can acquire different strategies to solve problems, increase information search, and provide diversified opinions for contemplating to make effective decisions especially, towards solving issues. Hillman, Shropshire and Cannella (2007) emphasised that with the heterogeneous nature of boards, directors can provide the needed advisory and counselling services to management, they can affirm the legitimacy and serve as a channel through which the firm gets resources and information from the external environment.

From the RDT's perspective, Gaur, Bathula and Singh (2015) elucidate that the board links the firm to an outside network for its long-term prospects and development. Board members' professional qualifications can lead the firm to acquire resources to satisfy the interest of a larger group of stakeholders and enhance the financial performance of the firm. Shaukat, Qiu and Trojanowski (2016) draw on the RDT and argue that a firm with the right blend of directors brings a diversity of knowledge, skills, experience, expertise and connections to the board. With the study focused on the directors' influence on social and environmental performance, the researchers assert that a well-structured board can be a response to the social and environmental challenges of the firm. These directors can provide the firm with stakeholder-related values and with their expertise, assist to solve relational and interpersonal problems. With the support of an efficient board, the firm develops proactive and detailed corporate social responsibility strategies to achieve environmental and social performance.

3.4.1 Criticism of resource dependency theory

The theory has been criticised for various reasons. The first criticism is that it has not been rigorously explored and tested as it ought to be (Drees and Heugens, 2013). Critics are of the view that the tests conducted on the theory are on empirical and conceptual grounds. However, empirically researchers who applied the theory always end up with inconsistent results (Davis and

Cobb, 2010; Shaukat, Qiu and Trojanowski, 2016). Evidence proves that results from RDT mostly end up with insignificant findings (Pfeffer, 1972; Nerkar and Hambrick, 2006). The theory has been criticised for the form of narrative reviews as it explains past research results conceptually (Davis and Cobb, 2010). As much as this narrative review approach has got its positive side, it has been criticised for the danger it possesses in terms of biased representation in literature and it is prone to giving false references.

Also, the theory is said to be ambiguous due to its power imbalance and mutual dependence on the single construct of interdependence (Piskorski and Casciaro, 2005). The theory proposes for organisational mutual interdependency to reduce dependency as each firm absorbs sources of external constraints. However, the theory refuses to consider the power imbalance between organisations which could be a major hindrance to this interdependency formulation. Because of the ambiguities in the theory, Piskorski and Casciaro (2005, p. 167) stated that

“Consequently, resource dependence theory has acquired the status of a powerful general metaphor, but it has been marginalised as an engine for theoretical advancement and a basis for testable empirical research. Why has such a foundational theoretical framework become a ghost in organisational discourse, a lingering presence without empirical substance?”

Despite the above criticisms, because of the strength of its explanatory power, the theory continues to be among the top theories to be applied in literature when issues of organisational behaviour are discussed (Nienhüser, 2017). Because before this theory, the corporation had only focused on internal processes of resource use without considering the procedure to gain resources. Through the RDT, firms understand the environment they are in and their competitors. They understand their extent of dependency on resources and how diverse they are as companies. RDT is one of the useful theories in studying board structure influence on sustainability performance because firms do not just create boards but bring on board people with the needed resources to formulate strategies to remain relevant.

3.5 Legitimacy theory

Legitimacy theory is extensively used in explaining the phenomenon in social and environmental research because it is perceived to be among the social and political theories to bring insightful theoretical viewpoints on corporate sustainability performance issues (Deegan, 2019; Kouaib, Mhiri and Jarboui, 2020). Several scholars have tried to define legitimacy over the years. Dowling

and Pfeffer (1975) define legitimacy as “congruence between the social values associated with or implied by their activities (those of the legitimacy-seeking organisations) and the norms of acceptable behaviour in the larger social system of which they are a part”. According to Suchman (1995 p 574), “legitimacy is a generalised perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions.” Recently, Kouaib, Mhiri and Jarboui (2020 p2), explained that the legitimacy theory “suggests that corporations continually attempt to ensure that they are perceived as functioning within the bond and norms of the society in which they operate.” A critical look at the various definitions of legitimacy shows that the concept of legitimacy focuses on the organisations making sure their value systems are not at variance with the value system of their larger society. The concept of legitimacy is very important for the organisation because society perceives firms with high legitimacy as trustworthy, meaningful, and desirable. Society, therefore, becomes more willing to share its resources with these organisations (Suchman, 1995; Aart, 2015).

There is an assumption of a “social contract” between the organisation and the society, and hence the theory is seen to be a system-oriented theory (Deegan, 2002). The organisation has an influence on its society and likewise, the firm is influenced by the society in which it operates (Deegan, 2002). When society has the perception that an organisation’s performance is legitimate, it means it is seen as fair and deserves to be supported, then the organisation becomes socially accepted. Society then becomes willing to work with, share resources, and have a continual relationship with the organisation. It is worth noting that the social contract between the firm and the society can be destroyed or there can be a legitimacy gap when an organisation’s values and behaviour become different from that of the society. If this happens, society could nullify the firm’s contract to carry on with its operations (Bebbington, Larrinaga-González and Moneva-Abadía, 2008; Eugénio, Lourenço and Morais, 2013). Deegan (2019) outlines the basic assumptions of legitimacy theory especially in explaining social and environmental issues in the accounting literature. Deegan (2019) first stated that for firms to continue to operate successfully, it is required managers to ensure that corporate activities are in congruence with the expectations of society to be seen as legitimate. From the perspective of legitimacy theory, the firm does not operate in isolation; it is seen as part of a larger operation that has an inherent right to resources. For a firm to sustain its access to the needed resources, it must be a “legitimate organisation” to get the right to these resources (Matthews, 1997; Deegan, 2019). Another assumption stated by Deegan (2019)

is that there will be two forms of organisations in society as far as legitimacy is concerned. Thus, the legitimate firm is the one that complies with the community's expectations. And an illegitimate organisation; one that is non-compliant with social expectations. The illegitimate organisations do not meet the expectations of the community, society will therefore have sanctions imposed on them. Society may as a form of sanctions decrease its demand for the goods and services of the firm or make it difficult for the firm to obtain the resources needed for its existence and many others. Also, legitimacy is not based on the actual conduct of the firm but depends on the perceptions of society in general. Societal expectations are not static but dynamic. As legitimacy is based on the social concept proportionate to the social system, the concept of legitimacy is specific to time and place.

Suchman (1995) identifies three types of organisational legitimacy of which he believes each type depends on behavioural dynamics. These types include pragmatic, moral and cognitive legitimacy. Pragmatic legitimacy is about the organisation winning the support of its immediate audience whose welfare gets affected by the activities of the firm (Suchman, 1995). Considering the subtypes under pragmatic legitimacy which are exchange, influence and dispositional, the organisation through legitimacy gets what they need for its survival from its audiences (O'Dwyer, Owen and Unerman, 2011). The organisation does what the audience wants so they are accorded some attributes such as trustworthiness, honesty, and sharing of the core values of the society, and these attributes contribute to the enhancement of the firm's legitimacy. Pragmatic legitimacy is accorded to the firm based on self-interest (O'Dwyer, Owen and Unerman, 2011). When stakeholders find the operations of the firm beneficial to them, they perceive them to be legitimate. The corporation may gain pragmatic legitimacy when the stakeholders consider the activities and policies of the firm as being in the interest of the audiences. For instance, companies incorporating sustainability activities into the structure of their policymaking may be seen as trustworthy, shares the values and the interest of audiences and hence would be granted legitimacy (Kouaib, Mhiri and Jarboui, 2020). Moral legitimacy is in contrast with pragmatic legitimacy. This kind of legitimacy is not granted based on what the audience gets from the organisation but rather if the organisational operations are assessed to be right. Thus, moral legitimacy is based on prosocial reasoning rather than self-interest fundamentals so making the concerns of moral legitimacy more resistant than pragmatic. Suchman (1995) describes four ways by which moral legitimacy could be evaluated and these include consequential, structural, procedural, and personal legitimacy.

Consequential legitimacy is where the organisations are valued based on their achievement like the emissions for polluting industry. Procedural legitimacy is judging the firm by the processes it followed for its achievements. Structural legitimacy looks at the structures of the firm while at the personal legitimacy level, the organisation is valued based on the perception of the stakeholders about the organisational leader (Aart, 2015). Cognitive legitimacy is not based on interest or evaluation but it places emphasises on the people's acceptance and understanding, mostly what is universally accepted which reflects the degree of co-occurrence between the activities of the organisation and the rule of taken-for-grantedness (Tang, 2017).

Legitimacy is a major determinant for a firm's survival, it is not the end in itself but it is considered more of a process, therefore, for a firm to gain legitimacy it needs to undergo some stages. The first stage according to Tilling and Tilt (2010) is to establish legitimacy. The firm establishes legitimacy through competency, sufficient financial resources, customer service, and above all by meeting socially designed standards of quality and desirability in addition to acting in conformity with accepted standards of professionalism (Hearit, 1995). After establishing legitimacy, then the firm enters the maintenance of legitimacy phase. This is when the firm responds positively to the continual changes of the community by keeping pace with the societal dynamics and keeping the society informed of its actions in these directions. This is done by the firm communicating such changes to society in the form of disclosure (Deegan, 2002; Tilling and Tilt, 2010). The third stage is the firm's need to extend legitimacy. This stage is critical for the firm to keep up with changing circumstances. However, Asford and Gibbs (1990) noted that this stage is intense and proactive because managers try to win the confidence and support of wary potential constituents. The final stage is the defence stage where organisations defend themselves when their legitimacy is threatened. The firm can defend itself by either changing itself, or changing the public, through manipulation and misrepresentation (Lindblom, 1994).

Tilling and Tilt (2010) mention that there are various layers of legitimacy theory. The first layer of legitimacy theory is the macro layer called the institutional legitimacy theory. The institutional legitimacy theory is concerned with how businesses, governments or organisational structures acquire societal acceptance making their operations to be regarded as significant and natural. Underneath the institutional layer is the organisational legitimacy or the strategic legitimacy theory. This level explains the procedure under which the organisation looks for approval or mechanisms to avoid sanctions from various groups in society. This level of

legitimation is of great importance to the organisation because it is relevant to the organisation's survival and development (Tang, 2017). The organisational legitimacy level is seen as synonymous with the framework of resource dependency theory. Thus, this function is an operational resource that the organisation endeavour to have in a plentiful supply mostly through competition from their environment to help achieve their goals (Tilling and Tilt, 2010). Legitimacy is just like any other resource; therefore, its inadequacy has dreadful consequences for the organisation which can even result in the folding of the organisation. The distinct nature of legitimacy is the fact that, unlike other resources which the firm has control over, legitimacy is to a greater extent controlled by collective stakeholders of the firm. Due to how sensitive the issue of legitimacy is to the firm's survival, organisations must deem it necessary to look out for the kind of influence each stakeholder exerts on the resources critical to the formation of the firm, its growth and survival.

Due to the dynamic concept of legitimacy, the expectations of society change so once acceptable behaviour may not be deemed acceptable anymore. If this happens and the organisation does not keep up with the changes it may not be considered legitimate. For instance, Hrasky (2012) contend that climate change falls under this category of legitimacy gap because companies are urged to vary actions as climatic concerns have become important in society. The companies must bridge the legitimacy gap that this climate change has caused by providing a legitimisation response not because the company has changed its system of operations, but because the taste and awareness of stakeholders have changed the social contract between the organisation and society. Also, there can be an occurrence that will impact the reputation or the legitimacy of the organisation negatively. These and several reasons can make the organisation illegitimate. In other words, a legitimate gap can occur at any point in the life of the organisation (Lindblom, 1994), and it is required managers to react to these gaps. When the managers suspect that the activities of the organisation are not corresponding to the "social contract", they need to implement a remedial strategy to either gain, maintain or repair legitimacy (Suchman, 1995) and this is where the role of the board of directors becomes handy.

Environmental management and social activities are perceived to be at the core of the legitimising process because it leads to the avoidance of revocation of the social contract by society. Firms with better pollution performance are more likely to earn higher short-term costs but may decrease expected litigation expenses and cost of capital, as well as uphold a positive

social reputation (Cong and Freedman, 2011). Committing to great social, financial, and environmental accountability meets the expectations of the corporate principals and improve corporate legitimacy. For firms to enjoy the benefits, they might need to maintain or improve their legitimacy level by reducing negative news about the firm, giving clarification about unhealthy mass media reports, and increasing adequately the CSP reports. Firms that want their operations to be legitimised by gaining the approval of the wider community may commit voluntarily to sustainability activities (Nguyen et al., 2021). Thus, legitimacy theory is much interested in enhancing a firm reputation and image by adopting strong governance structures.

From a legitimacy theory perspective, Nguyen et al. (2021) emphasise that a firm that has good governance structures has the capabilities to protect the interest of multiple stakeholders to impact positively on environmental and sustainability performance. Also, when firms attach specific governance structures directly to sustainability performance, the incentive to improve performance is enhanced. Thus, corporate governance determines the rules, practices, the institutions that legitimise the directors' power (Charreaux et al., 2006). The legitimacy originates from the effectiveness of both external control and internal control mechanisms and control from the board of directors is one of the internal control mechanisms (Ducassy and Montandrou, 2015). When the board of directors ensure the governance structures of the firm is good, the firm performs better as it can demonstrate good accountability to its constituent groups as well as gain and maintain a good relationship with relevant stakeholders (Cong and Freedman, 2011). Nguyen et al. (2021) also indicate that corporate boards, especially those structured with a larger size, independent directors, and board committees, with their qualifications and as good representatives of the various stakeholders have the likelihood to undertake sustainability activities to gain acceptance with powerful stakeholders. Moreover, a well-structured board will have the capacity to pressure management to disclose information on sustainability performance activities as per stakeholders' demands. This is because presumably, the board of directors, compared to management have a long-term view, hence, are more in pursuance of sustainable development activities. They are more focused on their accountability to the wider stakeholders, so they encourage the firm to be proactive in their actions to ensure congruence between the firm's decisions, corporate legitimacy and societal values. With legitimacy theory in place, the decision of the firm to separate the CEO role from the chairmanship position or to make it dual depends on

the company's desire for legitimacy. The reason is that the choice of a leadership structure depends on the institutional pressure in the company's community (Zhang, 2012).

Through the lens of legitimacy theory, Hassan and Halbouni (2013) posit that firms that do not disclose information on governance practices encounter political and social pressures which threaten their legitimacy to affect their financial performance negatively. They conclude that voluntary disclosure of information including financial performance improves the perception of society of the firm's actual performance. Nguyen et al. (2021) explain that firms with good governance, including effective board structure, through a commitment to environmental practices, conform to the rules and values of the larger community and develop a good relationship with external stakeholders. These firms gain better environmental performance as a symbol of accountability to the wider community. Zhang, Zhu and Ding (2013) perceive social performance as an indication of the moral legitimacy of the firm. In their opinion, the board of directors including outside, and women directors add to the resources of the firm to respond to the claims of stakeholders. They strengthen stakeholder management for the firm to gain stakeholder acceptance to increase social performance.

3.5.1 Criticism of legitimacy theory

Though Deegan (2002) argues that legitimacy theory is a useful theory and the mainstream theory for social and accounting literature, the theory has been criticised for being underdeveloped (Deegan, 2019). According to critiques, the theory does not provide a detailed understanding of whether legitimising disclosures affects the perception the community have about firms. There is a gap in the exact types of disclosures and media which is most efficient in assisting the organisation's legitimacy. Though the theory mentions that stakeholder groups are likely to be influenced by legitimising operations, the details of which stakeholder groups are to be influenced are yet to be addressed. These gaps in the theory are evidence that there is stagnation in the development of the legitimacy theory (Unerman and Chapman, 2014).

Also, people find legitimising disclosure more harmful to the community and the entire people on earth. This is because firms have concern for legitimacy, so managers only produce social and environmental disclosures as a response to community concerns indicating that these disclosures have nothing to do with corporate responsibilities and their related accountabilities.

This has raised concerns that organisations' actions to enhance social and environmental performances to have positive disclosures are not in the interest of society and hence making it a bit harmful to the entire world (Puxty, 1991; Deagan, 2019). Critics are arguing that the theory place emphasises on the "relevant public" moving the focus from the whole society as suggested in the social contract to focus on a particular part of the society making the theory indistinguishable from stakeholder theory. There is an argument that the assumption of a "homogeneous society" in legitimacy theory does not hold considering the emphasis placed on "relevant publics" and some stakeholders may demand disclosure more effectively than others in the society (Nue et al., 1998; Laine, 2009).

Nevertheless, the legitimacy theory continues to contribute towards sustainable development as it serves as a motivation for sustainability disclosure. It is argued that the theory provides the basis to understand the reason behind management's use of externally-focused reports to firms' advantage (Deegan, 2002). Processes to achieve sustainable development goals are concerns to the world as a whole and require everyone to be socially and environmentally accountable, hence we apply legitimacy theory to understand board structure effects on sustainability performance.

3.6 Stewardship theory

Stewardship theory asserts that managers are intrinsically motivated to conduct the duties and responsibilities they have been entrusted with (Donaldson and Davis, 1991). As an alternative theory to discuss the relationship between managers, shareholders and stakeholders, besides the ruling principal-agent theory, stewardship theory emerged in the early 1990s as a counterweight to agency theory (Donaldson and James H. Davis, 1991). Proponents of the theory, (Donaldson and James H. Davis, 1991; Davis, 1997) developed a novel and a more positive view between managers and owners of the firm, purporting to align the interest between stewards and firm objectives (Brennan and Kirwan, 2007).

Stewardship theory views managers as stewards who have a collective mindset and are pro-organisational, hence, they get total satisfaction from working towards the achievement of organisational, group or societal goals (Menyah, 2013). The fundamental proposition of the stewardship theory is that the interests of the executives are aligned with the interest of principals and that the managers are benign in their actions (Davis, Schoorman and Donaldson, 1997;

Donaldson, 2008). Under this theory, the success of the organisation is strongly related to the satisfaction of the principal. The manager, as the steward protects and maximises the wealth of shareholders through corporate performance because the steward's utility functions increase when the firm's value increases (Davis, Schoorman and Donaldson, 1997). The assumptions of the stewardship model are based on the model of man, the psychological mechanisms influencing behaviours, the social context settings, and situational mechanisms which trigger such behaviours (Menyah, 2013).

Under this formulation, stewardship theory proposes that the desires of man are for intrinsic rewards which are not easily quantifiable. The desire of a man is towards such things as growth opportunities, achievements, affiliations and self-actualisation (Davis, Schoorman and Donaldson, 1997). The stewards are seen to be motivated intrinsically, and as such, it is easier for them to identify themselves with the principal and commit themselves towards the attainment of organisational goals. According to Manz (1990), self-leadership is an influential factor towards intrinsic motivation. Self-leadership leads one to performance of naturally motivating tasks and encourages one to perform a task that needs to be performed but it is not naturally motivated (Manz, 1990). People who are intrinsically motivated derive their source of power from building their personalities as committed individuals. They can also be skilled personalities who are eager to develop long-term relationships in companies where trust and the collective approach to solving issues are typical (Menyah, 2013). From the theory's perspective, enhancing internal work motivation advances a higher level of performance and satisfaction with work (Davis, Schoorman and Donaldson, 1997). Stewardship proposes that the interest of management and shareholders is positioned towards the attainment of the objectives of stakeholders and shareholders. Therefore, monitoring mechanisms to ensure that managers work in the best interest of shareholders are not needed in this setup. Additionally, economic incentives needed to ensure effective monitoring are reduced under the stewardship theory, hence, principal benefits are enhanced (Donaldson, 2008).

Stewardship theory advocate for CEO duality rather than CEO non-duality as the agency theory proposes. CEO duality is encouraged because the managers are presumed to work in the interest of the firm. They need to have the freedom to use their discretion to manage the firm and act promptly towards changing circumstances that are deemed fit to meet the demands of shareholders (Donaldson and Davis, 1991). Donaldson and Davis (1991) tested the influence of dual CEO structure and independent chair structure on shareholders' returns and concluded that

firms with dual CEO structure are associated with higher shareholders' returns. This result is consistent with the stewardship theory's model of man where role-holders are motivated by exercising responsibility and authority and are satisfied through completing inherently challenging work successfully and gaining recognition from peers and superiors.

Another basis for contention on stewardship theory and board structure issues is regarding the role of outside independent directors on corporate boards. Stewardship theory argues for more inside directors who will work with the CEO to achieve the set objectives of the firm to dominate the board. According to the theory, inside directors working with the CEO will reduce the information gap and asymmetry which has been a critical issue for independent directors. Inside directors have much knowledge about the firm and its activities and can have access to all the important information needed to make good and informed decisions. Also, under stewardship theory, the board of directors are supposed to advise and support the work of managers instead of monitoring and controlling as has been propagated by the agency theory (Menyah, 2013) making the directors function more as facilitators than monitors.

Though earlier stewardship theorists focus on the behaviour of managers towards shareholders, it is undisputable fact that stewards who are pro-organisational by motivation would be committed to all stakeholders as they perform their duties as managers of the organisation (Menyah, 2013). Moreover, stewardship theory has been thought of as ethical leadership whereby the managers strive for an alignment between being committed to stakeholders to sustain an extensive commitment to societal and global moral norms (Hernandez, 2008). Stewards in modern times are therefore associated with leaders whose duties are committed towards the employees, stakeholders, and society in an attempt to create long-term wealth (Caldwell et al., 2008). Impliedly, stewardship-oriented managers in companies will commit to the implementation of CSR activities to enhance firm performance and meet the expectations of both stakeholders and shareholders (Menyah, 2013).

Khan, Al-Jabri and Saif (2019) mentioned that the application of stewardship theory is more favourable when both parties have agreed on the relationship based on the steward principle of choice. From the authors' view, in a situation where both the managers and the owners decide to assume the stewardship structure and agree on the same goal, the firm enhances its financial performance. Furthermore, the theory is more favourable in companies where monitoring and control mechanisms are not required because the managers are trusted for their job and are

authorised by the shareholders (Khan, Al-Jabri and Saif, 2019). Establishing more links between stewardship theory and firm performance, Lizares (2020) reiterated that the theory offers a complementary viewpoint that spells out governance situations not covered by the agency theory. The study argues for the need to net the stewardship theory and the agency theory in explaining the situations that inform the board's control and collaboration roles. The author emphasises that the main role of the board under the stewardship theory is of more proactive collaboration, which requires forward vision, mastery of the firm and its environment and the willingness to accept risks. With stewardship theory, the board are in partnership with management to supports and works together with management seeking to achieve effective and good financial performance. The results obtained by Lizares (2020) indicate that including a higher proportion of outside directors on the corporate board results in a negative impact on the firm's financial performance. This means that the fundamental premise of stewardship theory that greater board representation of executive directors is necessary, and that there is the need for independent directors to serve as facilitators instead of monitors have been upheld. In support, Adeola and Ohu (2019) have explained that the argument under the stewardship theory has been on the inspiration people have to do good and act unselfishly to ensure the needed organisational and societal requirements are met. Since the goals of the board of directors and management are aligned under stewardship theory, as a team, both parties will work to enhance, the economic, social and environmental performance of the firm (Nijhof, Schaveling and Zalesky, 2019).

3.6.1 Criticism of stewardship theory

Though stewardship theorists have been applauded for their contributions to business studies and corporate governance, especially as they have created more insight into the agency theory, the theory has been criticised for various reasons. First, according to Albanese, Dacin and Harris (1997), the theorists have created some misspecification in agency theory, especially in their explanation of the divergence of interests between agents and principals. According to the authors, this modification in the definition of agency theory has created some gaps in their modified definition for agency theory. They argue that the writers (Davis, Schoorman and Donaldson, 1997), at a point confused the definition of agency theory with the agency problem. As a recommendation, Albanese, Dacin and Harris (1997) suggested to the proponents of stewardship theory to adopt a more comprehensive view of agency theory. However, Davis, Schoorman and Donaldson (1997)

have defended that the basis for their definitions and characterisation was inspired by the originators and the main scholars in the area of agency theory and therefore disagree with the critique raised.

Chrisman (2019) has reiterated that the assumptions of the theory reduce its relevance and realism. According to Chrisman (2019), the main tenets of stewardship theory describes the model of man as more self-actualising than self-interested and self-serving. Also, the theory believes people will place higher utility on firm goals more than on personal goals making the use of control mechanisms less useful in organisations. The author debunks this assertion on the basis that the theory's model of man does not portray the behaviour of man in reality. In addition, the goals as assumed by the theory do not completely take into account the diversified nature and conflicting goals of corporate stakeholders. Chrisman (2019) rather recommends the stewardship theory be combined with the agency with a more set of realistic assumptions rather than taking the stewardship theory as an alternative to the agency theory.

Menyah (2013) has also noted that within the limited number of empirical testing of the theory available, most of the empirical evidence has been conflicting. He believes the conflicting evidence could be attributed to the shortfalls of the theory. In the opinion of the author, stewards are not always good stewards as the theory depicts making it very likely for managers to make some decisions that may not be in the interest of shareholders. In addition to this, the theory ignores the benefits the outside directors bring to the firm which includes connecting the firm to relevant networks and advice they provide to enhance firm performance. The author opines that the theory can be employed as a source of guidance to board structure but not as a complete framework to manage board organisation. Pastoriza-Rivas (2011) also refers to the stewardship theory as being static because it observes the Principal-Agent relationship at a single point in time.

Notwithstanding the criticisms, stewardship theory has been acknowledged for helping companies identify other forms of motivation rather than considering money and coerciveness as the entire motivation for people (Pastoriza-Rivas, 2011). Chrisman (2019) has also commended stewardship theory for being a valuable addition to the literature.

3.7 Summary and Conclusion

The study follows the growing trend of literature on financial, social and environmental performance and adopts a multi-theoretical approach to explaining the board structure-

sustainability performance relationship. The chapter discusses the theories in isolation, but it must be noted that each theory is a complement to the other. The chapter, to explain the board structure-sustainability performance relationship, discusses five theories namely stakeholder-agency, resource-based view, resource dependency theory, legitimacy theory and stewardship theory. It must be emphasised that the study employs the stakeholder-agency theory as the fundamental theory for the study while the remaining four support the main theory.

Stakeholder-agency theory discussed the role of the board of directors as monitors of management activities on behalf of stakeholders. The theory merges the stakeholder and agency theories to discuss the implicit and explicit contract between all stakeholders. The board of directors serve as a monitoring structures to control the activities of management and align their interest to that of the stakeholders. The resource-based view mainly focuses on how the board of directors can be a source of internal valuable resources to the firm. The board of directors serve as a valuable, rare, non-substitutable and inimitable resource to the firm through how they use their skills, knowledge, and expertise and provide the firm with connections to help gain and sustain competitive advantage. Regarding the view of resource dependency on how directors influence sustainability performance, it has been deduced from the theory that the board serves as a link between the firm and the external environment to provide the firm with the critical and valuable resources it needs for its survival and to increase performance. The theory explains that the advice, the skills and the external connections the firm gets through the directors are the source of power that enables the firm to be less dependent on others.

Legitimacy theory explains how the board of directors help to formulate policies and strategies to ensure the firm conforms to the norms and values of the society to gain and maintain legitimacy. The legitimacy theory proposes that good initiatives from the board help the firm to enhance its reputation and image to continue to function in the society. Another theory discussed is the stewardship theory which originates from organisational psychology and sociology and is seen as an alternative to agency theory. The theory helps to explain how the board of directors can be a source of facilitators rather than monitors. It is believed that managers will act in the interest of the firm and have the organisational goals as their motivation. The Board of directors can align with managers to help achieve the goals of the firm.

CHAPTER FOUR

HYPOTHESES DEVELOPMENT

4.1 Introduction

The existing literature indicates that board structure influences corporate financial, social, and environmental sustainability performance (collectively called sustainability performance under this study). Like prior studies, the identifiable and measurable characteristics of board structure that have the potential to affect the three dimensions of sustainability performance are examined through the development of testable hypotheses. A hypothesis specifically predicts an outcome of a phenomenon and it has been considered an informed estimate to detail a relationship between two or more measurable variables (Binoy, 2019). It is formulated based on a rigorous review of relevant literature and theories to give an informed advanced prediction of a phenomenon (Mourougan and Sethuraman, 2017). The hypothesis is critical to the completion of the research study because it gives directions to the research and provides a framework to report research conclusions (Toledo, Flikkema, and Toledo-Pereyra, 2011). Hence, the hypothesis becomes the pivot to the wholesome study of all the critical elements of the research process as well as the expansion of knowledge in a particular area (Mourougan and Sethuraman, 2017). This chapter is arranged as follows: Section 4.1 discusses the theoretical underpinnings and extant literature relevant to board structure and sustainability performance relationship and ends with a statement of hypothesis. Section 4.2 contains the conclusion and summary.

4.2. Independent variables

The board structure variables identified for this study are board size, board independence, board committee, board expertise, CEO duality, and board diversity.

4.2.1 Board size

4.2.1.1 Board size and financial performance

The reasoning behind board size is to help firms balance advisory needs with the costs of making decisions in large organisations. It has been argued that how the board is structured has a huge impact on how it executes its responsibilities (Galbreath, 2010). Board size has a crucial effect on firm objectives and performance because the value of the firm is highly dependent on directors' efficient monitoring and decision-making (Yermack, 1996). A common conception

is that large board size is likely to provide directors with diverse opinions and ideas for effective supervision to improve performance ((Barney, 1991; Galbreath, 2005; Arik et al., 2016 ; Kyere and Ausloos, 2020). However, others have argued that a smaller board is rather beneficial to firms in enhancing financial performance since it improves communication and decision-making (Christensen, Kent, and Stewart (2010). The stewardship theory argues that firms do not need to have a larger board size but rather a few numbers of directors to provide advisory and support services. This is because managers conduct their duties as responsible stewards to corporate assets under their care when they work independently. Thus, with issues regarding financial performance, the goal alignment between managers and shareholders is high, so less control is needed from directors (Davis et al., 1997; Jaskiewicz and Klein, 2007; Kalsie and Shrivastav, 2016). In favour of smaller board sizes, Khan, Al-Jabri, and Saif (2021) explain that a larger board may create room for free riding as some members may take advantage of others' efforts and not participate fully in board activities. The study continues to explain that due to communication-related issues, social loafing, and uneasiness in making decisions, smaller board size is more desirable for a firm's financial improvement. James and Joseph (2015) also argue that directors may possess the skills to contribute financial benefits, yet coordination issues and misallocation of resources may cause harm to financial performance. It is also argued that larger boards increase the cost of the firm and this includes coordination and agency costs (Guney et al., 2020). Mashayekhi and Bazaz (2008) accentuate that smaller boards are more effective in executing the controlling functions to direct the management towards an improvement in financial performance. According to Bonn, Yoshikawa, and Phan (2004), a larger board is difficult to harmonise and even more difficult to have all members partake fully in decision-making. It has further been argued that the communication and coordination problem that accompanies large boards allows the CEO to have control over board matters (Jensen, 1993). In support, Cancela et al. (2020) elucidate that a larger board concentrates on the welfare of workers most especially on wages increment and this lessens profitability.

There are empirical evidence in literature on the impact of board size on financial performance. Afrifa and Tauringana (2015), Kyere and Ausloos (2020), and Lee (2020) confirm the positive significant impact of board size on financial performance. Hussain, Rigoni and Orij (2018) and Lizares (2020) found insignificant relationship between board size and financial performance. However, a number of studies such as Liang, Xu and Jiraporn (2013), Chintrakarn et al. (2017) and M. and Sasidharan (2020) found a negative effect of board size

on financial performance on the bases that some board members may free ride and take advantage of other members, delay in decision-making, lack of communication and deficiencies in board monitoring functions. Based on the recommendation of the stewardship theory and previous discussion, this study develops the hypothesis regarding board size and financial performance. Therefore, this study expects to have

H1a: There is a negative significant relationship between board size and financial sustainability performance.

4.2.1.2 Board size and social performance

The general perception of the board's role in enhancing social performance is to mediate the conflict of interest and build cohesion and consensus between management and all stakeholders (Freeman, 1984). From the perspective of stakeholder-agency theory, the firm needs a larger board to enhance social performance because such boards are more likely to have prestigious directors to concentrate on meeting the demands of a wider spectrum of stakeholders, integrate information into annual reports and enhance social performance (Ali M. Shahzad, Rutherford and Sharfman, 2016). De Villiers, Naiker, and van Staden (2011) posit that when firms have large boards, they have the potential to enlarge their wealth of expertise which the firm needs to improve its social performance. Larger boards are known to promote better opportunities for more connections to other stakeholders and present social welfare objectives, values, and ethical approaches to support social objectives (Hillman et al., 2001). Also, Zubeltzu-Jaka, Álvarez-Etxeberria and Ortas (2020) explain that a large board increases board diversity, and more diverse boards are likely to represent the demands and needs of firm stakeholders. Thus, a larger board is likely to give the firm more opportunity to include social objectives in its decision-making process contrary to smaller boards with less diversity which are more profit inclined and hence likely to prioritise financial performance over social performance.

Furthermore, the resource dependency theory (RDT) supports the idea of a larger board. In that case, more directors use their social ties to establish and enhance the corporate relationship with relevant stakeholders. In line with the RDT view, Hillman et al. (2001) notice that a firm increases its linkage to critical resources and portrays its involvement in social issues if it includes more directors representing an extensive number of stakeholders on the corporate board. Zubeltzu-Jaka, Álvarez-Etxeberria and Ortas (2020) accentuate that a larger board encourages stakeholder involvement in a company's decision-making process and that motivates companies to contribute to sustainability including social practices. It is also noted

that a larger board increases the board capital which provides the firm with critical resources such as knowledge, skills, and reputation. These resources facilitate members' contributions during decision-making which encourages the companies to partake in social responsibility practices (Bachiller, Giorgino and Paternostro, 2015; Uyar et al., 2021). Moreover, a larger board may secure the advantage of collective intelligence. Thus, having the proper combination of educational background, skills and experience are likely to broaden directors' thinking and understanding of the interests of various stakeholders and respond to them (Endo, 2020).

Empirical evidence show a contradictory findings regarding board size effect on social performance; Shahzad et al. (2016); Cancela et al. (2020) and Zubeltzu-Jaka, Álvarez-Etxeberria and Ortas (2020) documented a positive significant relationship between board size and social performance. However, Bai (2013) and Uyar et al. (2021) found board size detrimental to social performance and Hafsi and Turgut (2013); Hussain, Rigoni and Orij (2018) and Kouaib, Mhiri, and Jarboui (2020) recorded no significant relationship between board size and social sustainability performance. However since a larger board is known to provide more people with connections to resources to improve social performance and create avenue for more expertise to tackle social issues, board size is expected to be positively linked to social performance. Consistent with the stakeholder-agency and the resource dependency theories view proposing a positive relation between board size and CSR performance, this study suggest the following hypothesis:

H1b: There is a positive significant relationship between board size and social sustainability performance

4.2.1.3 board size and environmental performance

The stakeholder-agency theory argues that the extent to which management is committed to environmentally friendly activities is comparatively lower than that of stakeholders. Consequently, more directors are needed to monitor management activities to prevent moral hazard problems since inefficient oversight duties by the board could affect stakeholders negatively (Kock, Santaló and Diestre, 2012). The theory goes on to explain that intensive monitoring of management activities is very important when it comes to long-term investments such as environmental performance since managers may be unwilling to undertake the effort needed to promote it (Kock, Santaló and Diestre, 2012; Nguyen and Thanh, 2021). However, smaller boards might be overloaded with responsibilities that could obstruct effective

monitoring. Walls, Berrone and Phan (2012) emphasise that it is the responsibility of top management to establish firm relationships with stakeholders, society, and the natural environment. Board effective monitoring could help prioritise environmental issues and ensure management responsibility and accountability. Moreover, more directors with the necessary expertise and experience could help companies to avoid environmental fines and violations or invest in green technologies (Walls, Berrone and Phan, 2012).

Additionally, de Villiers, Naiker and van Staden (2011) explain that large board size is one of the board characteristics that represent the resource-provisioning role of directors to promote environmental performance. Through the lens of RDT, the authors explain that a larger board will likely include more experienced and knowledgeable people with expertise to offer better advice on specific issues including environmental performance. When the board is large, there is a greater likelihood that some directors know the effect of environmental issues on stakeholders. These directors, with their experience and exposure, can advise the board on issues related to environmental challenges and opportunities. These counsels and guidance are critical in environmental matters as there are ambiguities between environmental policies and results. In support, Martin and Herrero (2020) mention that a larger board will increase board efficiency to lead the firm to embrace its environmental obligations.

Most existing studies have found that a larger board contribute positively to environmental performance (de Villiers, Naiker and van Staden, 2011; Nguyen, Doan and Frömmel, 2020; Endo, 2020). Based on prior evidence, the study suggests that a larger board is more likely to conduct efficient monitoring and advising services to enhance environmental performance. Hence, the study formulates a positive relationship between board size and environmental performance

H1c: There is a positive significant relationship between board size and environmental sustainability performance

4.2.2. Board independence

4.2.2.1 Board independence and financial performance

Both theoretical and empirical arguments have expressed different views on how board independence influences financial performance. Undeniably, most researchers have contended that independent directors are the best board monitors because they are independent decision-making bodies. Relating stakeholder-agency theory to board independence and financial performance, Squires and Elnahla, (2020) posit that independent directors are likely to align

management actions to corporate interests. Bachiller, Giorgino, and Paternostro (2015) reiterate that independent directors are mostly business experts, support specialists, and community opinion leaders who are responsible and sensitive to the interest of both shareholders and other stakeholders. Hence, they are able to contribute alternate ideas from those of the top management team to promote financial performance and firm value. Squires and Elnahla (2020) stated that considering the experience and skills of independent directors, they may be in a better position to influence the information asymmetry between the board and management. As argued by Jensen and Meckling (1976), agency problems that occur in firms require the presence of independent directors with no affiliation to the firm to monitor the activities of management to solve these issues, reduce agency costs, and information asymmetry to improve firm value. Moreover, complex, and larger firms have more outside contractual associations which may demand the appointment of independent directors to monitor and provide both financial and non-financial advice on these contractual relationships (Southern, 2020). Additionally, Prashar and Gupta (2020) explain that these directors are more objective and can critically examine strategic options and proposals offered by the CEO more than the insider directors who have the highest propensity to support the ideas of the CEO.

From the RDT perspective, the independent directors as essential board capital that provides resources to the firm (Hillman and Dalziel, 2003). Effective board and environment linkages enhances financial performance, and this originates from the valued resources and information in addition to the interfirm commitments facilitated by the independent directors (Dalton et al., 1998). The independent directors serve as boundary spanners between the firm and the environment (Daily et al., 2003), and provide the firm with resources in the form of advice, access to information, preferential access to resources, and legitimacy to enhance firm value. (Pfeffer and Salancik, 1978; Hillman, Withers and Collins, 2009; M. and Sasidharan, 2020). Hermalin and Weisbach (1988) indicated that independent directors are likely to be included on the board of poorly performed firms to provide additional guidance needed to revive such companies.

Empirically, Meyer and de Wet (2013) found that a higher proportion of independent directors improve financial performance. , Al-Najjar (2014) supports the positive effect of board independence on financial performance because independent directors bring their expertise and networks to the firm and also allow for better discussions to improve financial performance. Souther (2020) similarly found a positive relationship and argues that board independence convey greater outside monitoring to curtail agency problems. Some industries in this study

sample are highly related to independent directors since they are known to provide better inputs in board meetings, especially, as in most countries the position of independent directors are filled on voluntary basis. Therefore, the situation strengthens the study argument for a positive relationship between board independence and financial performance in our study sample. The study, therefore, hypothesises that:

H2a: There is a significant relationship between board independence and financial sustainability performance.

4.2.2.2 Board independence and social performance

From stakeholder-agency theory, Hussain, Rigoni and Orij, (2018) suggest that having a larger proportion of outside directors on the board signifies the board's commitment to increasing social performance keeping in mind the voluntary nature of corporate social responsibility initiatives. The independent directors, who are usually answerable and sensitive to the needs and interests of diverse stakeholders, are expected to control and influence the standard of service delivered by management concerning social responsibility activities (Bachiller, Giorgino and Paternostro, 2015; Lamont, Kennelly and Weiler, 2018). Veltri, Mazzotta and Rubino (2021) indicate that independent directors have higher reputation costs, hence, they think differently and are more sensitive to business ethical issues than insider directors. Moreover, independent directors are likely to increase social performance because they are effective monitors of management activities, are more objective in assessing management behaviour, and also hold more power over management (Nguyen and Thanh, 2021).

The arguments by the RDT indicate that a higher proportion of independent directors on a corporate board symbolises the firm's eagerness to link the firm to its external environment and enhance its legitimacy (Shaukat, Qiu and Trojanowski, 2016) because independent directors are known to be the firm's boundary spanners that link the firm to external relevant sources and provide the needed expertise to the firm (Endo, 2020). In support, Nguyen, Doan and Frömmel (2020) elucidate that since the presence of outside directors can help the firm access external relevant resources, their presence could likely facilitate the development of corporate strategies to help solve social problems and enhance social performance. Also, independent directors contribute significantly towards stakeholder management by increasing corporate resources to better address the claims of stakeholders. Through increased stakeholder

management, the business gets stakeholder acceptance which can improve social performance (Zhang et al., 2013).

Among the limited empirical evidence for social performance, most studies found that board independence has a significantly positive link with social performance (see, Johnson and Greening, 1999; Biswas, Mansi and Pandey, 2018; Mohammadi, Saeidi and Naghshbandi, 2020; Veltri, Mazzotta and Rubino, 2021). Based on prior evidence, the link between board independence and social performance is more likely to be positive, hence the following hypothesis is formulated:

H2b: There is a positive relationship between board independence and social sustainability performance.

4.2.2.3 Board independence and environmental performance

The Stakeholder-agency perspective considers the outside directors as a better monitoring mechanism to reduce stakeholder-agency costs which originates from conflicts between management who have an interest in initiatives with short-term benefits and the stakeholders who want an elevated level of environmental performance with long-term interest (Jensen and Meckling, 1976). Because outside directors are regarded as decision control adepts who have reputational concerns (Fama and Jensen, 1983), it follows that the outside directors have the incentive to closely monitor management decisions on sustainable development strategies to enhance environmental performance (de Villiers, Naiker and van Staden, 2011) to satisfy the interests of both shareholders and stakeholders of the firm. Following this logic, Biswas, Mansi and Pandey (2018) explain that independent directors play a significant role in monitoring managers and protecting stakeholders because compared to insider directors, outside directors have a stronger orientation to different stakeholder groups. Kassinis and Vafeas (2002) indicate that being more reputable directors, outside directors are better at paying attention to long-term performance, including environmental performance, and ensuring that management adheres to environmental laws to prevent environmental fines. Independent directors through enhanced monitoring can address likely stakeholder-agency problems that can arise as management strives for strong environmental performance. Post et al. (2015) agree that firms should include more outside directors on the board because their presence could encourage the firm to take some strategic actions such as forming sustainability-themed alliances to increase environmental performance. Though supporting such strategic actions may be incongruent

with the decisions of the CEO, outside directors would support such actions because they are more aligned with stakeholders than the CEO and the management of the firm (Post et al 2015).

In support, the RD posits that outside directors serve as a resource for the firm to manage external environmental dependencies and uncertainties including those caused by natural environmental problems (Pfeffer 1992, Hillman, Cannella and Paetzold,2000). Outside directors bring to the firm diverse knowledge, skills, experience, ties and a broader stakeholder orientation to contribute to the development of efficient CSR strategy to lead to enhanced environmental performance (Pfeffer and Salancik, 1978; Shaukat, Qiu and Trojanowski, 2016) Endo (2020) draw on RDT and argue that independent directors possess professional backgrounds and business experience which can broaden the board's understanding of the interest of stakeholders and help formulate strategies to respond to them accordingly. Thus, independent directors have the expertise and knowledge to monitor management towards improved environmental performance. To protect their reputation and to ensure continued director appointments, outside directors have the incentives to encourage the firm to pursue environmental opportunities. Hence, outside directors can be used as an efficient means to help the firm gain corporate moral legitimacy (Walls, Berrone and Phan, 2012).

Empirical evidence records that effective board independence encourage companies to incorporate environmental issues into its corporate strategies and engage in environmental practices, and positively influence environmental performance (Biswas, Mansi and Pandey (2018; ; Kouaib, Mhiri and Jarboui, 2020). Taking the theoretical views, and empirical evidence into account, the formulation of hypotheses for board independence and environmental performance is stated as:

H3c: There is a significant positive relationship between board independence and environmental sustainability performance.

4.2.3 Board sustainability/CSR committee

4.2.3.1 Board sustainability/CSR committee and financial performance

Sustainability committees (also known as CSR committees) are specialised sub-committee established at the board of directors level to specifically deal with sustainability-related issues to improve financial, social and environmental (sustainability) performance (Li et al., 2016; Uyar et al., 2020). Stakeholder-agency theory contends that firms that include sustainability practices in their strategic planning can efficiently allocate productive resources to enhance stakeholder management. Based on this, the theory suggests that companies form CSR

committees on their boards for effective performance (Hussain, Rigoni and Orij, 2018). Luoma and Goodstein (1999) explain that CSR committees review a firm's compliance with regulations and deal with the company's social and ethical concerns which can enhance the moral legitimacy of the company. The existence of a sustainability committee is a symbol to the public that the firm is properly and adequately acting on mutually valued purposes. This helps the firm to gain a reputation which is one of the most essential intangible assets that can lead the firm to gain a competitive advantage to positively influence financial performance (Li, Ngniatedema and Chen, 2017). A sustainability committee is an effective mechanism for shared value creation. Thus through the sustainability committee, firms can satisfy the interest of various stakeholders and ensure a sufficient profit is achieved (Burke, 2019). Moreover, the presence of a sustainability committee can serve as a tool that gives a positive signal to investors and other economic agents and that can lead to higher financial sustainability performance (López-Arceiz, del Río and Bellostas, 2022).

With the scanty empirical evidence relating to sustainability committees and financial performance, the evidence has mostly been in support of a positive relationship. For instance, Lopez-Arceiz et al. (2016) found that the presence of a sustainability committee has a positive influence on sustainability performance including financial performance. Accordingly, the CSR committee and financial sustainability hypothesis is stated as follows:

H3a: There is a positive significant relationship between the sustainability committee and financial performance.

4.2.3.2 Board sustainability/CSR committee and social performance

Stakeholder-agency theory argues that the CSR committee is an aspect of governance bodies that responds to the needs of stakeholders (Baraibar-Diez, 2019). The presence of a sustainability committee helps the board to monitor the firm's responsibility practices while making sure the firm complies with regulations regarding sustainability risks to monitor and assess the social performance of the firm (Birindelli et al., 2018). CSR committee can assist the firm to improve its opportunities for sustainability development because such committees can help the board design and implement CSR projects, improve the participation of stakeholders in the ethical culture of the firm and ensure that activities that could cause harm to the firm are critically assessed (Birindelli et al., 2018). The existence of a sustainability committee symbolises the board's commitment and orientation toward sustainable development and the firm's commitment to its stakeholder (Biswas, Mansi and Pandey 2018;

Hussain, Rigoni and Orij, 2018). This is because the committee's oversight role is to ensure that the actions and strategies of the firm align with the interest of stakeholders (Radu and Smaili, 2021). To this end, Orazalin (2019) posit that the CSR committee plays a critical role in the formulation of CSR strategies and revising social responsibility performance.

In line with stakeholder-agency theory, Cancela et al. (2020) concluded that firms with CSR committee elevates social concerns and therefore increase the value of social sustainability. The expertise of Sustainability committees members can help board and the firm to formulate strategies to promote social actiitives and socail performance the firm to plan strategies to increase corporate social performance (Hillman and Dalziel, 2003; Biswas, Mansi and Pandey 2018; Uyar et al., 2020). It is also expected that the committee members will manage and control the firm social concerns to promote social performance (Orazalin, 2019). Burke (2019) concludes that the presence of a sustainability committee strengthens social sustainability performance.

Legitimacy theory supports the positive effect of CSR committees on social performance because the effectiveness of the CSR committee in executing its functions and enhancing corporate social activities helps the firm to establish a good relationship with its stakeholders to gain, maintain and improve the firm legitimacy (Michelon and Parbonetti, 2012). The expertise and experience of committee members influence their advisory services, create access to resources, manage, and control the firm social concerns to enhance corporate image and legitimacy (Biswas, Mansi and Pandey 2018; Orazalin, 2020). According to Kitsikopoulos, Schwaibold and Taylor (2018), the sustainability committee supports board communication, enhances firm management and awareness, drives change in companies which then affect social performance positively. García Martín and Herrero (2018) explain that the sustainability committee helps the board to quickly adhere to stakeholder pressure and respond to them accordingly. The creation of a sustainability committee is symbolises the firm's commitment to social responsibility and sustainability-related issues. It also shows the firm's interest in addressing stakeholders' concerns, satisfying their needs while assuring shareholders and entire stakeholders on accountability issues (Pucheta-Martínez and Isabel Gallego-Álvarez, 2018).

The empirical findings regarding sustainability (CSR) committee and social performance are mostly in the positive direction. For instance, Hussain, Rigoni and Orij (2018); Biswas, Mansi and Pandey (2018); Baraibar-Diez (2019); Burke (2019); Cancela et al. (2020) and Govindan, Uyar and Karaman (2021) found that companies with sustainability committees

improve social performance. Considering the theoretical and empirical arguments above, the hypothesis is stated as:

H3b: There is a positive significant relationship between the sustainability committee and social performance

4.2.3.3 Board sustainability/CSR committee and environmental performance

From the perspective of stakeholder-agency theory, forming a CSR committee promotes environmental performance because the committee members have the specific knowledge to encourage the firms to enhance effective stakeholder relations while performing effective oversight duties to increase environmental performance (Govindan, Uyar and Karaman, 2021). Martín and Herrero (2019) explain that the sustainability committee helps the board to quickly adhere to stakeholder pressure and expresses concern for environmental risks that can harm the firm. The authors indicate that firms with a sustainability committee signal to investors, customers, and the public that it has a strong commitment to sustainability. From the perspective of Orazalin and Mahmood (2021), sustainability committees enhance CSR effectiveness and sustainability-related strategies which then improve environmental performance. Companies with sustainability committees are usually advanced in the formulation of CSR and environmental strategies to enhance environmental performance because such companies get help from the committee to plan, organise, implement and control firm sustainability policies (Orazalin, 2019). The creation of a sustainability committee is an indication of the firm's commitment to social responsibility and sustainability-related issues. It also signifies the interest the firm has in satisfying the needs and concerns of stakeholders while assuring shareholders and entire stakeholders on accountability issues (Pucheta-Martínez and Isabel Gallego-Álvarez, 2018).

Empirically, Biswas, Mansi and Pandey (2018); Orazalin (2019); Kitsikopoulos et al. (2018); Martín and Herrero (2019; Orazalin and Mahmood (2021), and Radu and Smaili (2021) recorded a positive effect of sustainability performance on environmental performance. Taking this perspective of theoretical reviews and existing evidence, the study hypothesises the following relationship:

H3c: There is a positive significant relationship between the CSR committee and environmental performance.

4.2.4 Board expertise

4.2.4.1 Board expertise and financial performance

Expertise has been explained as skilfulness through the means of having unique knowledge (Bouteska, 2020). From the stakeholder-agency theory viewpoint, a board expertise reduces corporate internal control problems and helps the board to perform its monitoring duties judiciously (Al-Okaily and Naueihed, 2019). A skilful and competent board contributes significantly toward maximizing shareholder wealth (Eisenhardt, 1989). Taking financial expertise as an example, Minton, Taillard and Williamson (2014) explain that experts have lower costs in getting information about the complexity and accompanying risks of a phenomenon, so they can effectively monitor and supervise the top management team to reduce agency problems and agency cost and ultimately have a positive influence on financial performance (Chaudhry et al., 2020).

According to the RBV, directors with firm-specific skills have unique and specific competencies which enable them to contribute differently to board processes and priorities. These unique competencies of resource-rich directors encourage management to adopt specific strategies and actions (Goodstein and Boeker, 1991). According to Hillman, Cannella and Paetzold (2000), expert directors are the firm's support specialists because they provide expertise and also connect the firm to specific identifiable areas where corporate strategies to enhance financial performance would be supported. Expert directors would be efficient in assessing financial and regulatory risks and assist management in effectively develop risk management and financial strategies to avoid risks, violations and fines and ultimately enhance financial performance. Shaukat, Qiu and Trojanowski (2016) cited that financial expert, for instance, would encourage companies to comply with regulatory guidelines and report their financial activities to attract investors. The firm-specific expertise makes directors valuable, enhances the quality of information the directors provide to the board, helps the directors to effectively monitor firm management, and ultimately improves corporate financial performance (Ujunwa, 2012; Dass et al., 2014)

Empirical evidence show that, Gaur, Bathula and Singh (2015) and Bouteska (2020) found a positive significant relationship between board expertise and financial performance. However, Kallamu and Saat (2015) found a significant negative effect of board expertise is on financial performance. Drawing from theoretical and empirical viewpoints, board expertise could potentially enhance financial performance. It is, therefore, hypothesised that:

H4a: There is a positive relationship between board-specific skills and financial sustainability performance

4.2.4.2 Board expertise and social performance

Stakeholder-agency theory predicts a positive association between board expertise and social performance. This is because the experts' knowledge and background can influence how they monitor management's activities to satisfy the interest of all other stakeholders (Dass et al., 2013). Kim et al. (2021) argue that in CSR-oriented companies, experts on the board advise and supervise the top management team to control the long-term investment strategy of the company. Hence, these experts are expected to influence corporate social performance by advising and monitoring executive directors. Directors with firm-specific skills introduce to the board a wide range of knowledge and skills which strengthens board decisions and then improve social sustainability performance (Harjoto, Laksmana and Lee, 2015). Directors who are equipped with industry history and knowledge about social issues are likely to provide the company with new information about the industry. Such directors will be willing to embrace changes and be more considerate in their inputs and concerns for new stakeholders. Directors with specific skills are the firm's source of unique resources that contribute uniquely to the board process and priorities to motivate management to embrace specific strategies and actions which will help the company to improve social activities and consequently social performance (Shaukat, Qiu and Trojanowski, 2016).

The resource dependency theory has suggested that directors' expertise enhances the board advisory function, reduces the information gap, and strengthens the quality of information available to the board to formulate strategies that will help the firm to promote its social performance (Pfeffer and Salancik, 1978; Hillman, Withers and Collins, 2009; Dass et al., 2014). Gray and Nowland (2017) affirm that expert directors convey to the board a wider range of knowledge, perspective, and a set of problem-solving abilities in the form of advice. As part of the advisory function of the board, directors with expertise are more likely to advise management and other board members on social concern issues to improve social performance (Bai, 2013). Empirically, Harjoto, Laksmana and Lee (2015) recorded a positive influence of board expertise on social performance. Based on evidence from theoretical and empirical views which mostly favour the positive effect of board expertise on sustainability performance, this study hypothesises that:

H4b: There is a positive relationship between board expertise and social sustainability performance.

4.2.4.3 Board expertise and environmental performance

The stakeholder-agency theory argues that expert directors help to reduce corporate internal control problems and strengthens the monitoring role of the board (Al-Okaily and Naueihed, 2019). This is because the knowledge and background of the experts are likely to influence their actions in monitoring management to conduct their activities in the interest of all other stakeholders (Dass et al., 2013). An effective board has experts that enforce the proper allocation of resources to distinct activities to motivate managers to attend to stakeholders' environmental claims. The effective oversight duties of resource-rich directors encourages managers to meet stakeholders' environmental demands which then strengthens environmental performance (Kock, Santaló and Diestre, 2012).

The resource dependency role indicates that directors create access to resources and decrease the information gap between the board and management. They have more human and social capital which helps them to provide better advisory services to the board (Pfeffer and Salinkic, 1978, Hillman and Dalziel, 2003). Homroy and Slechten (2019) suggest that directors with environmental expertise can provide the most critical information on environmental management and offer advice on environmental issues. These directors could be environmental experts who can provide the most critical information on environmental management to mitigate environmental hazards. In addition, these experts with their relevant skills can have a direct impact on corporate ethical behaviour in terms of environmental sustainability. Their efficient contribution during decision-making can also accelerate the exchange of environmental strategic information across the boundaries of the company (Homroy and Slechten, 2019). Shaukat, Qiu and Trojanowski (2016) reiterate that directors with specific skills and knowledge are in the best position to advise the board on policies and strategies to manage and prevent risks such as environmental risks. The experts have more understanding of environmental issues, have the analytical skills to analyse environmental opportunities and are conversant with stakeholder effects of environmental actions. These experts, because of their professional standards and reputation, are socially connected so they can link the firm to circles of many environmental opportunities (De Villiers, Naiker and van Staden, 2011).

Empirically, de Villiers, Naiker and van Staden (2011) and Homroy and Slechten (2019) documented a positive significant effect of expertise on environmental performance.

Orazalin and Mahmood (2021) found an insignificant relationship between board-specific skills and environmental performance. It is, therefore, expected that having directors with environmental expertise on the board will have a positive effect on environmental performance. Hence, the hypothesis is formulated as:

H4c: There is a positive relationship between board-specific skills and environmental sustainability performance.

4.2.5 CEO duality

4.2.5.1 CEO duality and financial performance

stakeholder-agency theory contends that CEO duality impedes financial performance because the practice promotes concentration of managerial power which can lead the CEO to have a very strong influence on the firm-stakeholder relationship (Rechner and Dalton, 1991; Jones and Wicks, 1999). CEO duality puts too much decision-making power in the hands of an individual which could interfere with the director's monitoring function over firm policies and elevate the occurrence of agency issues. The CEO may satisfy his interest and infringe on the expectations and demands of stakeholders in a circumstance where the interest of the CEO and stakeholders conflict (Fama and Jensen, 1983; Jensen, 1993), thereby reducing investor confidence in the firm to decrease firm value (Khan, Al-Jabri and Saif, 2021). Hsu et al. (2021) reiterate that CEO duality could mitigate the effectiveness of board monitoring and controlling duties resulting in high information asymmetry and agency costs. Kyere and Ausloos (2020) accentuate that CEO duality impedes board independence, obscures board oversight duties and makes it easier for executive directors to abuse power and engross in fraudulent activities (Hsu et al., 2021).

Khan et al. (2021) agree that duality harms board effectiveness because it takes strenuous effort to remove the CEO at the end of his tenure when duality is in place. Furthermore, duality dwindle the independence of external non-executive directors in performing their duties and responsibilities leading to an increase in agency costs and a decrease in financial performance. Conferring both the chairmanship position and CEO in one person calls for a large number of independent directors thereby augmenting corporate expenses (Dehaene, De Vuyst and Ooghe, 2001). In the nutshell, CEO non-duality dilutes CEO power, reduces the possible entrenchment of the CEO, and strengthens the effectiveness of the board in executing their oversight duties to enhance corporate financial performance (Boyd, 1995; Dehaene, De Vuyst and Ooghe, 2001; Lizares, 2020; Ozbek and Boyd, 2020).

Consistent with theoretical arguments, prior studies empirically documented that CEO duality is negatively linked with financial performance (Lizares, 2020; Ozbek and Boyd, 2020; Ahmadi et al., 2018). Thus, this study posits the following hypothesis:

H5a: There is a negative significant relationship between CEO duality and financial sustainability performance.

4.2.5.2 CEO duality and social performance

The stakeholder-agency theory predicts a negative impact of CEO duality on social performance since it reduces board independence and increases CEO power (Fama and Jensen, 1983). Companies need to meet the demands of all stakeholders, however, as CEO duality give more power to a single person, a CEO who is not interested in social activities might not satisfy the social needs of stakeholders which can harm social performance (Shahzad, Rutherford and Sharfman, 2016; Uyar et al., 2021). According to Kouaib, Mhiri and Jarboui (2020), duality can lead to CEO entrenchment and that may make the CEO more concerned about financial activities and less perturbed about social issues. Additionally, when two individuals are allowed to hold each position separately, it allows for a broader perspective on social performance and adhering to the demands of diverse stakeholders (Zhang 2012). Shahzad, Rutherford and Sharfman (2016) emphasise that CEO non-duality is more favourable to improving the corporate relationship with a wider range of stakeholders.

CEO duality can harm social performance by decreasing the board's monitoring and increasing management fraudulent activities (Shu and Chiang, 2020. In fact the fundamental aim of most companies is to maintain the financial health of the organisation to ensure survival and boost shareholders' confidence (Nguyen et al., 2020) hence, profit maximization plays the central role in management decisions. Consequently, if a CEO who doubles as the board chairs is less concerned about social issues they may have less incentive to pursue CSR activities. Moreover, the entrenchment and power in CEO duality could be a major mechanism to decrease corporate social performance (Shu and Chiang 2020). Therefore, this study expects CEO duality to relate negatively with social performance .

H5a: There is a negative significant relationship between CEO duality and financial sustainability performance.

4.2.5.3 CEO duality and environmental performance

Regarding environmental performance, the stakeholder-agency theory focuses on the monitoring role of the board to argue that duality may increase information asymmetry between the board and management to obscure monitoring. Drawing inferences from the theory, Nguyen, Doan and Frömmel (2020) accentuate that duality may cause conflict between management with short-term financial interest and the board of directors who have an interest in long-term investments towards the attainment of sustainable development goals including enhancing environmental development. Moreover, duality could lead to abuse of power to let the CEO/board chair reduce accountability and transparency of management to stakeholders. Uyar et al. (2021) indicate that CEO duality destroys corporate social responsibility commitment due to power entrenchment. The authors continue that duality leaders are not likely to develop CSR strategies and participate in CSR practices. Thus, separating the positions may provide new knowledge, ensure accountability and strengthen the board's ability to control management opportunistic activities (Naciti, 2019).

When CEOs are concerned about meeting short-term financial objectives, if they are also the chair of the board, the likelihood of implementing long-term strategic environmental investments may be lower. Hence, separating the two roles reduces management and directors' conflicts, increases the board's interests in investing in environmental activities with long term goals. Hussain, Rigoni, and Orij (2018) concluded that duality blurs management control, which may heighten conflicts with stakeholders. Empirically, Lu and Wang (2021), Nguyen, Doan and Frömmel (2020) and García Martín and Herrero (2020) record a negative effect of CEO duality on environmental performance. Accordingly, the hypothesis for this study is formulated as:

H5a: There is a negative significant relationship between CEO duality and financial sustainability performance.

4.2.6 Board gender diversity

4.2.6.1 Board gender diversity and financial performance

Considering that this study defines diversity as a representation of gender differences on corporate boards, Song, Yoon and Kang (2020) from a stakeholder-agency viewpoint argue that women directors are a relatively new group distinct from traditional male directors. Hence, their presence may strengthen board independence to ensure effective monitoring of managers to eliminate information asymmetry and reduce stakeholder-agency costs. Also, it is evident

that female directors have more moral values and are concerned about ethical matters more than their male counterparts (Ozdemir, 2020). Consequently, their inclusion on corporate boards is likely to strengthen the board's oversight of management activities to lessen agency costs and enhance financial performance. Due to the ethical nature of women and their orientation towards social issues, female directors are likely to protect the interest of all stakeholders which may ultimately enhance firm value (Shahzad, Mousa and Sharfman, 2016). Additionally, firms stand a great chance to build a beneficial link with stakeholders to increase financial performance as corporate stakeholders see the diversified board as a symbol of value (Song et al., 2020). According to Galbreath (2011), investors' confidence is raised when firms have a larger proportion of women on their boards because it is perceived that women do a better job by protecting investments from managerial misappropriation.

Gender diversity can facilitate the provision of firm critical resources, increase board legitimacy, and enhance corporate relationships with stakeholders to mitigate firm risk and increase financial performance (Hillman and Dalziel, 2003; Carter, Simkins and Simpson 2003; Sarhan et al., 2018). It is evident in the literature that females are better at creating relationships and bringing important skill sets to the board compared to male directors (Hafsi and Turgut, 2013). Female directors have the cognitive ability to create harmony in groups through effective information dissemination and communication (Post and Byron, 2015). This harmonisation on boards has a greater impact on financial performance because it facilitates effective communication and information processing which the firm needs to quicken decision-making and implement strategies (Erhardt 2003).

Female directors have unique experiences which help them to build differentiated human capital to solve operational problems and link the firm to external resources to enhance firm value as proposed by RDT. Also, gender diversity creates a positive public image which can increase firm financial performance. Gender diversity can be the firm's source of competitive advantage because the greater knowledge base of the women directors can enhance the creativity and innovation that the firm needs to gain a competitive advantage (Erhardt 2003; Khan et al., 2019; Song 2020). It is thus suggested that board gender diversity can enhance board independence and monitoring duties. It can also facilitate corporate investment opportunities, assist firms to gain competitive advantage and legitimacy, and facilitate firms' networks and investment opportunities. Through gender diversity firms can also get access to knowledge, expertise, and ideas to enhance decision-making and consequently increase financial performance.

Empirically, Bonn (2004); Carter et al. (2010) and Prashar and Gupta (2020) indicate that board gender diversity has a positive significant effect on financial performance. However, Hussain et al. (2018) and Fernández-Temprano and Tejerina-Gaite (2020) found an insignificant effect of board gender diversity on financial performance.

In the nutshell, from a theoretical viewpoint and based on literature, it is expected that board diversity impacts positively on sustainability performance. Therefore, it is hypothesised that:

H6a: There is a positive significant relationship between board diversity and financial performance.

4.2.6.2 Board gender diversity and social performance

Board gender diversity can contribute to reducing information asymmetries, conflict of interests, and stakeholder-agency costs in companies and contribute positively to social performance (Veltri, Mazzotta and Rubino, 2021)). Using the stakeholder-agency theory, Velte (2017) explains that women directors may be effective monitoring and controlling mechanisms through which firms can mitigate agency costs because female directors are mostly linked to more independence (Carter, Simkins and Simpson 2003). Given this, women as outsiders with the ability to enhance corporate decision-making will be encouraged to serve the interests of wider stakeholders with a high quality of monitoring to reduce agency costs, strengthen sustainable strategic management concept credibility and increase corporate social performance (Velte, 2017).

Research has shown that different genders react differently to norms, attitudes, perceptions, and beliefs (Beji et al., 2021). The values and professional experience of women are different from that of men. For instance, women have greater sensitivity to social-related issues than men (Uribe-Bohorquez et al., 2019). Also, women seem to have a stronger orientation toward CSR activities than men who are more oriented toward financial performance (Biswas, Mansi and Pandey 2018). Moreover, women are usually known to have a higher perception of risks and have more concern for the needs of others than men (Birindelli, Iannuzzi and Savioli 2019). Female directors are assumed to be characterised by empathy, communication skills, participation, and corporation which influence their greater concern for social issues and consequently lead to higher social performance (Galbreath, 2011; (Veltri, Mazzotta and Rubino, 2021)). Women are less inclined to unethical behaviour and are more socially oriented. Therefore, compared to men, women are more likely to be effective in

decisions regarding corporate social responsibility activities (Jouber, 2021). Women are said to make decisions using their “complex moral reasoning” (CMR), indicating that they recognise and consider the rights of others in their decisions. They are less power-driven, more sensitive, and emotional, and have higher moral standards than men meaning, female directors are more capable to influence firm sustainability commitments than men (Natici, 2019). Board gender diversity satisfies the current demands of stakeholders so including women on the board can contribute to the firm legitimacy and social performance (Velte, 2017).

In terms of education, Female directors are known to have different professional experiences and different knowledge (Beji, 2021). It has been documented that, women are more likely to hold advanced degrees than men (Hillman, Cannella, and Harris, 2002). Hence, through prior knowledge, experience, and values of female directors, they can contribute effectively to strategic decisions to influence social performance positively. Research shows that women are unlikely to have a business background but are rather engrossed in philanthropic and community service activities (Hillman, Cannella, and Harris, 2002). This indicates that the knowledge, experience, and values of female directors are mostly related to social responsibility. Given this, their presence on the board may provide new insights and perspectives on social issues and inform positive strategic decision-making and corporate social performance (Siciliano, 1996; Post and Byron, 2016).

From the legitimacy theory perspective, females on the board can be a mechanism to inform society of the firm’s desire to legitimise its operations in compliance with the expectation of society (Suchman, 1995). Given that women are sensitive to social performance activities, organisation enhances their legitimacy through the intellectual and interpersonal attributes of women (Shakil, 2020). Including women on corporate boards is the current demand of society as it is seen as a non-discriminatory practice that can enhance firm legitimacy and competitive advantage to promote social performance (Velte, 2017). Zhang (2013) explains that women strengthen the salience of stakeholder claims to affirm a firm’s moral legitimacy. Women’s sensitivity towards community services coupled with their backgrounds and experiences impact their decisions related to pro-social issues. Besides, they have some psychological traits like affection, helpfulness, kindness, concern about others’ welfare, and nurturing which may contribute to their hearing of certain stakeholders’ claims (Eagly et al., 2003). Additionally, women may bring unique resources to enable the firm to connect to stakeholder groups which then helps to obtain stakeholder acceptance (Zhang, 2013). Women will consequently play a distinct role in enhancing corporate moral legitimacy

in its industrial context. Empirical evidence from Kyaw et al. (2017), Macaulay et al. (2018), and Hussain et al. (2018) indicate that the presence of females on the board significantly influences social performance positively.

In the nutshell, from a theoretical viewpoint and based on literature, it is expected that board diversity impacts positively on sustainability performance. Therefore, it is hypothesised that:

H6b: There is a positive significant relationship between board diversity and social sustainability performance.

4.2.6.3 Board gender diversity and environmental performance

Women foster a good relationship with stakeholders, their presence increases management monitoring and strengthens the firm's interest in environmental practices (Martínez-Ferrero et al., 2020). Women have ethics of caring and considering the interests of multiple stakeholders more than men. Hence, a higher proportion of women on boards is likely to encourage companies to include the interests of wider stakeholder groups in their policies (Nadeem et al 2020). Cordeiro, Profumo and Tute (2020), using stakeholder-agency theory, concluded that gender diversity seems to be more socially responsible which enhances board decisions to contribute positively to environmental performance. Also, women are known to possess more ethical and social capabilities than men and are more likely to be socially and environmentally responsible (Martínez & Gallego-Álvarez, 2019). Consequently, they can exert pressure on companies to embrace diverse environmental practices to meet stakeholders' expectations.

Women directors are important internal human resources that may provide many competencies and stakeholder-related value to the firm board and increase environmental performance (Shaukat, Qiu and Trojanowski, 2016). The RBV argues that including women on the board provides unique resources and enhances the board's competence which is a great source of corporate competitive advantage (Wellalage and Locke, 2013). Diversity leads to greater variability of ideas, perspectives, knowledge, creativity, and innovation which becomes a competitive advantage to the firm (Carter, Simkins and Simpson 2003). Women and men bring diverse viewpoints, priorities, values, and resources to the firm. Therefore, the new insights and perspectives women will provide on the natural environment may add positively to board decision making to influence environmental performance (Lu and Herremans, 2019; Berindeli et al., 2020). Lu and Herremans (2019) found that females on corporate boards bring unique resources to boards concerning environmental performance. This is because women

contribute by bringing their educational background, experience, and talent to strengthen corporate interest in environmental objectives (Martinez-Ferrero et al., 2020).

Shaukat, Qiu, and Trojanowski (2016) in line with the RBV found that when women are part of the corporate social responsibility-oriented board, the company is likely to establish a proactive and detailed board CSR strategy to achieve higher environmental performance. This is because studies have shown that compared to business experts, women are likely to be supported by specialists or community influentials (Hillman, Cannella, and Paetzold, 2000). Notably, women directors are inclined to support others and partake in solving relational and interpersonal issues. Given this, with the sensitive nature of women in some organisational practices, it is very likely for them to exert influence on decisions relating to environmental issues (Shaukat, Qiu, and Trojanowski, 2016) to increase environmental performance. The study concludes that women on board have a positive influence on corporate social orientations as they are more sensitive to the demands of stakeholders and not just shareholders.

Legitimacy theory favours the positive link between gender diversity and environmental performance because board gender diversity can enhance the reputation and image of the firm through an increased commitment to the environment and society as a whole (Elmaghri et al., 2018). Empirically, Lu and Herremans (2019); Martín and Herrero (2020) and Cordeiro, Profumo and Tutore (2020), provide a positive significant relationship between board gender diversity and environmental performance. Galbreath (2011) however, found that women directors may have no significant on environmental performance.

In the nutshell, from a theoretical viewpoint and based on literature, it is expected that board diversity impacts positively on sustainability performance., hence, the hypothesis here is that:

H6c: There is a positive significant relationship between board diversity and environmental performance.

4.3 Conclusion and summary

SDGs has ignited the need to understand the board's effectiveness towards corporate financial, social and environmental performance. However, evidence in literature explaining this important concept is scanty. Hence, to contribute to empirical literature, this study, has developed testable hypothesis to examine how board structure affect financial, social and environmental performance. A total of eighteen (18) hypotheses have been formulated for the independent variables which are board size, board independence, board committees, board expertise, CEO duality, and board diversity. These hypotheses have been presented with their appropriateness explained through theoretical underpinnings and existing literature. Firms face a lot of pressure from stakeholders making it more likely for board structure to substantially impact the three dimensions of sustainability performance.

CHAPTER FIVE

RESEARCH METHODOLOGY

5.1 The research philosophy

Research philosophy revolves around the systems of beliefs and assumptions about the development of knowledge (Saunders, Lewis and Thornhill, 2019). It expounds on the various assumptions made by researchers to underpin the research strategy (Flick, 2011; Burrell and Morgan, 2019). It also builds how researchers understand their research questions, methods, and the interpretation of their results (Crotty, 1998). It demands analysing the essence of knowledge, how knowledge came into existence and its mode of transmission (Patton, 2002). The research philosophy is the foundation for the research strategy because they reflect the pivotal assumptions of the researcher (Dudovskiy, 2014). It is, therefore, highly important for each researcher to bring out the philosophical assumptions underpinning their studies. The major concepts in the literature which define the individual researchers' philosophical assumptions are axiology, ontology, epistemology, human nature, and methodology (Burrell and Morgan, 1979; Mertens and Wilson, 2012). However, it is noted that ontology and epistemology are the two predominant assumptions in business and management research (Saunders, Lewis and Thornhill, 2019; Hürlimann, 2019).

The axiological assumption is related to the nature of ethics, value, aesthetics and religion (Lincoln and Guba, 2005; Mertens and Wilson, 2012). Axiology guides investigators to judge their moral values and how their research is influenced by these beliefs (Hürlimann, 2019). Ontology, classified as the genesis of every research by Grix (2002), relates to the assumption of individual viewpoints about the form and nature of reality and how people relate to such viewpoints (Hürlimann, 2019). The researcher's ontological view shapes how they perceive and study the objects of their research. According to Burrell and Morgan (1979), ontology has two contrasting views; the subjective view (Nominalism) and the objective (Realism) of social science. From the subjective perspective, human actions and perceptions form social reality and this reality is created based on the use of names, concepts, and perceptions. However, the underlying reality of the social world is limited to the attributes social actors give (Saunders, Lewis and Thornhill, 2019). Realists equate social entities to the

physical entities of the natural worlds. They assume that the world exists independently of human awareness and perception (Holden and Lynch, 2004).

The second set of assumptions is epistemology which is about the study on the grounds of knowledge (Burrell and Morgan, 1979; Trochim, 2000). It explains the means through which one can receive and gain knowledge of the world (Hughes and Sharrock 1997). Singh (2006) explains that the validity of our knowledge and the authenticity of the source of human knowledge can be related to epistemology. It guides us to know what we should impact on others and how this knowledge should be impacted (Burrell and Morgan, 2016). It is a means through which we come to know the existence of something and how we know the reality (Kivunja and Kuyini, 2017). The meaning of validity of knowledge and reliability of the sources of knowledge are subjected to opinions. Hence, researchers need to identify, explain and justify their epistemological stance (Crotty, 1998). The two contrasting positions under epistemology are positivism and anti-positivism (Burrell and Morgan, 1979).

Human nature is an assumption about the relationship between human beings and the environment. According to Burrell and Morgan (1979), the relationship that exists between the two could be determinism or voluntarism. The determinist thinks that the activities of human beings are completely influenced by the situations in their environment. However, the voluntarist asserts that man creates his environment and is autonomous of it implying that human activities are not determined by their environment.

The two contrasting assumptions under methodology are ideographic and nomothetic. Under ideography, researchers are encouraged to acquire first-hand information to understand the social world. It further recommends that for researchers to have in-depth knowledge of the subject matter, they must be fully involved (Saunders et al., 2009). Nomothetic explains the approaches for studying social sciences by recommending natural science methods (Cohen et al., 2007).

5.2 Research Paradigms

Though Researchers may have different views, beliefs and processes regarding their studies, they are guided by a set of rules and assumptions in their field of study. This set of rules and beliefs guiding the steps and choices of the researchers are called research paradigms. Kuhn (1970) defines a paradigm as the set of common beliefs and agreements of scientists in addressing and understanding problems. According to Guba and Lincoln (2004), a paradigm is a system of worldviews that leads the researcher to make choices in methods and philosophical

assumptions. The main philosophical underpinnings of research paradigms in business studies are Positivism, anti-positivism, critical realism, postmodernism and pragmatism (Saunders, Lewis and Thornhill, 2019).

5.2.1 Positivism

Positivism is grounded in the scientific method of investigation which applies an experimental process to search for cause-and-effect relationships in nature (Kivunja and Kuyini, 2017). Positivists believe that reality in the social world is external and objective. As objectivists, research is conducted independently of the observations, values, beliefs and interests of the researcher. Researchers remain neutral throughout the research period with the expectation that social observations be treated as entities as physical scientists treat physical entities (Johnson and Onwuegbuzie, 2004). This paradigm expects the researcher to eliminate all forms of biases, emotions, and involvement from the object of study. The positivists concentrate rigorously on scientific empiricist methods created to give pure data and facts unadulterated by human interpretation (Saunders, Lewis and Thornhill, 2019).

Ontologically, positivists assume that realism exists outside the mind (Crotty, 1998). The researcher examines causal relationships in data to conduct value-free independent research using the scientific method, and observable and measurable facts to obtain law-like generalisation findings (Saunders, Lewis and Thornhill, 2019). The positivist depends on deductive logic and indulges in the “hypothetico-deductive process” which involves the formulation of a hypothesis, and applying quantitative methods to test or empirically justify the hypothesis (Holden and Lynch, 2006; Kivunja and Kuyini, 2017). Positivists intend to depend on measurable outcomes to make predictions and deliver explanations. The measurable outcome derived from research under positivism is expected to be guided by the assumptions of determinism, empiricism, parsimony and generalisability (Kivunja and Kuyini, 2017). Positivism embraces objectivity and supports a quantitative approach to research methods. With this, researchers will have more statistical reliance and generalisation to improve universal laws and results.

This approach is more appropriate for this study which intends to investigate the relationship between board structure and sustainability performance because the researcher aims to exhaust the conventional evaluative corporate governance research that shows the qualities of quantitative methodology. The researcher, to distinguish human knowledge and science, will be detached from the study participants and remain neutral throughout the study

period. Given this, the research aims to maintain an objective position and interpret results from a logical and scientific perspective. The current research shares the epistemological views of positivism that knowledge is quantifiable and observable and can be obtained in the social world and proposes to build hypotheses while relying on existing theories.

5.2.2 Anti-positivism (Interpretivism/constructivism)

From the perspective of this paradigm, as the human and social world is different from the physical world, research conducted in social sciences should be different from the natural sciences. The main tenet of this anti-positivism is that reality is socially constructed (Bogdan and Biklen, 1998) and this makes the researcher take cognition from the viewpoint of his participants and their interpretation of his social world (Kivunja and Kuyini, 2017). Contrary to the positivist epistemological view, an interpretivist will need to bring his opinions into the study to gain knowledge (Hürlimann, 2019). Interpretivism assumes reality as subjective to human experience, which calls for the need for researchers to penetrate the human world to understand and appreciate human experiences (Cohen et al., 2011).

Contrary to the hypothetico-deductive in positivism, anti-positivism researchers interpret the actions of their objects by using their own subjective framework. Under constructivism, the research questions and problems are developed grounded on the researcher's interest, involvement and commitment which leads the researcher to have an in-depth individual experience. The researcher adopts qualitative designs and methodology to conduct the studies for deep insights into the subject matter (Alharahsheh and Pius, 2020). Contrary to the aim and the objectives of this current study, this paradigm provides more detailed conclusions but lacks generalisability in its interpretations (Alharahsheh and Pius, 2020).

5.2.3 Critical Realism

Critical realism combines the stance of both positivism and interpretivism. The ontological view of the realists is that it is independent of human awareness and imagination, made up of different layers of structures and mechanisms and understood by observation and experience (Bhaskar, 1975). Contrary to Positivism, critical realists mostly conduct in-depth historical analysis research to find underlying causes and meanings to social structures which have given rise to phenomena (Reed, 2005). They acknowledge that social facts do not live independent of people but are socially constructed and knowledge is historically situated (Bhaskar, 2008).

Therefore, methodologically, critical realists adopt a retrodiction research strategy and design to discover the underlying and unobservable structures that act in certain social situations (Reed, 2005). The focus of this study is driven by the positivism paradigm as it aims to analyse impacts and effects on phenomena and draw conclusions which can contribute ideas to improve universal laws (Kivunja and Kuyini, 2017) but not the realism paradigm which is more enthused about finding reasons for historical events (Reed, 2005).

5.2.4 Postmodernism

From the postmodernist's perspective, the sense of social world order comes forth through language. However, language is partial and insufficient to detail all aspects in its description. Impliedly, the world has another dimension that is marginalised and suppressed but human perceptions and beliefs are confined to the dominant interpretation of order in the social world (Saunders, Lewis and Thornhill, 2019). Postmodernism examines the overlooked, the left out and what is generally forgotten (Kilduff and Mehra, 1997) to give a voice to the marginalised and excluded knowledge (Chia, 2003). Postmodernism tries to discover and inquire about the power of relations that hold dominant realities (Calás, M. and Smircich, 1997). Therefore, it is mostly associated with methods like deconstructionism (Fielding, 2009). A postmodernist researcher needs to be completely involved in the research process because the assumption is that scientific work happens with respect to interpretation (Kilduff and Mehra, 1997). With postmodernism, researchers indulge in a detailed examination of a few cases to provide as vivid a comprehensive report as possible (Kilduff and Mehra, 1997). Unlike the positivists, postmodernists are more related to subjective researchers with qualitative non-generalisable results (Kilduff and Mehra, 1997) making their views unsuitable for this current research.

5.2.5 Pragmatism

Pragmatic philosophers have explained that a single paradigm is not good enough to fully assess and understand the real world and that researchers should consider research methods that are most suitable for investigating the phenomenon at hand. Impliedly, the choice of the research method depends on the purpose of the research (Kivunja and Kuyini, 2017). The essence of pragmatism is to effectively mix research methods in such a manner that the best approach to answer relevant research questions is selected (Johnson and Onwuegbuzie, 2004). Ontologically, pragmatists argue for the non-existence of a singular reality, but rather, allow different people to interpret reality differently in their unique way and determine the

appropriate research approach to a specific study. This paradigm tries to mutually accommodate both subjectivism and objectivism, fact and values, accurate and rigorous knowledge and various contextualised practices to conduct value-laden research (Kivunja and Kuyini, 2017; Saunders, Lewis and Thornhill, 2019). A Pragmatic researcher, to answer their research questions effectively, will employ multiple data collection methods, apply both qualitative and quantitative data collection sources, and will concentrate on the practical outcome of the study to effectively resolve a research problem (Creswell, 2007). Though pragmatism offers a flexible method of research (Kaushik and Walsh, 2019), the combination of multiple methods could create inconsistency in addressing research problems. Because of this, the current study would focus on adopting one methodological approach (hypothetico-deductive process) instead of multiple methodological approaches as proposed by pragmatism.

5.3 The research Approach

Scientific reasoning specifies the approach researchers adopt in designing their research (Saunders, Lewis and Thornhill, 2019). Scientific reasoning forms the basis for the research design which helps in the formulation of hypotheses, building, and testing of theories. The two contrasting views in scientific reasoning that researchers mostly adopt are induction and deduction (Johnson and Onwuegbuzie, 2004; Ketokivi and Mantere, 2016). A researcher using an inductive approach starts with data and observation to produce a hypothesis and theories (Singh, 2006). Inductive reasoning makes inferences from empirical data to develop theoretical explanations (Ketokivi and Mantere, 2010). As inductive reasoning is more concerned with a specific event, a study of this nature selects a small sample of the subject to observe instead of a large sample as in deductive reasoning. This approach works better with qualitative data and different methods of collecting data are employed to establish diverse opinions about an event and this is contrary to the interests of this study. Inductive reasoning is more related to humanities and places significance on subjective interpretations, making it closely aligned with interpretivism (Saunders, Lewis and Thornhill, 2019).

The basis of the deductive approach is the relationship between a set of premises and its conclusions. It is said to use the backward movement approach because it starts with a set of theories and general premises of an event and moves towards a more specific outcome (Singh, 2006). The deduction process starts with the formulation of a hypothesis from a theory, then, testable propositions are deducted, and an appropriate research methodology is designed to test the hypothesis. Observations are then tested after critically analysing an expected

pattern. An observation is critically used to test the hypothesis to either confirm or reject it. The conclusion is drawn based on the consistency between the premises and the outcome. In a situation where the analysis is consistent with the premises, the outcome is accepted. The analysis is however rejected when the premises are inconsistent with the analysis (Saunders, Lewis and Thornhill, 2019). The deductive approach is mostly related to scientific research because it is a quantitative research approach that explains the causal relationships between variables. Most results obtained using a deductive method are generalisable (Johnson and Onwuegbuzie, 2004). The current study aims to achieve its set objectives by underpinning the study with sets of theories and formulation of hypotheses to achieve a specific outcome. This study is more in tune with the deductive method as it intends to analyse and test observations to either confirm or reject the formulated hypothesis. The deductive approach is more related to the positivism philosophy which underpins this study.

5.4 Research Methods

The research methods employed for a particular study show the strategies, processes, and techniques a researcher intends to adopt to collect data, analyse and solve the research problems at hand. The choice the researcher makes in terms of research methods is most often reflective of his ontological and epistemological stance together with the theoretical orientation of the research (Bryman and Bell, 2007). The literature identifies quantitative and qualitative as the two predominant research approaches to conduct research (Creswell, 2015).

5.4.1 Quantitative research

Quantitative research methods use a statistical approach or procedures to design research and analyse data (Creswell, 2015). It is specific to its observation and analysis because it is developed through theories (Williams, 2007). The methodology of quantitative research methods keeps the assumption of the positivism paradigm (Johnson and Onwuegbuzie, 2004). The data collection choices are determined using objective criteria and the researcher remains independent throughout the research period (Holden and Lynch, 2006). A quantitative researcher aims to determine the causal relationship between variables and to establish generalisations to contribute to theory. Hence, hypotheses are tested, and deductions are made through observations to either confirm or falsify these hypotheses (Williams, 2007). Reports and evaluations in quantitative research follow a standardised structure through a predictable pattern. The researcher uses methods that eliminate personal biases and values because the

researcher utilises devices that have proven value and have also received reliability and validity scores from previous users. This makes it relatively easier to validate the reliability, validity and quality of quantitative research reports (Creswell, 2015). The quantitative method is more applicable to this study since the study intends to keep to the assumptions of the positivism paradigm, use a deductive approach and also try to eliminate personal biases and values.

5.4.2 Qualitative research

The qualitative research method accentuates the use of words to collect and analyse data instead of numbers (Gelo, Braakmann and Benetka, 2008). Qualitative researchers use interviews, observations, and close interactions with participants to gather information for their study (Creswell, 2007). The observer gathers such information from multiple sources after which it is reviewed and organised into common groups. Qualitative research adopts inductive reasoning (Williams, 2007). The research starts from a specific observation that poses a question that demands answers from the researcher to help develop theories and generalisations (Soiferman, 2010). Unlike quantitative research, the interpretation of the social world is understood from the participants' perspective and not the researcher's (Bryman and Bell, 2011). A qualitative researcher may need to make some changes to the initial plans for the research as he keeps moving back and forth between data collection and analyses (Soiferman, 2010). According to Williams (2007), qualitative research describes, explains and interprets data. The researcher uses a descriptive format to make his personal judgement of the data which allows the researcher to contribute his own views to the interpretations. Together with the interpretations from participants, qualitative research allows for the provision of a complete understanding of social phenomena (Creswell, 2007). The researcher's values have a significant influence on the study because the researcher gets fully involved throughout the process. Also, the interpretations of the results are subjected to the views of the researcher. Therefore, qualitative research is seen as value-laden as opposed to value-free in quantitative research (Johnson and Onwuegbuzie, 2004). Qualitative research aims to allow researchers to identify the different and complex factors in situations using multiple views as opposed to finding cause-and-effect relationships between variables (Creswell, 2007). Qualitative research is closely linked to the interpretivism/constructivism paradigm with their subjective views making it the best approach to conduct an in-depth study on a limited number of cases to suit a local situation and stakeholders' needs. However, due to its subjective nature, it has often

been criticised for not allowing generalisability to other settings (Johnson and Onwuegbuzie, 2004).

5.5 Research design

According to Creswell and Creswell (2018), the research design is the systematic strategies the researcher adopts to collect, analyse and interpret data. The authors describe quantitative research design as the procedure of enquiry that adopts quantitative methods and relates mostly to the post-positivist/positivist worldview. This strategy of enquiry applies to research in which data can be collected in a single case (case study design) or multiple cases (cross-sectional) and multiple-time periods (longitudinal design). In this research, the longitudinal design is adopted. The longitudinal design is suitable for this study because it allows the researcher to examine the direction of sustainability performance for data collected over a six (6) year period from 2015 to 2020.

5.6 Data Collection Sources and sampling

To test the hypothesis and meet the set objectives for the research, the study adopts the secondary data collection method to gather the needed data for the study. Accordingly, the data for companies' performances in financial, social, and environmental activities, governance variables and any other firm-related information were taken from the Refinitiv database (formerly known as the Thomson Reuters Asset4) and country-level data was collected from the World Bank Indicators (WDI). The time range for the data collection was over a six-year period spanning from 2015 to 2020.

The Refinitiv is chosen mainly because it is considered to offer a comprehensive worldwide database on financial, social and governance variables (Haque and Ntim, 2018). The reliability of the Refinitiv database has been affirmed by the academic community and other users of corporate information. For instance, Cheng, Ioannou and Serafeim (2014) contend that the database specialises in offering objective, relevant, auditable, and systematic ESG information to users. It provides a comprehensive systematic platform that establishes customisable benchmarks (e.g., industry and country) for the assessment of the performance of publicly traded firms (Orazalin and Mahmood, 2021). The database provides industry-leading data on financial ratios, company fundamentals, CSR committees and others. Uyar et al. (2020) noted that the data on company fundamentals that Refinitiv provides is equivalent to 99% of the world market capitalisation which extends to over 150 countries and more than 72,000

listed firms. Also, the database permits the retrieval of ESG-related data on thousands of companies. The Refinitiv database is, thus, selected on the basis that it is broader enough to cover a wide range of industries around the world. It is also enriched with large companies which may provide standards as far as sustainability performance is concerned. Refinitiv is the ruling ESG database that is extensively used by scholars, investors, and practitioners (Cheng, Ioannou and Serafeim, 2014; Haque and Ntim, 2018; Uyar et al., 2020; Orazalin and Mahmood, 2021). In addition, the study collected longitudinal data on country indicators namely, inflation, gross domestic product (GDP), control of corruption, regulatory quality, rule of law, and voice and accountability from the World Bank Governance Indicators database to examine country governance quality.

This study, unlike most prior studies, aims to intensify the knowledge of board structure's impact on sustainability in a wider range of industrial sectors hence it includes both financial and non-financial firms in the analysis. The study started analysis with data from 2015 because it was the period for the launch of the seventeen sustainable development goals (SDGs) and the commencement of agenda 2030 (United Nations, 2015). The study aims to investigate the progress of performance after the outdoor of SDGs and how the board of directors affect this new development. The year 2020 was the most recent year for which data was available at the time data was gathered for this study. Also, the choice of the countries emulates evidence from prior studies which investigate the influence of some corporate governance structures and individual dimensions of sustainability performance (Naciti, 2019; Pucheta-Martínez and Gallego-Álvarez, 2020).

The study of an international-based sample will expand the literature on how board structure influences sustainability performance as the institutional environment among countries varies. The major factors influencing governance structures are the institutional dimensions, the legal systems, culture and laws in countries and the degree of enforcement of these laws (Claessens and Yurtoglu, 2013) which invariably impacts strategic decisions relating to sustainability performance. As the governance regulations around the world are very fragmented (Chanda, Burton and Dunne, 2017), including companies from a diverse environment will enhance the generalisability of the results globally (Pucheta-Martínez and Gallego-Álvarez, 2020). Consistent with previous studies (Naciti, 2019; Pucheta-Martínez and Gallego-Álvarez, 2020), the selected countries would be grouped into six geographical regions namely Africa, Asia, Europe, Latin America, North America, and Oceania.

The initial sample for this study consists of 9,882 international companies and a total of 59,292 firm-year observations between 2015 and 2020. These companies operate in six different industries and have data coverage from the Refinitiv database. Initially, the study considered all listed international companies whose data were available on the Refinitiv database. However, to ensure consistency and preciseness, countries with very scanty data on financial performance indicators (ROA), corporate governance variables, and social and environmental performance or countries without country-level data available on the worldwide indicators database were removed to avoid skewness. Next, it was observed that countries with a year or two of available data for social and environmental pillar scores similarly had very scanty or unavailable data for most board structure variables and firm value data which is critical for this study. The observations with this missing information were deleted. In all, a total of 17,148 firm-year observations consisting of 2,858 companies were eliminated from the study sample. The study sample is unbalanced because of the uneven distribution of the data. Though some firms have social and environmental data for the period employed, not all firms were observed because some had data for less than three and four years during the period explored. Therefore, the final sample for the study is based on a total of 7,024 international companies with a total of 42,144 firm-year observations from 2015 to 2020 operating in six different industries.

The industries are shown in Table 4.1, where observations by industry type and their frequencies are displayed. The industrial, other financial institutions and banks have the highest percentage representing observations of 70.64%, 9.8% and 8.35% respectively. Table 5.2 shows that 79.23% of companies for the study are non-financial companies and 20.77 are financial companies. These industries operate across 70 countries in Africa, Asia, Europe, North America, South America, and Oceania between 2015 and 2020. In table 5.3 where the sample observations by countries and their distributions are shown, the countries with the highest representation of companies are the United States with 37.67% of companies, followed by Japan with 6.15%, the United Kingdom with 5.32% and Australia with 4.83%. According to Table 5.3, the countries with the least firms are Sri Lanka, Slovenia, Nigeria, Mauritius, Liechtenstein, and Kenya and each one is represented by a sample of 1%. These countries have been grouped into six big geographical areas to control regional effects. Also, incorporating companies in regions with diverse institutional factors with different legal origins increase results robustness and generalisation. Accordingly, table 5.4 shows that developed countries have a higher representation of companies by 80.51% and developed countries take the

remaining 19.49%. Table 5.5 presents companies' observations frequencies by their legal origins; (common and civil law). From the table, companies from countries with common law systems are highly represented with a frequency of 64.22% and companies from civil law countries account for the remaining 35.78. In table 5.6, the observation by continent and their frequencies are also shown. North America has the highest representation of 46.24%, followed by Europe with 22.15%, Asia places third with 20.77% representation, Oceania has 5.61%, South America has 3.36% and Africa has the least representation of 1.87%.

TABLE 5.1 SAMPLE DISTRIBUTION BY INDUSTRY

<i>Industry</i>	<i>Freq.</i>	<i>Percent</i>	<i>Cum.</i>
Industrial	29,712	70.64	70.64
utility	2,454	5.83	76.48
transportation	1,140	2.71	79.19
Bank (savings and loans	3,510	8.35	87.53
Insurance	1,122	2.67	90.2
Other financials (diversified financials, mortgage real estate investment trusts (REITs), capital markets, consumer finance	4,122	9.8	100
Total	42,060	100	

TABLE 5.2 NUMBER OF OBSERVATIONS BY SECTORS

	<i>Freq.</i>	<i>Percent</i>	<i>Cum.</i>
Non-financial	33,390	79.23	79.23
Financial	8,754	20.77	100
Total	42,144	100	

TABLE 5.3 NUMBER OF OBSERVATIONS BY COUNTRY

Country	Freq.	Percent	Cum.
ARGENTINA	300	0.71	0.71
AUSTRALIA	2,034	4.83	5.54
AUSTRIA	174	0.41	5.95
BAHAMAS	12	0.03	5.98
BAHRAIN	36	0.09	6.06
BELGIUM	282	0.67	6.73
BERMUDA	588	1.4	8.13
BRAZIL	564	1.34	9.47
CANADA	1,770	4.2	13.67
CAYMAN ISLANDS	894	2.12	15.79
CHINA	1,968	4.67	20.46
CHILE	252	0.6	21.06
COLOMBIA	126	0.3	21.36
CYPRUS	12	0.03	21.38
CZECH REPUBLIC	18	0.04	21.43
DENMARK	246	0.58	22.01
EGYPT	60	0.14	22.15
FINLAND	210	0.5	22.65
FRANCE	828	1.96	24.62
GERMANY	960	2.28	26.89
GREECE	150	0.36	27.25
HONG KONG	384	0.91	28.16
HUNGARY	30	0.07	28.23
INDIA	690	1.64	29.87
INDONESIA	258	0.61	30.48
IRELAND	288	0.68	31.16
ISRAEL	138	0.33	31.49
ITALY	528	1.25	32.74
JAPAN	2,592	6.15	38.9
JORDAN	6	0.01	38.91
KAZAKHSTAN	12	0.03	38.94
KENYA	6	0.01	38.95
KUWAIT	66	0.16	39.11
LIECHTENSTEIN	6	0.01	39.12
LUXEMBOURG	156	0.37	39.49
MALAYSIA	342	0.81	40.3

TABLE 5.3 CONTINUED

Country	Freq.	Percent	Cum.
MALTA	24	0.06	40.36
MAURITIUS	6	0.01	40.38
MEXICO	288	0.68	41.06
MOROCCO	18	0.04	41.1
NETHERLANDS	426	1.01	42.11
NEW ZEALAND	330	0.78	42.9
NIGERIA	6	0.01	42.91
NORWAY	294	0.7	43.61
OMAN	60	0.14	43.75
PAKISTAN	30	0.07	43.82
PANAMA	36	0.09	43.91
PERU	174	0.41	44.32
PHILIPPINES	156	0.37	44.69
POLAND	246	0.58	45.27
PORTUGAL	84	0.2	45.47
PUERTO RICO	24	0.06	45.53
QATAR	96	0.23	45.76
ROMANIA	12	0.03	45.79
RUSSIAN FEDERATION	258	0.61	46.4
SAUDI ARABIA	192	0.46	46.85
SINGAPORE	252	0.6	47.45
SLOVENIA	6	0.01	47.47
SOUTH AFRICA	678	1.61	49.07
SOUTH KOREA	810	1.92	51
SPAIN	414	0.98	51.98
SRI LANKA	6	0.01	51.99
SWEDEN	720	1.71	53.7
SWITZERLAND	720	1.71	55.41
THAILAND	258	0.61	56.02
TURKEY	300	0.71	56.73
UGANDA	12	0.03	56.76
UNITED ARAB EMIRATES	102	0.24	57
UNITED KINGDOM	2,244	5.32	62.33
UNITED STATES	15,876	37.67	100
Total	42,144	100	

TABLE 5.4 GROUPINGS BY ECONOMIC STATUS

	Percent	Cum.	
Developing	8,214	19.49	19.49
Developed	33,930	80.51	100
Total	42,144	100	

TABLE 5.5 GROUPINGS BY LEGAL ORIGIN

	<i>Freq.</i>	<i>Percent</i>	<i>Cum.</i>
Common law countries	27,066	64.22	64.22
Civil law countries	15,078	35.78	100
Total	42,144	100	

TABLE 5.6. OBSERVATIONS GROUPINGS BY GEOGRAPHICAL REGIONS

<i>Continent</i>	<i>Freq</i>	<i>Percent</i>	<i>Cum</i>
Africa	786	1.87%	1.87%
Asia	8,754	20.77%	22.64%
Europe	9,336	22.15%	44.79%
North America	19,488	46.24%	91.03%
Oceania	2,364	5.61%	96.64%
South America	1,416	3.36%	100.00%
	42,144	100.00%	

5.7. Measurement of variables

5.7.1 Dependent variables

5.7.1.1 Financial performance measure

The idea of sustainable development and its triple bottom line (TBL) dimensions gradually moved from an ambiguous and typically qualitative concept to more accurate specifications which are mostly defined in quantitative terms (Moldan, Janoušková and Hák, 2012). Therefore, this study, in all possibilities, tries to measure quantitatively all the dependent variables. For the examination of sustainability, the study employs measures for economic, social, and environmental dimensions (Elkington, 1997; Hussain et al., 2018). The economic dimension could be aligned to the improvement in the economic standard of living or based on the firm-centric financial performance or both (Sheth, Sethia and Srinivas, 2011). Following the studies of Cancela et al. (2020), we define the economic dimension in this study by using the financial performance of the firm to ascertain economic profitability (Cancela et al., 2020). Thus, the financial performance is determined using an accounting-based measure, the return on assets (ROA).

Research indicates that accounting-based measures (ABMs) are the most popular applied in corporate governance literature (Tho, Dung, and Huyen., 2021). ABMs demonstrate historical, operation-orientated information and are generally treated as a measure of past or short-term financial performance (Gentry and Shen, 2010). These measures are historical indicators that concentrate on the stewardship of firm management (Christensen, Kent and Stewart, 2010). It has been argued that ABMs gained popularity because data for ABM are mostly available and accessible and can be observed over shorter intervals (Hax, 2003). Some examples of ABM include return on assets (ROA), return on sales (ROS), return on equity (ROE), Return on Capital Employed (ROCE), Profit margin, cash flows and others.

The relevance of ABMs has been acknowledged in the literature. First, it has been observed that ABMs are good performance indicators which provide a better predictor of firm performance (Masa'deh et al., 2015). Also, the availability of accounting numbers on firm profitability allows investors to have a critical examination of investment opportunities. Information on past and current profitability enable investors to make business decisions with the expectation of making some profit in the future. Moreover, this information can assist

managers during strategic decision-making processes (Tho et al., 2021). However, critics have contended that ABMs do not consider all relevant information as it is confined to a single aspect of financial performance. Considering that ABMs do not normally consider differences in systematic risk, tax laws and accounting conventions, critics have mentioned the likelihood of providing distortion and varied results across industries as against firms (Singh et al., 2018). In addition, the rules in financial measurement create room for information asymmetry which allow for managerial manipulation and distortion (Hax, 2003; Gentry and Shen, 2010; Masa'deh et al., 2015) Tho et al. (2021) further stated that ABM is not efficient enough to be able to identify the overall success factors of a company.

Despite the criticisms, the proxies of ABM have been used extensively in literature as a measure of financial sustainability performance. Boyd (1995) proxied average return on investment as a firm performance indicator to assess how CEO duality affects firm value between 1980 to 1984. Bouaziz and Triki (2013) also investigated the effect of board characteristics on performance using Tunisian companies and utilised ROA and ROE as their proxies for financial performance. Cancela et al. (2020) employed ROA when examining the link between corporate governance and sustainability performance and utilised ROA as a measure of economic sustainability performance indicator. Recently, Roffia, Simón-Moya and Sendra García (2021) applied ROA as an accounting performance measure in examining the effect of the board of director attributes on financial performance in SMEs. Hence, this study adopts ROA as a proxy for financial performance. According to Christensen, Kent and Stewart (2010) ROA is an ideal measure for analysing the board structure-performance relationship because leverage, extraordinary items and other discretionary items do not affect it. Mangena, Tauringana and Chamisa (2012) reiterate that ROA is a more prevailing measure of financial performance compared to other ABM because it possesses more required distributional properties. ROA also helps to assess the quality of management and allows investors to assess the potential growth of a company (Cancela et al., 2020). ROA has been used by a wide range of studies in the corporate governance literature (See, Afrifa and Tauringana, 2015; Abdullah et al., 2016; Cancela et al., 2020; Hsu et al., 2021). This study then adopts ROA to assess the influence of board structure on corporate financial sustainability performance.

5.7.1.2 Social and environmental performance measures

In addition to financial performance, corporate social performance and corporate environmental performance are the other two dependent variables selected for this study (to

ascertain true sustainability). Consistent with previous studies (e.g., Biswas, Mansi and Pandey, 2018; Orazalin, 2020a; Orazalin and Mahmood, 2021), the study measures the level of social and environmental performance using scores obtained from the Refinitiv database. The social performance in Refinitiv (formerly known as the Asset4 database) measures the firm's capacity to create trust and loyalty with its workforce, customers and society through the use of best management practices (Shaukat, Qiu and Trojanowski, 2016). Four dimensions make up the social performance scores. These are workforce, human rights, community, and product responsibility. The assessment of social performance is a relative sum of the category weights of the sub-dimensions which is per the Refinitiv database (Refinitiv, 2021). The total score is expressed in a percentage ranging between 0% and 100% with 0% indicating a poor relative social performance and a 100% score within this range indicating excellent relative social performance (Refinitiv, 2021).

The environmental performance assesses the impact the company has on living and non-living natural systems, which encompasses air, land, water, and complete ecosystems. It echoes the firm's effective use of best management practices to prevent environmental risks while exploiting environmental opportunities to create long-term shareholder value (Biswas, Mansi and Pandey, 2018). Refinitiv databases adopt three dimensions to measure environmental performance which are resource use, emissions reduction, and environmental innovation. The aggregate measure of environmental performance is assessed based on the weight of each dimension in accordance with the Refinitiv database. The total score is expressed in percentages ranging between 0% and 100% with 0% indicating a poor relative environmental performance and a 100% score within this range indicating excellent relative environmental performance (Refinitiv, 2021).

5.7.2 Independent variables

Prior studies have employed a variety of corporate governance characteristics in the literature trying to investigate the impact that these variables have on the various dimensions of sustainability performance. However, it is known that the board of directors are the lynchpin of corporate governance (Pucheta-Martínez and Gallego-Álvarez, 2020). Hence, it is expected that a well-structured board will contribute immensely to improving sustainability performance. Prior literature has identified varieties of board structure attributes that play a vital role in the development of firm performance, Gillan (2006), especially identified five main board attributes that have been predominant in academic literature to effectively structure

corporate boards. These include board size, board independence, board expertise, board committee and CEO/chair duality. In addition, Pucheta-Martínez and Gallego-Álvarez (2020) noticed that gender issues continue to be of global concern which calls for the need to investigate the impact of female directors on the board. However, a good review of the literature has shown that most studies in this line of research take a single country and/or a single performance indicator which financial performance has dominated the discourse in literature. Hence, to have an in-depth study of good board structure on performance, this study specifically focuses on board size, board independence, board expertise, board (CSR) committee, CEO duality and board gender diversity and investigates their impact on financial, social and environmental performance.

The description and definition of each board structure variable given in this study conform to the Refintiv database description. (1) The board size represents the total number of directors on the corporate board. (2) Board independence is the percentage of independent board members as reported by the company. (3) CSR sustainability committee is whether the company has a sustainability committee or not. The study uses a dummy score of 1 for companies with sustainability/CSR committees and 0 if otherwise (Orazalin, 2020). (4) Board expertise is represented by board-specific skills which are scored as the percentage of board members who have either industry-specific background or a strong financial background experience/ and or strong financial background (Orazalin and Mahmood 2021; Refintiv, 2021). (5) CEO duality is whether the CEO of the company simultaneously chairs the board. A dummy score of 1 is given to companies where the CEO doubles as the board chair and 0, if otherwise (Khan, Al-Jabri and Saif, 2019b). (6) Board gender diversity is the percentage of females on the board.

5.7.3 Control variables

Following prior studies (Orazalin, 2020a; Tingbani *et al.*, 2020; Lu and Wang, 2021), the study adds a lot of control variables to strengthen the validity of the study and also to lessen the confounding effect of various firms and country characteristics that may have an impact on the board structure-sustainability relationship. The study includes five conventional firm-level control variables as follows; firm size, leverage, firm age, capital intensity and sustainability reporting (Haque and Ntim, 2018; Ahinful, Boakye and Bempah, 2021). In addition, three country-level controls in the form of inflation, gross domestic product (GDP) and the index of country-specific governance indicators (covering control of corruption, regulatory quality, rule

of law, voice, and accountability) are adopted in this study (Lu and Wang, 2021). The study controls for these variables as they may influence the board structure-sustainability performance relationship. The control variables are explained below.

5.7.3.1 Firm size

Prior studies show that larger firms can improve their sustainability performance more than smaller firms due to the availability of slack resources which enable them to donate to the communities and indulge in other corporate social responsibility activities (Johnson and Greening, 1999). In support, Muller and Kolk (2010) affirm that large firms increase firm sustainability performance as they have the resources needed to partake in social behaviours. Moreover, compared to smaller firms, larger firms have higher regulatory requirements to be socially responsible. Chang et al. (2012) accentuate that though both large and smaller companies are under institutional pressure to be socially responsible, the magnitude of expectations from larger firms is higher than from smaller firms. Consequently, larger firms strive to increase their sustainability performance in response to institutional pressure to gain legitimacy.

Moreover, large firms can rely on the higher turnover they enjoy to generate higher income in addition to the opportunities they have to access better capital markets and lower costs of borrowing (Asimakopoulos, Samitas and Papadogonas, 2009). Asimakopoulos, Samitas and Papadogonas (2009) affirm that relatively, larger firms have the benefit of enjoying higher profits. They can also take advantage of their position to reduce average costs and increase profitability through negotiations. Comparatively, large firms can access more resources to help in obtaining and processing sustainability information to gain a competitive advantage. Ali, Yassin and AbuRaya (2020) affirm that larger firms have access to external resources to utilise in exploring sustainability opportunities. Besides, it is likely for such firms to have qualified, skilled, specialised and more centralised human resources than smaller companies. Ahinful et al. (2021) also indicate that larger firms enhance profitability because they are linked to resources and capabilities which have a huge impact on performance.

However, Salman and Yazdanfar (2012) in line with the agency theory suggest that the conflicts and clashes between shareholders and managers are prevalent in large firms and can lead to a lack of control to create room for opportunistic activities to reduce corporate profit. In addition, it is more plausible for larger companies to provide job security to managers and also increase their salaries. When this happens, managers are likely to become less enthused to improve the financial gains of the company. Eyigege (2018) posit the separation of ownership

which diverse management attention from maximisation of profit to managerial utility maximisation could cause an insignificant effect of firm size on performance in large firms.

5.7.3.2 Leverage

Leverage which is the ratio of a company's total debt to its total equity or assets, (Asimakopoulos, Samitas and Papadogonas, 2009) can have a huge impact on a firm's engagement in sustainability activities. According to Jihadi et al. (2021), leverage plays a positive significant role in a firm's financial sustainability because when a company has a good leverage ratio, it boosts public confidence and enhances the image and the value of the firm. Financial leverage can also act as a monitoring mechanism to enhance corporate performance due to the disciplinary role of debt. Thus, managers of highly leveraged firms are likely to desist from engaging in wasteful practices and are forced to make value-maximizing decisions (Modi and Cantor, 2021). Harrison and Coomb (2021) have argued that highly leveraged firms may be encouraged to undertake corporate social activities when the factors influencing the association have a potential return. Citing as an example, the study mention that though managers of leveraged companies may be acting cautiously, they are likely to invest in technologies that could reduce pollution and increase efficiency or if the external visibility of resources provided to a specific sector can affect the likely returns.

However, most prior literature depicts a negative relationship between leverage and performance. In Asimakopoulos, Samitas and Papadogonas (2009), it is mentioned that highly leveraged firms witness a decline in their profits because they need more resources to pay off their debts and this causes a reduction in their available funds for investment. González (2013) also mentioned the frequent loss of market share of highly leveraged firms in addition to the decline in their operating profits. The study further explains that companies with high debt ratios are required to settle their interest cost with part of their earnings which leaves fewer funds for reinvestment and, hence, a reduction in company growth opportunities. Similarly, Danso et al (2021) argue that firm owners may take the inefficiencies in debt monitoring as an advantage to undertake discretionary and uneconomical investments to cause harm to firm financial performance. In explaining the effect of leverage on environmental sustainability, Modi and Cantor, (2021) assert that considering the cost involved in investing in sustainability activities, high debt ratio companies may not have the ability to engage in CSR activities because managers in highly leveraged firms are encouraged to make strict decisions on organisational efficiencies which makes it likely for managers in such companies to follow projects with a positive net present value rather than social and environmental activities.

Harrison and Coombs (2021) explain that companies in high debt may not have the ability to channel resources into corporate social responsibility activities but are likely to focus and allocate resources to projects which will reduce the potential downturn risk.

5.7.3.3 Firm age

Company age can influence sustainability performance. According to Shergill and Sarkaria, (1999) firm age affects financial performance positively because older companies are well-established, have well-developed, skilled human resources, and are likely to earn higher returns than younger firms. Coad, Segarra and Teruel (2013) explain that firm productivity increases with age because as companies mature, they master different technological techniques for productivity and include these advancements in their production practices. From the authors' perspective, this learning effect becomes advantageous to older firms because they improve their routines and capabilities to affect performance. Furthermore, it is likely for matured firms to have a lower debt ratio and higher equity ratio and improve productivity and performance because they have gained experience over the years, established relationships and have contact with customers and are more likely than new companies to have easy access to resources.

Likewise, Withisuphakorn and Jiraporn (2016) suggest that there is a stronger link between firm maturity and CSR activities engagements based on the "outcome hypothesis." Thus, as firms age, they become much more responsible in terms of sustainability awareness. In addition, companies become more stable as they mature. Then also, it is easy to predict the cash flow and performance of old firms which grants them the ability to advance in more CSR activities. Badulescu (2018) explains that the link between firm age and CSR involvement follows some stage; in the early days, the companies are responsible to their shareholders, then to important stakeholders and finally to society at large. Onyali and Okafor (2018) indicate that older firms are likely to enhance their value and performance by taking advantage of the reputation effect. In support Ahinful et al. (2021) accentuate that older firms have experience and knowledge in their organisational environment which they can utilise to affect performance positively.

However, Elsayed (2006) contend that younger firms are more likely to enhance sustainability performance because young firms may possess newer assets that may conform to the regulatory and legislation standards. The modern assets will utilise energy efficiently and are unlikely to encounter the development and implementation of sustainability initiative problems. Coad, Segarra and Teruel (2013) posit that older firms may suffer from the 'liability

of obsolescence' to harm performance. Older firms are associated with inflexibility and rigidity which can hinder innovation recognition of potential opportunities and new businesses. New companies on the other hand have been described by Onyali and Okafor (2018) as being as dynamic, more adaptable to changes and innovative which can contribute to their performance development. According to Withisuphakorn and Jiraporn (2016), since older firms have stable performance and cash flow and have accrued stronger reputational capital, there will not be a need for them to invest in CSR to enhance their reputation. Younger firms, on the other hand, deem it highly important to partake in CSR activities to build their reputation.

5.7.3.4 Capital intensity

In Gamlath G.R.M. and Yogendarajah (2013), capital intensity has been defined as the ratio of a firm's total assets to its sales. According to Lee (2010), capital-intensive firms could lessen their cost of capital and increase their firm value, especially in uncertain economic downturns where economic savings become more critical. Lee and Xiao (2011) suggest that capital-intensive companies could be financially resourceful since they have already invested in fixed costs that will perpetually contribute to the production of the company. Thus, capital-intensive companies can enjoy cost savings to reflect positively on financial performance as they have committed huge capital in their fixed assets already. Lee, Koh and Kang (2011) noticed that capital-intensive reduce firm risk and financial distress and promote higher price-cost margins in firms. Welbeck, (2017) indicate that it is more likely for capital-intensive companies to be more adept in their responsibilities towards sustainability activities and performance to prevent sanctions. Considering that capital-intense companies have investments in fixed assets such as property plants and equipment, Oeta, Kiai and Muchiri (2019) explain that such companies enjoy wear and tear, investment deductions and industrial building deductions allowances with a positive impact on firm after-tax returns and consequently on firm value. Continual investment in non-current assets improves firm production quality and prevents waste of time to increase firm performance (Oeta, Kiai and Muchiri, 2019).

However, prior literature has shown that capital-intensive firms are subject to intensive regulatory requirements and also need to have more pollution abatement controls in place which can place huge financial stress on the companies (Reitenga, 2000). Lee, Koh and Kang (2011) suggest that the inherent fixed costs in capital-intensive firms could cause risks and losses to such firms. Cole and Elliott (2005) noted that capital-intensive companies showcase a remarkable number of fixed assets and are notably pollutant intensive. Hence, in the view of

Lee and Xiao (2011), these companies demand a significant amount of capital in their production and this can have a negative consequence on sustainability performance.

5.7.3.5 CSR reporting

According to Schadewitz and Niskala (2010), sustainability reporting serves as a means of reducing information asymmetry, decreasing agency costs and increasing firm value because it produces an accurate market evaluation of the company. Sustainability reporting also encourages sustainability practices and environmental innovations (Burhan and Rahmanti, 2012). Caritte, Acha and Shah (2015) accentuate that reporting help companies improve their environmental performance because committees can rely on the feedback provided by stakeholders to formulate strategies to meet corporate social and environmental long-term objectives. Social performance has also been noted to have a close link to sustainability reporting because public knowledge of the extent to which a company is socially responsible can make such an activity effective. Also, firms are noted to gain a competitive advantage through industry differentiation (Schreck and Raithel, 2018). According to Alhassan, State and Islam, (2021), disclosing sustainability information meets the expectations of stakeholders and facilitates the firm-stakeholder long-term sustainability relationships which are instrumental in achieving the strategic firm goals.

Nonetheless, Kasbun, Teh and Ong (2016) argue that sustainability reporting comes with high costs and measurement issues which may hinder its importance and this argument has been supported by Jadoon et al. (2021). Buallay, El Khoury and Hamdan (2021) further indicate that the value destruction hypothesis implies that the cost of disclosure causes harm to the value of shareholders.

5.7.3.6 Gross Domestic Product (GDP)

GDP is a macroeconomic indicator that measures the economic activities and growth rate of a country. It estimates the total market value of goods and services a country produces in a given period (Egbunike and Okerekeoti, 2018). GDP indicates the ability of a country to provide its citizens with good living conditions considering economic, social and environmental dimensions. Cracolici, Cuffaro and Nijkamp (2010) have acknowledged that it is common to use GDP to assess the level of growth and performance of a country. Thus, It is believed that a country with a good GDP will provide its citizens with a more sustainable environment (Gallego-álvarez et al., 2014). Studies have shown that a country's economic growth can

influence the financial and socio-environmental decisions of its companies (Vieira, Neves, and Dias, 2019). Moreover, a good number of studies indicate that per capita income levels are a good estimator for standards of living (Hobijn and Franses, 2001) and that people in an economy with a greater level of GDP reach a longer life expectancy and a higher education level (Aras and Yildirim, 2020).

In addition, it is presumed that countries with greater economic growth have the financial resources to handle environmental issues efficiently (Jahn, 1998). The Environmental Kuznets Curve (EKC) hypothesis postulates that economic growth (GDP per capita) has an inverted U relationship with environmental performance, where environmental degradation is seen to rise at a low income, reach a peak and then decline as GDP rises above this threshold (Kuznets, 1955; Ekins, 1997). The reasoning from the EKC hypothesis is that in the early stage of industrialisation, economies greatly rely on natural resources which has a huge impact on the environment. At this stage of economic development, a lot of wasteful and crude technologies are used to cause further environmental harm. The relationship continues until a certain threshold of economic wealth is reached, where economic growth is developed through the development of new technologies and the production of services to reduce the extraction of crude natural resources, and then the curve begins to slope downwards.

However, the EKC has been criticised that the argument only holds for a minor session of environmental impacts and that it might not apply to developing countries (Duit, 2005). Economic theory suggests that the development of a country improves its pollution control, indicating that rich countries should invest in environmental improvement activities (Gallego-álvarez et al., 2014). Yet, the argument holds that though wealthy countries may have the resources to improve environmental performance, they can increase pollution, generate more waste, use more natural resources, and cause other environmental hazards than poor countries because they have a high level of consumption (Gallego-Álvarez et al., 2014). Also, it has been argued that multidimensional concepts make up the social well-being of people, hence, income alone cannot determine the social well-being of people (Khan, 1991; Hobijn, and Franses, 1991).

5.7.3.7 Inflation

Prior studies have shown that inflation can influence the sustainability performance of a country. Literature has shown that an increase in the rate of inflation can hurt performance due to credit market frictions ((Naceur and Ghazouani, 2009). Boyd et al. (2001) assert that

inflation can have a significant impact on a country's economic development because a higher level of inflation can hinder the effective allocation of resources by the financial sectors. Kosmidou (2003) explain that inflation can have a positive effect on performance if it is anticipated to allow for a quick adjustment in interest rate. However, unanticipated inflation can increase costs and decrease profits because unanticipated inflation does not allow for quick adjustments in interest rates for revenues. Studies have shown that inflation adversely affects sustainability growth because, during a period of higher inflation, investments and productivity decline sharply which means companies will have fewer funds available for socio-environmental activities (Hong and Razak, 2015; Moyo et al., 2020; Almansour et al., 2021).

Meanwhile, Bernanke et al. (2001) found that a rise in inflation increases exchange rates and GDP growth while decreasing the rate of unemployment. According to Ahmad et al. (2021), inflation uncertainties improve environmental performance because a higher rate of inflation discourages investment projects and consumption.

5.7.3.8 Index of country-specific governance indicators (covering voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption)

Institutional theory has emphasised that companies are rooted within wider societal structures. These structures contain a wider range of institutions that exert a significant impact on corporate decision-making (Ioannou and Serafeim, 2012). Differences in national-level institutions have a greater impact on a firm's undertaking of sustainability activities. Hence, these institutional devices explain the corporate-level differences in the dimensions of sustainability performance across different nations (Ioannou and Serafeim, 2012; Zattoni et al., 2017; Orazalin and Mahmood, 2021). Anderson and Gupta (2009) indicate that apart from firm-specific factors and corporate governance mechanisms, the quality of a governance system within which companies are embedded also has a greater influence on firm performance. Corporate sustainability initiatives and legal and nation-level institutional heterogeneity led to differences in financial, social and environmental values (Orazalin and Mahmood, 2021).

Corporate governance literature has analysed the impact of the various dimension of country governance indicators comprising control of corruption, regulatory quality, rule of law and voice and accountability and its impact on the financial, social and environmental performance. They have almost unanimously accentuated those different institutions at the

country level have a significant impact on differences in corporate performance. For instance, Donadelli et al. (2014) confirm a significant positive relationship between the control of corruption and the industry average returns of a country. The authors explain that investors in countries with higher perceived corruption transfer their investments to countries with a lower perceived corruption to improve consumption smoothing. Hence, the countries with low-level corruption control begin to show a higher capital inflow amount which then increases output and investment and then financial performance. Barbu and Boitan (2020) provide support that increased control of corruption positively affects the liquidity of banks and allows industries to expand their territorial networks and coverage to enhance growth. Similarly, Nguyen et al. (2015) employed government effectiveness, regulatory quality, and rule of law to form an aggregate national governance index to conclude that low-risk investments are likely to be motivated by quality governance and this would lead to better profitability in countries with quality governance. Likewise, Bertelli and Whitford (2009) mention that good regulatory quality is a gesture for a conducive environment for capital investment and market entry which contributes to better financial and economic performance.

Ioannou and Serafeim (2012) assert that control of corruption increases social performance given that countries with low control of corruption are likely to engage in unethical behaviours such as child labour and bribery to decrease costs and increase market share. Also, it is likely for companies in countries with high control of corruption to be embedded in CSR activities within their core strategies. Furthermore, quality governance can affect social performance in diverse ways because it plays a vital role in the firm's engagement with stakeholders and the country. With a sample from OECD countries, Kaufmann and Lafarre (2021) explain the influence of some dimensions of governance on sustainability performance. With Voice and accountability (VA), the study explains that this allows stakeholders to get involved during the development phase of social and environmental initiatives to provide support at the implementation stage. Moreover, citizens through election can vote for political parties with much passion for sustainable development.

Kaufmann and Lafarre (2021) confirm that countries with strict regulatory requirements are associated with good environmental performance as rigorous regulations act as a stimulus for companies to operate sustainably. Kaufmann and Lafarre (2021) also find that countries with a strong rule of law (RL) decrease their environmental pollution, and emissions and increase their environmental performance because such countries specify the environmental rules and enforce these rules effectively. Hence, companies within countries with stringent rule

enforcement are conscious of their environmental responsibilities. However, lack of rule enforcement signifies that unsustainable behaviour may go unpunished, hence, firms operating in these countries may not be more concerned about sustainability activities.

Some studies have found that a high correlation exists between the six-country governance indicators (Globerman and Shapiro, 2002; Nguyen, Locke and Reddy, 2015). Hence, using them in a single regression can cause problems with empirical estimation (Almustafa, 2017). Consequently, this study follows prior studies (Lu and Wang, 2021; Orazalin and Mahmood, 2021) and combines the six individual indices from the Worldwide Governance Indicators (WGI) to form an aggregate country governance index as a proxy of national governance quality. Each of these six indicators from the WGI is shown with standard units ranging from 2.5 (weak) to 2.5 (strong) where a larger value symbolises a better national governance quality and a lower value indicates a weak governance quality (Lu and Wang, 2021). Table 5.6 details the dependent, independent and control variables' descriptions and Mnemonic adopted for this study.

5.6 DEFINITION OF REGRESSION MODEL VARIABLES

<i>Category</i>	<i>Measure</i>	<i>Mnemonic</i>	<i>Definition</i>
Dependent variable	Financial sustainability performance: Return on assets	roa	Log (ROA) (Refinitiv database)
	Social sustainability performance	soc	The social performance score is grounded on the measurement of the individual performance dimensions of the workforce, human rights, community and product responsibility and it is directly obtained from the Refinitiv database. The score is expressed in percentages and ranges between 0% and 100% (Orazalin, 2020a).
	Environmental sustainability	envt	The social performance score is grounded on the measurement of the individual performance dimensions of resource use, emissions, and innovation and it is directly obtained from the Refinitiv database. The score is expressed in percentages and ranges between 0% and 100% (Orazalin, 2020a).

TABLE 5.6 CONTINUED

Category	Measure	Mnemonic	Definition
Independent variables	Board size	bs	Total number of directors on the board (Refinitiv database; Hussain et al., 2018).
	Board independence	ind	The percentage of independent board members directors to the total number of directors (Refinitiv database)
	Sustainability/CSR committee	csr	Dummy variable with a value of 1 if the company has a CSR committee, and 0 otherwise (Cancela <i>et al.</i> , 2020; Orazalin, 2020a)
	Board expertise	skills	The percentage of board members with industry experience and/or a strong financial background (Refinitiv database; Orazalin and Mahmood, 2021)
	CEO duality	ceo	CEO dummy, 0 if CEO is also the board chairman, 1 if otherwise (Khan, Al-Jabri and Saif, 2019)
	Board gender diversity	bgd	Female members' percentage on the board (Refinitiv database; Shahbaz et al., 2020)
Control variables: firm-level controls	Firm size	fsize	Log (total asset) (Konadu, Ahinful and Owusu-Agyei, 2021)
	Leverage	lev	Total debt divided by total assets (Konadu et al., 2021)
	Firm age	age	Company age (in years) (Cancela et al., 2020)
	Sustainability reporting	reporting	Dummy variable with a value of 1 if the company discloses sustainability information, and 0 otherwise (Refinitiv database)
	Capital intensity	capint	The ratio of property, plant and equipment to total assets (Haque& and Ntim 2017) (Haque and Ntim, 2018)
Control variables: country-level controls	Gross domestic product	gdp	the annual percentage change of GDP growth, collected from the World Bank (WBI, Lu and Wang, 2021)
	inflation	inflation	The annual consumer price index, collected from the world bank
	country governance indicators	govest	Index of six indicators from The Worldwide Governance Indicators (WGI): voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption (Lu and Wang, 2021)

5.8 DATA ANALYSIS METHODS

This section aims to briefly describe the data analysis methods applied in this study. Researchers primarily research to get information that will help them answer the research questions (Zikmund, 1994). To get the needed information, researchers begin the process by gathering raw data, and then with the help of various analytical methods, proceed to transform this data to obtain the needed information to make informed decisions (Davis, 1996). Zikmund (2003) explains that it is very crucial to employ the correct and various analytical methods to draw correct conclusions. Consequently, this study adopts descriptive statistics, bivariate analysis, and multivariate analysis to reach the conclusions for the objectives set for this research. These objectives are:

1. To examine the impact of board structure on corporate sustainability performance (financial, social, and environmental).
2. To determine whether the impact of board structure on the corporate sustainability performance (financial, social, and environmental) differs between financial and non-financial firms.

5.8.1 Descriptive Statistics

This study begins with descriptive statistics because it describes the fundamental features and makes the data easily understood. From the viewpoint of Lind et al. (2006), descriptive statistics are statistical methods through which information is organised, summarised, and presented in an informative manner. Zikmund et al. (2010) accentuate those descriptive statistics as the first point of statistical analysis because it is the elementary transformation of data in such a way that the basic characteristics like central tendency (i.e., mode, median and mean), variability (i.e., standard deviation, variances, minimum and maximum values), relative position (i.e., standard scores and percentile ranks) are described.

5.8.2 Bivariate Analysis

The bivariate analysis examines the association between two variables simultaneously (Bertani et al., 2018). The two variables are called x and y variables where x mostly represents the independent variable and y is the dependent variable. The bivariate analysis allows for assessing how the values displayed by the dependent variables may vary depending on the changes in the independent variables. This quantitative data study employs Pearson's correlation and regression analysis equation. The correlation coefficient helps to measure the

magnitude of the linear relationship and the direction of the relationship (Zikmund et al., 2010). It measures the strength of the linear relationship between the variables. The correlation coefficient assumes the value range between +1 and -1 to indicate the correlation between variables (Bertani et al., 2018). A coefficient equal to or closer to 1 indicates a perfect positive relationship between the dependent and independent variables. Thus, +1 indicates that the two variables are one and together. A value equal to or closer to -1 shows a perfect negative relationship indicating that the two variables are inversely related while a coefficient of 0 indicates that there are no correlations between the two variables. The study also employs the correlation matrix to test for multicollinearity in the regression models.

5.8.3 Panel Data Analysis

The study adopts the panel data analysis to investigate the board structure-sustainability relationship. Panel datasets (or longitudinal data) incorporate time-series and cross-sectional datasets to provide repeated measurements of a particular number of variables over a time period on observed units (Xu, Lee and Eom, 2007). Hence, panel data observations have at least two dimensions which are a cross-sectional dimension, represented by subscript i , and a time-series dimension, mostly specified by subscript t . The panel data is distinct from a pooled cross-section in that the former follows the same cross-sectional units over a given period of time. Thus, the panel dataset requires an observation of the same unit across time.

According to Xu, Lee and Eom (2007), the use of Panel data has become one of the fundamental components of quantitative research because of some identified advantages it has over cross-sectional and time-series datasets. One of the key benefits of the panel dataset is the fact that it allows controlling for some unobserved characteristics of the observed units. Unlike cross-section data which makes inferring causality difficult, given that panel data allows for multiple observations over time can ease causal inference (Wooldridge, 2009). Secondly, the panel data sets use more advanced research designs, which helps the researcher to produce a higher level of statistical validity compared to the statistical techniques of a cross-sectional dataset (Xu, Lee and Eom, 2007). Also, panel data is effective in examining causal relationships because its repeated observation nature creates a time dimension that enables the researcher to rigorously examine time and effect relationships within units. Similarly, panel data analysis allows for an investigation into the stability link between the dependent and independent variables because unlike the cross-sectional analysis which analyses the link at a single time period, panel analysis facilitates the exploration of the dynamic differences in the

relationships. Additionally, it lessens the omitted variable bias (Wooldridge, 2006). With panel data, the degree of freedom is increased, collinearity among independent variables gets reduced and the efficiency of econometric estimates is improved because it gives the researcher a considerable number of data points (Hsiao, 2007). Moreover, compared with time-series data, it is easier to accurately predict individual outcomes with panel data analysis. This is because as panel datasets make it possible to learn the behaviour of individuals by observing how others behave, it is possible to pool the data to get a more accurate description of an individual's behaviour (Hsiao, 2003).

Despite the advantages of panel data analysis, it has some limitations. The foremost is that it is more expensive to collect panel data than it is to collect data for cross-sectional and time series. Also, the data set can create measurement errors to cause distortions and the likelihood to show bias due to sample problems, self-selectivity, and attrition. However, panel data collection problems arise because of improper consideration of selectivity and heterogeneity biases (Hsiao, 2003).

A linear regression of a panel data model is given as follows

$$Y_{it} = \alpha + x'_{it} \beta + \mu_i + \lambda_i + \varepsilon_{it} \quad i = 1, \dots, N \text{ and } t = \dots, T$$

Where i indicate the cross-sectional dimension and t represents the time-series dimension. x'_{it} is a vector of observations of K explanatory variables, β is a k vector of unknown coefficients, μ_i is the unobserved individual-specific effect, λ_i is an unobserved time-specific effect and ε_{it} is the zero mean random disturbance. It can be deduced from the above model that a panel data equation can be estimated with either one way (ε_{it} way or+two-way or two-way errors ($\varepsilon_{it} = \mu_i + \lambda_i + \varepsilon_{it}$)). This study adopts an Unbalanced panel data analysis because the data has an uneven distribution of observation in each time.

There are three classical means to estimate a static panel data model. The unobserved heterogeneity effect can be fixed, random or mixed. However, deciding on a choice of a model which is more efficient in analysing a given data depends on the application of the statistical tests. Therefore, all three models will be estimated and discussed. Subsequently, the required test will be applied to identify the most consistent and effective model to use to analyse the

given data. Detailed discussions on the three models follow in the subsequent sections of this chapter.

5.8.3.1 Pooled OLS regression

The Pooled OLS regression does not separate time series and cross-section data but combines all the data. It gives efficient and consists of estimates of the homogenous intercept and slope. To get the pooled OLS estimator is simply by piling up the time series (t) data into a cross-section data (i) into a long regression model which has N and T observations with ordinary least squares. It is easier to estimate and interpret pooled OLS model in a situation where the regressors and the error terms are not correlated because all the data can be pulled to run an OLS regression model. The pooled OLS model is simple to run and quicker to analyse but it is mostly subject to unrealistic and restrictive results considering that with pooled OLS, the unit-specific effects are the same. It has been noted that the results of pooled OLS regression could be spurious because it can cause errors like serial correlation within the units and heteroskedasticity across the panels (Baum, 2006). This study applies unbalanced data therefore there is the need to avoid the likelihood of encountering heteroskedasticity and correlation and consider dynamic estimation models that take care of endogeneity. Consequently, this study will not consider pooled OLS regression but will test the Fixed Effect (FE) and Random Effect (RE) models to select the suitable model.

5.8.3.2 Fixed Effects (FE) model

Fixed effect models are defined based on unit levels and include group-specific constants. These models were developed to reduce the tendency for unobserved heterogeneity and omitted variable bias in nonexperimental research (Hill et al., 2020). The FE assumes that the slope coefficients for all the sampled firms are fixed, however, the intercepts vary across industries. According to Brüderl and Ludwig (2015), there is an assumption under FE models that there are no units of specific unobserved heterogeneity because the group-specific FE eradicates all group-specific unobserved heterogeneity. According to Collischon and Eberl (2020), the FE model is an appropriate specification if the time-varying covariate is uncorrelated with the time-varying error term. Williams, Allison and Moral-Benito (2018) explain that FE models are perfect in providing means to control for omitted variable bias in a situation where the omitted variables are uncorrelated with the explanatory variables in the model. The authors justify that the model assumes in an event where the omitted variables have time-invariant

values with time-invariant effects, the effect of the omitted variables at a particular time will remain unchanged at a later time. The major strength of the FE model is its ability to control for unobservable characteristics that do not change over time (Hill et al., 2020). One advantage of the model is that it limits the potential sources of estimated biases because it reduces the sources of bias only to the time-varying variables that correlate with the treatment variables with interest (Collischon and Eberl (2020)). FE model has a limitation of unobserved heterogeneity because of unmeasured variables that change over time. Another disadvantage of the model is that it contributes to a lower statistical power because the sample size is limited to the FE estimates which are based on variables that change over time. Given this, the sample size is reduced and variation across cases is limited and this may render the results unreliable (Hill et al., 2020). Also, there is the likelihood of multicollinearity appearing in the regressors. In addition, because the FE models estimate individual and time dummies, it has a large amount of loss of freedom.

5.8.3.3 Random Effects (RE) model

Contrary to the FE model, the RE model assumes that the omitted variables are independent of the explanatory variables in the model. The RE estimator assumes that the firm effects are randomly distributed, and it is considered more efficient than the FE estimator. FE model that meets all underlying assumptions will produce unbiased estimates of the coefficient, it will efficiently use all available data and produce an insignificant standard of errors (Williams, Allison and Moral-Benito, 2018). Since there is an assumption that the explanatory variables are uncorrelated with the individual-specific effect, the RE can use Balestra and Nerlove's (1966) generalised least squares estimator for the analysis. In an event where the cross-sectional units are randomly selected from a large sample, the RE model is the best model to use. One of the advantages of the RE model is that it has more degree of freedom in the parameters. It can also estimate the coefficients of dependent variables that are fixed over the time period. Williams, Allison and Moral-Benito (2018) mentioned that RE models mostly have a smaller standard of errors however, there is a tendency for their coefficients to be biased.

5.8.4 Hausman Test

The study rejects the pooled OLS regression model, it is, therefore, imperative to choose between FE and RE models. This is done by first finding out if there is a correlation between the unobservable heterogeneity (μ_i) of each firm and the independent variables of the model.

In a situation where there is a correlation between the regressors and effects, then the FE (within-group) estimator can help to get a consistent estimation. However, the |RE model (between groups) GLS estimator is an appropriate estimator to use if there is no correlation. The Durbin–Wu–Hausman test (also known as the Hausman specification test, 1978) is used to decide whether to adopt FE or RE model in a specific panel data analysis. The Hausman test can be utilised to distinguish between the FE model and the RE model. The Hausman test can be used to check for the endogeneity of a variable. It foremost needs to check that the unobserved heterogeneity and the exogenous variables are not correlated.

The initial assumption under the Hausman test is that under the null hypothesis (H0) there should be no differences between the estimators and that FE and RE are consistent. The covariant of an efficient estimator with its difference from an inefficient estimator must be equal to zero. When the FE dummy variables get very near zero the null hypothesis is rejected which makes the FE very efficient to run. A further test is run on both specifications and then a test statistic of a complex linear algebra is calculated. This computation has to result in decreasing standard errors and increasing absolute values for dummy variables of FE. When the test statistics are extremely large, it means the RE is inconsistent and should be rejected for FE to be tested. The study utilised the Hausman specification test and it shows that the FE model is more appropriate for this all estimations in this study.

5.8.5 Econometric Model Analysis

The panel data regression technique (fixed effect) is used to establish the hypothesised relationships. The statistical package, STATA 17.0 is adopted in this study to perform all the statistical analyses which include the descriptive statistics, Pearson correlation, the ordinary least squares (OLS) and fixed effect multiple regression tests. Considering the uncertainty in the data due to sampling variability; considering the number of countries with different variables over different firm sizes and dimensions, it is likely for the model to violate the regression assumption of homoscedasticity. Hence, the Breusch-Pagan test for heteroskedasticity was employed and it confirmed that the assumption of homoscedasticity in the regression model has been violated and there is an occurrence of heteroscedasticity. To rectify this, the FE model with robust standard errors, which is known to be robust to the violation of homoscedastic assumption (Mansournia et al., 2021), is employed in this study. Fixed effect regression with robust standard error is employed as a baseline estimation method

for this study specially to check the sensitivity and, thus, the robustness of the regression results.

The regression model is shown below:

$$\begin{aligned}
 ROA_{it} &= \alpha_0 + \beta_1 BS_{it} + \sum_1^n \beta_i CONTROLS_{it} + \mu_i + \lambda_t + \varepsilon_{it} \\
 SOC_{it} &= \alpha_0 + \beta_1 BS_{it} + \sum_1^n \beta_i CONTROLS_{it} + \mu_i + \lambda_t + \varepsilon_{it} \\
 EVT_{it} &= \alpha_0 + \beta_1 BS_{it} + \sum_1^n \beta_i CONTROLS_{it} + \mu_i + \lambda_t + \varepsilon_{it}
 \end{aligned}$$

Where: ROA_{it} , SOC_{it} and EVT_{it} are the dependent variables and represent Return on Assets, social performance, and environmental performance. The independent variables are BS_{it} - board structure; bs_{it} -board size; ind_{it} - board independence; csr_{it} - sustainability committee; $skills_{it}$ -board expertise; ceo_{it} -CEO duality; bgd_{it} -board diversity. Controls variables are $CONTROLS_{it}$ - $fsize_{it}$ - firm size; lev_{it} -leverage; age_{it} - firm age; $reporting_{it}$ - reporting; $capint_{it}$ - capital intensity; gdp_{it} - gross domestic product; $inflation_{it}$ - inflation; $govest_{it}$ - country governance indicators. μ_i is the unobservable individual effects (heterogeneity) that are different but specific to each firm; λ_t is the parameters of time dummy variables, and ε_{it} is the standard error term.

5.8.6 Generalised Methods of Moments (GMM)

Oftentimes, corporate governance research, especially those that attempt to investigate the causes and effects of corporate performance experiences endogeneity. Endogeneity is where there are occurrences of correlation between the independent variables and the disturbances. Most prior studies have argued in governance, finance, and accounting literature that regressors are likely to encounter endogeneity because of causality problems. For instance, the sample in this study could be endogenous because reverse causality makes board structure and sustainability performance endogenously determined. Thus, corporate financial, social and environmental performance can similarly influence board structure (Pathan and Faff, 2013). Another important source of endogeneity is the presence of unobservable firm-specific characteristics that correlate with the regressors (Wooldridge, 2002). Also, there is an important source of endogeneity arising from the possibility that the current board structure could correlate with the past performance of the firm (Wintoki, Linck and Netter, 2012).

It is important to address all sources of important endogeneity to draw unbiased and efficient inferences. However, the ordinary least squares and traditional fixed effect estimations are unable to address these endogeneity concerns. Consequently, the results from these estimations mostly produce spurious and inconclusive findings (Al Farooque, Buachoom and Sun, 2020). To address the problem of possible endogeneity, the study follows prior studies (Haque and Ntim, 2020; Shakil, Tasnia and Mostafiz, 2020; Orazalin and Mahmood, 2021) and employs the dynamic generalised method of moments (i.e. system GMM) to control for simultaneity, measurement error, omitted variables and to solve the endogeneity problem of independent variables. The GMM regression models are run using the statistical package, STATA 17.0.

The study uses a dynamic two-step GMM panel data estimator introduced by Arellano and Bond (1991) to deal with endogeneity. With this method, the authors suggested a dynamic model of first differencing and the usage of suitable lagged values of dependent variables as instruments. Wintoki, Linck and Netter (2012) contend that with first differencing, all forms of bias which can come from time-invariant unobserved heterogeneity are removed. Also, the lagged dependent variables control for simultaneity, unobservable heterogeneity and independent variables endogeneity problems (Arellano and Bond, 1991). Wintoki, Linck and Netter (2012) cautioned that increasing the number of lags of the instrumental variables may weaken the instruments. Consequently, Martínez-Ferrero and García-Sánchez (2017) suggested for lesser instruments in relation to the number of observations to avoid unbiased estimations.

To overcome this problem of weak instrument biases, Arellano and Bover (1995) and Blundell and Bond (1998) introduced the system GMM (SGMM) to simultaneously include the lagged levels and differences of variables as instruments (Roodman, 2009). Based on the SGMM, the GMM estimation is valid when there is no second-order serial autocorrelation in the residuals and on the validity of the instruments used. Hence, for the GMM estimates in this study, the assumptions for specification are valid when the residuals in the first differences (AR1) are correlated but there is no serial correlation in the second differences (AR2). The study also reports the Hansen test for over-identifying restrictions that confirms the validity of the selected instruments. Though both the Sargan test (Sargan, 1958) and (Hansen, 1982) can be used to test the validity of instruments, the Hansen test is considered more reliable because the Sargan test exhibits inconsistency when the study sample is heteroscedastic (Roodman, 2009). Therefore, the instrumental validity is tested using Hansen's J statistics test of over

identifying restrictions in this study. The Hansen J-test (p-value) does not reject the null which implies that the instruments are valid. The study satisfies all the conditions in the estimations.

The results obtained from Fixed effect models are significantly different from those given by the GMM models. Considering that the GMM models are known to address all sources of important endogeneity to draw unbiased and efficient inferences (Wintoki, Linck and Netter, 2012), the study adopts the GMM as the baseline estimate and take inferences from the GMM models.

The model for the GMM is as shown below:

$$SP_{i,t} = \beta_0 + \beta_1 BS_{it-1} + \beta_1 BS_{it} + \sum_1^n \beta_i CONTROLS_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Where BS_{it-1} represents a one-year lag of the dependent variable.

5.8.7 Sensitivity Analysis/Robustness tests

A sensitive analysis examines how the uncertainties in a model's output can be allocated to diverse sources of uncertainty in the model's input (Saltelli, 2002). According to Hamby, (1994), it critically examines the input parameters of a model to help in model validation and serve as a guide for future research. Sensitivity analysis is carried out to determine the parameters that demand extra research to strengthen the knowledge base and reduce output uncertainty. Furthermore, it intends to reduce the risk of biased estimators from possible multicollinearity, heteroscedasticity, and serial correlation. It entails all the available techniques need to test for an incident of errors, accuracy, and validity of a model.

This study employs different regression methods and other measures to attest to the credibility of the results. Firstly, another financial performance indicator, Tobin's Q (TQ) has been used to assess the differences in the firm financial (economic) performance from an accounting measure and marketing measure perspective. Also, the study sample has been segmented into developed and developing to separately analyse board structure influence on sustainability performance in different geographical regions. In addition, the sample has been segmented into company size to separately analyse how board structure might impact the sustainability performance of different dimensions of companies. Finally, to ascertain the influence that legal origin of countries can affect the results, the sample has been segmented into common and civil law countries for additional analysis.

5.8.8 Mean and coefficient tests for the board structure-sustainability differences

between financial and non-financial performance

The second objective of this study is to ascertain the differences between the financial and non-financial firms regarding board structure and sustainability performance relationship. To achieve this objective, the study utilises three different approaches to understand whether significant differences exist in the link between board structure and sustainability performance among financial and non-financial firms. First, the statistical comparisons of declaring statistical significance or insignificance between financial and non-financial firms were carried out using the traditional regression analysis. Secondly, the study follows prior literature (Tauringana et al., 2016), to test the mean differences of the independent variables of financial and non-financial firms to ascertain if differences exist in the board structure of these two industrial sectors. Finally, the equality of the regression coefficients of financial and non-financial firms was tested.

The reason for testing for the differences in mean and coefficients is based on Gelman and Stern's (2006) submission that changes in statistical significance are not the same as their practical importance. The authors explain that traditional regression output alone is not enough for inferences because the fact that one variable predicts an outcome but not another is not a guarantee that significant differences exist between the two variables. In support, Shrout and Yip-Bannicq (2016) emphasise that it is necessary to test coefficients to ensure two variables are actually significantly different from each other. Consequently, this study, after testing for the mean differences in the independent variables, uses the moderating regression analysis (Bruin, 2006) to examine whether the effect of board structure on sustainability performance is moderated by the firm industry. Thus, the study follows the statistical procedures and guidelines provided by the University of California (UCLA) in 2006 to test for the differences in the coefficients of financial and non-financial companies. The study compares the regression coefficient of financial firms and non-financial firms by testing the null hypothesis; $H_0: B_f = B_{nf}$ (where B_f is the regression coefficient for financial firms and B_{nf} is the regression coefficient for non-financial firms). Since this study has already assigned dummy variables of 0 and 1 to non-financial and financial firms respectively, the study continued to find the product of financial firms and the independent variables (thus, board size, board independence, CEO duality etc.). The outcome of the product ($fin*BS$); the slope for financial firms less the slope for non-financial (i.e., $B_f - B_{nf}$) test the null hypothesis of $H_0: B_f = B_{nf}$. The regression equation for testing for differences in the coefficients is computed as:

regress roa financial BS fin*BS (1)

regress soc financial BS financial*BS.....(2)

regress envt financial BS financial*BS.....(3)

(Where: roa, soc, and envt are the dependent variables and represent return on assets, social performance, and environmental performance. BS represent the independent variables and fin represent financial firms). Prior studies have proven that it is important to mean-centre interactive term in moderated regression to lessen a potential threat of multicollinearity (Echambadi and Hess, 2007). Hence, following prior studies, (Kopalle and Lehmann, 2006) the moderated term (financial firms) has been mean-centred to reduce covariance between the linear and the interaction term to minimise collinearity.

Looking at the results in table 6.3, almost all the regression results reject the null hypothesis of $B_f = B_{nf}$, indicating significant differences in board structure effect on sustainability performance among financial firms and non-financial firms.

5.8.9 Dealing with Outliers

The initial process was to test for the presence of outliers in the data using the box plot approach considering the wide variability in the study sample before proceeding to test the models. The initial screening with the box plot showed that return on assets, board gender diversity, firm age, GDP, firm size, leverage, capital intensity, the index of country governance indicators and inflation had heavy skewness due to extreme values. For this reason, it was important to clean the sample to reduce the effect of these outliers and ensure robustness. In corporate governance literature, the impact of outliers is reduced either through trimming or winsorization of data (Uyar et al., 2021). With trimming, the data with extreme values are discarded and excluded from the sample. The winsorization process deals with the transformation of data by lowering the top tails of data with extreme values and replacing them with the nearest data without outliers (Hellerstein, 2008). Following prior literature (Dass *et al.*, 2013; Nguyen and Thanh, 2021; Lu and Wang, 2021), this study chose to winsorise all continuous variables at the 1st and 99th percentile values. The study decides to winsorize the data instead of trimming it because winsorized estimators are more robust compared to estimators which were not winsorized (Lee, 2020).

5.8.10 Breusch-Pagan/cook-Weisberg Test for Heteroskedasticity

The panel data model standard assumption that the disturbances have homoscedastic variances, and that the error variance of a model is constant, has been argued to be a restrictive assumption for most panel data applications. Because, for instance, there may be variations in the size of the cross-sectional units which will consequently exhibit heteroskedasticity (Baltagi, Jung and Song, 2010). Considering that the data for this study entails a wider range of variables (X), especially as the cross-sectional data involves heterogeneous units, the error variance can exhibit heteroskedasticity and serial correlation. It is important to test for the presence of heteroskedasticity because if the assumptions underlying homoscedasticity are violated the presence of heteroskedasticity will still cause consistency in the estimations of the regression coefficients, but these estimates will not be efficient (Baltagi, 2021).

To test for heteroskedasticity, the study utilises the Breusch-Pagan/cook-Weisberg test. The results as indicated in Table 6.4 shows that the models rejected the assumption of constant variance which indicate the presence of Heteroskedasticity in the sample. The study corrected the problem of Heteroskedasticity by using robust standard errors (see, Mansournia et al., 2021). Additionally, the robust standard errors also control for autocorrelation which can create

issues in the panel data. Hence, the study uses robust standard errors to control for heteroskedasticity and also to control for any problems with serial correlation (Lei, 2006).

5.8.11 Variance Inflation Factor (VIF)

Another potential problem in regression analysis is multicollinearity. It can arise when a set of highly correlated predictors are examined together (Thompson et al., 2017). Multicollinearity can affect the standard errors of the estimates such that the results of all the independent variables in the regression model will show statistical significance outcomes. Also, the presence of multicollinearity can cause a minor alteration in the data to result in extreme differences in the parameter estimates (Thompson et al., 2017). To cater for multicollinearity, the Variance Inflation Factor (VIF) is employed to test for potential multicollinearity among the predictor or explanatory variables. It assesses the extent to which the multicollinearity within the predictors lowers the precision of an estimate (Thompson et al., 2017). To test using VIF, the classical rule is that the VIF should not be beyond 10 (Belsley, Kuh, and Welsch, 1980). Gujarati (2009) explain that there is no issue with multicollinearity if the VIF is less than 10 and the tolerance coefficient is greater than 0.10. The results for the variance inflation factor (VIF) and the tolerance coefficients of each of the variables are presented in Table 6.3. The table indicates that the highest VIF is 1.88 with a mean of 1.32 and the lowest tolerance coefficient is 0.532 indicating that there is no unacceptable level of multicollinearity among the variables. Therefore, it can be concluded that there are no concerns about correlations between the explanatory variables.

5.9 Summary and Conclusion

This chapter has discussed the methodology employed in this study. It has detailed the varied approaches and methods the study employs to answer the research questions. The population for the study were chosen from the Refintiv database (formerly Asset4) and the WBI database for the period between 2015 to 2020. Considering the launch of sustainable development goals in 2015, the main reason for choosing the period for this study is to ascertain how effective and efficient the board has been structured to lead the firm to contribute significantly and join forces with the world to achieve the SDGs targeted for the year 2030. The remaining section gives a thorough discussion of the panel data quantitative analysis selected for this study while detailing all the tests needed to be done to obtain the suitable model. For the robustness of the model, a detailed discussion is given on all the diagnostic tests performed in this research.

CHAPTER SIX

PRESENTATION OF RESULTS AND DISCUSSION

6.1 Introduction

This chapter analyses the link between the variables in the econometric models. In this chapter, the study will present the results as per the research objectives stated in Chapter One. The chapter is organised as follows: Section 6.1 discusses the results of the descriptive statistics to provide basic information about the independent, dependent and control variables in the dataset. Section 6.2 represents the results of correlation analysis; it explains the extent to which the variables in the dataset are related and gives the preliminary results for the study. In Section 6.3, the main regression results for the study are presented and discussed. This section depends on theoretical underpinnings and empirical evidence to extensively discuss the recorded results of the study. Section 6.4 focuses on the robustness and sensitivity tests conducted in the study to check the robustness of the main results. Section 6.5 concludes the chapter.

6.2 Descriptive statistics

The summary statistics for all the variables included in the empirical analysis are shown in Table 6.1 below. It covers the full sample and the two subsamples of financial and non-financial firms which are shown as panel A, B and C respectively. The summary analysis suggests that the distribution of sustainability performance indicators, board structure, and all other control variables vary substantially. ROA is calculated in ratios and the minimum value in ratio for ROA is -1.56 with a maximum ratio of 3.60 across all study samples. The negative ROA indicates relatively lower returns for companies which is similar to the findings of Cancela et al. (2020). Furthermore, the results depict average profits in the ratios of 1.52, 0.83 and 1.73 for the full sample, financial and non-financial firms respectively. This indicates that there is a strong variation in firm performance, especially between financial and non-financial firms. The evidence indicates that on average, financial firms generate more profit than non-financial firms.

With social performance being measured in percentages, the average performance score for the full sample is 45.40% with a minimum of 2.14% and a maximum score of 93.69%. The average social performance score for financial companies is 45.33% and that of non-financial firms is 45.42%. The standard deviation in non-financial firms is comparatively higher indicating a higher variation in social initiatives among non-financial firms than in financial industries.

TABLE 6.1 DESCRIPTIVE STATISTICS

	Panel A (Full sample)					Panel B (Financial firms)					Panel C (Non-financial firms)				
	count	mean	sd	min	max	count	mean	sd	min	max	count	mean	sd	min	max
roa	33615	1.521407	1.004345	-1.56065	3.596764	7814	0.837832	1.071496	-1.56065	3.596764	25801	1.728432	0.884394	-1.56065	3.596764
soc	36404	45.4034	23.44661	2.14	93.69	7598	45.33186	21.99465	2.14	93.69	28806	45.42227	23.81516	2.14	93.69
envt	36409	33.91959	29.25255	0	93.34	7599	30.48812	30.10673	0	93.34	28810	34.82468	28.9559	0	93.34
bs	36371	9.539688	3.123124	4	20	7579	10.1198	3.404955	4	20	28792	9.386982	3.026232	4	20
ind	36371	61.51998	24.92682	0	100	7578	64.96715	24.06303	0	100	28793	60.61273	25.07098	0	100
csr	36409	0.465352	0.498805	0	1	7599	0.387419	0.487193	0	1	28810	0.485908	0.49981	0	1
ceo	36409	0.3428	0.474652	0	1	7599	0.307541	0.461506	0	1	28810	0.3521	0.477633	0	1
bgd	36336	17.98086	13.44998	0	50	7566	18.80025	13.16693	0	50	28770	17.76538	13.51541	0	50
skills	33181	50.64446	22.22476	0	100	7022	49.06284	22.24187	0	100	26159	51.06902	22.20141	0	100
reporting	36409	0.555797	0.496884	0	1	7599	0.46414	0.498745	0	1	28810	0.579972	0.493572	0	1
age	39148	32.55972	28.2739	1	129	8101	30.96704	27.29243	1	129	31047	32.9753	28.51023	1	129
fsize	41832	15.97683	3.026702	9.85666	24.4368	8729	16.93143	2.961881	9.85666	24.4368	33103	15.72511	2.993308	9.85666	24.4368
lev	41797	0.253782	0.208851	0	0.933333	8726	0.237112	0.220614	0	0.933333	33071	0.25818	0.205412	0	0.933333
capint	40954	0.274406	0.273116	0.000751	0.955457	8048	0.210668	0.355191	0.000751	0.955457	32906	0.289995	0.246468	0.000751	0.955457
gdp	42138	1.45129	3.071699	-9.39616	7.502	8748	1.432905	3.106815	-9.39616	7.502	33390	1.456106	3.062461	-9.39616	7.502
inflation	40926	1.708426	1.583756	-0.82565	10.5784	8508	1.769685	1.552226	-0.82565	10.5784	32418	1.692348	1.591561	-0.82565	10.5784
govest	41556	1.021079	0.607626	-0.47243	1.78647	8622	0.996351	0.609601	-0.47243	1.78647	32934	1.027553	0.606951	-0.47243	1.78647

Notes: Definitions for variables as shown in table 5.6. roa (in ratio) represents profitability performance. Soc and envt represent the percentage of corporate social and environmental performance respectively. bs represents board size which is the total number of directors on the board. Ind is the total number of independent directors to the total number of directors. csr indicates the presence or the absence of the CSR/sustainability committee on the corporate board. skills represent the percentage of board members with industry experience and/or a strong financial background. ceo indicates if the CEO is also the board chairman or otherwise. bgd signifies the percentage of female board members; fsize is the firm size; lev is corporate leverage; age is company age; reporting shows if companies disclose their sustainability information or otherwise; capint stand for capital intensity; gdp stands for the gross domestic product growth; inflation represents the inflation rate of countries and govest stands for the Index of the six country governance indicators (voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption).

The environmental score shows a minimum percentage of 0% and a maximum percentage of 93.34% across industries. The mean environmental performance score shows as 34.0% for the entire sample, 30.50% for financial companies and 34.82% for non-financial firms. The average environmental performance score is 34% and it is lower than reported in emerging East Asia by Nguyen and Thanh (2021). The findings in this study suggest that on average, companies do not perform well on environmental protection issues. The environmental score deviates with an approximation of 29%. The low standard deviation suggests a meagre variation in environmental initiatives among most listed firms worldwide.

With regards to the independent variables, the study found that the average board size for the entire sample grouping is 9.5, 10.1 for financial firms and 9.4 for non-financial firms. The results obtained indicate that the sample contains a wide range of firms where large and complex firms may require a larger board size. The total number of directors on each board ranges between 4 and 20 members. From Table 6.1, the mean percentage of independent directors stands at 61.52% for the total study sample, 64.98% for financial firms and 60.61% for non-financial firms. Most regulatory bodies recommend at least 50% representation of outside independent directors on corporate boards (Nguyen and Thanh, 2021). Consequently, companies in this study sample meet the recommended percentage of independent directors needed to monitor management affairs to help reduce information asymmetry and conflict of interests. The table shows that the minimum percentage of independent directors in the three sample groupings is 0 with a maximum of 100. Also, the 5% difference between independent directors on the board of financial firms and non-financial firms indicates a variation in monitoring and controlling in these two industrial sectors. This mirrors the findings of Adams and Mehran (2003) that the opacity in the activities of financial institutions demands a higher number of independent directors to monitor management activities even more than is needed in non-financial firms.

CSR/sustainability committee is a dummy variable, and the table shows a mean score of 0.47, 0.39 and 0.49 for the entire sample, financial firms, and non-financial firms respectively. The results are consistent with Olthuis and van den Oever (2020) and it indicates that approximately 40% of companies have CSR committees. While about 49% of non-financial firms have sustainability committees, only 39% of companies in the financial industry have such committees. The finding depicts a significant difference in board structure between these two industrial sectors as far as the sustainability committee is concerned. The board-specific skills (representing board expertise) have a mean percentage of 50.64% with a standard

deviation of 22.22 for the entire sample. The financial firms have an average of 49.06% of directors with specific skills with a standard deviation of 22.24. The board skills for non-financial firms show an average of 51.06% at a standard deviation of 22.20. In line with Roffia, Simón-Moya and Sendra García (2021), the results exhibit a variety of competence and skills among directors. Also, non-financial companies have more directors with expertise than it is in financial companies. The table further indicates that the minimum percentage for board expertise is 0% while the maximum is 100%. The percentage range of board gender diversity is from 0% to 50% across all samples. The mean percentage for full sample is 18.0%, 18.8% for financial firms and 17.8% for non-financial firms. The average percentage of women on records signifies that most companies have women underrepresented on their boards. These figures can be compared with the average board gender diversity in Kagzi and Guha (2018), García Martín and Herrero (2020) and Orazalin and Mahmood (2021). With regards to CEO duality, the table indicates a score of 0.34 which means that about 34.% of companies practice CEO duality, this is similar to the findings of Aksoy et al. (2020). In financial firms, the average score for CEO duality is 0.31 and 0.35 for non-financial firms. These results indicate that most financial companies do not practice the duality leadership style.

For the control variables, the table shows that sustainability reporting as a dummy variable has an average score of 0.55 with a standard deviation of 0.49 for the full sample. The financial firms have a mean sustainability reporting score of 0.46 with a standard deviation of 0.50 with non-financial firms showing an average score of 0.58 and a standard deviation of 0.49. The results indicate that approximately 50% of companies communicate their sustainability performance and its impact. The results also show a strong variation in sustainability reporting between financial and non-financial firms. For this study, the youngest company is a year old, and the oldest is 129 years old. The average age for sampled companies is 33 years. However, when the sample is split into financial and non-financial, the average age for financial firms is 31 years old and that of non-financial firms is 33. This indicates that relatively, non-financial companies are older than financial firms. The firm size for the full sample shows an average value of 15.98, 16.93 for financial firms and 15.72 for non-financial firms. The mean leverage for the full sample is 25.3%, and financial firms report average leverage of 23.7% with 25.8% for the non-financial firm. The minimum value of capital intensity is 0.00 with a maximum of 0.96 showing a mean of 0.27 for the full study sample, 0.21 for financial firms and 0.30 for non-financial companies. The gross domestic product for all companies averages at 1.45%, 1.43% for financial firms and 1.46% for non-financial firms.

The inflation rate on average for the entire sample is 1.70%. Financial companies show a mean inflation rate of 1.77% and the average inflation for non-financial firms is 1.69%. Regarding the country-specific governance indicators index, the full sample has a mean index of 1.02, 0.99 for financial firms and 1.02 for non-financial firms.

This study also tested the differences in the means of independent variables between financial and non-financial firms using the t-test. Table 6.1a presents sufficient evidence to reject the null hypothesis of no difference in the means independent variables which supports the study's argument that there might be significant differences in financial firms and non-financial firms regarding how boards are structured to affect sustainability performance. From Table 6.1a, the average board size for financial firms is 10.1 and that of non-financial firms is 9.4, indicating that the average number of directors on the board of financial companies is almost 1% larger than the board size of non-financial firms. This confirms the findings in prior literature on board size and performance that board members for financial firms are mostly larger than members in non-financial firms (See, John, De Masi and Paci, 2016). Furthermore, whereas Lipton and Lorsch (1992) recommend that board membership for non-financial firms must be between eight or nine members with a maximum membership of ten, regulations require that financial institutions, especially the banks must have board membership between five and twenty-five (Mehran and Mollineaux, 2012).

The test indicates that board independence is 4% higher in financial firms than in non-financial firms as the mean proportion of board independence shows as 65% and that of non-financial firms stands at 61%. Furthermore, the mean score of non-financial firms with sustainability committees is 0.48 and that of financial firms is 0.38 with a difference of 0.10, indicating that on average, non-financial companies form sustainability committees more than financial firms. Board expertise is 51.1% for non-financial firms and 49.1% for financial firms with a difference of 2%. This means that non-financial firms have more directors with firm-specific skills than financial firms. With CEO duality, the table evident that non-financial firms have a dummy score of 0.35 and financial firms with a score of 0.31 resulting in a difference score of 0.04. Thus, relatively, nonfinancial firms adopt the CEO leadership style more than financial companies. Finally, companies in the non-financial industry have a percentage of 17.9% of women directors while financial firms have 18.9% of their directors as women. This means that financial companies have a 1% higher number of women directors than non-financial firms.

TABLE 6.1A MEAN DIFFERENCES BETWEEN INDEPENDENT VARIABLES (T-TEST) (TWO-SAMPLE T TEST WITH EQUAL VARIANCES)

Independent variables	Mean	Standard dev	t-value	Difference	outcome
Board size					
financial	10.14171	3.561617	-18.1988	-.7518421	significant
Non-financial	9.389865	3.097799			
Board independence					
Financial	64.96715	25.07098	-13.5643	-4.354418	significant
Non-financial	60.61273	24.06303			
Board expertise					
Financial	49.06284	22.20141	6.7207	2.006175	significant
Non-financial	51.06902	22.24187			
CSR committee					
Financial	.3874194	.49981	15.3602	.0984883	Significant
Non-financial	.0029446	.4871928			
CEO duality					
Financial	.3075405	.4615055	7.2849	.0445595	significant
Non-financial	.3521	.4776332			
Board gender diversity					
Financial	18.88036	13.76644	-5.8142	-1.028317	significant
Non-financial	17.85204	13.39033			

6.3 Correlation analysis

Table 6.2a gives the pairwise correlation of the variables in this study using Pearson's correlation matrix. The correlation analysis shows that there is a negative significant correlation between ROA and board size. This gives preliminary evidence of a negative relationship between board size and financial sustainability. Also, the table shows that ROA has a positive significant correlation with board independence, board expertise and board diversity, hence, indicating preliminary evidence of a positive association between financial performance and board independence, board skills and board diversity. ROA is positively and significantly linked to CEO duality but insignificantly linked to the board sustainability committee. With the control variables, return on assets positively correlates with capital intensity (0.09), GDP (0.09) and inflation (0.02) but relates negatively to sustainability reporting, firm age, leverage, firm size, and country governance index.

Social performance has a positive significant correlation with a board size (0.28), board independence (0.09), sustainability committee (0.55), and board diversity (0.32). Preliminary, these results provide evidence of a positive influence of board size, board independence, CSR committee and board diversity on social performance. Nonetheless, the results indicate that social performance relates negatively to board skills (-0.11) and insignificantly to CEO duality (-0.01). With the controls, social performance correlates positively with all the firm-level controls, with a positive correlation with the governance indicators and a negative association with GDP and inflation. The environmental performance correlates positively and significantly with board size (0.36), board diversity (0.23) and sustainability committee (0.65). With these results, there is preliminary evidence of a significant relationship between board structure and environmental performance. However, environmental performance relates negatively to board independence, CEO duality and board skills. With the controls, environmental performance correlates positively with all firm-level controls but negatively with the country-level controls.

Table 6.2a indicate that there is a very weak correlation among the independent variables; there is a weak correlation between board size and board independence (-0.17), CSR committee (0.27), CEO duality (0.02), board gender diversity (0.08), and board skills (-0.13). Also, the correlation between board independence and CSR committee, CEO duality, board gender, and board skills which show as 0.08, 0.02, 0.3 and 0.09 respectively indicate a weak correlation among the variables. CSR committee has a weak correlation with CEO duality (0.08), board gender diversity (0.18) and board skills (0.08). CEO duality has a very weak correlation of -0.002 with board gender diversity and 0.13 with board skills. Finally, board

gender diversity is weakly correlated with board skills (0.1). These results indicate clearly that multicollinearity is not likely to be an issue in the sample.

Table 6.2b presents the correlation analysis for financial companies only. The table indicates that in financial companies, ROA has a significantly negative relationship with a board size (- 0.40) and sustainability committee (-0.03) while exhibiting a positive correlation with board independence (0.04), and board skills (0.14). However, financial performance correlates insignificantly with CEO duality and board gender diversity in financial firms. Regarding the firm-specific controls, the table indicates that ROA has a positive correlation with leverage (0.23) and capital intensity (0.41) but maintains a negative link with sustainability reporting (-0.07), firm age (-0.12) and firm size (-0.40). The table further indicates that ROA is positively related to all country-specific controls namely, GDP (0.09), inflation (0.01) and governance indicators (0.03). The results also indicate that social performance has a positive significant correlation with board size, board independence, CSR committee and board gender diversity and a negative significant correlation with CEO duality. However, board expertise is insignificantly related to social performance. Regarding environmental performance, the evidence shows that board size (0.25), sustainability committee (0.65) and diversity (0.28) relate positively to environmental performance. However, environmental performance associates negatively with board independence, CEO duality and board skills. All firm-level control variables are positively linked with environmental performance and all three country-level controls correlate negatively to environmental performance.

With the sample for financial firms, the table shows a very weak correlation among the independent variables. For instance, board size has a weak association with board independence (-0.13), CSR committee (0.22), CEO duality (0.04), board diversity (0.07) and board skills (-0.12). Board independence has a significantly negative relationship with the CSR committee (-0.11), a positive link with CEO duality (0.19), board gender diversity (0.23) and board skills (0.12). The relationships between the CSR committee, CEO duality (-0.10), board gender diversity (0.23) and board skills (-0.02) are equally weak. CEO duality has a weak correlation with board gender diversity, and board skills while diversity has a very weak correlation with board skills (0.01).

Table 6.2c presents the correlation analysis for non-financial firms and it shows that ROA has a negatively significant correlation with a board size (-0.2), and CSR committee (-0.01) and a positive significant correlation between ROA, board independence (0.05), CEO

duality (0.03), board gender diversity (0.04) and board skills (0.06). From the table, ROA is negatively linked to sustainability reporting, firm age, firm size, leverage, capital intensity, and governance indicators while establishing a positive link with GDP and inflation. Social performance is positively correlated with a board size (0.3), board independence (0.1), CSR committee (0.5) and board gender diversity (0.32). There is a negative link between social performance, board expertise and CEO duality. Social performance has a positive relationship with most of the control variables namely, sustainability reporting, firm age, firm size, leverage, and governance indicators. However, social performance correlates negatively with capital intensity, GDP, and inflation. Environmental performance shows a positive link with a board size (0.4), sustainability committee (0.6) and board gender diversity (0.2) and a negative association with CEO duality (-0.05), board independence (-0.1), and board skills (-0.1). Environmental performance has a positive relationship with firm-level controls and a negative link with country-level controls. Furthermore, the table shows a weak correlation among the independent variables. For example, board independence is negatively linked to CSR committee (-0.1), CSR committee correlates positively with board diversity (0.2), and CEO duality associates positively with board expertise (0.1).

Besides that the correlation analysis gives preliminary evidence of relationships between the dependent and the independent variables, it is very useful as it checks multicollinearity to prevent the wrong specification of regression results. To check for multicollinearity, it is argued that the acceptable threshold of correlation coefficient among independent variables should not exceed 0.80 (Konadu et al., 2022). Considering the results of the correlation analyses, the coefficient between the independent variables is less than 0.80, therefore, multicollinearity is not of great concern in this study.

TABLE 6.2(A) CORRELATION ANALYSIS FULL SAMPLE

Variables	roa	soc	envt	bs	ind	csr	ceo	bgd	skills	reporting	age	fsize	lev	capint	gdp	inflation	govest
Roa	1																
soc	0.00288	1															
envt	-0.0325***	0.732***	1														
bs	-0.200***	0.278***	0.363***	1													
ind	0.0328***	0.0852***	-0.108***	-0.165***	1												
csr	-0.00745	0.551***	0.645***	0.274***	-0.0887***	1											
ceo	0.0398***	-0.00837	-0.0469***	0.0193***	0.157***	-0.0845***	1										
bgd	0.0340***	0.320***	0.226***	0.0768***	0.299***	0.181***	-0.00173	1									
skills	0.0557***	-0.108***	-0.132***	-0.127***	0.0876***	-0.0825***	0.131***	-0.0956***	1								
reporting	-0.00277	0.599***	0.733***	0.292***	-0.191***	0.614***	-0.115***	0.204***	-0.148***	1							
age	-0.0364***	0.200***	0.298***	0.233***	-0.128***	0.226***	-0.0161**	0.0412***	-0.0371***	0.224***	1						
fsize	-0.265***	0.280***	0.462***	0.424***	-0.373***	0.355***	-0.0932***	-0.146***	-0.126***	0.425***	0.273***	1					
lev	-0.0327***	0.0761***	0.0974***	0.0463***	0.0247***	0.0783***	0.0311***	0.0381***	-0.0170**	0.0865***	-0.0588***	0.106***	1				
capint	0.0954***	0.00205	0.125***	-0.0540***	-0.0334***	0.145***	-0.0321***	-0.0360***	0.0197***	0.126***	0.00964	0.0449***	0.297***	1			
gdp	0.0872***	-0.135***	-0.109***	-0.0151**	-0.0196***	-0.132***	0.00701	-0.152***	-0.00824	-0.0988***	-0.111***	0.0211***	-0.0219***	-0.0364***	1		
inflation	0.0174**	-0.0368***	-0.0444***	-0.0471***	-0.0225***	-0.0185***	0.00641	-0.0453***	-0.0547***	-0.0227***	-0.115***	0.0138**	0.0119*	0.0402***	0.0394***	1	
govest	-0.00347	0.0265***	-0.0264***	-0.160***	0.326***	-0.0530***	0.0523***	0.206***	0.177***	-0.121***	0.0360***	-0.354***	-0.0623***	0.0155**	-0.132***	-0.153***	1

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 6.2(B) CORRELATION ANALYSIS-FINANCIAL

Variables	roa	soc	envt	bs	ind	csr	ceo	bgd	skills	reporting	age	fsize	lev	capint	gdp	inflation	govest
roa	1																
soc	-0.0162	1															
envt	-0.0901***	0.729***	1														
bs	-0.401***	0.180***	0.249***	1													
ind	0.0402***	0.0579***	-0.104***	-0.134***	1												
csr	-0.0271*	0.591***	0.647***	0.226***	-0.107***	1											
ceo	0.00284	-0.0410***	-0.117***	0.0483***	0.189***	-0.102***	1										
bgd	0.0232	0.331***	0.281***	0.0767***	0.297***	0.239***	-0.0392***	1									
skills	0.141***	0.0114	-0.0684***	-0.123***	0.126***	-0.0215	0.152***	0.00691	1								
reporting	-0.0713***	0.662***	0.723***	0.227***	-0.184***	0.629***	-0.141***	0.266***	-0.102***	1							
age	-0.124***	0.169***	0.200***	0.182***	-0.0905***	0.143***	-0.0887***	0.0888***	-0.0731***	0.133***	1						
fsize	-0.396***	0.354***	0.472***	0.420***	-0.360***	0.371***	-0.132***	-0.0613***	-0.146***	0.475***	0.228***	1					
lev	0.234***	0.0331**	0.0270*	-0.220***	-0.0489***	0.0223	0.0238*	-0.0436***	0.106***	0.0290*	-0.181***	-0.0239*	1				
capint	0.410***	0.0465***	0.0740***	-0.342***	0.0719***	0.0540***	0.00201	0.0107	0.159***	0.0174	-0.185***	-0.281***	0.477***	1			
gdp	0.0827***	-0.0728***	-0.0491***	0.0215	-0.0740***	-0.132***	0.00566	-0.170***	-0.00548	-0.0589***	-0.0938***	0.0542***	0.0491***	-0.0494***	1		
inflation	0.0125	-0.0217	-0.0228*	0.00251	-0.0696***	0.00760	0.00357	-0.0882***	-0.0345**	0.0222	-0.0556***	0.0305**	0.0142	0.0353**	0.0168	1	
govest	0.0284*	-0.0142	-0.0305**	-0.196***	0.443***	-0.0969***	0.0895***	0.258***	0.196***	-0.153***	-0.0666***	-0.380***	-0.0202	0.218***	-0.111***	-0.126***	1

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 6.2(C) CORRELATION ANALYSIS-NON-FINANCIAL

Variables	roa	soc	envt	bs	ind	csr	ceo	bgd	skills	reporting	age	fsize	lev	capint	gdp	inflation	govest
roa	1																
soc	0.0120	1															
envt	-0.0306***	0.739***	1														
bs	-0.227***	0.306***	0.393***	1													
ind	0.0473***	0.0637***	-0.125***	-0.161***	1												
csr	-0.0186**	0.562***	0.678***	0.292***	-0.102***	1											
ceo	0.0347***	-0.0151**	-0.0524***	0.0452***	0.135***	-0.0822***	1										
bgd	0.0424***	0.354***	0.260***	0.107***	0.257***	0.213***	-0.0239***	1									
skills	0.0630***	-0.162***	-0.166***	-0.136***	0.00243	-0.109***	0.0982***	-0.202***	1								
reporting	-0.00301	0.621***	0.761***	0.311***	-0.178***	0.649***	-0.114***	0.257***	-0.168***	1							
age	-0.0304***	0.187***	0.317***	0.255***	-0.173***	0.238***	-0.0192**	0.0284***	-0.0480***	0.259***	1						
fsize	-0.294***	0.311***	0.512***	0.483***	-0.319***	0.382***	-0.0572***	-0.0911***	-0.0605***	0.425***	0.330***	1					
lev	-0.00687	0.0877***	0.100***	0.0420***	0.0496***	0.0797***	0.0373***	0.0584***	-0.00685	0.0852***	-0.0589***	0.0959***	1				
capint	0.0874***	-0.00705	0.125***	-0.0686***	-0.0378***	0.153***	-0.0298***	-0.0426***	0.0381***	0.134***	0.0110	0.0629***	0.308***	1			
gdp	0.100***	-0.117***	-0.124***	-0.0472***	0.0754***	-0.149***	0.0411***	-0.148***	0.0363***	-0.161***	-0.0854***	-0.0942***	-0.0338***	-0.0282***	1		
inflation	0.0131*	-0.0527***	-0.0743***	-0.0830***	0.0568***	-0.0564***	0.0212***	0.00106	-0.00947	-0.0688***	-0.156***	-0.0694***	0.00896	0.0386***	0.0198***	1	
govest	0.0773***	0.0122*	0.0410***	-0.144***	0.0319***	0.0713***	-0.144***	0.0857***	-0.00445	0.0626***	0.0444***	-0.125***	-0.0604***	0.0427***	0.206***	-0.0107	1

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 6.3 shows variance inflation factor test carried out to determine the multicollinearity and possible correlation between the variables used in this thesis.

Table 6.3 Correlations and Multicollinearity

	Financial performance		Social performance		Environmental performance	
reporting	1.78	0.561404	1.88	0.53215	1.88	0.532129
fsize	1.73	0.578224	1.84	0.543801	1.84	0.543855
csr	1.67	0.598285	1.72	0.581753	1.72	0.581762
ind	1.44	0.695382	1.4	0.712778	1.4	0.712756
govest	1.38	0.725758	1.35	0.741678	1.35	0.74167
bgd	1.35	0.741814	1.32	0.759123	1.32	0.75913
bs	1.25	0.79782	1.31	0.764917	1.31	0.764851
age	1.18	0.849501	1.19	0.838848	1.19	0.838901
capint	1.14	0.875931	1.14	0.878633	1.14	0.878625
lev	1.13	0.885496	1.12	0.89424	1.12	0.89426
skills	1.09	0.919883	1.09	0.919005	1.09	0.919011
ceo	1.08	0.928114	1.07	0.937558	1.07	0.937539
gdp	1.08	0.928692	1.06	0.938975	1.06	0.938975
inflation	1.07	0.938778	1.05	0.950785	1.05	0.950784
Mean VIF	1.31		1.32		1.32	

Table 6.4 Breusch-Paga/Cook-Weisberg Test to correct for heteroskedasticity

	ROA	SOCIAL	ENVIRONMENTAL
Heteroskedacity tests	47.23***	180.95***	1834.95***

Note: figures are in Chi2(1). *** p < 0.01

6.4 Results and discussion

This study relies on the results provided by the GMM model because the results from the GMM models are known to produce consistent results even in the presence of diverse sources of endogeneity (Ullah, Akhtar and Zaefarian, 2018). The GMM uses lagged dependent and independent variables as instruments to control for endogeneity. The GMM estimation is valid when there is no second-order serial autocorrelation in the residuals and on the validity of the instruments used which has been confirmed in this study. Also, the assumptions for specification are valid when the residuals in the first differences (AR1) are correlated but there is no serial correlation in the second differences (AR2). The study, after confirming AR2 as valid also reports the Hansen test for over-identifying restrictions that confirm the validity of the selected instruments. Therefore, following prior studies (Wintoki, Linck and Netter, 2012; Al Farooque, Buachoom and Sun, 2020; Cancela et al., 2020), the study depends on the GMM model to discuss board structure and sustainability performance relationship. Thus, all discussions done in this study follow the results obtained from the GMM models as shown in Table 6.3.

The second objective of this study demands the test for differences in the effect of board structure on sustainability performance among financial and non-financial firms considering that the activities in these industrial sectors are different and might call for differences in their board structure to improve sustainability performance. This is very crucial at this point when both financial and non-financial firms are important stakeholders and are expected to contribute immensely towards the achievement of SDGs. This makes it important to test for differences in coefficients of financial and non-financial firms to ascertain if similarities exist between the two sectors in terms of board structure influence on sustainability performance. In Table 6.3c, the study adopts the guidance and procedure provided by the University of California, Los Angeles (UCLA) to compare the regression coefficients between the two groups; financial and non-financial firms to determine if there are differences in board structure influence on sustainability performance among these two groups (Bruin, 2006). Since the study is interested in the effect of board structure on sustainability performance, the coefficient tests are conducted on independent variables only. Lastly, sensitivity analysis is performed to check the robustness of the main regression analysis. Results are then discussed and analysed in terms of the theoretical framework chosen for this study and conclusions drawn from statistical findings.

6.4.1 Presentation of results

To confirm the validity of the GMM models, the overidentifying restrictions are tested using Sargan-Hansen statistics. Also, the AR (1) and AR (2) that test for first-order and second-order residual correlation have been reported. Based on the GMM results shown in Table 6.3, for the full sample, board size relates negatively to financial and environmental performance but positively to social performance. The coefficient for board size to financial, social, and environmental performance stands at -0.106, 0.0039 and 0.0029 respectively indicating that holding all other things constant, when one additional member joins the board, it decreases financial performance by \$0.2, increase social performance by 0.4% and increase environmental performance by 0.3%. The study predicted a negative and significant relationship between board size and financial sustainability performance, a positive significant relationship between board size and social performance and a significant relationship between board size and environmental performance. Hence, hypotheses H1a, H1b and H1c are confirmed. The results indicate that there is an insignificant relationship between board independence and financial (-0.05) and environmental performance (-0.002). Board independence has a positive relationship with social performance (0.0092), which suggests that an additional percentage increase in board independence increase social performance by 0.92%. The study predicted a significant relationship between board independence and all three dimensions of sustainability performance. The results, therefore, reject hypotheses H2a and H2c but accept H2b. The findings show a positively significant relationship between sustainability committee, financial, social, and environmental performance which confirms the study's predictions, hence, supporting hypotheses H3a, H3b and H3c. For sustainability committee, the results show coefficients of 0.038 for financial, 0.07 for social and 0.004 for environmental performance suggesting that holding other variables constant, a one percentage increase in sustainability committee board membership sustainability result in \$0.04 increase in financial performance, 0.01% increase in social performance and 0.04% increase in environmental performance. This study predicted a positive relationship between board expertise and all three dimensions of sustainability performance. The recorded evidence shows a positive relationship between board expertise and financial and environmental performance and a negative relationship between expertise and social performance suggesting support for H4a and H4c and rejection for H4b. Looking at the coefficients for the board expertise, if all other variables are held constant, increasing board expertise by 1% will increase financial

performance by \$0.6, decease social performance by 0.43% and increase social performance by 0.36%. The results show a positive link between CEO duality and financial, social, and environmental performance which contrast hypotheses H5a, H5b and H5c, hence the hypotheses are rejected. Considering the economic benefits, the study indicates that companies that adopt the CEO duality could increase their financial performance \$0.02 per each dollar spent for each period, increase social and environmental performance by 0.07%. Finally, though there was a prediction of a positive relationship between board gender diversity and financial, social, and environmental performance. The findings show that board gender diversity has an insignificant effect on financial and environmental performance but a positive effect on social performance (0.0145), suggesting that an additional percentage increase of women directors will enhance social performance by 5.68%. Based on the study's predictions, the results reject hypotheses H6a and H6c but accept H6b.

Regarding the control variables, specifically for the firm-control variables, the table shows that firm age does not affect financial and social performance but causes detriment to environmental performance. The coefficient for environmental performance shows as 0.00328 which means that a year growth in companies increase their environmental performance by 0.01%. Sustainability reporting influences financial, social, and environmental performance positively. From the table, the coefficient of sustainability reporting is 0.048, 0.0084 and 0.0059 for financial, social, and environmental performance respectively. Which suggest that anytime companies disclose their financial, social, and environmental activities, their financial performance increase by \$0.05, social performance increase by 0.84% and environmental performance increase by 0.59%. Firm size harms financial performance (0.445) has a positive effect on social performance (0.00999) and has an insignificant effect on environmental performance. Thus, holding other variables constant, as companies get a year older, their financial performance decrease by \$0.5 and their social performance increase by 0.99% Furthermore, the table shows that though leverage harms financial sustainability (0.00741), it improves environmental performance (0.00053) but does not affect social performance. Thus, a one dollar borrowing of companies decease their financial performance by \$0.74 and increase their environmental performance by 0.05%. Capital intensity enhances financial and environmental performance and causes detriment to social sustainability. For the country-level controls, GDP shows an insignificant relationship with financial and social performance but a positive link to environmental performance. From the table, an annual percentage increase in the country's economic growth affects its companies' environmental performance by 0.12%

Inflation records an insignificant relationship with all three dimensions of sustainability performance. The country governance index shows a negative association with financial performance, a positively link to social performance and an insignificantly link with environmental performance.

TABLE 6.3A GMM RESULTS-OVERALL

Variables	roa	soc	envt
L.roa	0.445** 0.216		
L.soc		0.707*** 0.0506	
L.envt			0.897*** 0.0218
bs_n	-0.215** -0.106	0.0112*** -0.00392	-0.00584** -0.00294
ind	-0.0561 -0.0563	0.0457*** -0.00924	-0.00233 -0.00359
csr	0.0874** -0.0379	0.0327*** -0.00664	0.00966** -0.00377
skills	0.142** -0.0594	-0.00722* -0.00433	0.0106*** -0.00367
ceo	0.0517*** -0.0191	0.00683*** -0.00179	0.00700*** -0.00155
bgd	0.0187 -0.0659	0.0568*** -0.0145	0.00633 -0.00703
age_n	0.018 -0.013	-0.00168 -0.00104	-0.00328*** -0.00101
reporting	0.109** -0.0483	0.0741*** -0.00842	0.0643*** -0.00589
fsize_n	-1.053** -0.445	0.0238** -0.00999	0.0118 -0.00876
lev_n	-0.0136* -0.00741	0.00101 -0.00064	0.00197*** -0.000532
capint	0.198** -0.0773	-0.0255*** -0.00431	0.0201*** -0.00274
gdp_n	0.000319 -0.0165	-0.000245 -0.00138	0.00600*** -0.00127
inflation_n	-0.0118 -0.00785	0.00119 -0.000947	-0.00124 -0.000812
govest	-0.119** -0.0565	0.00443* -0.0023	0.00239 -0.00188
Year effect	Yes	Yes	Yes
Observations	15,216	17,143	17,327
Number of groups	4,862	5,476	5,503
No of instruments	23	23	22
AR1	0.001	0.000	0.000
AR2	0.329	0.479	0.105
Hansen p-value	0.272	0.135	0.155

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

To answer the second research question, the study sample was divided into financial and non-financial firms and a further regression analysis was performed on the segmented samples. The aim at this point is to test whether the influence of board structure on sustainability performance differs among financial and non-financial firms. Table 6.3b confirms that the influence of board structure on financial, social, and environmental performance differs among financial and non-financial firms. Board size hurts financial performance in financial firms, but the effect is insignificant in non-financial firms. Also, board size has an insignificant effect on social performance in financial firms, but it improves social performance in non-financial firms. Thus, there is a significant difference in terms of board size effect on financial and social performance among financial and non-financial firms. The evidence from financial firms indicates a negative relationship between board independence and financial performance, but this relationship is positive in non-financial firms. Board independence is positive to environmental performance in financial firms but insignificant in non-financial firms. This shows that differences exist between the effect of board independence on financial and environmental performance among financial and non-financial firms.

Furthermore, the CSR committee improves the financial and environmental performance of financial firms, but this relationship is insignificant in non-financial firms. Hence, CSR committee influence on financial and environmental performance in financial firms is significantly different from such a relationship in non-financial firms. The evidence shows that board expertise is insignificant to social and environmental performance in financial firms, but it is negative to social performance and positive to environmental performance in non-financial companies. Hence, a significant difference exists between board expertise and social and environmental performance in financial and non-financial firms. CEO duality has an insignificant effect on all three dimensions of sustainability performance in financial firms, but a positive significant effect on financial, social, and environmental performance in non-financial firms. This shows that CEO duality's effect on sustainability performance in financial firms is different from CEO duality's influence on sustainability performance in non-financial firms. Board diversity has a positive relationship with environmental performance in financial firms, but such a relationship is insignificant in non-financial firms. Also, while diversity has an insignificant effect on social performance in financial firms, the relationship with social performance is positive in non-financial firms. Board diversity-sustainability relation in financial firms is therefore significantly different from board diversity effect on sustainability performance in non-financial firms.

In Table 6.3c, the coefficient tests (Bruin, 2006) confirm that board structure influence on sustainability performance differs among financial and non-financial firms. According to the table, on average, board size in financial firms achieve stronger financial performance than non-financial firms. This is an indication that the industrial sector of the firms has a significant effect on financial, social, and environmental performance. The difference in the effect of board size on sustainability performance across the two firm groups is found to be significant at -0.10(-25.62) for financial performance, -0.10(-14.35) for social performance and 0.02(-16.28) for environmental performance. Regarding board independence, the table shows that on average, non-financial firms achieve stronger financial performance than financial firms and financial firms achieve stronger social performance than non-financial firms. The difference in the effect of board independence on performance across the two firm groups is found to be significant at -0.13(-2.56) for financial performance and -0.03(-2.77) for social performance. Similarly, the analysis for board expertise shows that on average, there is a significant industry effect on financial, social, and environmental performance such that non-financial firms achieve higher sustainability performance than financial firms. The difference in the effect of board expertise on sustainability performance across the two firm groups is found to be significant at -0.60(10.12) for financial performance, 0.15(11.33) for social performance and 0.11(6.11) for environmental performance. With the sustainability committee, on average, there is a significant industry effect on financial and social performance such that non-financial firms achieve stronger financial and social performance than financial firms. Evidence for CEO duality also indicates that the effect is significant on financial performance (-0.07(-2.38)), social performance (-0.01(-2.94)) and environmental performance (-0.06(-7.07)) in a manner that non-financial firms attain a stronger financial and environmental performance than financial firms, while financial firms attain stronger social performance than non-financial firms. Finally, board gender diversity shows a significant industry effect in financial and environmental performance such that with financial performance, the effect is stronger in non-financial firms and with environmental performance the effect is strong in financial firms than in non-financial firms.

The GMM results for the control variables similarly show significant differences between financial and non-financial firms in terms of board structure effect on sustainability performance. From Table 6.4, firm age has an insignificant effect on social and environmental performance in financial firms. However, it is negatively related to social and environmental performance in non-financial firms. Hence, firm age effect on social and environmental

performance is significantly different between financial and non-financial firms. Firm size exerts a positive significant influence on environmental performance in financial firms but an insignificant influence in non-financial firms; financial and non-financial firms differ in terms of firm size and environmental performance. Leverage has a positive relationship with financial performance in financial companies, but a negative link with financial performance in non-financial firms. In addition, leverage improves the environmental performance in financial firms but exerts an insignificant influence on environmental performance in non-financial companies. Thus, the effect of leverage on financial and environmental performance differs among financial and non-financial firms. Capital intensity improves the financial, social, and environmental performance in financial firms but hurts financial, social, and environmental performance in non-financial firms. This indicates that a significant difference exists between financial and non-financial companies regarding capital intensity effect on sustainability performance. Concerning country-level controls, while gross domestic product improves the social and environmental performance in financial firms, the relationship is insignificant in non-financial firms. Therefore, the impact of GDP on social and environmental performance differs among financial and non-financial firms. Inflation affects the environmental performance of financial companies negatively but does not influence environmental performance in non-financial firms. This portrays a significant difference between the effect of inflation on environmental performance in financial and non-financial companies. The country governance index has an insignificant effect on social performance in financial firms but a positive significant effect on social performance in non-firms. Thus, how country governance impact social performance differs among financial and non-financial firms.

TABLE 6.3B- GMM RESULTS-FINANCIAL AND NON-FINANCIAL

VARIABLES	FINANCIAL			NON-FINANCIAL		
	<i>roa</i>	<i>soc</i>	<i>envt</i>	<i>roa</i>	<i>soc</i>	<i>envt</i>
L.roa	0.326*** (0.0658)			0.433*** (0.116)		
L.soc		0.731*** (0.0575)			0.777*** (0.0243)	
L.envt			0.778*** (0.0364)			0.923*** (0.0927)
bs_n	-0.366*** (0.0632)	0.00865 (0.00578)	-0.00273 (0.00652)	-0.0438 (0.0311)	0.0101*** (0.00340)	-0.00582 (0.0120)
ind	-0.174** (0.0786)	0.0416*** (0.0129)	0.0195* (0.0105)	0.182*** (0.0425)	0.0354*** (0.00547)	0.0157 (0.0110)
csr	0.145*** (0.0402)	0.0231*** (0.00775)	0.0248*** (0.00823)	0.0183 (0.0176)	0.0255*** (0.00376)	-0.0233 (0.0300)
skills	0.297*** (0.0744)	0.00414 (0.00795)	-0.0116 (0.00922)	0.0673** (0.0341)	-0.00697* (0.00409)	0.0189** (0.00960)
ceo	0.0218 (0.0332)	0.00380 (0.00320)	-0.00271 (0.00361)	0.0247* (0.0146)	0.00621*** (0.00166)	0.00997*** (0.00317)
bgd	0.179 (0.134)	0.0285 (0.0175)	0.0425** (0.0176)	0.110 (0.0746)	0.0420*** (0.00914)	-0.0352 (0.0403)
age_n	-0.0337 (0.0218)	0.00151 (0.00203)	0.000500 (0.00252)	0.00146 (0.00843)	-0.00292*** (0.000943)	-0.00589* (0.00317)
reporting	0.116*** (0.0437)	0.0739*** (0.0113)	0.0962*** (0.0120)	0.0335* (0.0185)	0.0615*** (0.00449)	0.117** (0.0497)
fsize_n	-1.567*** (0.215)	0.0474** (0.0221)	0.110*** (0.0214)	-0.486*** (0.128)	0.0157** (0.00731)	-0.0141 (0.0530)

lev_n	0.0763*** (0.0203)	0.00150 (0.00134)	0.00300* (0.00159)	-0.0584*** (0.0132)	-3.37e-05 (0.000590)	0.000202 (0.000755)
capint	0.376*** (0.0683)	0.0148** (0.00641)	0.0828*** (0.00689)	-0.116*** (0.0417)	-0.0345*** (0.00413)	-0.0125** (0.00519)
gdp_n	0.0362 (0.0231)	0.00878*** (0.00316)	0.00975*** (0.00369)	0.000280 (0.0138)	-0.00147 (0.00145)	0.00313 (0.00227)
inflation_n	0.00625 (0.0167)	5.50e-05 (0.00199)	-0.00515** (0.00257)	0.00585 (0.00865)	0.00125 (0.000913)	0.00142 (0.000984)
govest	-0.215*** (0.0402)	5.86e-05 (0.00389)	0.00756 (0.00502)	-0.0929*** (0.0260)	0.00389** (0.00194)	0.00192 (0.00570)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,391	3,416	3,416	11,825	13,727	13,727
Number of groups	1,054	1,117	1,117	3,808	4,359	4,359
No of instruments	23	23	23	23	24	22
AR1	0.000	0.000	0.000	0.000	0.000	0.000
AR2	0.296	0.613	0.971	0.363	0.192	0.127
Hansen p-value	0.160	0.249	0.115	0.764	0.164	0.338

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

TABLE 6.3C. COEFFICIENT TESTS (MODERATING EFFECTS OF FIRM INDUSTRY ON THE LINK BETWEEN BOARD STRUCTURE AND SUSTAINABILITY PERFORMANCE)

	Financial firms' model			Non-financial firms' model			Interaction effect model		
	ROA	SOC	ENVT	ROA	SOC	ENVT	ROA	SOC	ENVT
Board size (BS)	-0.13(-36.27) ***	0.01(15.93) ***	0.02(22.36) ***	-0.03(-15.81) ***	0.02(54.81) ***	0.04(76.07) ***	-0.03(-15.37) ***	0.02(55.31) ***	-0.04(74.39) ***
Firm industry (financial = 1) (FIF)							0.10(2.62) ***	0.11(11.87) ***	0.10(9.13) ***
BS × FIF							-0.10 (-25.62) ***	-0.10(-14.35) ***	-0.02(-16.28) ***
Constant	2.11(56.65) ***	0.34(43.10) ***	0.08 (7.76) ***	2.01(104.00) ***	0.23(52.20) ***	-0.02(-3.77) ***	2.01(101.12) ***	0.23 (52.69) ***	-0.02 (-3.69) ***
R ²	0.16	0.03	0.06	0.01	0.09	0.16	0.19	0.08	0.15
Board Independence (ind)	0.18(3.33) ***	0.05(5.04) ***	-0.13(-9.08) ***	0.31(13.75) ***	0.09(15.66) ***	-0.12(-17.70) ***	0.31(13.04) ***	0.09(15.90) ***	-0.12(-17.55) ***
Firm industry (financial = 1) (FIF)							-0.82(-22.80) ***	0.02 (2.12) *	-0.03 (-3.04) **
BI × FIF							-0.13(-2.56) **	-0.03(-2.77) **	-0.01(-0.65)
Constant	0.07(19.03) ***	0.42(57.73) ***	0.39(39.22) ***	1.53(104.48) ***	0.40(109.77) ***	0.42(94.79) ***	1.50(99.09) ***	0.40 (111.43) ***	0.42 (93.99) ***
R ²	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Board-specific skills (skills)	0.68(11.36) ***	0.01(0.95)	-0.09(-5.75)	0.08(2.82) **	-0.03(-15.81) ***	-0.10(-25.06) ***	0.08(2.68) **	-0.14(-22.86) ***	-0.10(-24.79) ***
Firm industry (financial = 1) (FIF)							-1.18 (-36.60) ***	-0.08(-11.11) ***	-0.10(-10.73) ***
BSS × FIF							0.60(10.12) ***	0.15(11.33) ***	0.11(6.11) ***
Constant	0.52(15.98) ***	0.45(70.68) ***	0.35(40.07) ***	1.69(112.76) ***	2.01(104.00) ***	0.45(101.44) ***	0.14 (1560.78) ***	0.53(147.52) ***	0.45(100.33) ***
R ²	0.02	0.00	0.00	0.00	0.02	0.02	0.15	0.02	0.02

Notes:

1. Dependent variables are ROA (economic performance), SOC (social performance), and ENVT (environmental performance).
2. Unstandardized regression coefficients along with t-values (in parentheses) are reported.
3. All effects are evaluated at t-values ≥ 1.96 for 5% (2-tailed test).

TABLE 6.3C. CONTINUED

	Financial firms' model			Non-financial firms' model			Interaction effect model		
	ROA	SOC	ENVT	ROA	SOC	ENVT	ROA	SOC	ENVT
CSR committee (CSR)	-0.06(-2.25)*	0.27(63.83)***	0.40(74.01)	-0.12(-10.08)***	0.26(109.93)***	0.37(142.26)	-0.12(-9.57)***	0.26(112.44)***	0.37(141.23)***
Firm industry (financial = 1) (FIF)							-0.93(-54.93)***	0.02(6.57)***	-0.02(-4.66)***
CSR_C × FIF							0.06(2.23)*	0.01(1.50)	0.03(4.73)***
Constant	0.86(51.84)***	0.35(134.54)***	0.15(44.57)	1.78(210.09)***	0.33(199.93)***	0.18(91.81)	1.78(199.39)***	0.33(204.50)***	0.18(91.15)***
R ²	0.00	0.35	0.42	0.00	0.30	0.41	0.14	0.31	0.42
CEO duality (CEO)	0.01(0.24)	-0.02(-3.57)***	-0.08(-10.26)***	0.07(5.87)***	-0.00(-0.13)	-0.02 (-5.34)***	0.07(5.57)***	-0.00(-0.13)	-0.02(-5.30)***
Firm industry (financial = 1) (FIF)							-0.86(-55.58)***	0.00(1.36)	-0.03(-5.85)***
CEO_D × FIF							-0.07(-2.38)*	-0.01(-2.94)**	-0.06(-7.07)***
Constant	0.83(53.19)***	0.46(151.61)***	0.33(79.65)***	1.70(233.40)***	0.45 (260.63)***	0.35(167.56)***	1.70(221.59)***	0.45(264.76)***	0.35(166.39)***
R ²	0.00	0.00	0.01	0.00	0.00	0.00	0.14	0.00	0.01
Board diversity (bgd)	0.19(1.92)*	0.55(30.48)***	0.64(25.47)***	0.36 (8.36)***	0.56(56.75)***	0.46 (37.27)***	0.36(7.93)***	0.56(57.68)***	0.46(37.10)***
Firm industry (financial = 1) (FIF)							-0.86(-38.90)***	-0.00(-1.09)	-0.08(-13.20)***
BD × FIF							-0.17(-1.76)	-0.01(-0.28)	0.18 (6.59)***
Constant	0.80(35.23)***	0.35(84.07)***	0.18(31.62)***	1.66(170.88)***	0.36(161.61)***	0.27(96.86)***	1.66(162.12)***	0.36(164.26)***	0.27(96.41)***
R ²	0.00	0.11	0.08	0.00	0.10	0.05	0.14	0.10	0.06

Notes:

1. Dependent variables are ROA (economic performance), SOC (social performance), and ENVT (environmental performance).
2. Unstandardized regression coefficients along with t-values (in paratheses) are reported.
3. All effects are evaluated at t-values ≥ 1.96 for 5% (2-tailed test).

6.4.2 Discussion and implication of regression results

6.4.2.1 Board size

This study investigates the influence of board structure on all three dimensions of sustainability performance. The evidence presented in Table 6.3a suggests that board size has an inverse relationship with financial and environmental performance, across all industries. These results contradict the prediction of the stakeholder-agency theory that firms require more directors to provide efficient oversight services (Ntim and Soobaroyen, 2013). However, it supports the argument of stewardship theory that executive directors work responsibly to increase shareholders' wealth if they are allowed to work more independently (Davis, 1997) and have fewer directors to provide advisory services (Menyah, 2013). The results enhance the stewardship theory argument that internal directors get job satisfaction when they are less monitored and are allowed to make some important decisions on their own. This contributes to increase productivity and financial performance. Kyere and Ausloos (2020) argue in line with stewardship theory that the firm does not need more external directors to monitor and control management activities because managers are concerned about their reputation and career development which makes them more motivated to work toward the interest of stakeholders including making sure corporate affairs are geared towards sustainable development. Christensen, Kent, and Stewart (2010) stated that managers have intensive knowledge to increase firm profitability more than external directors. Furthermore, García Martín and Herrero (2020) posit that a larger board size leads to board inefficiencies and this can cause the neglect of environmental commitments. These results are in line with some prior studies that argue in favour of smaller board size (Guney, Karpuz and Komba, 2020; García Martín and Herrero, 2020; Khan, Al-Jabri and Saif, 2021).

The results indicate that board size promotes social performance as argued by the stakeholder-agency theory. According to the theory, companies need more prestigious directors to commit to CSR activities and focus on policies which meet the demands of diverse stakeholders. Similarly, the resource dependency theory supports the argument for a larger board size because more directors create avenues for more resource-rich directors to share diverse opinions on corporate strategies and diffuse power concentration to enhance efficient monitoring. Furthermore, increasing the board size will likely bring people who are passionate about meeting stakeholders' needs on board. Such directors can influence the board decisions by contributing ideas which will safeguard the interests of all stakeholders. Empirically, these results are consistent with those of Biswas, Mansi, and Pandey (2018); Nguyen, Doan and Frömmel (2020) and Nguyen and Thanh (2021). The authors explain

that firms need more directors to improve monitoring and advisory services. A larger board will also provide greater human resources to encourage the firm to understand and deal with relevant issues concerning the environment and society.

Focusing on the second objective, the finding that there is a significant difference between the impact of board size on financial performance among financial and non-financial companies links with the stewardship theory proposition that companies perform better with a smaller board size (Davis, 1997). It is reasonable to believe that in financial firms where management is likely to conduct risky business without the immediate notice of the directors or external investors due to the opacity in the activities of financial firms (Becht, Bolton and Röell, 2011) will demand even a smaller board size than non-financial firms to ensure quick and efficient decision making by the board. The small board size in financial firms will also possibly prevent social loafing and avoid negligence of board monitoring and advisory duties (Nguyen and Thanh, 2021). Similarly, the significant difference in social performance affirms the stakeholder-agency theory argument in favour of more directors to promote social performance (Shahzad, Rutherford and Sharfman, 2016), especially, in non-financial firms where the demand for expert directors is relatively less intense (Hopt, 2021).

6.4.2.2 Board independence

The results for the full sample suggest that board independence has an insignificant effect on financial and environmental performance but a significant impact on social performance. This supports the theoretical implication of the stewardship theory that the executive directors are trustworthy stewards with the needed knowledge to perform and conduct firm operations effectively which then renders the involvement of more outside independent directors less important (Donaldson and Davis, 1991). Similar results were recorded by Daadaa (2020), Uyar et al. (2020) and Roffia, Simón-Moya and Sendra García (2021). The authors report that outside directors are not more efficient in safeguarding the interests of stakeholders than executive directors. Also, most of these independent directors have affiliations with either managers or firm owners which hinders their ability to perform their duties as true independent directors. The study supports the argument put forward by Sharma (2016) and Cavaco et al. (2016) that some of these independent directors may lack the needed expertise and knowledge to make a significant impact on the board.

However, the findings show that a larger proportion of independent directors promote social performance among industries which supports the ideologies of stakeholder-agency theorists that as independent directors represent the entire stakeholders, increasing their number on the board shows the firm's commitment to social performance initiatives. The result points to the fact that outside directors, due to their reputational

concerns, conduct their monitoring and advisory duties to broaden stakeholder orientation which includes promoting social activities. The result is supported by Shaukat, Qiu and Trojanowski (2016) who found that including more independent directors helps the board to develop more proactive and detailed corporate social strategies to enhance social performance. Ducassy and Montandrou (2015) also emphasised that a firm increases its social performance if it is infused with directors with less personal interests such as independent directors. However, this result contradicts the findings of Naciti (2019) which found a negative significant relationship between board independence and social performance. The author argues that independent directors may cause harm to social performance if they act on manipulative and misleading information that they are provided with by managers

The study findings indicating a significant difference in board independence influence on financial and social performance in financial and non-financial firms can be linked to regulatory recommendations and the complexity of financial institutions which demands that independent directors of financial institutions should not only be independent but should primarily be knowledgeable, competent, and experienced (Hopt, 2013). It can be argued that financial institutions will potentially improve financial performance with fewer but knowledgeable, competent and resource-rich independent directors than in non-financial firms where a larger percentage of independent directors are required for management oversight duties (Jensen and Meckling, 1976). The finding indicating differences in environmental performance among financial and non-financial firms aligns with the argument of RDT that when companies select directors with valuable skills, corporate performance improves significantly (Hillman, Shropshire, and Cannella, 2007). This is evident in the differences in that compared to non-financial firms, the regulatory requirements in financial firms are likely to reduce the number of independent directors with a knowledge gap and increase the number of directors with enough expertise and knowledge to question and assess decisions of management on environmental strategies and practices (de Villiers, Naiker and van Staden, 2011; Cavaco et al., 2017). Consequently, the presence of board independence in financial firms is likely to be more significant than in non-financial firms.

6.4.2.3 CSR committee

The study finds the presence of the sustainability (CSR) committee on the board is significantly positive to financial, social, and environmental performance, across all industries. This supports the ideologies of stakeholder-agency theorists that the presence of a CSR committee will possibly encourage the board and management to respond to stakeholders' needs (Baraibar-Diez and Odriozola, 2019). Also, the committee monitors the firm's responsibility practices while making sure it complies with regulations regarding

sustainability risks (Birindelli et al., 2018). This result is consistent with earlier findings on the relationship between CSR committee and sustainability dimensions (Burke, Hoitash and Hoitash, 2019; Del Valle, Esteban and De Foronda Pérez, 2019; Orazalin, 2020) which explain that the presence of a CSR committee generates value to allow formal commitment to stakeholders to lead to positive performance implications. Though the formation of a board sustainability committee is voluntary, most corporate governance codes of best practices around the world emphasise the need to have a board committee to increase performance (Christensen, Kent, and Stewart, 2010). Given this, some people argue that companies form sustainability committees and ensure frequent meetings for regulatory purposes (Hopt, 2021). It must, however, be noted that as the committee meets frequently, they get the opportunity to formulate policies to improve corporate sustainability performance. Uyar et al. (2020) conclude that the sustainability committee is a specialised sub-committee established to deal with sustainability-related issues to improve social and environmental performance.

The resource dependency theory suggests that the sustainability committee is a specialised team with experience, skills, and knowledge about sustainability issues. It follows, therefore, that this committee facilitates strategy formulations, provides advice, and creates an avenue for resource provisions to promote sustainable activities and performance (Hillman and Dalziel, 2003; Uyar et al., 2020). Also, the sustainability committee lessens moral hazards, agency costs and the likelihood of failures in firms because it provides specialised people to handle extremities in companies. The argument is supported by the findings of Hussain, Rigoni and Orij (2018), García Martín and Herrero (2020) and Uyar et al. (2021). These authors argue that the sustainability committee helps to promote sustainable activities, and stakeholder engagement (Govindan et al., 2021), and to help the firm to prevent litigations (de Villiers, Naiker and van Staden, 2011).

The finding that there is a significant difference between the impact of sustainability committees on financial and non-financial companies is consistent with the arguments of stakeholder-agency and the RBV theories that the directors who form these specialist boards have unique knowledge and expertise in the area of sustainability and serve as unique resources for the firm to gain competitive advantage and enhance sustainability performance (Hill and Jones, 1992; Shaukat, Qiu and Trojanowski, 2016). The regulatory demand in the financial industries which is more focused on the expertise of the directors (Hopt, 2021) can be an opportunity for financial companies to get enough directors with knowledge and experience on sustainable activities to form the CSR committees more than it can happen in the non-financial industries. The significant difference in favour of financial firms could be that the quality oversight of financial institutions' CSR committees due to their expertise and experience may restrict bank risk-taking operations and environmental

issues and its impact to increase financial and environmental performance as has been predicted by the resource dependency theory (Hillman, Cannella and Paetzold, 2000; John, De Masi and Paci, 2016).

6.4.2.4 Board expertise

With the full sample, the results show that board expertise improves profitability and environmental performance supporting the suggestions of stakeholder-agency and resource-based view theories. From the stakeholder-agency theory perspective, expert directors have enough experience to perform effective oversight duties to lessen internal control problems (Al-Okaily and Naueihed, 2019). The skilfulness and competence of these directors help in the effective execution of board oversight duties to reduce conflict of interest, agency costs, litigation and environmental expenses. The finding is also in line with the RBV theory which suggests that resource-rich directors have unique and specific competencies that enable them to contribute differently to board processes and priorities and also connect the firm to the relevant resources (Shaukat, Qiu and Trojanowski, 2016). This encourages management to adopt specific strategies and actions (Goodstein and Boeker, 1991). In this instance, board expertise may have linked the firm to specific identifiable areas for the required strategies to improve financial and environmental performance. The expert directors might have been efficient in assessing financial and environmental risks and had encouraged management to develop effective risk management plans and strategies to avoid those risks, violations and fines which might have contributed to an increased financial and environmental performance. This argument has been supported by (de Villiers, Naiker and van Staden, 2011; Chaudhry, Roomi and Aftab, 2020).

Contrary to the study's prediction, board expertise decreases social performance. From a theoretical perspective, this finding contributes to the stewardship theory which supports the engagement of executive directors in business affairs more than external directors to improve sustainable development and performance since the executives have the expertise to independently manage business affairs. Supporting this assertion is the work of Crifo, Escrig-Olmedo and Mottis (2019) which posits that inside directors play significant roles which undermine the potential of expert directors. Empirically, Crifo, Escrig-Olmedo and Mottis (2019) found a negative significant effect of expert directors on sustainability performance. The findings contradict the stakeholder-agency theory and some studies that support a positive relationship between board expertise and social performance (Shaukat, Qiu and Trojanowski, 2016; Mohammadi, Saeidi and Naghshbandi, 2020).

With the second objective, the results show that there is a significant difference between the impact of board expertise and all three dimensions of sustainability performance by financial and non-financial companies can be linked to the regulatory issues and organisational structure in financial firms (Arnaboldi et

al., 2020). Sarbanes-Oxley Act (SOX) in 2002, and The Basel Committee on Banking Supervision, 2015 have emphasised that financial expertise play important role in the governance of financial firms due to complexities and risks linked to their activities (Aebi, Sabato, and Schmid, 2012; John et al., 2016) making it mandatory for financial firms to fill their boards with expert directors to meet regulatory demands. Consequently, introducing additional expert directors might not make any significant difference in financial firms compared to non-financial firms where the regulatory demands for expert directors are not as intense as in financial companies (Hopt, 2021). Thus, non-financial firms may need more expertise to contribute ideas to enhance firm performance more than financial firms since the latter might have these expert directors already due to regulatory demands.

6.4.2.5 CEO duality

The results show a positive significant relationship between CEO duality and the various dimensions of sustainability performance for all industry types. The evidence is consistent with the stewardship theory (Zhang, 2012) and the RDT (Ozbek and Boyd, 2020). These authors assert that duality improves sustainability performance because it promotes unified leadership and reduces the chain of command which then allows the CEO to make quick and important decisions to safeguard the interests of stakeholders. In support, Ozbek and Boyd (2020) imply that the duality leadership style promotes harmony between the board and the top management team which hastens decisions and also gives a positive signal to investors. CEO duality and its unified leadership attribute can be a valuable resource to the company to enhance sustainability performance because it allows for clear leadership command for effective strategic policy formulation and implementation (Cheng, 2013; Goergen, Limbach and Scholz-Daneshgari, 2020; Kyere and Ausloos, 2020). Bouteska (2020) also argues that the unity of command in duality help to curtail information and processing costs and increase business savings while preventing communication conflicts and information gaps between the CEO and the firm. Empirically, Zhang (2012), Naciti (2019) and Prashar and Gupta (2020) found a positive significant relationship between financial, social and environmental performance respectively. However, the results reject the predictions of stakeholder-agency theory and some empirical evidence which believe that CEO duality could harm the dimensions of sustainability performance as it reduces board independence, increases CEO power and CEO entrenchment (Kouaib, Mhiri and Jarboui, 2020; Hsu et al., 2021; Uyar et al., 2021).

The finding that there is a significant difference between the impact of CEO duality on all three dimensions of sustainability performance among financial and non-financial companies mean that the choice of leadership style is more important in non-financial firms than they are in financial companies. Literature has

shown that CEO entrenchment in duality can harm performance while the unity of command associated with duality can increase performance (Kyere and Ausloos, 2020). The regulatory requirements imposed on financial firms may dominate banking activities such that it can make the impact of CEO duality less visible (Aebi, Sabato, and Schmid, 2012). Compared with financial firms, non-financial firms are less regulated (Hopt, 2021). This can make the impact and consequences of adopting the CEO duality leadership style considerably appreciated in non-financial firms than in financial firms.

6.4.2.6 Board gender diversity

Contrary to expectations, the results found an insignificant relationship between board gender diversity and financial and environmental performance. The findings are in line with Fernández-Temprano and Tejerina-Gaite (2020) who accentuate that the dearth number of women on corporate boards hinders their impact. It is also contended that women directors can only make an impact when their number rises to a certain threshold because gender inequality can affect communication and hinder the voice of women. Some prior studies found an insignificant effect of board gender diversity on financial performance (Arnaboldi et al., 2020; Fernández-Temprano and Tejerina-Gaite, 2020; Kouaib, Mhiri and Jarboui, 2020). Evidence of an insignificant relationship between gender diversity and environmental performance has been recorded by Galbreath (2011) who explains that sex biases and stereotyping by male directors could prevent the voice of women on environmental issues. Alazzani, Hassanein and Aljanadi (2017) also put forward that, male directors can dominate discussions on environmental issues to override the voice of women. Also, women concentrate more on social-related issues than environmental issues. Therefore, their impact on environmental performance is likely to be insignificant.

As expected, board gender diversity is significant to social sustainability performance indicating that a greater percentage of women on the board promotes social performance. This supports the stakeholder-agency theory argument that women being a new distinct group from the traditional male-dominated board will increase board independence to foster good monitoring which the firm needs to reduce information asymmetry and stakeholder-agency costs (Song, Yoon and Kang, 2020). This outcome supports prior findings (Biswas, Mansi and Pandey, 2018; Orazalin and Baydauletov, 2020). It is known that women can enhance board effectiveness through diverse ideas, experience, and knowledge. Also, the ethical nature of women coupled with their empathetic, caring nature, the presence of women directors reduces unethical and harmful practices and promotes good social practices (Galbreath, 2011). The findings also support the resource dependency theory and the legitimacy theory (Shakil, Tasnia and Mostafiz, 2020) which argues that the presence of women

directors becomes the firm's source of critical resources due to the intellectual and interpersonal traits of women. Moreover, besides that women are unconditionally committed to ethical standards, they also have a passion for social activities (Arayssi, Jizi and Tabaja, 2020). Therefore, their presence not only improves social performance but also enhances firm legitimacy. However, Fernandez-Tempreno (2020) explain that Gender diversity can create self-categorisation processes where people are prone to form in-groups and out-groups to create friction on the board and prevent the board from performing its duties effectively.

The finding that there is a significant difference between the impact of board gender diversity in financial and non-financial companies aligns with the assertion made by Birindelli, Iannuzzi and Savioli (2019) regarding women and the critical mass. The authors argue that for women to provide new ideas, and skills, have a positive impact and contribute to firm performance, they need to reach a certain number or threshold. In this study, the findings favour non-financial firms more than financial firms. The differences could be due to stringent criteria for selecting directors for financial firms. Thus, despite that all companies diligently select their directors, the selection criteria are more rigorous in financial firms than they are in non-financial firms. Consequently, it is likely for non-financial firms to have a larger pool of women to select female directors from than it is in financial firms making it more likely for non-financial firms to meet the needed threshold for women to make an impact on corporate boards (Fernández-Temprano and Tejerina-Gaite, 2020; Hopt, 2021).

6.4.2.7 Control Variables

Regarding firm-level control variables, firm age is insignificant to financial and social performance but significantly negative to environmental performance. The significance of firm age on environmental performance could be linked to the argument that younger firms may potentially have newer assets that may conform to the regulatory standards and meet environmental standards. Also, due to the possible inflexibility of older firms, they may be less innovative in new business ideas and miss important opportunities for environmental development (Elsayed, 2006; Coad, Blasco and Teruel, 2013). Sustainability reporting has a positive relationship with financial, social, and environmental performance. This supports the legitimacy theory suggestion that reporting encourages companies to engage in sustainability practices and environmental innovations to help gain corporate legitimacy (Burhan and Rahmanti, 2012). From the results, firm size hurts financial performance, has a positive impact on social performance and has an insignificant link to environmental performance. The negative relationship offers support to the agency theory assertion that conflicts and clashes between shareholders and managers are prevalent in large firms, which can lead to a lack of control to create room for opportunistic activities to reduce corporate profit (Salman and Yazdanfar (2012).

However, the result is evident that firm size improves social performance which offers support for Johnson and Greening (1999) and Muller and Kolk (2010) that larger firms are likely to have available financial resources to support sustainability activities. In financial firms, firm size remains negative to environmental performance but insignificant in non-financial firms.

Leverage is negatively related to financial performance but positively related to environmental performance and insignificantly related to social performance, across all industries. The negative effect of leverage on profit supports the views of Asimakopoulos, Samitas and Papadogonas (2009) that leverage causes a decline in firms' available resources for investment. In terms of environmental performance, Harrison, and Coomb (2021) argue that considering the positive returns one may accrue from engaging in CSR activities, highly leveraged firms are likely to increase their CSR operations for potential returns. Additionally, leverage increases profit and social performance in financial firms, it decreases profit in non-financial firms. The findings indicate a positive effect of capital intensity on financial and environmental performance but a negative effect on social performance. Capital-intensive companies could be financially resourceful since they have already invested in fixed costs that will perpetually contribute to the production of the company (Lee and Xiao, 2011). Moreover, capital-intensive companies enhance environmental performance because they have stringent regulatory requirements which make them more proficient in their responsibilities toward sustainability activities to prevent sanctions (Welbeck, (2017). However, Cole and Elliott (2005) noted that capital-intensive companies showcase a remarkable number of fixed assets and are notably pollutant intensive, hence their activities are likely to harm social performance.

With country-level controls, GDP affects environmental performance positively but has no significant effect on financial and social performance. This could be because countries with higher economic growth have vibrant supportive sectors to contribute significantly to the financial growth of the economies (Kosmidou, 2003; Njenga and Jagongo, 2019). GDP is positive significant to social and environmental performance in financial firms but remains insignificant in non-financial companies. Inflation has an insignificant effect on financial, social and environmental performance, across industries. Regarding financial and non-financial firms, inflation is only negatively significant to environmental performance in financial firms. The evidence shows that country-specific governance indicators harm financial performance but improve social performance. The results for social performance confirm that the institutional environment influences corporate sustainability performance as has been indicated by Lu and Wang (2021). Thus, different countries with different institutional systems enforce different sustainability policies. Orazalin and Mahmood (2021) concluded that country governance quality has a significant impact on sustainability performance. The results

indicate that country governance improves social performance in non-financial firms but has no such impact on financial firms.

6.5 Robustness test/sensitivity analysis

This study uses sensitivity analysis to test the credibility and validity of the model used for the analysis. Sensitivity analysis is a method to ascertain the robustness of findings or conclusions by examining the extent to which differences in methods, models, assumptions or unmeasured variables can affect the results (Thabane et al., 2013). This study has performed a series of sensitivity tests to check the robustness of the main analysis to determine the reliability of the results. The foremost is that the variance inflation factor (VIF) in all the regression for the study is less than 10 (see Table 6.3) indicating that the study models are not affected by issues of multicollinearity and that there are no concerns about correlations between the explanatory variables (Gujarati 2009; Thompson et al., 2017). Also, the study employs an alternative financial performance measure. The main measure of financial performance employed in this study for analysis is the Return on assets (ROA), however, to test for the robustness of results, Tobin's Q is employed as an alternative standard measure of financial performance. In addition, the study sample is divided into common and civil law countries for robustness checks since domestic legal system can greatly influence regulatory practices and corporate sustainability due to differences in legal origins of countries (La Porta et al., 1998). The segmentation of the data into common and civil law countries are based on the countries originally selected by Pucheta-Martínez and Gallego-Álvarez (2020). These countries together with the additional countries significant to this study were confirmed and crossed check from reputable data sources for world population reviews and groupings. Also, to determine if the research findings are driven by differences in firm size, the study sample are segmented into small and large firms. Following prior studies (Konadu et al., 2022), firm size in this study is defined as the total assets. The study marks companies in the top one-third as bigger firms, while those in the bottom one-third quantile are marked smaller firms. Thus, the entire study sample has been divided into small and large firms and additional analysis regarding firm size is conducted within the financial and non-financial samples. Finally, to verify whether the results are driven by variations in institutional and cultural values and regulations as board structure characteristics vary among countries, the sample is divided into developed and developing countries based on the United Nations classifications.

6.5.1 Board structure and financial performance (TQ)

Table 6.4a results for the full sample show an insignificant relationship between board size, independent directors and financial performance and an insignificant link between the presence of a CSR committee, CEO duality, board skills and board gender diversity and financial performance. When the sample is grouped into two, board independence has a negative significant effect on financial performance in financial firms while board expertise relates negatively to TQ in non-financial firms. The rest of the independent variables are insignificant to TQ. Considering the control variables, firm age, CSR reporting and firm size connects negatively with TQ but TQ links positively with leverage. However, all country controls have an insignificant relationship with TQ. Firm age, CSR reporting and capital-intensive links negatively with TQ in financial firms and firm size in non-financial firms while the rest remain insignificant. The results of the TQ give validity to the main model because the independent variables which are consistently significant to the ROA also maintain their direction. The negative effect of board independence on financial performance as shown in the full sample supports the main assumption of stewardship theory that it is important to bring more executive directors; the firm stewards, on the board (Lizares, 2020). Besides, board busyness and contradictory roles of independent directors can affect their performance. Therefore, introducing more outside directors does not automatically stimulate monitoring, independence and objectivism (Lizares, 2020).

TABLE 6.4A- GMM RESULTS-TOBIN'S Q

VARIABLES	OVERALL	FINANCIALS	NON-FINANCIALS
	<i>tq</i>	<i>tq</i>	<i>tq</i>
L.tq	0.702*** (0.0563)	0.973*** (0.0730)	0.872*** (0.206)
bs_n	-0.00423** (0.00212)	-0.00191 (0.00432)	-0.00450 (0.00717)
ind	-0.00927*** (0.00296)	-0.0151*** (0.00376)	-0.00875 (0.00554)
csr	-0.00102 (0.00149)	0.00352 (0.00229)	-0.00135 (0.00215)
skills	-0.000915 (0.00296)	-0.00280 (0.00483)	-0.00705* (0.00389)
ceo	0.00207 (0.00155)	0.000633 (0.00191)	-0.000733 (0.00300)
bgd	0.00857 (0.00537)	0.0216*** (0.00786)	0.00606 (0.00642)
age_n	-0.00385*** (0.00103)	-0.00273* (0.00148)	-0.00173 (0.00264)
reporting	-0.00522*** (0.00177)	-0.00509** (0.00252)	-0.00337 (0.00439)
fsize_n	-0.0254*** (0.00532)	-0.00177 (0.00871)	-0.0282*** (0.00631)
lev_n	0.0377*** (0.00567)	0.00742 (0.00854)	0.0212 (0.0188)
capint	0.00827	-0.0123* (0.0123)	-0.00513 (0.00513)

gdp_n	(0.00564)	(0.00699)	(0.0154)
	-0.00122	0.000746	-0.00324**
	(0.00105)	(0.00124)	(0.00136)
inflation_n	1.92e-05	9.36e-06	0.000223
	(0.000742)	(0.000959)	(0.000953)
govest	-0.00151	-9.86e-05	7.42e-05
	(0.00140)	(0.00191)	(0.00196)
Year effect	Yes	Yes	Yes
Observations	18,317	3,679	14,431
Number of groups	5,457	1,111	4,314
No of instruments	21	23	23
AR1	0.000	0.000	0.000
AR2	0.506	0.622	0.952
Hansen p-value	0.636	0.110	0.329

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, *p<0.1

6.5.2 Developing and developed countries

Due to variations in board structure attributes in different countries, the study sample is divided into developed and developing countries to understand if the main results are driven by variations in institutional, cultural and regulatory dimensions since governance characteristics vary among countries (Pucheta-Martínez and Gallego-Álvarez, 2020).

6.5.2.1 board structure and sustainability performance in Developing countries

Table 6.4b reports the results for developing countries and it confirms the negative relationship between board size and financial performance in the main model. However, board size relates insignificantly to social and environmental performance in this model. Board independence is positively linked to social performance and insignificant to financial and environmental performance. The presence of the sustainability committee increases financial and environmental performance but insignificantly affects social performance. Directors with specific skills do not influence financial and social performance but improve environmental performance. Also, the presence of CEO duality improves financial performance but has no significant effect on social and environmental performance. Lastly, board gender diversity has an insignificant effect on the financial, social, and environmental performance of companies in developing countries.

With the control variables, companies that report on their sustainable activities enhance social performance in developing countries. Firm size harms financial performance and has a positive effect on environmental performance. Leverage hurts financial performance while capital intensity improves financial and environmental performance. Looking at the country-level controls, GDP improves financial and environmental performance, inflation has an insignificant effect on sustainability performance and the index of country governance hurts financial performance but has a positive effect on environmental performance.

6.5.2.2 board structure and sustainability performance in Developed countries

From Table 6.4b, board size improves social performance but is insignificant to financial and environmental performance. Board independence does not affect financial performance, but it improves social and environmental performance. Though the presence of a sustainability committee improves financial performance, firms in developed countries that do not have sustainability committees on their boards improve their social. Board skills and CEO duality improves financial and environmental performance and gender diversity improves social

performance in developed countries. With the controls, firm age decreases environmental performance, but sustainability reporting enhances both financial and social performance. Firm size decreases financial performance but increases social performance, leverage harms both financial and environmental performance and capital intensity improves financial, social, and environmental performance. Also, the gross domestic product enhances environmental performance. However, inflation and country governance index decrease financial and environmental performance.

It is noticeable that the findings align with the study's baseline results. All independent variables maintain expected signs while mostly remaining significant. The only exception is the presence of a sustainability committee on social performance that changed from positive in the main model to negative in the model for developed countries. The negative effect of board skills on social performance could be explained from the perspective of stewardship theory that the insider directors as the firm's trusted stewards have access to information and technology, and have in-depth knowledge about the company to improve performance more than external directors (Kyere and Ausloos, 2020). In this case, it could be explained that it is very likely for developed countries to have access to a larger pool of knowledgeable insider directors who can enhance social performance more than external expert directors. Nonetheless, the models for developing and developed countries can be considered as a robust measure for board structure and sustainability relationships because almost all the independent variables in these models support the core findings, the sign and significance of the main models.

TABLE 6.4B RESULTS FOR DEVELOPED AND DEVELOPING COUNTRIES

Variables	DEVELOPING			DEVELOPED		
	roa	Soc	envt	roa	soc	envt
L.roa	0.464*** (0.114)			0.189*** (0.0731)		
L.soc		0.818*** (0.129)			0.918*** (0.0804)	
L.envt			0.951*** (0.0558)			1.221*** (0.240)
bs_n	-0.168*** (0.0619)	0.0418 (0.0323)	0.0140 (0.0125)	-0.143 (0.113)	0.0741** (0.0333)	0.0211 (0.0197)
ind	0.0710 (0.0853)	0.0935* (0.0536)	-0.0106 (0.0143)	0.446 (0.334)	0.0566*** (0.0214)	0.108** (0.0526)
csr	0.0778** (0.0317)	-0.102 (0.0848)	0.0420*** (0.0159)	0.202*** (0.0730)	-0.402** (0.180)	-0.0279 (0.0349)
skills	0.0822 (0.0633)	-0.00589 (0.0261)	0.0299** (0.0152)	0.309*** (0.105)	-0.00703 (0.0137)	0.0457** (0.0229)
ceo	0.122*** (0.0315)	-0.00755 (0.0103)	0.00466 (0.00586)	0.0860* (0.0461)	0.00398 (0.00586)	0.0145* (0.00797)
bgd	0.0689 (0.107)	-0.000999 (0.0254)	0.0426 (0.0330)	0.369 (0.277)	0.172*** (0.0651)	0.0416 (0.0459)
age_n	0.00443 (0.0202)	0.0282 (0.0190)	-0.00389 (0.00435)	-0.0616 (0.0614)	0.00614 (0.00525)	-0.0304** (0.0141)
reporting	0.00248 (0.0299)	0.103** (0.0499)	-0.109 (0.0780)	0.246*** (0.0686)	0.223*** (0.0695)	-0.000226 (0.0555)
fsize_n	-0.952*** (0.245)	0.108 (0.0760)	0.0685** (0.0332)	-1.490*** (0.189)	0.197** (0.0899)	-0.0119 (0.0713)
lev_n	-0.0558*** (0.0173)	-0.00585 (0.00625)	0.00144 (0.00172)	-0.721 (0.454)	-0.0144* (0.00841)	-0.186** (0.0883)
capint	0.345*** (0.345***)	0.0822 (0.0822)	0.0321** (0.0321**)	1.129* (1.129*)	0.387* (0.387*)	0.233** (0.233**)

	(0.0808)	(0.155)	(0.0142)	(0.589)	(0.207)	(0.0993)
gdp_n	0.0297*	0.00332	0.0182***	0.0257	-0.00127	0.0237**
	(0.0176)	(0.00465)	(0.00497)	(0.0520)	(0.00856)	(0.0116)
inflation_n	0.00905	0.00150	-0.00197	-0.0560*	-0.00596	-0.00909*
	(0.0159)	(0.00527)	(0.00331)	(0.0331)	(0.00437)	(0.00528)
govest	-0.0740**	0.0905	0.0117*	-0.257**	0.0732	-0.0535**
	(0.0329)	(0.0593)	(0.00611)	(0.108)	(0.0701)	(0.0252)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,625	3,649	3,649	11,591	13,494	13,494
Number of id	1,150	1,195	1,195	3,712	4,281	4,281
AR2	0.470	0.298	0.334	0.316	0.127	0.121
Hansen p-value	0.113	0.377	0.101	0.664	0.309	0.634

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

6.5.4 Common and Civil law countries

Following prior studies, (La Porta et al., 1998; Kock and Min, 2016; Pucheta-Martínez and Gallego-Álvarez, 2020), the study sample is segmented into common and civil law countries to understand if the main results is driven by differences in the origin of legal foundations and its associated fundamental philosophical orientations since institutional logics can affect the decisions of the board of directors to influence sustainability performance (Anderson and Gupta, 2009; Siddiqui, 2015; Kock and Min, 2016)

6.5.4.1 board structure and sustainability performance in CoMMON LAW COUNTRIES

According to Table 6.4c, board size influence on financial firms and environmental performance is insignificant in common law countries. Moreover, there is a positive relationship between board size on social performance. Board independence shows a positive significant relationship with financial and social performance and insignificant link with environmental performance. CSR committee is insignificantly linked with financial and environmental performance but positively with social performance. Board expertise has insignificant relationship with financial and environmental performance and a positive effect on social performance. CEO duality links insignificantly with financial and social performance but maintains a positive relationship with environmental performance. Board gender diversity has a positive effect on social performance and an insignificant effect on financial and environmental performance.

Regarding the firm control variables, firm age has an insignificant effect on financial performance and a negative effect on social and environmental performance. There is a positive significant relationship between CSR reporting and financial, social, and environmental performance. Firm size has a negative effect on financial performance and a positive effect on social and environmental performance. There is a negative relationship between leverage and financial and social performance and an insignificant link between leverage and environmental performance. Capital intensity has an insignificant effect on financial and environmental performance and a negative effect on social performance. With country level controls, whereas GDP has a positive effect on financial and environmental performance with an insignificant effect on social performance, inflation and specific country governance indicators have an insignificant effect on financial, social, and environmental performance.

6.5.4.2 board structure and sustainability performance in CIVIL LAW COUNTRIES

From table 6.4c, board size has a negative significant effect on financial performance and an insignificant effect on social and environmental performance. Board independence has a positive significant effect on financial performance and an insignificant effect on social and environmental performance. CSR committee and CEO duality have an insignificant effect on financial performance but positive significant effect on social and environmental performance. Board expertise has no significant relationship with financial and environmental performance but has a significant negative effect on social performance. Also, there is an insignificant relationship between board gender diversity and financial and social performance but a positive link with environmental performance.

With firm-level controls, firm age has an insignificant relationship with financial, social, and environmental performance. CSR reporting has no significant effect on financial performance; however, it has a positive effect on social and environmental performance. Firm size and leverage have a negative effect on financial performance, insignificant effect on social performance and a positive effect on environmental performance. Capital intensity has an insignificant effect on financial performance and environmental performance and a negative effect on social performance. GDP has a negative effect on financial performance and insignificant effect on social and environmental performance. Inflation positively affects financial and social performance but insignificantly influence environmental performance. Finally, governance indicators harm financial performance but improves social and environmental performance.

Evidently, these results align with the baseline results of the study. All independent variables maintain expected signs while mostly remaining significant. The only exception in the common law country is the board expertise effect on social performance that changed from negative in the main model to positive in the model for common law countries. This positive effect is driven by the concept that the legal origin of a country defines the social mechanism that control the country's economic activity and impliedly outlines the agreements between firms and their stakeholders (Castillo-Merino and Rodríguez-Pérez, 2021). Shareholder rights are stronger in common law countries (Siddiqui, 2015). In Common law countries, the market is the private mechanism to optimise the best interests of shareholders and stakeholders (La Porta et al., 1998) which leaves sustainability activities at the discretion of managers (Castillo-Merino and Rodríguez-Pérez, 2021). Against this backdrop and based on the stakeholder-agency theory, the expert directors with their knowledge, experience and skills will potentially

perform good oversight and advisory services to encourage management to partake in social activities (Dass et al., 2013) since in recent times, corporation and shareholders have come to realisation that investing in sustainable activities enable companies to achieve long-term values to benefit shareholders and all stakeholders (Orazalin and Mahmood). Nonetheless, the models for common and civil law countries can be considered as a robust measure for board structure and sustainability relationships because almost all the independent variables in these models support the core findings, the sign and significance of the main models.

6.4C RESULTS OF COMMON AND CIVIL LAW COUNTRIES

Variables	COMMON LAW COUNTRIES			CIVIL LAW COUNTRIES		
	roa	soc	envt	roa	soc	envt
L.roa	0.534*** 0.165			0.429*** 0.0547		
L.soc		0.751*** 0.0302			0.723*** 0.108	
L.envt			0.940*** -0.0457			0.719*** -0.0921
bs_n	0.025 -0.037	0.0162*** -0.00503	0.00707 -0.00592	-0.0759** -0.034	0.0014 -0.00735	0.011 -0.0108
ind	0.165*** -0.0546	0.0449*** -0.00723	0.00254 -0.00674	0.167*** -0.0554	0.0346 -0.0219	0.0152 -0.0143
csr	0.0165 -0.0212	0.0229*** -0.00394	0.0046 -0.00647	0.00549 -0.0249	0.0408** -0.0178	0.0450*** -0.0172
skills	0.0303 -0.044	0.00935* -0.00509	0.00755 -0.00548	0.0579 -0.0491	-0.0277* -0.0147	-0.00378 -0.00817
ceo	0.0268 -0.0178	0.002 -0.00203	0.00573*** -0.0022	0.0107 -0.022	0.0121*** -0.00468	0.00957** -0.00414
bgd	0.154 -0.137	0.0413*** -0.0105	-0.00583 -0.0113	0.14 -0.0858	0.0489 -0.0303	0.0372* -0.0197
age_n	0.00197 -0.00923	-0.00314*** -0.00112	-0.00551*** -0.00211	-0.0194 -0.0143	0.00156 -0.00302	0.00654 -0.00411
reporting	0.0578* -0.0312	0.0585*** -0.00489	0.0375*** -0.00846	0.00145 -0.0281	0.0861*** -0.0222	0.105*** -0.0237
fsize_n	-0.519** -0.259	0.0481*** -0.0145	0.0539** -0.0265	-0.521*** -0.105	-0.00651 -0.0142	0.0347* -0.02
lev_n	-0.0265** -0.0119	-0.00149* -0.000789	-0.0005 -0.000772	-0.0581*** -0.0113	0.00227 -0.00157	0.00334** -0.00162
capint	-0.0724 -0.056	-0.0346*** -0.00491	-0.0013 -0.00415	0.0703 -0.0556	-0.0262** -0.0123	-0.00484 -0.00782
gdp_n	0.0757*** -0.0241	0.00336 -0.00241	0.00936*** -0.00244	-0.0426** -0.0167	-0.00361 -0.00242	0.00356 -0.00223
inflation_n	-0.00318 -0.0106	-0.000751 -0.00126	0.000505 -0.00128	0.0193* -0.0114	0.00493* -0.00258	0.000268 -0.00167
govest	-0.0892 -0.0552	2.08-05 -0.00292	0.00612 -0.00474	-0.0993*** -0.0209	0.00998* -0.00568	0.00880* -0.0052
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6962	8782	6215	4913	4976	4976
Number of groups	2266	2755	2515	1547	1594	1594
Number of instruments	22	23	23	23	22	23
AR1	0.000	0.000	0.000	0.000	0.000	0.000
AR2	0.228	0.913	0.829	0.957	0.113	0.762
Hansen p-value	0.307	0.32	0.274	0.635	0.319	0.639

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

6.4.5 BOARD STRUCTURE AND SUSTAINABILITY PERFORMANCE IN SMALL AND LARGE FIRMS

From Table 6D, the results for the entire sample indicate that in smaller companies, board size has insignificant effect on financial, social, and environmental performance. However, the effect of board size on financial and environmental performance in large companies is significantly negative. Board independence has a positive effect on financial, social, and environmental performance in smaller firms, but in larger firms, board independence is insignificant to financial and social performance and negative to environmental performance. With sustainability committee, the relationship is insignificant to financial performance and positive to social and environmental performance in smaller firms. However, sustainability committee links positively to financial performance, insignificantly to social and environmental performance in large companies. CEO duality and board gender diversity have an insignificant effect on financial performance and a positive effect on social and environmental performance in smaller firms; but in larger firms, the relations between CEO duality and financial and environmental performance are positive and insignificant with social performance. Board gender diversity has a negative effect on financial and insignificant effect on social and environmental performance in larger companies.

With the control variables, the table indicates that firm age has an insignificant effect on financial and environmental performance and a negative effect on social performance in a small firm. In large firms, firm age is positively linked to financial performance and negatively linked to social and environmental performance. Sustainability reporting has an insignificant effect on financial performance and positive effect on social and environmental performance in smaller firms. However, the relationship between sustainability reporting and financial, social, and environmental performance is positive in large companies. Firm size has an insignificant effect on financial performance, and a positive effect on social and environmental performance in small companies. However, the relationship between firm size and financial performance is negative and insignificant to social and environmental performance in large companies. Leverage exerts insignificant effect on financial, social, and environmental performance in small firms, but the relationship between leverage and financial performance is negative, insignificant to social performance and positive to environmental performance in large companies. The effect of capital intensity on financial performance is insignificant, the effect is negative to social performance and positive to environmental performance in small

firms. In contrast, capital intensity affects financial and environmental performance positively and social performance negatively in large companies. GDP has a positive effect on financial, social, and environmental performance in small companies, but the relationship between GDP and financial and social performance is insignificant and positive with environmental performance in large firms. Both inflation and country governance indicators have insignificant effect on financial, social, and environmental performance in small firms. Meanwhile, inflation affect environmental performance negatively and has no impact on financial and social performance in large companies. Finally, Country governance indicators harms financial performance, has no effect on social performance and improve environmental performance in large companies.

Table 6E presence the results on the impact of board structure on financial, social, and environmental performance in small and large financial and non-financial firms. From the table, the effect of board size on financial performance is negative but insignificant to social and environmental performance for small financial companies. However, board size has a negative effect on financial and environmental performance and insignificant on social performance for large financial companies. Board independence and CEO duality have an insignificant effect on financial performance, a positive effect on social and environmental performance for small financial companies. However, the effect of board independence is insignificant to financial and social performance and negative to environmental performance, and the impact of CEO duality is positive to financial and environmental performance and insignificant to social performance for large companies in financial companies. Sustainability committee and board gender diversity has a positive effect on financial, social, and environmental performance for small financial companies. Nonetheless, sustainability committee improve financial and environmental performance but has no impact on social performance in large financial companies. Board expertise has a positive effect on financial and environmental performance and an insignificant effect on social performance in small financial firms. This relationship is insignificant to all three dimensions of sustainability performance in large financial companies.

With the control variables, the results show an insignificant impact of firm age on financial and environmental performance and a negative effect between firm age and social performance in small financial companies. However, the relationship between firm age and financial performance is positive and negative to environmental performance in large financial firms. Sustainability reporting has a positive effect on financial, social, and environmental

performance in both small and large financial firms. Firm size harms financial performance but enhances social and environmental performance in small financial firms, however, firm size has no effect on social and environmental performance in large financial companies. Leverage has no effect on financial and social performance but a positive effect on environmental performance in small financial firms. In large financial firms, leverage improves financial performance and harms environmental performance. Capital intensity has insignificant effect on financial performance, a negative effect on social performance and a positive effect on environmental performance in small financial firms. Though the effect of leverage in large financial firms is like the effect in small financial firms, the relationship between leverage and financial performance in large financial firms is negative. Capital intensity is insignificant to financial performance in small financial companies, it improves financial performance in large financial companies. In small financial firms, GDP has a positive effect on financial, social, and environmental performance, inflation is insignificant to financial, social, and environmental performance and governance indicators is negative to financial performance and insignificant to social and environmental performance. However, in large financial firms, GDP has insignificant effect on financial and social performance. inflation harms environmental performance and country governance indicators improve environmental performance.

Table 6E further show the impact of board structure on sustainability performance in small and large non-financial companies. The table indicates that board size has an insignificant effect on financial, social, and environmental performance in small non-financial companies. However, in large non-financial companies, board size harms financial and environmental performance. The results indicate that board independence is significantly positive to all three dimensions of sustainability performance in small non-financial firms. However, in large non-financial firms, board independence is insignificant to financial performance, improve social performance and harms environmental performance. sustainability committee and board gender diversity in small non-financial firms improve social performance but has no impact on financial and environmental performance but sustainability committee in large non-financial firms enhance financial and social performance and has no effect on environmental performance and board diversity in large non-financial firms harms financial performance. board expertise has an insignificant effect on financial and social performance and a positive effect on environmental performance in small non-financial firms. However, in large non-financial firms, board expertise has no effect on all three sustainability dimensions. CEO

duality has no effect on financial performance, a positive effect on social and environmental performance in small non-financial firms, however, CEO duality improve both financial and environmental sustainability.

Firm age is insignificantly related to financial and environmental performance and negatively related to social performance in small non-financial firms, the effect of firm age on financial performance is positive and negative to social and environmental performance in large non-financial firms. Sustainability reporting has no effect on financial performance, a positive effect on social and environmental performance in small non-financial companies, the link between sustainability reporting and financial social and environmental performance in large non-financial firms is positive. The effect of leverage on financial, social, and environmental performance in small non-financial companies is insignificant but the impact of leverage on financial performance is negative and on environmental performance is positive in large non-financial companies. Capital intensity has no impact on financial performance in small non-financial firms, the effect is positive in large non-financial firms. Though GDP improves social performance and has no impact on environmental performance in small non-financial firms, the relationship between GDP and social performance insignificant and positive to environmental performance on large non-financial firms. Inflation harms environmental performance in large non-financial firms but has no impact on environmental performance in small non-financial firms and country governance indicators has an insignificant effect on financial, social, and environmental performance in small non-financial firms, the impact is negative to financial performance and positive to environmental performance in large non-financial companies.

From the further analysis conducted, is it evident that the results correspond to the baseline results of the study. Hence, the models for small and large firms across all industries and within financial and non-financial firms can be considered as a robust measure for board structure and sustainability relationships because almost all the independent variables in these models support the core findings, the sign and significance of the main models.

TABLE 6D GMM RESULTS FOR SMALL AND LARGE FIRMS

VARIABLES	Small firm			Large firm		
	Fin performance	soc performance	Envt performance	fin performance	soc performance	Envt performance
L.roa	0.809***			0.460***		
	0.156			-0.116		
L.soc		0.782***			0.911***	
		0.0324			0.0354	
L.envt			0.860***			0.907***
			-0.0377			-0.0281
bs_n	-0.0492	-0.00062	-0.00128	-0.212***	0.0015	-0.0119***
	-0.0688	-0.00454	-0.00451	-0.0625	-0.00354	-0.00405
ind	0.0904*	0.0122**	0.0137**	-0.0723	0.0123	-0.0144***
	-0.0477	-0.00551	-0.00579	-0.0472	-0.00865	-0.0054
csr	0.038	0.0181***	0.0183***	0.0871***	0.00834	0.00738
	-0.0253	-0.00386	-0.00524	-0.0305	-0.00543	-0.00511
skills	0.112*	0.00701	0.00841*	0.0371	0.000203	0.008
	-0.0657	-0.00511	-0.00487	-0.0427	-0.00468	-0.00524
ceo	0.0113	0.00437**	0.00828***	0.0881***	0.00165	0.00584***
	-0.0166	-0.00221	-0.00224	-0.0232	-0.00183	-0.00215
bgd	0.0563	0.0466***	0.0387***	-0.191**	-0.00624	-0.0149
	-0.144	-0.011	-0.0105	-0.0839	-0.012	-0.01
age_n	-0.00662	-0.00294**	-0.00133	0.0251*	-0.00324***	-0.00488***
	-0.01	-0.00114	-0.00143	-0.0132	-0.00116	-0.00146
reporting	0.0416	0.0580***	0.0737***	0.0797***	0.0435***	0.0624***
	-0.0508	-0.00555	-0.00936	-0.0272	-0.00684	-0.00808
fsize_n	-0.366	0.0526***	0.0595***	-1.294***	-0.00572	-0.0132
	-0.563	-0.0167	-0.0169	-0.286	-0.0105	-0.0138
lev_n	0.00474	9.92-05	0.00103	-0.0378***	-0.00011	0.00290***
	-0.00788	-0.00073	-0.00065	-0.0111	-0.00069	-0.00085
capint	0.0159	-0.0211***	0.0255***	0.329***	-0.0145***	0.0150***
	-0.028	-0.00444	-0.00394	-0.0766	-0.00357	-0.00381
gdp_n	0.0800**	0.00944**	0.0185***	-0.00944	-0.00054	0.00542***
	-0.0357	-0.00374	-0.00384	-0.0144	-0.00119	-0.0014
inflation_n	-0.00557	-0.00052	0.000742	-0.00856	0.000995	-0.00230**
	-0.00951	-0.0013	-0.00122	-0.0097	-0.00089	-0.00109
govest	-0.0351	-0.0064	-0.00249	-0.109***	-7.8-05	0.00400*
	-0.035	-0.00431	-0.00411	-0.0328	-0.00171	-0.00233
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,755	6,973	6,973	9644	10354	10,354
Number of groups	2,112	2,621	2,621	2998	3112	3,112
AR1	0.000	0.000	0.000	0.000	0.000	0.000
AR2	0.1	0.95	0.34	0.44	0.297	0.14
Hansen p-value	0.168	0.4	0.101	0.485	0.107	0.135

Notes: Standard errors are below the estimates. *** p<0.01, ** p<0.05, * p<0.1

6E RESULTS FOR SMALL AND LARGE FIRMS (FINANCIAL AND NON-FINANCIAL FIRMS)

VARIABLES	Non-financial firms						Financial firms					
	Financial firms		social firms		Envnt firms		fin performance		soc performance		Envnt performance	
	small firm	large firm	small firm	large firm	small firm	large firm	small firm	large firm	small firm	large firm	small firm	large firm
L.roa	2.466**	0.453***					0.287***	0.460***				
	1.158	0.124					-0.0399	-0.116				
L.soc			0.782***	0.893***					0.782***	0.911***		
			0.0324	0.038					-0.0327	-0.0354		
L.envt					0.959***	0.904***					0.895***	0.899***
					0.0861	0.028					-0.0287	-0.0281
bs_n	0.578	-0.216***	-0.00062	0.00279	-0.00514	-0.0115***	-0.252***	-0.212***	-0.00085	0.0015	-0.0025	-0.0111***
	-0.454	-0.0661	-0.00454	-0.00371	-0.00552	-0.00406	-0.0551	-0.0625	-0.00454	-0.00354	-0.00433	-0.00406
ind	0.350*	-0.0735	0.0122**	0.0160*	0.0181***	-0.0144***	0.0205	-0.0723	0.0125**	0.0123	0.0147***	-0.0135**
	-0.211	-0.0485	-0.00551	-0.00921	-0.00693	-0.00539	-0.0623	-0.0472	-0.00552	-0.00865	-0.00551	-0.0054
csr	-0.0969	0.0885***	0.0181***	0.0109*	0.00771	0.00792	0.0806***	0.0871***	0.0185***	0.00834	0.0150***	0.00897*
	-0.113	-0.0319	-0.00386	-0.00578	-0.00984	-0.0051	-0.0294	-0.0305	-0.00386	-0.00543	-0.00465	-0.00515
skills	-0.475	0.0386	0.00701	-0.00154	0.0108**	0.0075	0.293***	0.0371	0.00696	0.000203	0.0100**	0.00628
	-0.425	-0.0443	-0.00511	-0.00484	-0.0053	-0.00525	-0.0597	-0.0427	-0.00511	-0.00468	-0.00489	-0.00529
ceo	-0.00945	0.0889***	0.00437**	0.00218	0.00817***	0.00589***	0.0203	0.0881***	0.00449**	0.00165	0.00805***	0.00616***
	-0.0605	-0.0239	-0.00221	-0.00187	-0.00218	-0.00215	-0.0276	-0.0232	-0.0022	-0.00183	-0.0022	-0.00215
bgd	-1.26	-0.192**	0.0466***	-0.00069	0.0239	-0.0144	0.473***	-0.191**	0.0469***	-0.00624	0.0340***	-0.0128
	-0.946	-0.0855	-0.011	-0.0127	-0.016	-0.01	-0.108	-0.0839	-0.0111	-0.012	-0.00935	-0.0101
age_n	-0.06	0.0256*	-0.00294**	-0.00304**	-0.00344	-0.00498***	0.00883	0.0251*	-0.00292**	-0.00324***	-0.00194	-0.00475***
	-0.0478	-0.0136	-0.00114	-0.00118	-0.00223	-0.00146	-0.0135	-0.0132	-0.00114	-0.00116	-0.0013	-0.00146

6E CONTINUED

	Non-financial firms						Financial firms					
	Financial firms		social firms		Envnt firms		fin performance		soc performance		Envnt performance	
reporting	-0.467	0.0806***	0.0580***	0.0464***	0.0520***	0.0628***	0.202***	0.0797***	0.0579***	0.0435***	0.0655***	0.0642***
	-0.36	-0.028	-0.00555	-0.00727	-0.0192	-0.00805	-0.0311	-0.0272	-0.00556	-0.00684	-0.00759	-0.00808
fsize_n	5.325	-1.310***	0.0526***	-0.00155	0.0249	-0.0128	-2.122***	-1.294***	0.0529***	-0.00572	0.0454***	-0.0101
	-3.991	-0.302	-0.0167	-0.011	-0.031	-0.0138	-0.275	-0.286	-0.0167	-0.0105	-0.015	-0.0139
lev_n	-0.0374	-0.0381***	9.92E-05	1.28E-04	0.000916	0.00292***	0.017	-0.0378***	9.38-05	-0.00011	0.00110*	0.00300***
	-0.0362	-0.0114	-0.00073	-0.00071	-0.00069	-0.00085	-0.0111	-0.0111	-0.00072	-0.00069	-0.00065	-0.00086
capint	-0.0147	0.333***	-0.0211***	-0.0152***	0.0249***	0.0148***	0.025	0.329***	-0.0209***	-0.0145***	0.0251***	0.0149***
	-0.102	-0.0808	-0.00444	-0.00368	-0.00388	-0.00382	-0.0455	-0.0766	-0.00444	-0.00357	-0.00385	-0.00382
gdp_n	-0.184	-0.0097	0.00944**	-0.00057	0.0181***	0.00541***	0.158***	-0.00944	0.00909**	-0.00054	0.0183***	0.00536***
	-0.195	-0.0146	-0.00374	-0.0012	-0.00388	-0.0014	-0.0346	-0.0144	-0.00375	-0.00119	-0.00382	-0.0014
inflation_n	0.0263	-0.00866	-0.00052	0.00117	0.000731	-0.00243**	-0.0156	-0.00856	-0.00061	0.000995	0.000839	-0.00255**
	-0.0382	-0.00987	-0.0013	-0.00091	-0.00118	-0.0011	-0.0153	-0.0097	-0.0013	-0.00089	-0.00119	-0.0011
govest	0.227	-0.111***	-0.0064	0.000455	-0.00535	0.00406*	-0.126***	-0.109***	-0.00674	-7.79E-05	-0.00341	0.00431*
	-0.198	-0.0348	-0.00431	-0.00177	-0.00467	-0.00233	-0.0406	-0.0328	-0.00433	-0.00171	-0.00376	-0.00234
Observations	5,755	9,644	6,973	10,354	6,973	10,354	5,755	9,644	6,973	10,354	6,973	10,354
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of groups	2,112	2,998	2,621	3,112	2,621	3,112	2,112	2,998	2,621	3,112	2,621	3,112
AR1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR2	0.673	0.467	0.95	0.303	0.424	0.138	0.405	0.44	0.951	0.297	0.36	0.134
Hansen p-value	0.97	0.299	0.4	0.272	0.119	0.16	0.977	0.485	0.103	0.107	0.886	0.75

Notes: Standard errors are below the estimates; *** p<0.01, ** p<0.05, * p<0.1

6.6 Summary and Conclusion

This chapter has discussed descriptive statistics, mean differences, correlation analysis and empirical results for the study objectives. The chapter started by presenting and discussing the descriptive statistics, the correlation analysis, and the empirical findings of board structure influence on sustainability (financial, social, and environmental) performance. All study analyses are done based on the results provided by the GMM models because the results from this source are likely to be robust, unbiased and efficient (Wintoki, Linck and Netter, 2012). The descriptive statistics show that on average, companies do not perform well in environmental protection issues, which is quite a concern considering the impact this has on sustainability issues and the SDGs targeted for 2030 (United Nations, 2015). Independent directors are well-represented on the corporate board which gives a positive signal that management is well monitored and controlled, hence, agency problems are controlled to a larger extent (Ameer, Ramli and Zakaria 2010). The representation of women directors is relatively low, and the chapter has discussed that women can only make a huge impact on sustainability issues when they obtain a critical mass (Kanter, 1977).

From the empirical findings, it is evident that board structure has a significant effect on TBL dimensions. Having a larger board harms financial and environmental performance but improves social performance. This has been discussed in the light of theoretical framework and prior literature in relation to the firm needs, and functions of the board and the executive directors. From the results, board independence affects social performance only. The identified issues on what could cause the insignificant effect on other dimensions have been centred on information gaps, independent directors not being truly independent and lack of knowledge and expertise of independent directors. The results indicate that companies that have sustainability committees increase their sustainability performance, and it has been discussed that having a specialised sub-committee to deal with sustainability-related issues will likely promote sustainable development. Furthermore, the findings show that expert directors promote financial and environmental performance but harm social performance. The positive results have been discussed from the angle of resource-rich directors serving as the firm's unique resources to help the firm gain a competitive advantage and, have the skills to conduct their oversight duties effectively. From the findings, it has been reported that firms that practice CEO duality increase all three dimensions of sustainability performance. The chapter has discussed this based on the unified leadership and the reduced chain of command associated with the duality leadership style. Finally, this study has shown that board gender diversity

increases social performance but has no impact on financial and environmental performance. From prior studies and theoretical viewpoints, the chapter has discussed this finding based on the altruistic nature of women, underrepresentation of women on corporate boards, sex biases and stereotyping against women on board.

To address the question relating to the differences that may exist between financial and non-financial firms, the study sample was divided into financial and non-financial firms. The segmented data were subjected to a series of statistical analyses including descriptive statistics, t-test, correlation analysis, and multiple regressions which includes testing for differences in the data coefficients. Using descriptive statistics indicate that significant difference exists between financial and non-financial firms. For instance, it is seen that financial firms generate more profit than non-financial firms. Though both financial and non-financial firms do not perform well in environmental issues, non-financial firms perform slightly better than financial companies. Also, the proportion of independent directors on the board of financial companies is larger than they are represented on the board of non-financial companies which means that on average, board monitoring and controlling is more enhanced in financial firms than it is in non-financial firms. Also, compared to non-financial firms, financial companies form more sustainability committees on their boards. Also, board expertise is more predominant in non-financial companies than in financial companies. The descriptive statistics show that CEO duality is mostly adopted by non-financial firms more than financial companies. Again the t-test confirms the possible differences between board structure in financial and non-financial firms. The t-test results show that there is a significant difference between financial and non-financial firms in terms of the number of board members, the proportion of independent directors, the percentage of directors with expertise, the number of companies that have sustainability committee and CEO duality and, the percentage of women on corporate boards.

Furthermore, the empirical findings also portray that variation exists between financial and non-financial companies in terms of how board size, board independence, sustainability committee, board expertise, CEO duality and board diversity affect financial, social, and environmental performance. Testing the coefficients of the sample show that industry effect on financial and non-financial firms differ. The findings show that the negative effect of board size on all three dimensions of sustainability performance is more pronounced in financial firms than in non-financial firms. Also, the findings show that board independence effect on financial and social performance differs among financial and non-financial firms; the effect on financial performance is higher in non-financial companies while the effect on social

performance is higher in non-financial firms. It is shown that board expertise and CEO duality effect on financial, social, and environmental performance differ among financial and non-financial firms. Furthermore, the sustainability committee's effect on financial and environmental performance differs among financial and non-financial firms. It is also evident that board gender diversity impact on financial and environmental performance differs among financial and non-financial firms. The study can conclude based on the GMM and the coefficient test results that industry has a significant effect on board structure and sustainability performance relationship.

A robustness test was conducted using Tobin's Q, and by dividing the sample into developed, developing, common and civil law countries, and small and large companies. The results confirmed the validity of the main model. Finally, based on stakeholder-agency theory, the study concludes that the firm needs a larger board, more outside directors, expert directors, the presence of a sustainability committee and a higher representation of women to improve sustainability performance, especially, for social and environmental dimensions. However, the study supports the proposition of stewardship theory and concludes that the firm needs a smaller board and a few independent directors to enhance financial performance.

CHAPTER SEVEN

SUMMARY, CONCLUSION AND RECOMMENDATIONS

7.1 Summary

The study investigated the relationship between board structure and sustainability performance. It specifically examined the influence of board structure on the three dimensions of sustainability (financial, social, and environmental) performance. The set objectives of the study were first, to find the relationship between board structure and all three dimensions of sustainability (financial, social, and environmental) performance. Secondly, to examine the differences between board structure and sustainability performance among financial and non-financial firms. To achieve these objectives, the study employed the secondary data collection method and sampled 7,024 unbalanced panel data from the Refnitiv and the World Bank Indicators databases from 2015 to 2020. The study carefully explored the data and excluded all companies and countries with unavailable data on board and firm characteristics variables needed for this study.

The dependent variables for the study were financial performance (represented by ROA), social performance and environmental performance. The independent variables selected for this research were board size, board independence, sustainability committee, board expertise, CEO duality and board gender diversity. The study controlled for firm characteristics and country characteristics variables. The firm control variables employed were firm age, firm size, leverage, capital intensity and sustainability reporting. The study also controlled for these country-level variables; GDP, inflation, and country-specific governance indicators. A total of eighteen hypotheses based on prior literature reviewed and theories adopted (stakeholder-agency, resource-based view, resource dependency, legitimacy, and stewardship theories) were formulated and tested.

The findings indicate that there is a positive relationship between the sustainability committee, CEO duality and all three dimensions of sustainability performance. However, board size harms financial and environmental performance but has a positive effect on social performance. Additionally, it was established that board expertise improves financial and environmental performance but decreases social performance. It was also found that board independence has no impact on financial and environmental performance but improves social performance. Like prior findings, board gender diversity is insignificant to financial and

environmental performance but promotes social performance (Kouaib et al., 2020). The results from the tested hypotheses are shown in Table 7.1

Additional tests and further analysis showed that financial firms differ from non-financial firms in terms of how board structure affects sustainability performance (Adams and Mehran, 2003; Becht, Bolton, and Roell, 2011; Hopt, 2013). This was first realised through the GMM regression results where most of the board structure variables' effects on sustainability performance were significantly different from the results obtained for non-financial firms. For preciseness, the coefficients of the financial and non-financial board structure variables were tested against all three dimensions of sustainability performance. The results show sector-based differences in board structure and sustainability performance. Differences between financial and non-financial firms were found in the effect of board size, board independence, board expertise, CSR committee, CEO duality, board gender diversity and how they impact the various dimensions of sustainability performance. The tests conducted confirmed that indeed, board structure effect on sustainability performance differs among financial and non-financial firms (Díaz Díaz, García-Ramos and Baraibar Díez, 2018).

7.2 Limitations of the study

The findings of this study have several managerial and policy implications, yet it acknowledges some limitations which can serve as recommendations for future studies. First, the study sample was taken from a secondary data source which could be a limitation because other research methods like surveys and case studies can provide other insights to support board structure and sustainability relationships (Bentahar and Cameron, 2015). Thus, the findings from this study are quantitatively informed and may not serve the needs of some non-quantitative characteristics. Therefore, future studies can adopt mixed methods designs which can use both qualitative and quantitative techniques in examining the board structure-sustainability performance relationship.

Secondly, the findings of this study are focused on listed companies making the results not generalisable to unlisted firms. This is because the findings may not have captured the behavioural and demographic characteristics of non-listed companies since these companies are mostly small and medium and might behave differently from listed companies (Fukuda, Kasuya and Nakajima, 2018). It is important to also understand the board structure's effect on sustainability performance in unlisted firms because these companies may have some board

structure features that are worth studying. It is, therefore, important that future studies extend this research to include non-listed companies.

Thirdly, this study focuses on the linear relationship between board structure and sustainability performance relationship even though the relationship could be non-linear. Nguyen and Thanh (2021) showed an inverse U-shaped relationship between one board structure variable on one dimension of sustainability performance: board size and environmental performance. This calls for the need to investigate the other variables on all three dimensions to ascertain a possible non-linear relationship. Moreover, some researchers have argued that some micro and macro-organisms can have an indirect influence on corporate governance and firm performance (Sakawa and Watanabel, 2018b; Al-Okaily and Naueihed, 2019; Merendino and Melville, 2019; Sarhan, Ntim and Al-Najjar, 2019). However, the findings of this study are based on the direct relationship between board structure and sustainability performance. Hence, it might be useful for future studies to explore the indirect effect of some organisms, for example, firm growth on the board structure- sustainability performance relationship.

Another suggestion for future research could be the use of different indicators to proxy economic performance. This study relies on the financial performance indicator (ROA) as a proxy for economic performance. There may be other economic performance measures which can serve as a firm performance indicator. For instance, Hussain, Rigoni and Orij (2018) employed the Product of economic Disclosure Index and Economic Sustainability Index as a proxy for economic performance and obtained different results. Future studies can explore other indicators of sustainability performance. Finally, this study relies only on the board of directors' elements, hence, other studies may well investigate other corporate governance elements and the triple bottom line performance. For example, future studies could use other internal corporate governance elements such as managerial incentives, capital structure and internal control systems and examine their effect on sustainability performance.

TABLE 7.1 SUMMARY OF HYPOTHESES AND RESULTS

<i>Hypotheses</i>	<i>Outcome</i>	<i>Financial</i>	<i>Social</i>	<i>Environmental</i>
H1a: There is a negative significant relationship between board size and financial sustainability performance.	Supported	✓		
H1b: There is a positive significant relationship between board size and social sustainability performance	Supported		✓	
H1c: There is a positive significant relationship between board size and environmental performance	Not supported			✗
H2a: There is a positive relationship between board independence and financial performance	Not supported	✗		
H2b: There is a positive relationship between board independence and social performance	Supported		✓	
H2c: There is a positive relationship between board independence and environmental performance	Not supported		✗	
H3a: There is a positive relationship between the sustainability committee and financial performance	Supported	✓		
H3b: There is a positive relationship between the sustainability committee and social performance	Supported		✓	
H3c: There is a positive relationship between the sustainability committee and environmental performance	Supported		✓	
H4a: There is a positive relationship between board expertise and financial sustainability performance.	Supported	✓		
H4b: There is a positive relationship between board expertise and social sustainability performance.	Not supported		✗	
H4c: There is a positive relationship between board expertise and environmental sustainability performance.	Supported			✓
H5a: There is a negative relationship between CEO duality and financial sustainability performance.	Not supported	✗		
H5b: There is a negative relationship between CEO duality and social sustainability performance.	Not supported		✗	
H5c: There is a negative relationship between CEO duality and environmental sustainability performance.	Not supported			✗
H6a: There is a positive relationship between board gender diversity and financial performance	Not supported	✗		
H6b: There is a positive relationship between board gender diversity and social performance	Supported		✓	
H6c: There is a positive relationship between board gender diversity and environmental performance	Not supported			✗

7.3 Conclusion

The findings affirm that in a global context, companies with sustainability sub-committees have the advantage of having collective ideas from people with specific knowledge on sustainable issues, hence, such companies achieve positive financial, social, and environmental performance. Contrary to the theoretical and empirical argument that CEO duality harms sustainability performance due to CEO entrenchment and abuse of power (Hsu et al., 2021; Khan et al., 2021), the results indicate that CEO duality has a positive effect on all three dimensions of sustainability performance. However, the board size, board independence, board expertise and board gender diversity give mixed results on their effect on the three dimensions of sustainability performance. From the findings, though board size improves financial and environmental performance, it has a negative effect on financial performance. Moreover, more expert directors improve financial and environmental performance, their presence does not always guarantee effective monitoring and can cause detriment to social sustainability performance. The findings indicate that women on corporate boards and board independence only promote social performance but do not contribute significantly to financial and environmental performance. Furthermore, the study findings indicate that the influence of board structure on sustainability performance differs among financial and non-financial firms.

Generally, the findings largely align with the theoretical assertions of the stakeholder-agency theory and the stewardship theory concerning the board's role in improving sustainability performance (Zhang, 2012; Ali M Shahzad, Rutherford and Sharfman, 2016). The study records that the presence of a sustainability committee strengthens corporate monitoring and controlling to serve as a mechanism to curb stakeholder-agency problems and promote sustainability performance. Also, the theoretical proposition that companies need to reduce the chain of command and unified leadership to promote sustainable performance is upheld as CEO duality had a positive effect on all three dimensions of sustainability performance.

Also, this study concludes that industry has a significant impact on board structure and performance relationships (Di'az, Garcí'a-Ramos, and Di'ez, 2018). Based on the findings, this study can conclude that for good sustainability performance, the board of financial firms should be different from non-financial firms. This could probably be because the activities of financial companies can create a significant effect on externalities and as such needs to be governed

differently (de Haan and Vlahu, 2016). This result implies that an effective board structure helps the firm to meet sustainable development goals, and this includes ensuring a board structure that meets the needs of specific industries.

7.4 Contributions

The study makes many contributions to literature. First, it adds to the paucity of literature on the influence of board structure on all three dimensions of sustainability performance which is very crucial at the time that the world is geared towards the attainment of SDGs by the year 2030. Notably, the board of directors play a significant role to ensure corporate sustainable development (Galbreath, 2018) because sustainable activities are voluntary in nature (Porter, 1991) so it requires a lot of monitoring and supervisory services to encourage management, who are mainly interested in short-term projects, to get involved in such long-term activities to improve the firm (Nguyen, Doan and Frömmel, 2020). To fully understand the board structure's relationship with sustainability performance demands a complete detailed investigation into the relationship, yet an attempt made by most prior studies focusing on the subject matter dwells on a single or two dimensions (Naciti, 2019; Hsu et al., 2021; Nguyen and Thanh, 2021; Veltri, Mazzotta and Rubino, 2021) only a few have explored three sustainability dimensions (Hussain, Rigoni and Orij, 2018; Cancela et al., 2020; Kouaib, Mhiri and Jarboui, 2020; Nguyen, Doan and Frömmel, 2020) with most of them reporting inclusive findings. Accordingly, prior studies focusing on single, or two dimensions of sustainability indicate partial sustainability which has caused the need to conduct a further study on all three dimensions of sustainability performance (financial, social, and environmental). Therefore, the findings of this study contribute to the literature such that it extends the limited literature on board structure and sustainability performance relationship. This is useful because it facilitates a full understanding of such an important relationship needed for policy implementations and regulatory reforms to enhance sustainable development towards the attainment of SDGs.

Secondly, the study contributes to the literature by enhancing knowledge of the differences between the impact of board structure on sustainability performance between both financial and non-financial firms. This is important considering that the SDGs, 2030 calls for all relevant stakeholders including financial and non-financial firms to play an active role to make this agenda

a reality (United Nations, 2015). This call makes it important to understand board structure in financial firms and board structure in non-financial firms and their effect on sustainability performance and possible differences that might exist among them to help policymakers and important decision-makers in formulating relevant policies. However, the scanty evidence regarding corporate governance and sustainability performance excludes financial companies and limits their conclusions to only non-financial companies making it difficult to appreciate the differences that might exist in these two industries in the board structure and sustainability performance link. Researchers mainly attribute their exclusion to the special characteristics of financial companies (Cancela et al., 2020; Kouaib, Mhiri and Jarboui, 2020). However, scholars who have conducted some studies in financial industries have emphasised that performance measures of financial institutions are not different from those applied in non-financial firms (Grove et al., 2011). Moreover, some scholars have accentuated that firms in the financial industry need board supervision even more than non-financial firms due to their vulnerability to risks (Belkhir, 2009; Hopt, 2013). The evidence from this study suggests that there are some significant differences in board structure effectiveness on performance in each industry type. This new evidence provides an empirical contribution and may draw the attention of relevant stakeholders to “avoid one size fits all” policies. This may help improve corporate sustainability and, thus, help companies to contribute positively to the SDGs.

Thirdly, this study contributes to the improvement of the generalisability of the results. Notwithstanding the dearth study on corporate governance and triple bottom line relationship, the limited studies are either conducted in a single country (Hussain, Rigoni and Orij, 2018; Kouaib, Mhiri and Jarboui, 2020) or cross-border countries (Cancela et al., 2020) which invariably hinders the generalisation of research findings. The issue of sustainability is a global concern which requires samples from all over the world where differences in culture, environment, institution and governance have a major influence on sustainability activities to fully understand it and make it relatable to everyone. Furthermore, studies have indicated that presenting data from different regions in the world helps to develop a better approach to analysing global corporate performance that will provide transparent, systematic, and comparable economic, social, and environmental information which is useful for establishing a benchmark for a better measure of stakeholders’ claims (Palmer et al., 2010). Existing knowledge then creates a gap that requires further

exploration by limiting the sample to specific continents. Moreover, Cancela et al. (2020) and Kouaib, Mhiri and Jarboui (2020) call for a study on other geographical regions to reduce the difficulties in generalising results from studies relating to sustainability performance. The study, therefore, responds to this call and contributes to the literature by conducting a thorough analysis by employing a unique dataset spanning 70 different countries from six different geographical regions to provide new insight into the board structure-sustainability performance relationship. As a robustness check, the study sample is divided into developed and developing countries based on the United Nations classifications indicating the generalisability of this study to different regions. To the best of my knowledge, this study is the first to conduct such a cross-country analysis in the board structure-sustainability performance literature to provide new evidence from numerous countries in both developing and developed economies to improve results generalisation.

Finally, the study findings provide a new contribution to the opposing views of stakeholder-agency theory and stewardship theory regarding the involvement of outside directors or insider directors in corporate affairs to enhance performance. Since on one hand, the stakeholder-agency theory argues for outside directors (Squires and Elnahla, 2020) while on the other hand, the stewardship theory contends that corporate affairs should be left in the hands of insider directors (Donaldson 1990; Donaldson and Davis 1991). For instance, in terms of board size, the stakeholder-agency theory argues that with larger boards, companies may have the opportunity to access more prestigious and knowledgeable directors to commit to sustainable activities to initiate policies to meet stakeholders' demands (Kock, Santaló and Diestre, 2012). Moreover, a larger board ensures effective board oversight and monitoring duties. On the other hand, the stewardship theory contends that managers are good stewards who only require a small number of directors for advisory purposes (Davis, Schoorman and Donaldson, 1997; Jaskiewicz and Klein, 2007). This is because executive directors are good stewards and would manage corporate affairs effectively to increase performance if they are allowed to work independently under very little supervision (Kyere and Ausloos, 2020).

The two theories also have contending views on having independent directors on the board. On one hand, the stakeholder-agency theory argues that the firm needs a larger percentage of independent directors to monitor management activities to prevent agency costs since the independent directors have no affiliation with the firm and also have their reputation to protect,

they will effectively execute their duties on behalf of all stakeholders (Bachiller, Giorgino and Paternostro, 2015). However, the stewardship theory argues that insider directors have more firm-specific knowledge to oversee corporate affairs than independent directors with limited knowledge of the firm (Christensen, Kent, and Stewart, 2010; Menyah, 2013). Hence, from the perspective of stewardship theory, the firm will perform better with internal directors who possess firm-specific knowledge. Another area of contention is the issue of CEO duality. Whereas the stakeholder-agency theory argues that duality promotes CEO entrenchment and power, so the two roles need to be separated (Shahzad, Rutherford, and, Sharfman, 2016), the stewardship theory believes that the duality role enhances performance as it reduces the chain for quick decision makings (Zhang, 2012; Cheng, 2013). The two aspects, therefore, develop theoretical ambiguities that call for further empirical analysis.

Therefore, the result that a larger board harms financial and environmental performance but promotes social performance, board independence promotes social performance and CEO duality increases financial, social and environmental performance may be of importance to policymakers and practitioners in structuring the board to suit each dimension of sustainability.

7.5 Policy Implications

The study findings provide a lot of important practical and managerial implications for policymakers and practitioners. First, the findings indicate that forming sustainability committees on corporate boards is linked to a higher level of sustainability performance (financial, social and environmental). Therefore, the findings from this study affirm the preposition of prior studies (Hussain, Rigoni and Orij, 2018; Cancela et al., 2020) that a sustainability committee is an essential feature of board structure which may potentially help the firm to improve sustainability performance. The results may serve as a guide for policymakers and practitioners to appropriately reform board structure such that companies may deem it necessary to have sustainability committees on their boards. To a larger extent, policymakers may consider having a sustainability committee as a regulatory requirement.

Secondly, the findings that CEO duality affects all three dimensions of sustainability performance may have important implications for companies that reinforce non-CEO duality. The results show that the unified leadership structure, the reduced chain of command and the unity of

command that is associated with CEO duality are effective mechanisms to help firms promote sustainable activities which substantially improve sustainability performance. This could be of importance to policymakers that they may encourage companies who are passionate about sustainable development to consider restructuring their boards to accommodate the CEO duality leadership style. Policymakers should also be aware of the importance of CEO duality style and may initiate policies that will encourage companies to assess their long-term plans and objectives and adopt the leadership style towards attaining the set objectives.

Finally, the study findings depict that financial firms and non-financial firms differ in terms of board structure impact on sustainability performance. This indicates that widening the scope of sustainability studies to comprise both financial and non-financial industries will enrich the level of analysis relating to sustainability developments. With this, policymakers and policy implementers may be guided to formulate appropriate strategies aimed at improving internal governance to reduce governance deficiencies across all industries to enhance corporate sustainability performance and give a positive signal towards the attainment of SDGs. Also, the results may of significant implications for practitioners and policymakers to the extent that they may initiate separate requirements for board structure depending on the industrial sector in which a firm operates.

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APPENDICES

Appendix A

Table A. Fixed effect regressions results

	Full sample			Financial companies			Non-financial companies		
	roa	soc	envt	roa	soc	envt	roa	soc	envt
bs	-0.008** (-2.09)	0.006 (0.10)	-0.006 (-0.09)	-0.004 (-0.60)	-0.030 (-0.28)	-0.048 (-0.30)	-0.010** (-2.03)	0.012 (0.19)	-0.011 (-0.16)
ind	0.000 (0.65)	0.029*** (3.00)	0.001 (0.05)	0.000 (0.43)	0.034 (1.62)	-0.001 (-0.04)	0.000 (0.54)	0.028** (2.55)	-0.001 (-0.10)
csr	-0.020 (-1.04)	6.680*** (17.94)	9.335*** (21.16)	0.010 (0.32)	5.576*** (7.26)	11.512*** (10.27)	-0.028 (-1.22)	6.993*** (16.51)	8.936*** (19.25)
ceo	0.026 (1.11)	-0.250 (-0.71)	-0.158 (-0.39)	-0.000 (-0.01)	-0.231 (-0.33)	-0.560 (-0.54)	0.031 (1.12)	-0.224 (-0.56)	-0.047 (-0.11)
bgd	0.000 (0.08)	-0.001 (-0.07)	0.025* (1.96)	-0.000 (-0.03)	-0.014 (-0.53)	0.133*** (3.75)	0.000 (0.09)	0.002 (0.16)	-0.003 (-0.25)
skills	-0.000 (-0.32)	0.010* (1.92)	-0.002 (-0.30)	-0.000 (-0.49)	0.022* (1.91)	-0.028* (-1.72)	-0.000 (-0.34)	0.008 (1.24)	0.005 (0.76)
reporting	0.001 (0.04)	8.568*** (24.82)	12.940*** (29.49)	-0.015 (-0.47)	10.088*** (11.79)	13.017*** (10.89)	0.007 (0.30)	8.207*** (21.85)	12.946*** (28.59)
age	0.013*** (2.58)	1.790*** (28.68)	0.901*** (12.05)	0.007 (0.85)	1.613*** (11.02)	-2.099*** (-10.41)	0.014** (2.39)	1.824*** (26.20)	1.579*** (21.02)
fsize	-0.143*** (-3.63)	2.399*** (8.57)	1.719*** (5.28)	-0.166* (-1.83)	3.044*** (3.31)	-0.845 (-0.78)	-0.136*** (-3.15)	2.312*** (7.90)	2.185*** (6.69)
lev	-1.248*** (-11.54)	-1.007 (-1.18)	-1.158 (-1.27)	-0.968*** (-3.99)	-3.275 (-1.34)	-1.400 (-0.39)	-1.292*** (-10.84)	-1.182 (-1.30)	-2.123** (-2.30)
capint	-0.603*** (-4.52)	0.672 (0.56)	2.401* (1.76)	0.201 (0.62)	0.009 (0.00)	10.462** (2.03)	-0.692*** (-4.67)	0.233 (0.18)	0.941 (0.66)
gdp	0.032*** (14.82)	-0.004 (-0.15)	-0.207*** (-6.86)	0.040*** (10.45)	0.109** (2.33)	-0.762*** (-10.32)	0.029*** (11.56)	-0.037 (-1.25)	-0.095*** (-2.92)

Table A. CONTINUED.

	<i>Full sample</i>			<i>Financial companies</i>			<i>Non-financial companies</i>		
inflation	-0.004 (-0.01)	11.220 (0.93)	21.545 (1.56)	-0.176 (-0.17)	5.172 (0.28)	29.887* (1.94)	0.071 (0.10)	13.897 (0.86)	5.395 (0.39)
govest	-0.247*** (-3.49)	4.858*** (4.77)	4.883*** (3.99)	-0.614*** (-6.26)	10.693*** (5.11)	-1.753 (-0.63)	-0.143 (-1.60)	3.010*** (2.59)	5.408*** (4.07)
Constant	4.208*** (3.10)	-88.287*** (-4.10)	-78.493*** (-3.17)	4.485* (1.86)	-85.807** (-2.31)	46.360 (1.34)	4.066*** (2.79)	-91.010*** (-3.24)	-80.610*** (-3.27)
Observations	24288	29276	29281	5285	5765	5766	19003	23511	23515
R2	0.051	0.340	0.303	0.085	0.337	0.201	0.048	0.344	0.384
Adjusted R2	0.050	0.340	0.302	0.082	0.335	0.199	0.047	0.344	0.384
F	37.222	272.407	201.011	12.052	49.965	38.386	29.099	225.320	224.120
p	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hausman test	550.89	1643.29	4285.32	316.36	799.78	1269.32	143.86	1715.35	4220.32
Chi-Square									
Statistic									
Hausman p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: t statistics in parentheses; * p < 0.1, ** p < 0.05, *** p < 0.01.

Appendix B

Table B. Fixed effects result for developed and developing

	<i>Developed countries</i>			<i>Developing countries</i>		
	<i>roa</i>	<i>soc</i>	<i>envt</i>	<i>roa</i>	<i>soc</i>	<i>envt</i>
bs	-0.008*	0.030	0.044	-0.010	0.067	0.003
	(-1.68)	(0.46)	(0.56)	(-1.32)	(0.58)	(0.02)
ind	0.001	0.032***	-0.008	0.001	0.017	0.054**
	(0.80)	(3.05)	(-0.69)	(0.48)	(0.76)	(2.20)
csr	-0.027	6.222***	8.929***	0.002	8.326***	10.145***
	(-1.20)	(15.15)	(18.17)	(0.05)	(9.86)	(10.43)
ceo	0.023	-0.250	-0.042	0.051	-0.428	-0.651
	(0.82)	(-0.63)	(-0.10)	(1.23)	(-0.56)	(-0.64)
bgd	0.000	0.009	0.044***	-0.001	-0.017	-0.031
	(0.33)	(0.78)	(3.27)	(-0.82)	(-0.58)	(-0.86)
skills	-0.000	0.009	-0.005	-0.000	0.014	0.001
	(-0.19)	(1.53)	(-0.79)	(-0.67)	(1.07)	(0.09)
reporting	-0.018	7.931***	12.645***	0.045	10.717***	13.147***
	(-0.86)	(20.95)	(25.87)	(1.25)	(13.37)	(13.48)
age	0.019***	1.753***	0.682***	-0.021*	1.824***	1.216***
	(3.36)	(24.91)	(8.51)	(-1.95)	(12.24)	(6.36)
fsize	-0.189***	1.963***	0.902***	-0.034	3.764***	4.303***
	(-4.19)	(6.69)	(2.83)	(-0.39)	(5.36)	(3.79)
lev	-1.176***	-1.255	-0.277	-1.381***	1.109	-2.332
	(-9.69)	(-1.39)	(-0.29)	(-5.77)	(0.46)	(-0.83)
capint	-0.575***	1.255	3.434**	-0.797***	-1.276	-2.972
	(-3.71)	(0.94)	(2.38)	(-3.00)	(-0.46)	(-0.83)
gdp	0.040***	-0.003	-0.154***	0.020***	0.025	-0.014
	(13.52)	(-0.12)	(-4.50)	(5.87)	(0.49)	(-0.22)
inflation	-0.142	-1.939	18.929	0.410	47.372***	46.549
	(-0.16)	(-0.16)	(1.39)	(0.42)	(3.52)	(1.30)
govest	-0.454***	3.868***	-1.298	0.149	-1.650	22.632***
	(-4.81)	(3.18)	(-1.01)	(0.87)	(-0.53)	(5.66)
Constant	5.142***	-56.886***	-44.763**	2.512	-200.711***	-199.344**
	(3.22)	(-2.73)	(-1.96)	(0.96)	(-6.06)	(-2.42)
	18833	23297	23302	5455	5979	5979
Observations	0.050	0.326	0.303	0.069	0.393	0.322
R2	0.049	0.326	0.303	0.067	0.392	0.320
Adjusted R2	29.731	207.055	160.450	10.034	72.839	53.312
F	0.000	0.000	0.000	0.000	0.000	0.000
p	501.97	2138.09	3502.03	138.80	622.84	360.64
Hausman test Chi-	0.000	0.000	0.000	0.000	0.000	0.000
Square Statistic						
Hausman p-value						

Notes: t statistics in parentheses; * p < 0.1, ** p < 0.05, *** p < 0.01.

Appendix C
Table C. Fixed effects result for Common law countries and Civil law countries

	Common law countries			Civil law countries		
	roa	soc	envt	roa	soc	envt
bs	-0.007 (-1.16)	0.000 -0.64	0.001 -1.07	-0.010* (-1.92)	0.000 -0.34	-0.001 (-0.92)
ind	0.108	0.030**	0.002	0	0.015	0.005
	-1.02	-2.52	-0.14	0	-0.94	-0.27
csr	-0.034 (-1.33)	0.064*** -14.83	0.093*** -17.06	-0.002 (-0.05)	0.071*** -10.29	0.090*** -12.01
ceo	0.009	-0.008*	-0.006	0.063**	0.007	0.008
	-0.26	(-1.84)	(-1.17)	-2.03	-1.11	-1.03
bgd	0.103	0.014	0.019	-0.279** (-1.98)	-0.017 (-0.71)	0.051* -1.9
	-0.89	-1.13	-1.28			
skills	0.034	0.013**	-0.007	-0.107** (-1.98)	0.009	0.011
	-0.67	-2.02	(-0.98)	(-1.98)	-0.88	-0.95
reporting	0.007	0.081*** -0.29	0.135*** -21.01	-0.02 (-0.66)	0.099*** -13.75	0.112*** -13.41
age	0.018*** -2.58	0.017*** -22.23	0.008*** -8.39	0.004 -0.55	0.019*** -16.63	0.009*** -7.11
fsize	-0.185*** (-4.08)	0.018*** -6.42	0.009** -2.56	-0.042 (-0.55)	0.047*** -6.44	0.048*** -5.5
lev	-1.141*** (-8.74)	-0.004 (-0.44)	-0.011 (-1.16)	-1.560*** (-9.13)	-0.049** (-2.24)	-0.012 (-0.51)
capint	-0.653*** (-3.90)	0 0	0.017 -1.1	-0.480** (-2.27)	0.042	0.041 -1.46
gdp	0.030*** -10.31	-0.001* (-1.66)	-0.002*** (-5.93)	0.034*** -10.88	0.001* -1.8	-0.001** (-2.25)
inflation	2.320* -1.7	-0.025 (-0.20)	0.321 -1.25	-1.144*** (-2.63)	0.227	0.189 -1.24
govest	-0.222** (-2.40)	0.055*** -4.28	0.032** -2.03	-0.074 (-0.48)	-0.064** (-2.56)	0.082*** -2.64
Constant	0.489	-0.472** -0.2	-0.800* (-2.06)	4.723*** (-1.78)	-1.644*** (-3.07)	-1.347*** (-4.69)
Observations	15407	19570	19574	8881	9706	9707
R ²	0.045	0.344	0.328	0.07	0.345	0.259
Adjusted R ²	0.044	0.343	0.328	0.069	0.344	0.258
F	20.216	186.589	151.94	21.856	93.372	55.996
p	0.000	0.000	0.000	0.000	0.000	0.000

Notes: t statistics in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01

Appendix D
Table D. Fixed effects result for Tobin's Q

Variables	full sample	Financial companies	financial companies
	tq	tq	tq
bs	0.000*	0	0
	-1.75	-1.3	-1.57
ind	-0.000*	0	-0.000**
	(-1.89)	-1	(-2.04)
csr	0	0	0
	(-1.41)	(-0.99)	(-1.20)
ceo	0	0	0
	-1.27	(-0.55)	-1.36
bgd	0	0	0
	-0.05	-0.91	(-0.15)
skills	0	0	0
	(-1.26)	(-0.90)	(-1.17)
reporting	0.000*	0	0.000**
	-1.94	(-0.13)	-2
age	0	0	0
	-0.01	-0.86	(-0.09)
fsize	0	0	0
	-0.13	(-0.88)	-0.31
lev	0.992***	0.997***	0.992***
	-1109.07	-341.6	-1063.56
capint	0.001**	-0.002	0.002***
	-2.27	(-0.80)	-2.97
gdp	0.000***	0.000**	0.000***
	-5.85	-2.08	-5.62
inflation	-0.001	0	-0.001
	(-1.36)	-0.03	(-1.63)
govest	0.001***	0	0.001***
	-2.64	(-0.01)	-2.65
Constant	0.003	0.007	0.004
	-0.93	-0.89	-1.02
Observations	28736	5690	23046
R2	0.999	0.999	0.999
Adjusted R2	0.999	0.999	0.999
F	153439.02	92181.835	133861.217
p	0	0	0
Hausman test Chi-Square	26.2	68.65	23.04
Statistic			
Hausman p-value	0.01	0	0.027

Notes: t statistics in parentheses; * p < 0.1, ** p < 0.05, *** p < 0.01

Appendix E

Table E Existing literature on board structure and the dimensions of sustainability performance

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Hsu et al 2021	all non-financial companies listed on the Taiwan Stock Exchange and Taipei Exchange from 2000 to 2012. 13-year period	Taiwan	Nonfinancial	Linear	Taiwan Economic Journal (TEJ) database	Financial	Stewardship theory agency theory	None	CEO duality: insig(+)
Nguyen and Thanh 2021	1,394 firm-year observations in the three emerging East Asian markets from 2011 to 2016 6-year period	Emerging East Asian countries (China, South Korea and Taiwan)	Non-financial	Linear and Non-linear	Thomson Reuters environmental, social and governance (ESG) ratings.	Environmental	Agency theory Stakeholder theory	Board size: U shape (non-linear) Independent directors: sig(+)	CEO duality: insig
Lu and Wang 2021	12,218 observations (1,870 unique firms) over the period of 2010 and 2017. 8-year period	25 Asian and European countries	Non-financial	Linear	Sustainalytics database-ESG rating Thomson Reuters Eikon database-finance information	Environmental	Voluntary disclosure theory Legitimacy theory Resource dependency theory	CEO non-duality: sig(+) Gender diversity: sig(+) Board independence: sig(-)	None

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Veltri et al 2021	33 firms listed on FTSE MIB from 2010–2019 10-year period	Italy	Non-financial	Linear	TSE MIB listed groups on the Italian Stock Exchange	Social	Stakeholder agency theory	Independence: sig(+)	BGD: insig(+)
Khan et al 2021	226 listed firms from Bursa Research Scheme from 2010 to 2015 6-yr period	Malaysia	Nonfinancial	Linear	Capital Market Development Fund–Bursa Research Scheme: sec sources (website, annual report, DataStream, and Kuala Lumpur stock exchange	Financial	Agency theory Stewardship Resource dependence	Non-executive directors: sig(+) Board size: sig(-) CEO duality: sig(-)	None
Roffia et al 2021	184 Italian SMEs from 2014–2017. 4-year period	Italy	Nonfinancial	Linear	Manual data: statistics from the Italian Institute of Statistics Italian Public Register of Companies	Financial	Agency theory Resource-based view	Board skills and competencies: sig(+) presence of committees: sig(-)	Board size: insig Board independence: insig
Souther 2021	682 funds between 1997 and 2014(close-end funds 18-year period	USA	Investment company	Linear	Manual data from statements	Financial (premium)	None	Board independence: sig(+)	None

Table E CONTINUED

Author(s) & year	Sample size	Country	Financial/ Non-Financial companies	Linear/Nonlinear/ Curvilinear/ concave	Data set	Performance measure	theories	Variables confirmed	Variables not confirmed
Akram et al 2020	375 non-financial firms of Pakistan Stock Exchange for the years 2010–2016 7-year period	Pakistan	Non-financial	Linear	Pakistan Stock Exchange Secondary sources used: (annual reports, Bloomberg, 4traders and World-Scope database)	Financial	Agency theory Upper echelon Resource-based view	Educational heterogeneity: sig(+) Business and Economics education background: sig(+) Engineering and Computer education: sig(+) MBA degree holders: sig(+) Gender diversity: sig(-) National heterogeneity: sig(+)	Financial education: insig(+) Directors' other education: insig(+)
Olthuis and Oever 2020	372 Dutch municipality boards from 2014 to 2017 4-year period	Netherlands	Nonfinancial	Linear	Database of the Dutch association of municipalities- CSR performance Database of research institute 'Governance in the Netherlands'- board diversity&Board size,	Social (CSR performance)	Upper echelons theory	Ideological diversity: sig(-)	None

Table E CONTINUED

Author(s) & year	Sample size	Country	Financial/ Non-Financial companies	Linear/Nonlinear/ Curvilinear/ concave	Data set	Performance measure	theories	Variables confirmed	Variables not confirmed
Prashar and Gupta 2020	148 papers published between 2000 and 2020. 21-yr period	31 countries (Meta-analysis technique)	(Meta-analysis technique)	Linear	online database search for relevant papers	Financial	Agency theory Resource-based view	Board independence: sig(+) Board diversity: sig(+) Board size: sig(+) Duality: sig(+) Board meetings: sig(+)	Board committee: insig(+)
Shahbaz et al 2020	414 companies for the period 2011–18. 8-year period	global energy sector.	Nonfinancial	Linear	Thomson Reuters' EIKON database: ESG performance, board characteristics, and financial performance	Environmental, social, and governance (ESG)	Agency theory Stakeholder theory	Board Independence: sig+(ESG) (G) Board gender diversity: sig+(ESG) (G), E CSR committee: sig+(ESG)	
Nguyen et al 2020	1596 firm-year observations during the period of 2011–2016. 6-year period	China, South Korea, and Taiwan (emerging East Asia)	Non-financial	Linear	Thomson Reuters ESG ratings: sustainability performance	Economic environmental and social	Agency theory and stakeholder theory	Board size: sig+(En), (S) independent directors: sig+(En) (S) CEO duality: sig-(En)	independent directors: Insig(E), Board size: insig+(E), CEO duality: insig+(E) (S)
Song et al 2020	publicly traded US lodging from 1993–2018 25-year period (320 firm-year observations)	USA	Non-financial	Linear	DEF14A (other definitive proxy statements): Board diversity 10-Ks (firms' annual reports): performance, internationalisation	Financial	Human capital Resource dependence Agency theory Stakeholder	Gender diversity: sig(+)	Age diversity: insig

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Martín and Herrero 2020	644 nonfinancial European Union-based companies. from 2002 to 2017. 16-year period	European union countries	Non-financial	Linear	Thomson Reuters Environment Pillar Score (ASSET4): environmental information, environmental category scores (emissions, innovation, and resource use)	Environmental	Agency theory and stakeholder theory	Gender diversity: sig(+) Env CEO duality: sig(-) Env Board size: sig(-) Env	None
Martínez-Ferrero et al 2020	702 firm year observation From 2012 to 2018	Argentina, Brazil, Chile and Mexico	Non-financial	Linear	Thomson Reuters Eikon	Social Environmental (EGS scorecard)		cultural diversity: sig(+) on ESGScore	None
Arnaboldi et al 2020	77 publicly listed commercial banks from 20 EU countries over the period 2007–2015. 8-year period	20 EU countries	Financial	Linear	EU countries publicly listed commercial banks: countries under study Thomson Eikon: bank's stock market data Orbis Bank Focus: balance sheet and income statement BoardEx: corporate governance data	Financial	None	size of the board: sig(+) Board tenure: sig(+) Presence of employee representative: sig(+)(non-linear) Age diversity: sig(-) Board internationalisation (Foreign directors): sig(-)	Overall board diversity: insig Gender diversity: insig
Augusto et al 2020	858 American and 560 European firms, in the year 2016. 1 year period	USA& Europe	Non-financial	Linear	Datastream	Financial	None	Board size: sig(-)	Firm size: insig(-)

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Lizares 2020	40 publicly listed Philippine conglomerates from 2012 and 2015 4-year period	Philippines	Non-financial	Linear	firm's SEC Annual Corporate Governance Report Thomson Reuters Worldscope: financial data	Financial	Agency Stewardship	Board Leadership (CEO duality): sig(+) Independent directors: sig(-)	Board size: insig(-)
Guney et al 2020	47 firms listed on the three frontier stock markets in the EA from 2000–2013 14-year period	Multi-country (Kenya, Tanzania, and Uganda)	Non-financial	Linear	hand-collected data set on all the listed non-financial firms manually collected published annual reports: board characteristics	Financial	Agency Resource dependence	Foreigners on the board: Sig(+) Board size: Sig(-) Civil servants on the board with education: Sig(+)	None
Ozdemir 2020	36 tourism firms for the period 2007–2016. 10-year period	US	Non-financial	Linear	ISS database: board related data Compustat and Centre for Research in Security Prices (CRSP) database: companies financials and share price information	Financial	Agency and Resource dependence	Board diversity: sig(+)	None

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Lee 2020	1200 publicly listed U.S. firms between 2005 and 2015 11-yr period	US	Non-financial	Linear	BoardEx: board composition, board committees, and directors' professional backgrounds Compustat: financial statement information Center for Research in Security Prices (CRSP): stock price information.	Financial	None	Multi roles: sig(+) Board size: sig(+) Number of independent directors: sig(-) Director tenure: sig(+)	Independent dir tenure: insig(-)
Aksoy et al 2020	63 firm of BIST 100 Index from 2014 to 2018. 5-year period	Turkey	Non-financial	Linear	BIST 100 Index (as proxied by their inclusion in the Borsa Istanbul Sustainability Index)	Corporate sustainability Agency	Stakeholder theory Agency	Board size: sig(+) Independence board membership: sig(+)	CEO duality: insig Female board membership: insig
Dato et al 2020	392 MFIs from 74 countries around the globe from 1998 to 2011. 14-year period	74 countries around the globe	Financial	Linear	Hand collected data from collected from risk assessment reports	Financial Social	None	Board size: Sig(-) Fin Female directors: sig(-) Meetings: sig(-)	None
Qureshi et al 2020	812 listed European firms from 2011 to 2017 7-year period	22 European countries	Financial & Non-financial	Linear	Thomson Reuters Eikon database	Financial	Stakeholder theory Shareholder theory	Board gender diversity: Sig(+)	
Cordeiro et al 2020	751 firms from 2010–2015 6-year period	US	Non-financial	Linear	CSRHub database: environmental categories Bloomberg database: number of women	Environmental	Resource dependency, Socioemotional wealth theory secondary agency theory	Board gender diversity: sig(+)	None

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Zubeltzu-Jaka et al 2020	80 articles more than 80,000 international companies between 1997 and 2018 21-year period	International meta-analytical studies	meta-analytical studies	Linear	scientific databases journals	Social	Stakeholder theory	Board sizes impact on CSP: sig(+)	None
Wang et al 2020	64 non-financial firms listed on Pakistan Stock Exchange 100 index for the years 2011-2014 4-year period	Pakistan	Non-financial	Linear	PSX-100 index (manually collected from annual reports and Financial Times.)	Financial	Entrenchment theory	Gender diversity: sig(-)	Board size: insig Board independence: insig(+)
Abdel-Azim and Soliman 2020	21 banks from 2012 to 2018. 7-year period	Egypt	Financial	Linear	Banks listed at the EGX	Financial	Resource-dependency theory Agency theory	Board size: sig(+) Proportion of women: sig(+) Proportion of foreign directors: sig(+) proportion of independent directors: sig(-)	None

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Daadaa 2020	11 banks from 2005 to 2018. 12-year period	Tunisia	Financial	Linear	Manual collection: annual bank's corporate governance reports: board structure data from the financial market comity (CMF) database: governance report	financial	Agency theory Stakeholder theory	Board size: sig(-) institutional members: sig(-)	Duality: insig Board independence: insig(-)
Ruta et al 2020	20 Italian and 15 English football clubs from 2005 to 2015 10-year period	Italy& England	Non-financial	Linear	hand-collected from each club's annual reports: financial data, governance information	Financial Sporting performance	Agency theory, Property rights theory	Board size: sig(-) CEO Tenure: sig(+) Board Independence: sig(+)	CEO Duality: insig
Fernández-Temprano and Tejerina-Gaite	87 non-financial Spanish firms from 2005-2015 11-year period	Spain	Non-Financial	Linear	BoardEx database: independent variables CNMV (Spanish Securities and Exchange Commission): dependent variables	Financial	Resource dependence theory Cognitive diversity theory similarity-attraction Agency theory	Directors' age diversity: sig(+) Higher educational diversity: sig(-) Board positions diversity: sig(-) National diversity: sig(+)	Gender diversity: insig
Al Farooque et al 2020	452 firms listed on the Thai Stock Exchange for the period 2000-2016 17-year period	Thailand	Non-financial	Linear	The SET database, from company annual reports and from their disclosure reports	Financial	Agency theory	Board size: sig (+) Board independence: sig(+) Audit committee meeting frequency: sig(+) Dual role of leadership: sig(-)	Audit committee indep Audit committee size

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Ozbek and Boyd 2020	134 US-based spin-offs from 2000 and 2014 5-yr period	USA	Non-financial	Linear	SDC Platinum database: spin off companies US Securities and Exchange Commission (SEC) website: governance data The CompuStat database: firm and industry level data	Financial	Stewardship theory Resource dependence theory	Board size: sig(+) CEO duality: sig(+)	None
Chaudhry et al 2020	50 non-financial firms on KSE 100 for 2016 1-year period	Pakistan	Non-financial	Linear	KSE 100 index	Financial	Agency theory, Human capital theory	audit committee (AC) Chair financial expertise: sig(+) AC Chair monitoring expertise: sig(+) nomination committee Chair experiential expertise: sig(+) AC Chair experiential expertise	AC Chair experiential expertise NC Chair HR expertise NC chair monitoring expertise
M. and Sasidharan 2020	163 listed firms on National and Shanghai stock exchanges for the period 2010–2017. 8-year period	India and China	Non-financial	Linear	Bloomberg	Financial	Resource dependence theory Agency theory	Board independence: sig(+) Board size: sig(-)	None

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Musallam 2020	31 Palestinian non-financial listed companies from 2010 to 2016 7-year period	Palestine	Non-financial	Linear	Companies annual reports in the Palestine Stock Exchange website	Financial	Agency theory	Board independence: sig(+) Audit committee size: sig(+) Audit committee meeting: sig(+) Audit committee: sig(+) Financial expertise: sig(+) CEO duality: sig(-)	Board size: insig CEO Tenure: insig
Borsa Italia and Ferraro 2020	22 Italian listed banks for the period 2008–2014 7- year period	Italy	Financial	Linear	Borsa Italia	Financial	Agency and resource dependence theories	Presence of female directors: sig(+) Positioning of female directors: sig(+)	None
Al-Okaily and Naeihed 2020	359 firms listed on London Stock Exchange between 2005 and 2013 9-year period	UK	Non-financial	Linear	Financial Times Stock Exchange DataStream: firm-specific market and accounting variables Firm's annual reports: board characteristics	Financial	Agency and resource dependence theories	audit committee meetings (ACM): sig(+) audit committee members (ACS): sig(+) audit committee expertise (ACX): sig(+)	None
Shakil et al 2020	37 US banks from the period of 2013 to 2017. 5-year period	USA	Financial	Linear	Refinitiv: the ESG and ESG controversies data, financial data	Social Environmental and Governance (ESG)	Resource dependence and legitimacy theory	Gender diversity: sig(+) to ESG	None

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Mohammadi et al 2020	150 companies on Tehran Stock exchange from 2012-2018	Iran	Non-financial	Linear	Database of Tehran Stock Exchange.	Social	Agency	Audit committee size: sig(+) Audit committee independence: sig(+) Financial expertise of audit committee: sig(+)	None
Nadeem et al 2020	U.K.-listed firms available from 2007–2017	UK	Non-financial	Linear	Thomson Reuters' ASSET4 database: composite of economic, social and envtal(shareholder value)	Stakeholder value (economic, social, environmental)	Stakeholder theory	Females on board: sig(+)	
Vairavan and Zhang 2020	Firms listed on S&P 1500 from 2011 to 2015. 5-year period	USA	Non-financial	Linear	Archival sources: Institutional Shareholder Services (ISS), COMPUTSTAT and WRDS RQ.: firm-level	Financial	Upper echelons theory	None	Board racial diversity: insig(+)
Pucheta-Martínez and Gallego-Álvarez 2020	10,314 international firm year observations from 2004 to 2015 12-year period	34 countries in Africa, Asia, Europe, Latin America, North America	Non-financial	Linear	Thomson Reuters database	Financial	Agency theory and Resource Dependence theory	Board Size: sig(+) CEO Duality: sig(+) Female Directors: sig(+) Board independence: sig(+)	board compensation: insig(+)

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Shu and Chiang 2020	1563 listed firms in the Taiwan Stock Exchange in the period of 2008–2015(11,439 firm-year observations) 8-year period	Taiwan	Non-financial	Linear	Taiwan Economic Journal (TEJ)	Social	Institutional theory Agency theory	CEO duality: sig(-) Board independence: sig(-)	None
Bouteska 2020	50 banks in five Eurozone countries during the period 2000–2019 20-year period	UK, Germany, France, Italy, and Spain	Financial	Linear	Fitch Global Banking database	Financial	Agency theory Stewardship theory	Board size: sig(+)optimal board size Independence: sig(+) Duality: sig(+) Board meeting: sig(+) Financial expertise: sig(+)	None
Uyar et al 2020	172 H&T firms from the Thomson Reuters database between 2011 and 2018. 8-year period	cross-country sample	Non-financial	ear	the Thomson Reuters Eikon (hereafter Eikon) database	Environmental, Social Governance (ESG)	Upper echelons theory Resource Dependence	CSR committee: sig(+) Board independent: sig(+)G Board diversity: sig(+) Board diligence: sig(+)	Board independent: insig(E, S)

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Al-Matari 2020	24 financial firms from 2011-2017 7-year period	Oman	Financial	Linear	Annual reports of Omani listed companies online at the Muscat Securities Market (MSM) data stream: corporate performance	Financial	Agency theory Resource dependence theory	Board Size: sig(+) independent non-executive directors: sig(+) Board Meeting: sig(+)	None
Fan et al 2020	640 listed Taiwanese firms from 2000–2015 (6-yr period)	Taiwan	Non-financial	Linear	Taiwan Economic Journal (TEJ) database or Manual collection: financial statements, stock prices and board characteristics	Financial	None	Complaint to Independent director regulation: sig(-)	None
Endo 2020	90 unique from 2012–2015 (325 firm year observations) 4-year period	Japan	Non-financial	linear	Nikkei newspaper's annual Environmental Management Survey: CEP The Directory of Corporate Boards: Independent variables	Environmental	Agency Resource dependency	Proportion of outside directors: sig (+) Board size: sig (+)	None
Kyere and Ausloos 2019	252 firms listed on London Stock Exchange for the year 2014 1-year period	United Kingdom	Non-financial	Linear	Listed on London Stock Exchange	Financial	Agency theory and stewardship theory	Board independence: sig(+) Board size: sig(+) Audit committees: sig(-)	CEO duality: insig

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Aggarwal et al 2019	380 unique firms, on NIFTY 500 index from 2006 to 2015 (10-year period)	India	Non-financial	Linear	NIFTY 500 index: data for the study NSE Infobase on Indian Boards: demographic diversity Prowess database: structural diversity	Financial	Resource dependence Agency theory	Demographic diversity for Group-affiliated firms: sig(-) Demographic diversity for Standalone firms: sig(+) Structural diversity for both group and affiliated firms: sig(+) (Independent, non-independent)	None
Kanapathipillai et al 2019	5303 firm-year observations from ASX-listed firms from 2005 to 2015 11-year period	Australia	Non-financial companies	Linear	Connect4 Boardroom and SIRCA databases: governance data DatAnalysis database: financial variables	Financial	prospect theory agency theory	Compensation committee existence (CCX): sig(+) Compensation committee effectiveness (CCE): sig(+)	None
Khan and Subhan 2019	100 listed companies in PSE-100 Index from 2008 to 2017 10-year period	Pakistan	Non-financial	Linear	Data extracted from annual reports and websites of listed companies on PSX-100	Financial	Agency theory Stewardship theory	Presence of female board member (board diversity): sig(+) Nationality diversity: sig(-) Quality audit: sig(+) Audit cost: sig(+)	Number of female board members: insig

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Sarhan et al 2019	100 firms drawn from five Middle Eastern countries from 2009–2014 period. 6-year period	Egypt, Jordan, Oman, Saudi Arabia, and United Arab of Emirates	Non-financial	Linear	Sampled firms' annual reports: board characteristics Datastream database: financial and accounting variables	Financial	Agency Resource dependency and Social identity theories	Board diversity: sig(+) Gender diversity: sig(+)	Board ethnic diversity: insig Board national diversity: insig
Lu and Herremans 2019	837 unique firms from S&P 1500 composite index from 2009–2015 7-year period	USA	Non-financial	Linear	Sustainalytics database: environmental performance data S&P Capital IQ: financial data Institutional Shareholder Services: board of directors data	Environmental	Resource dependence theory	Gender diversity: sig(+)	None
Alqatan et al 2019	78 UK nonfinancial companies using data from the period 2012 to 2015 4-year period	UK	Non-financial	Linear	UK FTSE Bloomberg database online sources (eg firms' annual reports.)	Financial	Stakeholder Agency	Board remuneration: sig(+) Board size: sig(+) Board independence: sig(+)	None
Kao et al 2019	Taiwanese listed firms from 1997 to 2015 (10,151 firm-year observations) 18-year period	Taiwan	Non-financial	Linear	Taiwan Economic Journal database	Financial	Agency theory	Board independence: sig(+) Board size: sig(-) separation between chairman and CEO: sig(-)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Homroy and Slechten 2019	FTSE 350 index over the period 2006–2014(3244 firm-year observation) 9-year period	UK	Non-financial	Linear	FTSE 350 index Datastream: performance, size, risk in the operating environment and industry classifications. BoardEx European Pollutant Release and Transfer Register (E-PRTR): firm-level environmental emission data	Environmental	Resource dependence	Non-executive directors with expertise: sig(+) network connections of EED: sig(+)	None
Unite et al 2019	250 Philippine firms listed on the Philippine Stock Exchange from 2003 to 2014 12-year period	Philippine	Non-financial	Linear	Hand collected from Annual Reports Financial database Osiris	Financial	Agency, social psychology, and investor-bias theories	None	greater board diversity: insig
Harjoto et al 2019	874 US firms from the BoardEx database for the period of 2000 to 2013 14-year period	USA	Non-financial	Linear	BoardEx MSCI ESG Stats (formerly known as KLD) database: CSP measures Compustat: financial information CRSP: stock returns RiskMetrics: CG characteristics	Social	Social categorization theory Similarity/attraction theory Cognitive resource diversity theory Intergroup contact theory.	Board nationality diversity: sig(+) educational background diversity (Bachelor & Masters):sig(+)	None

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Merendino and Melville 2019	65 Listed companies on Italian stock exchange over the period 2003-2015 13-yr period	Italy	Non-financial	Non-linear	Company's corporate governance reports database DataStream by Thomson Reuters: financial data	Financial	Agency theory	Board size: sig(-) Non linear Board roles (Director commitment): sig(-) Independent directors: sig(+) - non-linear	CEO/CM duality: insig
Crifo et al 2019	120 biggest French companies listed on the French SBF120 index in 2013. 1-year period	France	Non-financial	Linear	Vigeo database: CSR Datastream base	Environmental	Stakeholder Shareholder	Share of sectoral expert: sig(-)	Independent directors: insig General expertise: insig
Birindelli et al 2019	96 listed banks in the EMEA (Europe, Middle East and Africa) region from 2011 to 2016. 6-year period	Europe, Middle East and Africa	Financial	Non-linear	Thomson Reuters Asset4 database: CG variables Thomson Reuters Datastream: bank-specific financial data World Bank Data: country's variables	Environmental	critical mass, and homophily	Women on board-U relationship	None
Nawaz 2019	47 Islamic banks listed in Bankscope database from 2005–2010 6-year period	15 countries around the world	Financial	Linear	Bankscope database: Islamic bank data hand-collected for bank annual reports, governance reports, quarterly reports: bank governance	Financial	Resource-based theory (RBT) Human capital theory	Board size: sig(+) CEO power (duality role): sig(+)	Independent directors: insig(+) Audit committee members: insig(+)

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Shan 2019	Australian listed from 2005-2015 (9,302 firm-year observations) 10-year period	Australia	Non-financial	Linear	Thomson Reuters DataStream: accounting, finance and CG data	Financial	Agency theory Stewardship theory	Board independence: sig(-)	None
Kagzi and Guha 2018	knowledge-intensive firms in India for the period 2010-2014 (126 firms' observations). 5-year period	India	Non-financial	Linear/curvilinear	NSE's Infobase database: demographic variables Center for Monitoring Indian Economy Prowess: accounting variables	Financial	13 theories applied	Total board demographic diversity index: sig(+) Age diversity: sig(+) Education diversity: sig(-)	gender and tenure diversity: insig
Ferraz et al 2018	93 non-financial companies listed on the Iberian stock exchanges for the financial year 2014 1-year period	Spain and Portugal	Non-financial	Linear	Annual corporate governance reports: independent variables DataStream: company profitability	Financial	Resource dependence theory Human capital theory Agency theory	Board size: sig(-) Foreigners on the board: sig(-)	Women on the Board: insig(+) Auditing company hired: insig(-) Independent directors: insig(-)

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Lew et al 2018	110 Chinese manufacturing firms on Shanghai Stock Exchange and the Shenzhen Stock Exchange in 2010 1-year period	China	Non-financial	Linear	Annual reports: firm's performance data Thomson DataStream, the China Statistical Yearbook, and the Stockstar	Financial	Agency and resource dependence theories	CEO duality: sig(-)	Board size: insig(+) Proportion of independent directors: insig(+)
Haldar et al 2018	large listed Indian firms from 2004-2007. (412 observation)	India	Non-financial	Linear	Prowess database CG reports Annual reports	Financial	Stewardship theory Agency	independent directors: sig(-)	Majority independent directors: insig
Macaulay et al 2018	577 firm years from 2007–2011	US	Non-financial	Linear	The S&P 500 Kinder, Lydenberg, Domini Research and Analytics (KLD) database: dependent variables (CSP)	Social	Stakeholder theory	percentage of female directors: sig(+)	None
Dato 2018	23 MFIs in Ethiopia over a period of 2006-2011 6-year period	Ethiopia	Financial	Linear	RiskMetrics database in Wharton Research Data Services: % of female dir, outside dir	Financial and social	Resource dependence theory Agency theory	Number of board comm: sig(-) Number of advisory comm: sig(-) Number of monitoring comm: sig(+)	None

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Singh et al 2018	324 listed firms in Pakistan from 2009 to 2015 7-year period	Pakistan	Non-financial	Linear	Manually from the annual reports: empirical analysis data	Financial	Agency and resource dependence theories	Board size: sig(+) Board independence: sig(-) CEO duality: sig(-) Board committees: sig(+)	None
Scholtz & Kieviet 2018	80 of Top 100 South African companies listed on the Johannesburg Securities Exchange 2013–2015. 3-year period	South Africa	Non-financial	Linear	annual reports available on JSE	Financial	Agency and resource dependency theory	Directors with a business qualification: sig(+) Ethnic diversity: sig(-) Number of directors: sig(+)	Prop of females on board: insig(+)
Green and Homroy 2018	EuroTop 100 firms for the period 2004–2015 12-yr period	European countries (Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom)	Non-financial	Linear	BoardEx. Datastream: financial performance measures	Financial	None	Proportion of female on board: sig(+) Proportion of female in committees: sig(+) Proportion of female on board: sig(+) Proportion of female in committees: sig(+)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Kramaric' et al 2018	all insurance companies in Croatia operating in the 2007–2013 period(25 companies on ave) 7-year period	Croatia	Financial	Linear	Annual reports called Croatian Insurance Market:gender of the president of the BOD reports published by Croatian Financial Services Supervisory Agency: firm size&ROA	Financial	None	Board size: sig(-) Women on board: sig(-)	None
Ahmadi et al 2018	108 non-financial companies on CAC 40 companies from 2011–2013 4-year period	France	Non-financial companies	Linear	French firms listed on the CAC 40(corporate website of sample firms)	Financial	Agency Stewardship	Board independence: sig(+) Duality: sig(+) CEO tenure: sig(+) Gender diversity: sig(+)	None
Zhou et al 2018	Athens Stock Exchange during 2008–2012 (774 firm year observations) 5-year period	Greece	Non-financial	Linear	Annual reports of the listed firms on the Website of the ASE	Finance	Agency theory Resource dependency theory	Board size: sig(+) Board independence: sig(-)	Audit committee formation: insig

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Sakawa and Watanabel 2018	84 Japanese banks listed on the Tokyo Stock Exchange 2006–2011 6-yr period	Japan	Financial	Linear	Nikkei NEEDS database: financial data Nikkei NEEDS Cges database: board membership&charat eristics	Financial	None	Board Size: sig(-)	Ratio of Outside Director: insig
Uribe-Bohorquez et al 2018	international sample of 2185 firms from 2006 to 2015 10-year period	24 Countries from America, Europe, the Middle East, Africa, and Asia	Non-financial	Linear	Thomson One Analytic database: study's data Thomson Reuters Eikon: achival data	Financial	Agency theory	Board independence: sig(+)	None
Asante-Darko et al 2018	companies listed on the Ghana Stock Exchange from 2010-2014 5-year period	Ghana	Non-financial	Linear	Ghana Stock Exchange fact book and companies' annual report	Financial	Agency theory Free cash flow theory	Audit type: sig(+)	Board size: insig(-) Non-executive directors: insig(+)

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Dang A. et al 2018	478 non-financial companies listed on Vietnamese stock exchanges from 2012 to 2014. 3-year period	Vietnam	Non-financial	Linear	Tai Viet Corporation (Vietstock): Financial data and board data	Financial	Agency theory	Board independence: sig(-) CEO duality: sig(-)	Board size: insig(-)
Hassan and Marimuthu 2018	330 Malaysian-listed companies for the period from 2009 to 2013 5-year period	Malaysia	Non-financial	Linear	Datastream (Thomson Reuters) Company's annual reports	Financial	The upper echelons theory	Gender diversity: sig(+) Ethnic diversity: sig(+) Age profile: sig(+) Foreign participation: sig(+) technical educational diversity: sig(+) Experience diversity Tenure diversity: sig(-) Board of directors age: sig(+)	technical experience diversity: insig

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Mutlu et al 2018	84 studies, 684 effect sizes, and 547,622 firm observations from 1991 to 2011 (meta-analysis studies) 20-year period	China	Meta-analysis	HOMA	Electronic databases	Financial	None	Board independence: sig(+) CEO pay: sig (+)	CEO duality: insig (+)
Roudaki 2018	20 companies (11 listed and 09 non-listed) from 2012 to 2015. 4-year period	New Zealand	Non-financial	Linear	Annual reports	financial	Agency theory	Women % on board: sig(-)	Board size: insig(-) Board independence: insig(+) Auditor remuneration: insig(-) Director compensation: insig(+)
Elmagrhi et al 2018	383 A-shares on Shanghai Stock Exchange from 2011 to 2015 5-year period	China	Non-financial	Linear	A-share listed companies on Shanghai Stock Exchange.	Environmental	Agency Stakeholder Resource dependence Legitimacy Neo-intuitionist Tokenism	BGD: sig(+) Age of female directors: sig(+)	Level of education of female directors: insig(+)

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Wang et al 2018	7 publicly traded hotels from 1998 to 2013 15-year period	Taiwan	Nonfinancial	Non-linear (U shape)	Taiwan Economic Journal (TEJ)	Financial	Agency theory Resource dependence theory	Board size: sig(+)	None
Shettima and Dzolkarnaini 2018	30 MFIs in the periods from 2010 to 2013. 4-year period	Nigeria	Financial	Linear	Annual reports	Financial	Agency theory	Board size: sig(+)	Board diversity: insig
Yasser 2017	475 firms on Karachi Stock Exchange 100 (KSE-100) in the 2014 year. 1-yr period	Pakistan	Non-Financial	Linear	Company's statements	Financial	Resource dependence theory Agency theory	Board size: sig(+) Minority representation: sig(+)	Outside independent directors: insig Gender diversity: insig
Mayur and Saravanan 2017	40 banks listed banks in India period 2008-2012. 5-year period	India	Financial	Linear, Quadratic and Curvilinear	Prowess database	Financial	Agency theory	Board size: sig(+)	Frequency of board meetings: insig(-) Proportion of Non-executive directors (NEDs): insig(-)
Ariff et al 2017	220 companies of Bursa Malaysia for the financial year 2013 1-year period	Malaysia	Non-financial	Linear	Bursa Malaysia's website	Innovative performance	Resource dependence theory	Board diversity (age, gender, ethnicity, nationality, education, tenure): sig(+)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Song et al 2017	25 publicly traded US restaurant firms from 2007 to 2013 7-yr period	USA	Non-financial	Linear	Institutional Shareholder Services Compustat database: financial data	Financial	stewardship theory	None	Insider directors: insig Outsider directors: insig
Alazzani et al 2017	Firms listed on Bursa Malaysia during 2009	Malaysia	Non-financial	Linear	Capital Market Development Fund–Bursa Research Scheme (CBRS) Annual report: dependent & independent variables	Social Environmental	Upper echelon theory	Female directors: sig(+)Soc	Female directors: insig(env)
Yasser et al 2017	475 firms' years on Karachi Stock Exchange 100 (KSE-100) from 2009 to 2013 5-yr period	Pakistan	Non-financial	Linear	Financial statement part of Annual Reports.	Financial	agency theory and stewardship theory	Board size: sig(+) Independent directorship: sig(+)	Board independence: insig(-) Gender diversity: insig(+)
Mishra and Kapil 2017	391 companies listed on National Stock exchange from 2010 to 2014 5-yr period.	India	Non-financial	Linear	Prowess database of Centre for Monitoring of Indian Economy (CMIE).	Financial	agency theory Stewardship Resource dependence	Board size: sig(+)	independence: insig

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Berezinets et al 2017	207 Russian companies during the period 2007-2011 5-year period	Russia	Non-financial	Non-Linear/quadratic	SKRIN database (www.skrin.ru)	Financial	Resource dependence theory stewardship theory Agency theory	Board size: sig(+) women on board: sig(+) Audit committee: insig Nomination and remuneration committee: insig Board chair xtics (age& tenure of the board chair): insig	Proportion of Independent directors: insig
Dixon-Fowler et al 2017	485 firms of S&P 500 firms, for the year 2004 1-year period	USA	Non-financial	Linear	Review of company proxies, 10-Ks, and The Corporate Library Database The KLD database u	Environmental	Agency theory Resource dependency theory	Board environmental committee: sig(+) Sustainability manager: sig(+)	None

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Muravyev 2017	575 firms year sample of publicly traded Russian companies over the period 1998–2014 16-year period	Russia	Non-financial firms	Linear	hand-collected dataset from RTS and/or the MICEX and MOEX	Financial	None	Foreign directors: sig(+) Directors on other boards: sig(+) Insider-outsider director representation Female director: sig(+) representation: sig(+)	None
Cavaco et al 2017	107 distinct firms of SBF120 companies for the 2006–2011 period 6-year period	France	Non-financial	Linear	hand-collections from annual reports and internet researches	Financial	Managerial power theory Agency theory Resource dependence theory	Independence directors: sig(-)	None
Gray and Nowland 2017	1548 ASX-listed companies in 2007 1-year period	Australia	Non-financial	Linear	Boardroom database from Connect4	Financial	Agency theory Resource dependency theory	Expertise index: sig(+) Specialist business expertise: sig(+) General executives expertise: sig(-)	None
Tang 2017	82 unique publicly traded firms in 1997. (364 firm-year observations) 1-year period	USA	Non-financial	Linear	Company proxy statements and annual reports	Financial	Agency theory Stewardship theory	CEO duality: sig(-)	None

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Chintrakarn et al 2017	9462 observations from ISS database and Compustat from 1996 to 2010 15-yr period	USA	Non-financial	Linear	ISS database: data on directors COMPUSTAT: firm characteristics	Financial	Agency theory	Board size: sig(-)	None
Rubino et al 2017	193 Italian listed firms from 2003 to 2013 11-yr period	Italy	Non-financial	Linear	Datastream: sample of industrial firms Annual reports: corporate board structure	Financial	Agency, stewardship and resource dependence theories	CEO duality: sig(+) Busy directors: sig(+) Board size: sig(+)	Independent directors: insig(-) Female directors: insig(-)
Zattoni et al 2017	1024 domestically-listed IPO companies in the period 2006–2008 3-year period	Multi country (18 countries around the world)	Non-financial	Linear	Personal contacts: country experts EURIPPO Fact Books: IPOs	Financial	Agency theory	Board independence(BI): sig(+)	Equity market-based system: insig(+) Education level: insig(+) Government intervention: insig(+) Systemic trust: insig(+) Power distance: insig(+)
Cuadrado-Ballesteros et al 2017	471 US non-financial companies for the period 2008–2010	US	Non-financial	Linear	Thomson One Analytic database: financial information Ethical Investment Research Service (EIRIS): CSR & board xtics	Social	Complexity theory	Results depends on combination of variables	

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Shehata et al 2017	34,798 U.K. SMEs for the year 2005–2013 9-yr period	UK	Non-financial	Linear	Fame database	Financial	Agency theory, Resource dependency theory, Stakeholder theory and Contingency theory	Gender: sig(-) Percentage of Females: sig(-) Age Diversity: sig(-)	None
Thrikawala et al 2016	300 MFI-year observations for the period 2007 to 2012 6-year period	Sri Lanka	Financial	Linear	Sri Lankan microfinance network (Microfinance Information Exchange market and LMFPA) websites	Financial Social	Agency theory	Female directors on board: sig(-) Female CEO: sig(+) Female chairperson: sig(+) International directors/donor representatives on board: sig(+) Client/borrower representatives on board: sig(+) Non-executive directors on board: sig(-)fin	None
Mohapatra 2016	35 companies on National Stock Exchange studied from 2005 to 2010. 6-year period	India	Financial	Linear	Company database (PROWESS). Websites Published Annual Reports, research articles	Financial	None	Board independence: sig(+)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Fernández-Gago et al 2016	145 firm year observations of Spanish listed firms over the period 2005–2010 6-year period	Spain	Non-financial	Linear	Data base of the SABI (Sociedad de Análisis de Balances Ibericos) Annual reports	Financial	Stakeholder Agency Shareholder	Independent board: sig(+)	None
Arora and Sharma 2016	20 important manufacturing industries in India from 2001-2010 10-year period	India	Non-financial	Linear	PROWESS[3] database Annual reports	Financial	Resource dependency theory Agency theory	Board independence: sig(-) Board meetings: sig(+) Board size: sig(+)	CEO duality: insig(+)
Darko et al 2016	20 of the 34 listed companies on the Ghana Stock Exchange from 2008 to 2012 5-year period	Ghana	Non-financial	Linear/ANOVA	Annual reports and financial statements of the listed companies Websites	Financial	Agency theory Resource dependency theory	Board independence: sig(-) Board gender: sig(+) Frequency of audit committee meetings: sig(-)	Board size: insig Audit committee size: insig
Lau et al 2016	471 listed firms in China from 2010 and 2011 2-year period	China	Non-financial	Linear	Rankins CSR Ratings (RKS): CSR Database for listed Chinese firms namely WIND: board composition	Social	Institutional theory Agency theory Resource-based view stewardship theory	Foreign experiences of board members: sig(+)	Outside directors: insig(+) Foreign directors: insig(+)

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Estélyi and Nisar 2016	all FTSE companies with foreign nationality directors over the period 2001–2011 11-yr period	UK	Non-financial	Linear	Boardex: director dataset. Hemscott: board and company information FAME: financial performance-related dataset	Financial	None	Foreign Director: sig(-) Outside London Headquarters: sig(+) Fraction Foreign Directors: sig(-) Product Market Heterogeneity: sig(-)	None
Terjesen et al 2016	3,876 public firms in 47 countries in 2010 1-year period	Multi country (in 47 countries around the world)	Non-financial	Linear		Financial	Agency theory resource dependency theory Upper echelons theory	Female directors: Sig(+) Independent directors: sig(-) Board structure (comp of fem&ind): sig(+)	None
Duru et al 2016	6848 firm-year observations and 950 unique firms from 1997–2011 15-year period	USA	Non-financial	Linear	ExecuComp: financial data ISS (formerly RiskMetrics): board characteristics Compustat databases: CEO characteristics	Financial	Agency theory Stewardship Resource dependence theory	CEO duality: sig(-) Board Independence	Board Independence: insig

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Cavaco et al 2016	unbalanced panel from a total 331 distinct firms, over the period 2003–2011 9-yr period	France	Non-financial	Linear	Proxinvest database and InFinancials database	Financial	None	Independent directors: sig(-)	None
Frijns et al 2016	243 large British firms from Datastream from 2002 to 2014 13-yr period	UK	Non-financial	Linear	Datastream	Financial	None	cultural diversity of the board: sig(-) Board size: sig(-) Director age: sig(-)	Gender (male): insig(+) Board independence: insig(-)
Nguyen et al 2016	1141 unique non-financial firms from 2001 to 2011 11-year period	Australia	Non-financial	Linear	SIRCA's corporate governance database: study sample Aspect Huntley's Fin-Analysis: financial data	Financial	Resource dependence theory	Board size: sig(-)	None
Afrifa and Tauringana 2015	234 SMEs listed on the Alternative Investment Market from 2004-2013. 10-year period	UK	Non-financial	Linear	AMADEUS database	Financial	Resource-dependency theory Life cycle theory Market learning theory Agency theory	Board size: sig(+)	Proportion of non-executive directors: insig

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Wahba 2015	40 Egyptian listed firms from 2008 to 2010 3-year period	Egypt	Non-financial	Linear		Financial	Agency theory Stewardship theory	Board composition (the ratio of non-executive directors): sig(+) CEO duality(board structure): sig(+)	
Yeh and Trejos 2015	17 publicly traded hotel firms in Taiwan from 2000 to 2012 (357 individual observations) 13-year period	Taiwan	Non-financial	Linear	Taiwan Economic Journal Market Observation Post System.	Financial	Social loafing theory Agency theory Resource dependence theory	Board size: sig(-) gender diversity: sig(-) with Tobin's Q	gender diversity: insig(-) with ROA
Gaur et al 2015	145 firms listed firms on the New Zealand Stock Exchange between 2004 and 2007 4-year period	New Zealand	Non-financial	Linear	NZX Data Deep Archive (for annual reports) Company's websites	Financial	Agency theory, stewardship theory, resource dependence theory and stakeholder theory	Separation of board chair and CEO : sig(-) independent members: sig(-) Board size: sig(+) professionally qualified directors: sig(+)	None
Ferrero-Ferrero et al 2015	146 companies listed in FTSE 100, DAX 30, and CAC 40 for the year 2009. 1-year period	UK, German and France	Financial & Non-financial	Linear	BoardEx database: board characteristics Asset4 database (Thomson Reuters): CSR	Social	Stakeholder theory The upper echelon theory	Generational diversity: sig(+)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Liu et al 2015	2057 unique firms listed firms on the Shanghai and Shenzhen Stock Exchanges for the period of 1999 to 2012 14-year period	China	Non-financial	Linear	Securities Market and Accounting Research (CSMAR) Database	Financial	None	independent directors: sig(+)	None
Volonté 2015	1494 firms on Swiss Performance Index (SPI) from 2005 to 2012 8-year period	Switzerland	Non-financial	Linear	Hand collected annual reports	Financial	Agency theory Resource dependence theory	Independence: sig(-) non-independent — executive directors: sig(+) former executives: sig(+) independent — outside executives: sig(-)	Total outside activities: insig(-)
Ararat et al 2015	95 firms on Bourse Istanbul (BIST-100 index) in 2006 1-year period	Turkey	Non-financial	Non-linear	Thompson-Reuters' Datastream financial database and the BISTwebsite: dependent variables Hand collected annual reports: independent variables	Financial	Agency theory Social psychology theory	Board diversity indices (age, education, gender, nationality): sig(+) Board diversity indices & independence: sig(+)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
García-Meca et al 2015	159 banks in nine countries during the period 2004–2010 5-year period	Canada, France, Germany, Italy, the Netherlands, Spain, Sweden, the UK, and the US	Financial	Linear	Compustat database: bank performance EIRIS and the Spencer & Stuart Board Index: boardistics variables	Financial	Resource dependence theory	Board national diversity: sig(-) Board gender diversity: sig(+)	None
Guetat et al 2015	63 Tunisian hotels during 2011–2012 2-year period	Tunisia	Non-financial	stochastic frontier analysis		Financial	None	CEO duality: sig(+) Board meetings: sig(+) Outside directors: sig(+)	Board size: insig(-) Outside directors: insig(-) strategy committee: insig(-) governance committee: insig(-)
Post et al 2015	36 publicly traded oil and gas companies listed on Global 2000 2004–2008 5-year period	USA	Non-financial	Linear	KLD indicators: environmental performance Bloomberg Research and corporate websites: women and independent directors	Environmental	Upper echelons theory Resource dependence theory	Women directors: sig(+) Independent directors: sig(+)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Srivastava 2015	164 non-financial listed firms in India during the period of financial crisis of 2008-2009. 2-year period	India	Non-financial	Linear	Annual reports: CG reports Prowess database: financial and market data	Financial	Stewardship theory Agency theory	CEO duality: sig(+) Presence of inside directors: sig(+) percentage of grey directors: sig(-)	Board size: insig(-) proportion of independent: insig(+)
Ducassy and Montandrou 2015	41 French listed companies for 2011 1-year period	France	Non-financial	Linear	Ratings by a rating agency (CFIE, French Corporate Information Center): CSP Annual and sustainable development reports	Social	Stakeholder theory Neo-institutional theory Legitimacy theory	Independent directors: sig(+)	None
Kallamu and Saat 2015	37 finance listed on Bursa Malaysia for 1992-1996 and 2007-2011	Malaysia	Financial	Linear	The annual report of the companies available from the website Bloomberg data source: financial information	Financial	Agency theory Stewardship theory	Independent directors on audit committee (AC): sig(+) Interlock of directors on audit: sig(-) Finance expertise: sig(-) Executive experience: sig(+)	Audit/remuneration: insig Audit/nomination: insig

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Harjoto et al 2015	1,489 U.S. firms from 1999 to 2011 13-year period	USA	Non-financial	Linear	RiskMetrics Directors database: board characteristics and board diversity MSCI ESG Stats (formerly known as Kinder, Lyndenberg, and Domini or KLD Stats): corporate social performance	Social	Stakeholder theory	Board diversity: sig(+)	None
Vafaei et al 2015	500 listed companies in Australia during the period 2005–2011 7-year period	Australia	Non-financial	Linear	Connect 4 database: annual report DatAnalysis: company data Securities Industry Research Centre of Asia Pacific (SIRCA)	Financial	resource dependence and agency theory	Diversity(presence of women on the board): sig(+)	None
García-Ramos and García-Olalla 2014	247 publicly traded firms from Spain, Portugal and Italy 2003 to 2007 5-year period	Spain, Portugal, and Italy	Non-financial	Nonlinear (U shape)	Amadeus Database and the financial reports company websites	Financial	Agency theory Stewardship theory	Board size: sig(+) Independent directors: sig(+) CEO duality: sig(+)	None
Soliman et al 2014	30 companies on EGX 30 index from 2007- 2010 4-year period	Egypt	Non-financial	Linear	Annual reports and the Directors report purchased from the Egyptian Company for Information Dissemination (EGID)	Financial	Agency theory	Board size: sig(+) Presence of audit committee: sig(+) CEO duality: sig(+)	Board independence: insig

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Leung et al 2014	487 firms from December 2005 - November 30, 2006 1-year period	Hong Kong	Non-financial	Linear	Global Vantage database: financial data manually collected annual reports	Financial	Agency and stewardship theories	Audit committee chairman: sig(+) Nomination committee chairman: sig(+) Remuneration committee chairman: sig(+)	Board independence: insig
Al-Najjar 2014	32 listed companies in five countries from the Middle East from 2005 to 2010 6-year period	five countries in the Middle East (Bahrain, Kuwait, Oman, Egypt, and Jordan)	Non-financial	Linear	DataStream: financial data World Tourism Organization (UNWTO) guides: tourism information	Financial	Agency theory	Board independence: sig(+) Board size: sig(+)	None
Yang and Zhao 2014	1926 unique firms or 25,246 firm years from 1979–1998 20-year period	Canada–United States	Non-financial	Linear	Compustat North America: financial data Compustat segment: segment sales CRSP: stock returns SEC Compact Disclosure Database: board and ownership data	Financial	Agency theory	Duality: sig(+)	None

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Zied and Mohamed 2013	26 companies listed on the Tunisian Stock Exchange (TSE) from 2007–2010. 4-year period	Tunisia	Non-financial	Linear	financial statements: financial data Market data: websites prospectuses of companies available in the CMF and guide from stocks provided by the TSE: board of director data	Financial	Agency theory Theory of governance.	Independence of board members: sig(+) Size of the audit committee: sig(-) Independence of audit committee: sig(+) Frequency of meetings: sig(+) Gender diversity of the Board: sig(-)	Board size: insig(-)
Wellalage and Locke 2013	198 firms listed on the CSE during the period 2006–2010 5-year period	Sri Lanka	Non-financial	Linear	Fact Book 2008 and Handbook of Listed Companies 2007 and audited annual reports	Financial	Stakeholders theory Agency theory Resource dependency theory Upper echelon theory Signalling theory Behavioural theory Social identity theory Resource based view	Ethnicity diversity: sig(+) Age diversity: sig(+) Board gender: sig(-) education diversity: sig(-) Occupational diversity: sig(-)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Meyer and Wet 2013	126 companies from 2010 to 2012 3-year period	South Africa	Non-financial	Linear	McGregor BFA: all input data except BCOMP and BSIZE: company annual report	Financial	Agency theory Resource dependency theory Stakeholder theory Stewardship theory	Proportion of independent non-executive: sig(+) Board size: sig(+)	None
Boulouta 2013	126 firms drawn from the S&P500 from 1999–2003 5-year period	US	Non-financial	Linear	Socrates KLD database: social performance collected annually from the RiskMetrics database: gender and number of directors Mergent and Datastream databases: controls	Social	Social role theory	Board gender diversity: sig(+) BGD: sig(+)soc concern	BGD: insig-soc strength
Bai 2013	363 for profit and not for profit hospitals from 2000-2005 6-year period	USA	Non-financial	Linear	Office of statewide health planning and development (OSHPD) and statistics from US census bureau	Social	Institutional theory	For-profit Board size: sig(-) Physicians(expertise): sig(+) Board size: sig(+): not-for-profit	Physicians: insig- Not for profit

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Kumar and Singh 2013	176 Indian firms listed on the Bombay Stock Exchange from 2008-2009. 2-year period	India	Non-financial	Linear	Annual reports of the companies: board size Prowess database of Centre for Monitoring Indian Economy (CMIE): financial and market data	Financial	Agency theory	None	Board size: insig(-)
Yeh 2013	7 hotels in Taiwan from 2000 to 2011 12-year period	Taiwan	Non-financial	Linear	Database of Taiwan Economic Journal and Market Observation Post System.	Financial	Agency theory Resource dependency theory	Board independence: sig(+) CEO duality: sig(+)	None
Pathan and Faff 2013	212 large US bank holding companies over the period 1997–2011 15-year period	USA	Non-financial	Linear	Proxy statements, BANKSCOPE, DATASTREAM	Financial	None	Board size: sig(-) Independent directors: sig(-) Gender diversity: sig(+)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Zhang et al 2013	516 of the largest companies listed on the U.S. stock exchanges in 2008 1-year period	USA	Non-financial	Linear	the IRRC: corporate director data COMPUSTAT: financial data for public companies FORTUNE magazine's America's Most Admired Corporations (FAMA): CSR performance data.	Social	Legitimacy theory	Proportion of outside directors: sig(+) Proportion of women directors: sig(+)	None
Hassan and Halbouni 2013	95 corporations in 2008 1-year period	United Arab Emirates	Financial & Non-financial	Linear	Annual reports downloaded from Emirates Security and Commodity Market Authority (ES&CMA).	Financial	Agency theory Legitimacy theory	Board size: sig(-) CEO duality: sig(-)	Board committees: insig
Nyamongo and Temesgen 2013	37 commercial banks in Kenya over the period 2005-2009. 5-year period	Kenya	Financial	Linear	Audited financial statements	Financial	Agency theory Stewardship theory	Board size: sig(-) Independent directors: sig(+) CEO duality: both sig pos and neg	None
Guillet et al 2013	351 firms year observation for the period 1992–2008 17-year period	USA	Non-Financial	Linear	Compustat: annual financial information ExecuComp: board of directors roles, U.S. Bureau of Economic Analysis: recession years data	Financial	Stewardship theory	Duality: sig(+)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Al-Saidi and Al-Shammari 2013	9 listed Kuwait banks over the 2006 to 2010 period. 5-year period	Kuwait	Financial	Linear	Annual Companies Guide published by KSE (2010) and banks' annual reports.	Financial	Agency theory	Board size: sig(-)	Non-executive directors: insig(-) CEO duality: insig(+)
Hafsi and Turgut 2013	95 companies listed in the S&P500 in 2005 1-year period	USA	Non-financial	Linear	IRRC-Directors database: directors' age, ethnicity and gender rom Board Analyst database: board characteristics Compustat: financial data KLD database: CSP	Social	Agency and resource dependence	Diversity on boards: sig(+) Female: sig(+) Age diversity: sig(-)	Diversity of boards: insig Board size: insig Outsiders: insig Duality: insig Experience diversity: insig Tenure diversity: insig
Liang et al 2013	50 largest Chinese banks during the period of 2003–2010 8-year period	China	Financial	Linear	Bankscope database: financial information Hand collected mostly from the individual banks' annual reports: board structure	Financial	None	Independent directors: sig(+) Board size: sig(-) Duality: sig(-)	None
Bouaziz and Triki 2012	26 companies listed on the Tunisian stock exchange from 2007-2010 4-year period	Tunisia	Financial	Linear	CMF and guide from stocks provided by the TSE: board of directors data Data on financial and marketing from websites	Financial	Agency and stewardship theories	Independence of audit committee members: sig(+) Board gender diversity: sig(-) Independent directors: sig(+) Audit size: sig(+) Duality: sig(-)	Board size: insig(-)

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Muttakin and Ullah 2012	30 banks listed with Dhaka Stock Exchange (DSE) in Bangladesh from 2005 to 2010 6-year period	Bangladesh	Financial	Linear	Annual reports of the sample banks listed on the stock exchange: financial data Datastream: stock price data CG disclosures and directors report: CG data	Financial	Agency theory Resource dependence theory	Board independence: sig(+) Board size: sig(+)	Female directors
Choi et al 2012	896 observations of firms on KOSPI200 during 2004-2007 4-year period	Korea	Non-financial	Linear	KisValue and Financial Supervisory Service: Financial data Annual reports and TS-2000 database: governance data	Financial	None	Foreign board membership: sig(+)	None
Mahadeo et al 2012	42 companies listed on the Stock Exchange of Mauritius in 2007 1-year period	Mauritius	Non-financial	Linear	Annual reports & websites: board diversity data	Financial	None	Educational background: sig(-) Age diversity: sig(+) Proportion of female directors: sig(+) Proportion of independent directors: sig(-)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Mangena et al 2012	53 distinct firms listed on Zimbabwe Stock Exchange for the period 2000–2005 6-year period	Zimbabwe	Non-financial	Linear	Annual reports	Financial	Political theory	Proportion of non-executive directors: sig(-) Board size: sig(+)	None
Adams and Mehran 2012	35 BHCs from 1986 to 1999 and extended sample from 1965-1985 34-year period	USA	Financial	Linear	Federal Reserve Board: balance sheet CRSP: stock price and return data	Financial	None	Board size: sig(+) committee size: sig(-)	Proportion of outside directors: insig
Syriopoulos and Tsatsaronis 2012	43 shipping firms listed on US stock exchanges from 2002 to 2008. 7-year period	USA	Non-financial	Linear	corporate annual reports, financial statements and IPO prospectuses, firm websites and press releases, listed firms exchanges	Financial	Agency theory Stewardship theory	CEO duality: sig(-)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Zhang 2012	475 publicly traded Fortune500 from 2007 to 2008.	Global	Non-financial	Linear	Census conducted by Executive Leadership Council: demographic information the Kinder, Lydenberg, Domini (KLD) index: CSP COMPUSTAT and ExecuComp databases: independent & control variables	Social	Agency theory Resource dependence theory	Race diversity: sig(+) Proportion of outside directors: sig(+) CEO duality: sig(+) Board gender diversity: sig(+)	None
Christensen et al 2012	1039 Australian publicly listed companies in 2004 1-year period	Australia	Non-financial	Linear	Aspect DatAnalysis	Financial	Hong Kong	Audit committee: sig(+) Nomination committee: sig(+) Remuneration Committee: sig(+) Board independence: sig(-) Board meeting frequency: sig(-) Board size: sig(+) Dual CEO/chair: sig(-)	None
Lam and Lee 2012	346 firm-year observations of public companies in Hong Kong for the periods 2001-2003. 3-year period	Hong Kong	Non-financial	Linear	Financial databases and companies' annual reports. Datastream International and Worldscope: accounting and market based performance	Financial	Agency theory	None	Nomination committee (NCOM): insig(+) Remuneration committee (RCOM): insig(+)

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Black and Kim 2012	public companies listed on the Korea Stock Exchange from 1998–2004 7-year period	Korea	Non-financial	Linear	KINDS (Korean Integrated News Database System) database	Financial	None	Board Independence: sig(+) Board Committee S: sig(+) Board Structure I: sig(+)	None
Walls et al 2012	313 firms from S&P 500 firms from 1997–2005 9-year period	USA	Non-financial	Linear	Kinder, Lydenberg, and Domini's (KLD) dataset: CEP RiskMetrics database: Bindependence, diversity, Bsize ExecuComp data: CEO duality	Environmental	Agency and stakeholder	Board independence: sig(-) Board size: sig(-) Diversity: sig(+) Board gender diversity: sig(+)	None
Aldamen et al 2012	120 firm on S&P300 during the period of the GFC 2008–2009 2-year period	Australia	Non-financial	Linear	Bloomberg: stock price Aspect Huntley databases: financial data Annual reports: CG data	Financial	None	Number of audit committee (AC) members: sig(-) AC independence with managerial experience: sig(+) AC chair experience: sig(+) AC expertise: sig(+) AC education and experience: sig(+) AC external directorship and experience: sig(+) AC chair tenure: sig(-)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Ujunwa 2012	122 quoted firms in Nigeria between 1991 and 2008 18-year period	Nigeria	Non-financial	Linear	Nigerian Stock Exchange Factbook and annual reports and statement of accounts of quoted firms in Nigeria.	Financial	Agency theory Resource dependency theory. Stewardship theory	CEO duality: sig(-) Gender diversity: sig(-) Board nationality: sig(+) Number of board members with a PhD qualification: sig(+)	Board ethnicity: insig(+) Board size: insig(-)
Essen et al 2012	86 meta-analysis studies covering nine Asian countries.	9 Asian countries (China; Hong Kong; India; JP Japan; Malaysia; Korea; Singapore ; Thailand; Taiwan)	Meta-analysis	HOMA/MA SEM (Linear)	Electronic databases	Financial	agency theory	Board size: sig(-)	Board independence: insig CEO duality: insig
Garcí'a-Ramos and Garcí'a-Olalla 2011	77 nonfinancial Spanish, Portuguese and Italian publicly traded FBs during the 2001–2007 period 8-year period	Spanish, Portuguese and Italian	Non-financial	Linear	Hand-based on information supplied by Bureau Van Dijk Firms' financial and corporate reports: board and management data Amadeus Database and the financial reports, stock exchanges: financial and market data	Financial	Agency theory	Board size: sig(+) Board independence: sig(-) Board activity: sig(+) CEO duality: sig(+)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Grove et al 2011	236 public commercial banks from 2005 to 2008 4-year period	USA	Financial	Non-linear (Concave)	Equilar, Execucomp, Compustat, and CRSP	Financial	Agency theory	Board size: sig(+)(concave) Duality: sig(-) Average director age: sig(+) (non linear) Busy Directors: sig Board meeting freq: sig(-)	Insider rep: insig Affiliated: insig affiliated audit and compensation committees: insig
Villiers et al 2011	1,216 US publicly traded firms for the 2003 and 2004 (2,151 firm-year observations) 2-year period	USA	Non-financial	Non-linear (independenc e)	KLD database: CEP Standard and Poor's Compustat Files: independent variables Corporate Library's Board Analyst database: Bgovernance data	Environme ntal	Agency theory Resource dependence theory	Director independence: sig(+)-Non-linear Board size: sig(+) Law experts: sig(+)	CEO-chair duality: insig
Elsayed et al 2011	92 Egyptian companies that were listed during the period from 2000 to 2004 5-year period	Egypt	Non-financial	Linear	all firms listed in the CASE	Financial	None	Board size: sig(+)	None
OConnell and Cramer 2010	44 companies quoted on the Irish Stock Market in 2001 1-year period	Ireland	Non-financial	Linear	Datastream: accounting and stock market data annual financial report and/or Primark Global Access: Board of directors' data	Financial	Agency theory	Board size: sig(-) proportion of non-executive directors: sig(+)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Ameer et al 2010	277 non-financial listed Malaysian firms over the period 2002-2007. 6-year period	Malaysia	Non-financial	Linear	Annual reports: data on board and profile of directors Financial data using Thomson Worldscope: performance measures	Financial	Agency theory Stewardship theory Resource-based theory	Outside and foreign directors: sig(+)	None
Brick and Chidambaran 2010	5,228 firm-year observations from 1999 to 2005 7-year period	USA	Non-financial	Linear	RiskMetrics Group: Bsize and composition data EXECUCOMP: compensation data COMPUSTAT: accounting data CRSP: stock returns data	Financial	None	None	Nominating Committee meetings: insig Compensation Committee meetings: insig(-) Audit committee meeting: sig(-)
Ramdani and Witteloostuijn 2010	66 firms listed on the stock exchanges in four East Asian countries in 2001–2002. 2-year period	Indonesia, Malaysia, South Korea and Thailand	Non-financial	Linear	Corporate governance survey Annual reports	Financial	Agency theory Stewardship theory Contingency theory	CEO duality: sig(+) Proportion of independent directors: sig(+)	None
Drakos and Bekiris 2010	232 firms listed on the Athens Stock Exchange from 2000 to 2006 7-year period	Greece	Non-financial	Linear	Company annual reports: Bcomposition, Bsize, leadership structure Datastream: performance data	Financial	None	Duality: sig(-) Board size: sig(-)	Outside directors: insig(-)

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Yammeesri and Herath 2010	245 Thai non-financial listed companies in 2004 1-year period	Thailand	Non-financial	Linear/Curvi linear	Annual report of the Stock Exchange of Thailand: independent variables CompuStat: financial and market data	Financial	Agency theory	Inside directors: sig(+) Duality: sig(-) Proportion of	Independent directors: insig(+) Board size: insig(+) independent directors: insig(-)
Duchin et al 2010	2,897 firms from 1996 to 2005 (15,820 firm-year observations) 10-year period	USA	Non-financial	Linear	Investor Responsibility Research Center (IRRC): BOD information The Institutional Brokers' Estimate System (IBES): information costs variables Compustat and the Center for Research in Security Prices (CRSP): firm performance	Financial	None	Independent directors: sig(+)	None
Larmou and Vafeas 2010	257 poor performers firms from 1994 to 2000 6-year period	USA	Non-financial	Linear	Compustat	Financial	None	Board size: sig(+) Board activity: sig(+)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Wang and Young 2010	243 companies listed on the ASX in 2001–2003 3-year period	Australia	Non-financial	Linear	Connect 4 database containing the corporate annual reports Fin Analysis database: market information and statistics Huntleys' Shareholder: firm age and lines of business.	Financial	Institutional theory Organizational portfolio theory Agency theory	Remuneration committee independence: sig(-)	Monitoring committee independence: insig Board independence: insig
Carter et al 2010	641 unique firms on S&P 500 index from 1998–2002 5-year period	USA	Non-financial	Linear	Investor Responsibility Research Center (IRRC): director &CG variables COMPUSTAT database: Tobin's Q	Financial	Resource dependence theory Human capital theory, Agency theory Social psychology theory	Number of Female Directors: sig(+) Number of ethnic minority: sig(+) Number of women on committee boards: sig(+)	Number of diverse directors: insig Number of ethnic minority on committee boards: sig(+)
Ramli et al 2010	277 listed companies from 2002–2007 6-year period	Malaysia	Non-financial	Linear	Published annual reports:	Financial	Agency theory stewardship theory Resource-based theory	Independent outside directors: sig(+) Foreign outside directors: sig(+)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Zulkafli et al 2010	107 listed banks in nine Asian countries	Nine Asian countries (Malaysia, Thailand, the Philippines, Indonesia, Korea, Singapore, Hong Kong, Taiwan and India.)	Financial	Linear	Author's calculations based on Bloomberg: Tobin's q Author's calculations based on annual reports: independent variables Bloomberg database: capital adequacy Bloomberg and Annual Report: firm size	Financial	Agency theory	CEO Duality: sig(+)	Board independence: insig Board size: insig
Shao 2010	75 publicly traded media companies from 2004-2007 4-year period	USA	Non-financial	Linear	RiskMetrics and the SEC filings CG databases: independent variables Compustat North America database: ROE & ROA, firm size & firm risk	Financial	Stakeholder theory Agency theory	Proportion of non-independent: sig(+) directors Board Interlocks: sig(+)	Board Size: insig
Dunn and Sainty 2009	104 unique firms in Canada for the five-year period 2002 to 2006 5-year period	Canada	Non-financial	Linear	Canadian Social Investment Database as prepared by Janzi Research Associates (JRA): CSP	Social	Agency theory	Board independence: sig(+)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Miller and Triana 2009	Fortune 500 firms; 432 firms(innovation)& 326 firms (reputation) between 2002 and 2005 4-year period	USA	Non-financial	Linear	COMPUSTAT	Financial	Signalling theory Behavioural theory	Racial: sig(+) to reputation	Gender diversity: insig
Ehikioya 2009	107 firms listed on the Nigerian Stock Exchange from 1998 to 2002. 5-year period	Nigeria	Non-financial	Linear	listed firms' annual reports: performance NSE fact book: Bsize, Bcomposition Personal observations and interviews: CEO duality, board skills	Financial	Agency theory	Board size: sig(+) Board skill: sig(+) CEO duality: sig(-)	Outside Director: insig(-)
Guest 2009	2746 UK listed firms over 1981–2002. 22-year period	UK	Non-financial	Linear	Datastream: study sample	Financial	None	Board size: sig(-)	None
Belkhir 2009	174 bank and savings-and-loan holding companies, over the period 1995–2002. 8-year period	USA	Financial	Linear	Centre for Research in Securities Prices (CRSP) database Research Insight database and on the Securities and Exchange Commission (SEC) website	Financial	None	Board size: sig(+)	None

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Jackling and Johl 2009	180 observations for companies listed on the Bombay Stock Exchange in 2006 1-year period	India	Non-financial	Linear	OSIRIS database: initial sample annual reports SEBI's Corporate Filing and Dissemination System database	Financial	Agency theory Resource dependency theory	Outside Directors: sig(+) Board size: sig(+)	Duality: insig
Selekler-Goksen and Karatas 2008	102 firms listed on the ISE from 1997 to 2002. 6-year period	Turkey	Non-financial	Linear	Annual reports financial statements	Financial	Agency, stewardship and resource dependence theories	None	Board size: insig(-)
Mashayekhi and Bazaz 2008	companies listed in the Tehran Stock Exchange for the years 2005-2006 2-year period	Iran	Non-financial	Linear	Annual reports or from company handbooks: board composition and other board characteristic data TSE reports on CDs and from the Internet: financial and accounting data	Financial	Agency theory	Board size: sig(-) Independence: sig(+)	Duality: insig(+)
Abor and Biekpe 2007	120 firms SMEs from 1998-2003 6-year period	Ghana	Non-financial	Linear	Financial statements Interviews	Financial	Agency theory, the stewardship theory, the resources dependence theory, and the stakeholder theory.	Board size: sig(+) Proportion of non-executive: sig(+) CEO duality: sig(+)	Board skills: sig(-)

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Braun and Sharma 2007	84 Family controlled public firms (FCPFs) from 2001–2002 2-year period	USA	Non-financial	Linear	Reuters financial database: duality CRSP database: cumulative returns for performance COMPUSTAT: controls	Financial	agency theory and stewardship theory	None	Duality: insig(-)
Staikouras et al 2007	58 large European banks over the period 2002–2004 3-year period	Germany, France, the Netherlands, Denmark, Spain, Italy,	Financial	Linear	Published annual reports: Bsize & composition Fitch-IBCA Bankscope database: accounting and market variables	Financial	None	Board size: sig(-)	Proportion of non-executive directors: insig(+)
Elsayed 2007	92 Egyptian public limited firms from 2000 to 2004. 5-year period	Egypt	Non-financial	Linear	Egyptian Capital Market Agency (ECMA)	Financial	Agency theory Stewardship theory	None	CEO Duality: insig(+) Board size: insig(+)
Bonn 2004	84 manufacturing firms from publicly listed companies in Australia from 1999 to 2004 8-year period	Australia	Non-financial	Linear	Huntleys' Shareholder: The Handbook of Australian Public Companies and the companies' annual reports Aspect Fin Analysis database	Financial	Agency theory Stewardship theory	Outside directors: sig(+) Female director ratio: sig(+)	Board size: insig

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<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Bonn et al 2004	273 Japan and Australia manufacturing firms for 1998 and 1999	Japan and Australia	Non-financial	Linear	Yakuin Shikoho (Board of Director Handbook) and Nikkei Kaisha Joho Huntleys' Shareholder: The Handbook of Australian Public Companies, and the companies' annual reports.	Financial	Agency theory and resource dependence theory	Board size: sig(-) Female director ratio: sig(+) Outside ratio: sig(+)	None
Santiago-Castro and Baek 2004	71 large companies from nine Latin American countries in 2001 1-year period	Argentina, Brazil, Chile, Colombia, Dominican Republic, Mexico, Panama, Peru, and Venezuela	Non-financial	Linear	Lexis®-Nexis® Academic Universe and the individual company web pages.	Financial	Agency theory	Outside Directors: sig(-) outside directors tenure: sig(+)	CEO Duality: insig(-)
Judge et al 2003	45 firms in 2002 1-year period	Russia	Non-financial	Linear	Survey	Financial	Agency theory, and institutional theory	Informal CEO duality: sig(-)	Proportion of insiders: insig(+)
Erhardt et al 2003	127 large US companies from 1993 to 1998	USA	Financial & Non-financial	Linear	Self-reports compiled by Fortune magazine (Fortune database).	Financial	None	Board diversity: sig(+)	None

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Dehaene et al 2001	122 Belgian listed and non-listed companies in 1995 1-year period	Belgium	Non-financial	Linear	CD-ROM of the Nationale Bank van Belgie" (central bank): financial statements Datastream & Financieel Economische Tijd: stock performance	Financial	None	number of external directors: sig(+) CEO duality: sig(+)	Board size: insig
Dalton et al 1999	27 studies with a total of 131 samples drawn from an aggregate 20,620 companies- meta-analysis studies		Meta-analysis	Linear	Computer-aided and manual researches	Financial	Resource dependence theory Agency theory	None	Board size: insig
Johnson and Greening 1999	300 firms from KLD database for 1993	US	Non-financial	Linear	Kinder, Lydenberg, Domini (KLD) Company corporate social performance database COMPUSTAT data: listed firms	Social	Agency Stakeholder theory	Outside director: sig(+)	None
Eisenberg et al 1998	879 Finnish firms, 1992—1994 3-year period	Finland	Non-financial	Linear	Asiakastieto Oy database: healthy firms, financial data	Financial	None	Board size: sig(-)	None

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Vafeas and Theodorou 1998	250 publicly traded firms in 1994 1-year period	UK	Non-financial	Linear	Global Vantage database: UK based listed firms Silverplatter database: annual reports	Financial	None	None	Non-executives on the board: insig(+) Remuneration committee: insig(+) Audit committee: insig(+) Nomination committee: insig(+)
Yermack 1996	452 large U.S. industrial corporations between 1984 and 1991 8-year period	USA	Non-financial	Linear (Convex shape)	The annual Forbes magazine rankings of the 500 largest U.S. public corporations	Financial	None	Board size: sig(-)	None
Siciliano 1996	240 YMCA organizations in 1989	USA	Non-financial		240 YMCA organizations (interviews & questionnaires)	Social and economic	Resource dependence	Occupational diversity: sig(+S) Gender diversity: sig(+S) Gender diversity: sig(-E) Age diversity: sig(+E)	Age diversity: insig-S

Table E CONTINUED

<i>Author(s) & year</i>	<i>Sample size</i>	<i>Country</i>	<i>Financial/ Non-Financial companies</i>	<i>Linear/Nonlinear/ Curvilinear/ concave</i>	<i>Data set</i>	<i>Performance measure</i>	<i>theories</i>	<i>Variables confirmed</i>	<i>Variables not confirmed</i>
Boyd 1995	192 firms in 12 industry groups in 1980 1-year period	USA	Non-financial	Linear	Moody's manuals and the Compact Disclosure data base: list of industries Annual reports: CEO duality Compustat and annual reports: performance	Financial	Agency and stewardship theories	None	CEO duality: insig(-)
Rechner and Dalton 1991	141 corporations from 1978-1983 6-year period.	USA	Non-financial	Linear	Standard and Poor's Register of Corporations, Directors, and Executives: CEO duality, B independence COMPUSTAT sources and Standard and Poor's Stock Reports: performance (ROE, ROI, profit margin)	Financial	None	CEO non-duality: sig(+)	None

