Corporate governance and extent of corporate sustainability practice: the role of investor activism

Nusirat Ojuolape Gold and Fauziah Md. Taib

Abstract

Purpose – *Following the unceasing pressure on companies to adopt sustainable business practices to mitigate climate effect, this study aims to examine corporate governance (CG) attributes and role of activist investors in influencing extensive sustainability practice for firms in the developed and emerging climes.*

Design/methodology/approach – *Using a panel ordered probit regression analysis for 368 companies over 2016 to 2019, the study examined CG attributes that drive extensive corporate sustainability practice. The study addressed endogeneity bias using STATA Extended panel ordered probit regression model with endogenous covariates.*

Findings – *The result showed CG attributes is critical for firms, and activist investors play a critical role in driving extensive sustainability practice. Findings further reveal the extent of adoption is relatively low in the emerging climes but showed sign of improvement over the years examined.*

Research limitations/implications – *The study focused mainly on larger firms operating in different sectors globally. Hence, findings cannot be generalized for small sized entities.*

Practical implications – *The study provides an insightful explanation regarding the extensive sustainability practices and the vital role assumed by activist investors.*

Social implications – *The increasing number of companies responding to Carbon Disclosure Project and consequent improvement in scores indicates a corporate commitment to ensuring a sustainable future.*

Originality/value – *This research offers significant insights to the extent discussion on attributes of CG critical for sustainability practice. The findings ascertain useful tools to aid the continued adoption of sound sustainability practices around the globe.*

Keywords *Corporate governance, Carbon disclosure project, Corporate sustainability practice, Investor activism, Panel ordered probit, Emerging climes, Developed economy*

Paper type *Research paper*

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1. Introduction

Over the years, the practice of sustainability has established itself as a critical tool for businesses and organizations to satisfy the growing need for transparency from stakeholders such as investors, consumers, policymakers and society at large (García-Sánchez *et al.*, 2020; Gerged, 2021). It becomes increasingly essential to both developed and developing economies (Girón *et al.*, 2020) due to the growing concern for global environmental challenges and the resulting necessity for ecosystem preservation, piquing the interest of the literature (Hahn and Kühnen, 2013). According to Giannarakis *et al.* (2020) and Jan *et al.* (2021), the concept of sustainability embeds three aspects of economic, environmental and social issues necessary to be fulfilled simultaneously to achieve the ultimate goal. The three aspects have been commonly referred to as the "triple bottom line (TBL)" (Lassala *et al.*, 2017; Beekaroo *et al.*, 2019; Carp *et al.*, 2019), a concept

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that is fast gaining popularity among stakeholders. Being a key player in the society, companies are pressured to integrate sustainable development principles into their daily business practices, to align corporate operations and social values (Baldini *et al.*, 2016; Miras-Rodríguez *et al.*, 2018; Liu *et al.*, 2019). As a result, the concept of sustainability has gained a lot of traction (Jan *et al.*, 2021) because it allows companies to reduce information gaps and promote transparency about their sustainability endeavors, whether positive or one with a negative impact (Girón *et al.*, 2020). Besides, it also serves as a means to enhance reputation and company identity (Lassala *et al.*, 2017). General debate suggests with improved transparency, and investors can make more informed decisions pertaining to socially responsible investment and better direct their investments capital toward firms that have a greater positive societal impact (Girón *et al.*, 2020). Consequently, it will enhance competitive advantage and market benefits for companies that demonstrate their social commitment, accountability and long-term behavior to gain legitimacy and societal acceptability necessary to succeed.

As previously stated, sustainability issues have piqued the scientific community's interest, with climate change becoming a priority for several international organizations (Ullah and Nasim, 2021) due to the numerous consequences on ecosystems and human lives, resulting in the development of several initiatives and policies such as the Carbon Disclosure Project (CDP) and the Kyoto Protocol to mitigate the environmental pollution that has burgeoned, and help in building a sustainable economy. In this regard, businesses and organizations have begun paying more attention to sustainability challenges, and a growing number of academics have started to investigate the factors influencing the adoption of sustainability approaches (Liao *et al.*, 2015; Manita *et al.*, 2018; Miras-Rodríguez *et al.*, 2018; Dissanayake *et al.*, 2019; Liu and Lu, 2019; Akhtar *et al.*, 2020; Giannarakis *et al.*, 2020; Girón *et al.*, 2020; Tibiletti *et al.*, 2021). However, with the recent COVID-19 crisis having a catastrophic effect on livelihood (UN, 2021) and sabotaging efforts made so far regarding sustainable development agenda, slow response on the part of organizations, as KPMG previously recorded in their survey report (KPMG, 2017) will not be sufficient to combating climate change. Instead, efforts need to be intensified (World Bank, 2021) at all levels and the rate of progression must be doubled (UN, 2021) if at all a sustainable economy will be achieved by the year 2030 and beyond to safeguard the needs of future generation.

Albeit, prior studies have provided empirical evidence showing corporate governance (CG) has an association with environmental disclosures with findings that factors such as independent directors, higher percentage of women directors, board size, and so on play a vital role. Meanwhile, the existing literature that analyzed the relationship were majorly done in the context of developed nations (Manita *et al.*, 2018; Liu and Lu, 2019; Giannarakis *et al.*, 2020), with only scanty literature existing for sustainability practice that entails the TBL (Hussain *et al.*, 2018; Alcaide González *et al.*, 2020). Hence, leaving the topic partly unexplored in both developed and developing economies combined. With all been said, it is no doubt that sustainability concern is a delicate issue for the global economy generally, and to achieve a sustainable future, organizations need to embrace extensive sustainability practice in response to stakeholder concerns. To bridge the gap in existing literature, however, this study investigated the association between CG and sustainability practice as well as the roles activist investors can assume in driving extensive corporate sustainability practice to enable for the attainment of sustainable development.

Overall objective of the study is three folds. First, the study examines CG attributes that influences extensive corporate sustainability practices using companies' investors requested and responded to CDP during the years 2016 to 2019. Second, the study analyzed the roles played by activist investors in the attainment of a sustainable world. Finally, the authors determine how far sustainability practice defer among companies in the developed and emerging climes. The accomplishment of the set objectives would shed

light on CG's role in promoting sustainable development by assuring sustainable practices. This study provides the general public with a better understanding of activist investors' influence on sustainability performance. Pragmatically, improved sustainability practices will allow businesses to expand globally and compete more effectively.

Findings from the study reveal CG attributes such as board size, board independence and sustainability committee, as well as firm size, industry and profitability, have a significant positive influence in driving extensive corporate sustainability practice. Activist investors, according to the study results, are critical in influencing firms' positive behavior to adopt sustainable practices and embed sustainability strategies into corporate decision-making, which could then direct organizations' affairs to match with stakeholder demands. Finally, while the result suggests that companies operating in developed economies practice sustainability at a considerably higher level than those operating in emerging economies, the scope of the practice in both economies still shows that there is room for development.

This research offers significant insights to the extent discussion on attributes of CG that are critical for sustainability practice and ascertain useful tools to aid continued adoption of sound sustainability practices around the globe. The current study contributes to the body of knowledge in several folds. First, previous literatures relied on discretionary data, such as establishing an index based on content analysis, a technique that has been proved to be biased. To determine the breadth of company sustainability activity, this study used publicly available CDP scores, which are non-discretionary data. CDP scores have been shown to be less prone to bias, implying data reliability, especially given that past studies had yielded contradictory results on factors impacting corporate behavior. Second, this study acknowledges the lack of a single theoretical construct and advocates the use of diverse theories to investigate various elements of CG and other factors deemed vital to drive corporate behavior. Most importantly, CG attributes, investors activism and industry sector that a firm belongs to were developed from different isomorphism of institutional theory, agency theory and legitimacy theory, and their linkage with the TBL approach. Hence, the research supplements existing discussions by focusing on firms from different industry sectors and geographical location, most importantly, firms scored by CDP, a non-profit organization with record for credibility and professionalism in data gathering. Third, concerning methodology, the study used ordered probit regression modeling based on panel data, and treated endogeneity bias which according to scholars (Ullah *et al.*, 2018) often causes inconsistent estimates in panel regression models with the aid of STATA Extended Regression Models, i.e. ordered probit with endogenous covariates, one which had not been previously used by prior studies. This approach is a novelty idea as it was recently introduced into the STATA software, and besides, extant literatures had not investigated the sustainability practice of firms using purely non-discretionary data supplied by the companies themselves. Our study, therefore, contributes to research on CG, role of activist investors as well as on corporate sustainability practices globally.

The remainder of the research article is structured as follows: Next section gives conceptual definition on CG, followed by corporate sustainability practice, and a detailed overview describing CDP and its importance to sustainability research. Theoretical explanation follows suit, and this is accompanied by literature review and hypothesis development. We continued to research design, then empirical findings and discussion. The final section concludes the study.

2. Conceptual definitions

2.1 Corporate governance

CG is understood as the system of rules, practices and processes through which a company has been directed and controlled (Ong and Djajadikerta, 2018). It can also be assumed as a system for balancing the company's economic and social goals, and

therefore balancing the interests of shareholders and society at large (Giannarakis *et al.*, 2020; Jan *et al.*, 2021). In this regard, CG is regarded to be necessary for a company's good operation because it can boost its success and economic growth. In general, academic research on CG shows that effective governance is critical for long-term organizational growth and survival because firms with a strong CG framework are better prepared to deal with sustainability-related concerns (Jan *et al.*, 2021). Furthermore, debates argue different attributes often drives corporate decision pertaining to the firm's sustainability strategy. In the opinion of Ashfaq and Rui (2019), CG structure such as board of directors' composition and type of ownership can play a critical role in safeguarding stakeholders' interests in decision-making contests. As a result, given that the corporate board of directors represents the company's highest level of management, it is thought that they are a vital internal mechanism for the business's proper operation (Ong and Djajadikerta, 2018; Jamil *et al.*, 2020). Besides, they are saddled with the responsibility of monitoring management and providing them with advice on strategic issues (Garcia-Torea *et al.*, 2016). In terms of board monitoring function, debates suggest board attributes like size, board independence, gender diversity, ethnicity and duality are all factors thought to influence board performance and effectiveness in decision-making (Tibiletti *et al.*, 2021).

2.2 Corporate sustainability practice

Several definitions have been expanded for sustainability, however, the most widely accepted is the Brundtland definition which refers to sustainability "as a development that meets the needs of the current generation without compromising the needs of future generations to meet their own needs" (World Commission on Environment and Development, 1987). Sustainability is a complex phenomenon that covers environmental, social and governance (ESG) issues, often times termed as TBL (Lassala *et al.*, 2017; Beekaroo *et al.*, 2019; Carp *et al.*, 2019). It embodies an idea that human society should operate by using industrial and biological processes that can be sustained indefinitely (Griffiths *et al.*, 2018). To be sustainable, organizations need to adopt good practices by behaving in socially and environmentally responsible manner without neglecting their financial objectives (Kılıç and Kuzey, 2017). As such organizational sustainability can be said to lie in the intersection of a firm's economic, environmental and social performances (Rajesh, 2020). In this study, we define corporate sustainability as a business strategy wherein ESG issues are incorporated into the firms' business model to promote long-term firm value and performance.

2.3 Carbon disclosure project and its relevance to this study

CDP is an independent non-profit organization that collects data at the request of investors from large companies worldwide to ensure climate-safe, deforestation-free and water-secure world. CDP holds the largest repository of corporate carbon data and are supported by nearly 800 institutional investors representing more than $90tn in assets (Elalfy, 2020), having record for credibility and professionalism in data gathering. CDP collects data from large companies all around the globe, with organizations having the option to engage voluntarily, but not discretionarily because respondents are not permitted to manipulate their responses, even though they may choose to skip a question. Skipping queries, on the other hand, may communicate to investors a high level of sensitivity or data non-availability, as well as a refusal to divulge information. CDP data are exceptionally credible because they are non-discretionary, making it extremely unlikely that corporations will greenwash them (Luo and Tang, 2016). Furthermore, any disclosed information that is later revealed to be false renders managers potentially accountable. No doubt, debates often argue manipulation cannot be completely eliminated from voluntary disclosures. Nonetheless, the threat of potential legal action can thwart corporate manipulation attempts. Furthermore,

any operation like CDP that may minimize the flexibility and possibility for greenwashing to the barest minimum should be considered creditable.

Scholars further observed that CDP reports provide very consistent data (Luo *et al.*, 2012), and it has been widely recognized and used by many companies around the world (Kim and Lyon, 2011; Luo and Tang, 2016) with over 8,000 large global firms answering to its questionnaire as of 2019 (CDP, 2019). In addition, CDP reports have been proven to provide more credible information that may be used to measure sustainability practices than other sources (Luo and Tang, 2016). Works of literature that had used information provided by CDP in the past include (Kim and Lyon, 2011; Luo and Tang, 2014, 2016; Liesen *et al.*, 2015; Lewandowski, 2017; Griffiths *et al.*, 2018).

3. Theoretical explanation

Earlier debates suggest sustainability is a complex phenomenon which can only be best explained from the lens of multiple theories (Cormier *et al.*, 2005). On this argument, this study used legitimacy theory, agency and institutional theories to present theoretical explanation to the current research.

3.1 Legitimacy theory

Legitimacy theory has been one of the prominent theories often used in sustainability research (Hahn and Kühnen, 2013) proposes the concept of a "social contract" existing between the company and the larger society. The theory contends that organizations tend to legitimize their operations through discretionary disclosure to change public perception (Liao *et al.*, 2015). CG concept can be linked to the legitimacy tenet, which assumes that organizations must legitimize their actions to gain wider acceptability in the society. In addition, Suchman (1995) views legitimacy as a generalized assumption that the actions of an entity will be desirable, proper, appropriate within some socially constructed system of norms, values, beliefs and definitions. Accordingly, Kilincarslan *et al.* (2020) opined that legitimacy theory is anchored on the premise that greater environmental disclosure will help improve corporate legitimacy by maintaining good relations with powerful stakeholders while seeking to gain their support. In line with the forgoing debates, we argue the connection between legitimacy theory and corporate sustainability practice that due to the desire to maintain operating license and legitimize business activities, organizations will adopt practices which powerful stakeholders deemed relevant.

3.2 Agency theory

Agency theory is another prominent theory extant literatures have used to present arguments pertaining to the influence of board attributes on corporate sustainability practice. In this regard, Fama and Jensen (1983) offer arguments which is the basic foundation of the theory suggesting that the board perform an oversight role by monitoring the top management and other senior executives to ensure they uphold the interest of shareholders since it is presumed that managers due to self-interest and opportunistic behavior often conceal information from their shareholders. Therefore, to minimize conflicts, studies suggest a good governance mechanism as an effective tool to limit the divergence of interests ensuing between the principal and the agents (Kapkiyai *et al.*, 2020). Moreover, general debate noted that when the board is highly diversified, it tends to contribute to better leadership and management oversight function, which, in turn, impacts greatly by improving board independence (Jan *et al.*, 2021). As such, the board of directors is used as an internal governance mechanism to oversee managers' behavior in conformity with management rules. It is thought that the board of directors could play a crucial role in reducing organizational conflicts by allowing leadership to convey proactive and widely accessible information. As a result, having a diverse board demonstrates a higher

commitment to sustainability practice. Given the preceding considerations, this study uses agency theory as a critical component of the theoretical underpinning for a strong linkage between CG and sustainable practice.

3.3 Institutional theory

Institutional theory is another theory closely linked with the legitimacy theory that offers an explanation for corporate sustainability practice. The theory argues that organizations are greatly affected by the environment in which they operate. As such, they must adapt to the changes in it to ensure sustainability (DiMaggio and Powell, 1983). Furthermore, the theory's basic premise is that organizations are governed by a web of values, norms, rules and beliefs that drive their behavior and activities. These cultural aspects often termed institutions are social constructs that evolve over time and provide legitimate actions (Latif *et al.*, 2020). According to this theory, three types of institutional pressures, namely, coercive pressure, mimetic pressure and normative pressure, are crucial to how organizations function and respond to stakeholder pressure (DiMaggio and Powell, 1983). The coercive pressure is believed to emanate from strong stakeholders like government, regulatory authorities, non-governmental organizations, powerful customers and suppliers. Debate noted coercive pressure occurs when stakeholders exert intense pressures in the form of laws and regulations, sanctions and punishments (Latif *et al.*, 2020). The normative pressure, according to Jan *et al.* (2021), is exerted by a variety of social actors, including academics, social activist groups, institutional financiers or the media. Hence, pressures emanating from this social actors can push companies to adopt new practices (Latif *et al.*, 2020). Mimetic pressure, on the other hand, is believed to develop when companies imitate the methods of competitors, who are usually regarded as role models or industry leaders (Jan *et al.*, 2021). These pressures can occur as businesses react to stimuli generated by both their internal and external environments. Shreds of evidence from literatures have demonstrated that when external reliance on imposing entities grows, corporations are more likely to implement specific policies and adopt some practices to meet stakeholders' expectations because significant pressures from major players are drivers for sustainability practices.

4. Literature review and hypothesis development

In this section, we present some arguments previously expanded to demonstrate the linkage between CG, corporate sustainability practice and investor activism.

4.1 Board size

Corporate board is considered a mechanism that provides the firm access to crucial resources for its survival (Jamil *et al.*, 2020). Jan *et al.* (2021) offer an explanation that when the board is highly diversified, it can spark enhanced leadership and management oversight function, which, in turn, can impacts greatly to improve board independence. Similarly, having a larger number of directors enhances the talent pool of expertise available because larger boards are more likely to have more knowledgeable and skilled professionals at their disposal (Tibiletti *et al.*, 2021). de Villiers *et al.* (2011), on the other hand, argue a firm with larger board size will benefit enormously from its board composition in situations requiring professional advice as the directors would have varied expertise with much wider experience. A similar opinion suggests board size can affect corporate selection strategies and that larger boards could be optimal in likely situations (Lu, 2013). Hermalin and Weisbach (1998) noted that firms operating in multiple environments tend to benefit from having a larger board that can provide them with needed counsel in strategic decision-making. Thus, suggestive that larger companies with more external relationships and complex contracts would require a larger board for strategic decisions. Moreover,

since sustainability issues is a complex phenomenon, we presume larger board will be required to make informed decisions. Extant literatures have equally documented positive evidence for larger board size with supportive argument that firms with larger boards have broader visions and experiences of different professionals, which strengthens their decision-making processes (Hashim *et al.*, 2015; Nasih *et al.*, 2019; Correa-Garcia *et al.*, 2020). In this regard, we hypothesize:

H1. Larger board size positively influence extensive corporate sustainability practice.

4.2 Board independence

Fama and Jensen (1983) suggest a higher proportion of independent directors can monitor more effectively because they have greater control over managerial decisions. The role and percentage of independent directors have been the subject of much academic debate on boards of directors. Independent directors are widely acknowledged to play a vital role, particularly in areas where there is a risk of conflicts of interest. According to the agency theory, conflicts of interest that can arise owing to the separation of ownership and control between shareholders (principals) and managers (agents) can be mitigated if the board has a higher number of independent directors, who can more effectively monitor management (Liao *et al.*, 2015). In another argument, Prado-Lorenzo and Garcia-Sanchez (2010) opined that a company's reputation will be made stronger when the board is composed of higher proportion of independent directors since they are the most interested in demonstrating compliance with regulations and corporate responsible.

Numerous empirical literatures have also documented positive evidence for board independence and corporate sustainability practice (Hashim *et al.*, 2015; Crifo *et al.*, 2019; Kılıç and Kuzey, 2019; Nasih *et al.*, 2019; Tibiletti *et al.*, 2021). For instance, Kılıç and Kuzey (2019) found positive evidence that suggests entities with a high percentage of independent directors responded better to the CDP, while Tibiletti *et al.* (2021) document findings that companies with more independent directors have a higher level of stakeholder protection. Therefore, in conformity with agency theory, we argue that having a higher proportion of independent board will act as a mechanism to mitigate agency conflicts and allow the participation of a variety of representatives. In addition, the presence of independent directors offers a lower propensity of collusion with corporate executives, thereby reducing agency costs and strengthens the effectiveness of board monitoring (Crifo *et al.*, 2019). This may, in turn, curb the domineering power of the chief executive officer (CEO) (Correa-Garcia *et al.*, 2020). In line with the foregoing arguments, we propose board composed of a high number of independent directors will likely influence positively extensive sustainability practice.

H2. Board independence positively and significantly influence extensive corporate sustainability practice.

4.3 Gender diversity

Gender diversity is another attribute of CG literatures argue will aid the proper functioning of the board. Recently, most laws and regulations are formed on principle that boards of directors composed of more women can improve the quality of CG. Moreover, debates often stress that diversity in the boardroom can improve governance processes by giving decision-makers a broader viewpoint, minimizing groupthink and enhancing creativity and innovation (Tibiletti *et al.*, 2021). Meanwhile, from the empirical literatures' standpoint, findings have been equivocal. For example, Fuente *et al.* (2017) noted that the inclusion of women on the board positively influences CSR disclosure and that gender diversity can help persuade the board to become largely responsible towards all the stakeholders of the organization. In contrast, Ullah and Nasim (2021) found women directors have no significant impact on corporate environmental innovation. In a similar vein, Manita *et al.* (2018) found no significant relationship between board gender diversity and ESG disclosures for USA

companies. While Al-Shaer and Zaman (2016) argue gender diversity tends not to have an explicit impact on firm corporate sustainability disclosure. Given the conflicting findings so far documented by extant literatures, we hypothesize as follows:

H3. Board gender diversity has no association with extensive corporate sustainability practice.

4.4 Sustainability committee

Sustainability committee is another component of CG studies have been examined to influence business practices. Debate noted that an environmental committee motivated by legitimacy and reputation management would seek to put in place policies and methods for measuring and reporting GHG emissions levels to mitigate the hazards connected with global warming (Kılıç and Kuzey, 2019). Rossi and Tarquinio (2017), who examined the role played by the sustainability committee, stressed that firms began advancing sustainability committees as an element of their CG structures to address sustainability risks and opportunities. Moreover, Kılıç and Kuzey (2017) posit that the existence of a sustainability committee is a significant determinant of publishing sustainability report because it encourages firms to engage in socially responsible actions, thereby signifying to stakeholders the company's strong commitment to sustainability issues. From the empirical realm, authors such as Kılıç and Kuzey (2019) found evidence that the existence of a sustainability committee has a significant positive impact on carbon disclosures. Dienes *et al.* (2016) document similar evidence. Another scholar found the presence of a CSR committee provided better integration of sustainability matters (Ruhnke and Gabriel, 2013), and finally, Kent and Monem (2008) established sustainability committee positively relates with adoption of TBL reporting. In conformity with the legitimacy proposition that organizations to gain organizational legitimacy will strive to convince stakeholders that they are environmentally conscious, hence, will set up sustainability committee. Accordingly, we propose the below hypothesis:

H4. Presence of sustainability committee have significant positive influence on extensive corporate sustainability practice.

4.5 Chief executive officer duality

Duality of the role of CEO arises when the same individual serves in the capacity as the chairman of the board of directors and concurrently as the CEO (Prado-Lorenzo and Garcia-Sanchez, 2010; Gerged, 2021). Jensen and Meckling (1976) noted, based on theoretical viewpoint, that dualizing these roles can enhance the likelihood that the CEO will execute strategies that emphasize his or her own interests at the expense of the firm. Similarly, extant literatures document results that a negative association exists between CEO Duality and corporate environmental disclosures, suggesting duality may increase conflicts of interest and thus influence a corporation's transparency process. In addition, Tibiletti *et al.* (2021) found an overlap between the roles of the CEO and the board chairman poses an undesirable influence on a CSR report. Other debates suggest that companies who have CEO doubling as the chairman often present less information on their CSR disclosure and environmental information (Giannarakis, 2014; Li *et al.*, 2017). Based on aforesaid, we argue that board's ability to perform advisory and monitoring role might be weakened should CEO double as the chairman. Hence, we hypothesis negative influence of CEO Duality:

H5. CEO Duality negatively influence extensive corporate sustainability practice.

4.6 Investor activism

Institutional investors often use activism as a political ploy to leverage ownership power, and it denotes actions taken by institutional investors to pressure managers (David *et al.*, 2001).

Investor activism, sometimes called institutional shareholder activism, is another term for relationship investing (Gillan and Starks, 2000), which gained attention in financial markets due to the increasing surge for ESG adoption (Eccles and Klimenko, 2019). Three critical means identified by literatures in the transition toward sustainability include: developing voluntary programs to reduce emissions and negative externalities (Crifo and Forget, 2015); having regulation at national or international level to constrain firm behaviors, guard against negative externalities and promote alternative production modes (Crifo and Sinclair-Desgagńe, 2014); and the last often ignored is transition as the result of institutional investors' investment policies (Crifo *et al.*, 2019). Hence, the objective of this research.

Debate on the transition toward sustainability suggests pressures exerted on companies by institutional investors could intensely influence how far listed companies would engage in sustainability transitions (Ioannou and Serafeim, 2015). Accordingly, institutional investors play a significant role in orientating corporations' goal functions and theories of value (Arjaliès and Durand, 2019; Crifo *et al.*, 2019). They push toward categorizing firms' strategies as "green," "alternative" or "socially impactful," sending signals that the investors value these investments and scrutinize their multidimensional impacts (Dimson *et al.*, 2015; Gond *et al.*, 2018). Besides, scores and ratings provided by independent organizations such as CDP provide an enabling ground for investors to push corporations toward the adoption of ESG management processes and the implementation of sustainability strategies (Crifo *et al.*, 2019). Despite this crucial roles of activist investors, empirical evidence is limited (Dimson *et al.*, 2015).

David *et al.* (2001) found institutional investor activism increased R&D inputs. As per Dimson *et al.* (2015), companies with inferior governance and socially conscious institutional investors have tendency of engaging in corporate social responsibility especially if the firm have reputational concerns and higher capacity to implement changes. Harber (2017) found evidence proving institutional investor activism is a credible solution to short-term management behavior and irresponsible shareholder pressures on management. Kelly (2021) expanded arguments supporting that activist investors can force companies through their pressure to take on sustainable practices to mitigate climate change impacts. Grewal *et al.* (2016) found filing of shareholder proposals spark subsequent improvements in corporate performance.

On the contrary, Gerged (2021) found that institutional ownership is negatively linked with the amount of environmental information disclosed by firms. Another author found large shareholdings have no significant impact on corporate environmental innovation (Ullah and Nasim, 2021). Michelon *et al.* (2020) noted that in the short-term, shareholder activism demanding CSR transparency failed to inspire change in corporate activities beyond disclosure, while Luo and Tang (2016) equally document significant negative association.

Nonetheless, from the institutional viewpoints, we suggest that when institutional investors take a keen interest in sustainability issues, they can have a significant impact on company sustainability practices. We claim this because activist investors' actions could harm the company's reputation, resulting in a loss or decline in share value. To avoid a misalignment of interests afterward, management will work hard to meet stakeholder demands by implementing extensive sustainable practices to reflect corporate transparency. This is also consistent with legitimacy theory that firms would adopt practices that align with stakeholders' norms and values to legitimize the business and ensure corporate continuous survival. Hence, we hypothesis as follow:

H6. Investor activism positively influence extensive corporate sustainability practice.

4.7 Firm size

Numerous literature document a positive association between firm size and corporate sustainability practice (Brammer and Pavelin, 2008; Dissanayake *et al.*, 2019; Kılıç and

Kuzey, 2019; Nasih *et al.*, 2019). Plausible explanations include that larger entities have a high propensity to respond to the CDP, probably because they face higher scrutiny, intense pressure and higher public visibility (Rudyanto and Siregar, 2018; Kılıç and Kuzey, 2019). Other arguments suggest larger companies have higher agency costs due to the higher information asymmetry between managers and shareholders (Ho and Taylor, 2007). Therefore, to prevent incurring agency costs, larger firms are more likely to adopt extensive sustainability practice and present higher disclosure of carbon emission (Nasih *et al.*, 2019). Empirical results such as those of Dissanayake *et al.* (2019) document evidence that firm size is a relevant characteristic associated with corporate sustainability reporting. Luo *et al.* (2012) noted larger firms are usually more aware of their environmental responsibilities, as a result, they tend to show more willingness to disclose carbon information voluntarily than smaller firms. In line with these arguments, we develop the hypothesis that goes thus:

H7. Firm size is positively and significantly associated with extensive corporate sustainability practice.

4.8 Profitability

The firm's profitability, according to research, is another major element that could influence the amount of corporate sustainability policies. According to Ho and Taylor (2007), large organizations have greater financial resources than medium or small businesses, hence the cost of producing disclosure for them will be lower due to economies of scale. Similarly, according to Banerjee *et al.* (2019), higher levels of financial success increase the chance for corporate managers to gain the resources needed to engage in long-term business operations. Based on aforesaid, we hypothesize that:

H8. Profitability is positively linked with extensive corporate sustainability practice.

4.9 Industry

Industry attributes are another major aspect that may influence corporate voluntary adoptions. Al Farooque and Ahulu (2017) argued that industry is a significant factor of social and economic disclosures, while Kuzey and Uyar (2017) argued that companies in high-risk industries are more likely to disclose in sustainability reports than companies in low-risk industries. Furthermore, Luo and Tang (2016) stressed that corporate practices are influenced primarily by the activities and practices of other groups within the same industry, and are not only dependent on the managers' intent to accomplish the intended objective. Thus, in line with an institutional perspective that businesses react to stimuli generated by both their internal and external environments, and that organizations tend to imitate the practices of competitors who are usually regarded as role models or industry leaders, we hypothesize as follows:

H9. Industry that a firm belongs to positively influence the extent of their corporate sustainability practice.

5. Research design

5.1 Sample selection

Our study focused CDP scored companies over the years 2016 to 2019. Study sampled firms were systematically selected using Krejcie and Morgan's (1970) sample selection guide. While we were constrained by data availability, utmost attention was paid to firms from across different industry sectors covering developed and emerging climes. With due diligence, the final sample consisted of 368 firms with 1,472 firm year observations.

5.2 Source of data

All data necessary for the study dependent variable, i.e. extent of corporate sustainability practice was sourced from CDP website, while data pertaining to independent and control variables were sourced from S&P Global MI and corporate annual reports (Integrated reports and stand-alone sustainability reports).

5.3 Measurement of variables

The key variable of interest is "extent of corporate sustainability practice," proxied by CDP publicly disclosed categorical score levels comprising leadership level, management, awareness, disclosure and failed levels. The highest category score level is the leadership level, while the least score is the failed level. Since the score levels are of ordered preference, consisting of more than two categories, the appropriate estimation technique is ordered regression modeling as a binary model cannot be applied (Long and Freese, 2001; Wooldridge, 2010; Williams, 2016). Therefore, the ordinal outcome for the dependent variable proxied by the CDP scores consists of five ordered levels that are represented as leadership =5; management = 4; awareness = 3; disclosure = 2; and fail = 1. As for the study independent variables, CG attributes include "Bsize" for board size measured as the total number of directors composed on the board (Ullah *et al.*, 2019; Gerged, 2021), "Bind" is board independence which is measured as percentage of independent or external directors to the total number of directors sitting on the board. Similar approach was adopted by Tibiletti *et al.* (2021) and Ullah and Nasim (2021). Gender diversity is a proxy for female representation and it is measured as the percentage of female board of directors to the total number of directors similar to proxy used by Ullah *et al.* (2019) and Ullah and Nasim (2021). Suscmtee represents sustainability committee, a dummy variable taking the value of 1 to signify if the company has a sustainability committee set up to address sustainability-related concerns, otherwise 0. A similar approach was taken by Kılıç and Kuzey (2019). CEO Duality is also a dummy variable where 1 represents dual role for the chairman and CEO, otherwise 0 in a similar way as used in the studies of Kent and Monem (2008), Ruhnke and Gabriel (2013) and Kılıç and Kuzey (2019). InAct is a proxy for investor activism represented by the percentage of shares owned or held by institutional investors with holdings greater than or equal to 3% of the company shares. Debates suggests that large investors serve as effective corporate monitor than small and dispersed investors (Ullah *et al.*, 2018). A similar measure was used by Ullah *et al.* (2018) and Ullah and Nasim (2021). As for the control variables, we proxied firm size by logtover a measure representing market size occupied by the firm; profitability is measured using return on asset (ROA) (Ullah and Nasim, 2021); and finally, industry is a dummy variable taking the value of 1 if firm operates in the high impact sectors including electric utilities, cement, chemicals, metals and mining, steel, transport originals equipment manufacturers and related services, according to the CDP activity sector classification (CDP, 2021). Otherwise, the firm is score 0 if they belong to other industries. High impact sectors, according to Faisal *et al.* (2012), are those industries with consumer visibility, a high level of political risk or concentrated intense competition whose activities pose greater damage on environmental well-being (Table 1).

5.4 Empirical model

The general panel data model is presented as:

$$Y_{it} = \beta_0 + \beta_1 Bsize_{it} + \beta_2 Bind_{it} + \beta_3 Gender_{it} + \beta_4 CEODual_{it} + \beta_5 Suscmtee_{it} + \beta_6 InAct_{it} + \beta_7 logtover_{it} + \beta_8 ROA_{it} + \beta_9 Ind + \varepsilon_{it}$$

Table 1 Variable measurement and definitions

Variables	*Proxy*	*Measurement/description*	*Source*
Dependent variable The extent of sustainability practice and reporting	CDP categorical scores	CDP category scores for leadership, management, awareness, disclosure and failed levels	CDP categorical scores publicly disclosed on the CDP website
Independent variables: Investor Activism (InvestAct)	Institutional Investors (InAct)	Percentage of shares held by institutional investors holding ≥3% of the total shares of the company	S&P Global MI
Corporate Governance Structure (CGStruc)	Board size (Bsize)	Total number of directors on the board	S&P Global MI, Annual Reports and Stand-Alone Sustainability Reports
	Board Independence (Bind)	Percentage of independent directors to the total number of directors on the board	
	Gender diversity	Percentage of female director to the total number of directors on the board	
	CEO Duality (CEODual)	Dummy variable that takes a value of 1 if the CEO doubles as board chairman, otherwise 0	
	Sustainability Committee (Suscmtee)	Dummy variable that takes a value of 1 for the presence of sustainability committee, otherwise 0	
Control variables	Firm size	Log of the firms' turnover	S&P Global MI.
	Profitability-return on asset (ROA)	Net income to total assets	
	Industry	Dummy variable 1 if firm operates in a highly impactful sector, otherwise 0	CDP high impact sector classification
	Year	Dummy variable for each year, corresponding to the period 2016–2019	

6. Empirical findings and discussion

6.1 Descriptive analysis of dependent variables

We ascertained that the extent of corporate sustainability practice differs between developed and emerging climes for the years examined (Table 2). Results revealed that companies with the least score (fail) about 32% of the sample are companies from the emerging clime suggesting that majority of these firms are weak on sustainability practice. However, result also indicated that as the score progresses upward from disclosure to leadership, a higher percentage frequency was noticed for firms operating in the developed economy, suggesting corporate sustainability practice in the developed economies is quite advanced compared to the emerging economies. Despite the low practice observed for the emerging climes, a closer look at the statistics reveals that as the score progresses up the ladder, the number of companies scored at each level increases relative to the previous level suggesting the increasing number of firms are improving on their sustainability

Table 2 Descriptive analysis for dependent variable (CDP scores)

		Economy				
Category scores	*Score code*	*Emerging*	*Developed*	*Freq.*	*(%)*	*Cum.*
Fail	1	351	122	473	32.13	32.13
Disclosure	2	43	95	138	9.38	41.51
Awareness	3	83	187	270	18.34	59.85
Management	4	125	196	321	21.81	81.66
Leadership	5	90	180	270	18.34	100.00
Total		692	780	1,472	100.00	

Source: Authors computation

practice. This was confirmed by KPMG in their 2017 survey report that sustainability practice and number of companies disclosing integrated reports is slowly growing though steadily. Thus, revealing remarkable growth in recent years (KPMG, 2017).

6.2 Descriptive analysis of the independent variables

From the descriptive statistics in Table 3, Bsize showed that total observations for firms scored on the highest level (leadership category) is 270, with the average board comprising about 11 board members, ranging from 5 to 25. However, as for firms scored on the lowest level (fail category), total observations were 473, having an average of 9 board members ranging from 3 to 18 directors. Overall, the total number of observations was 1,472, with an average of 10 board members and a range of 3 to 25. This suggests that the typical firms examined by our study are of relatively larger size. Bind showed a mean of roughly 63% for firms scored on the leadership level, with a minimum and maximum percentage of 8% to 100%, respectively, with a standard deviation of 21.248. However, observation for firms scored in the failed level is approximately 47%, with a standard deviation of 20.972 and a range of 0 to 100%. Overall, the average firm had around 59% independent directors, with a variance of 23.279 that ranged from 0 to 100%, out of 1,472 total observations. As for gender diversity, the descriptive statistic revealed for companies on the leadership level showed board is composed of roughly 22% female members, with a deviation of 14.903 and a minimum and maximum of 0 and 57%, while firms scored on failed level had just 16% female members, with a deviation of 14.94 and a minimum and maximum of 0 and 63%, respectively. Overall, the average board of all sampled firms had 21% female members, with a deviation of 14.356 and a range of 0% to 63%. This implies that majority of the sampled companies had fewer female members, as such, they are heavily male skewed. As for Suscmtee, majority of the examined firms (54% overall) had established a sustainability committee, with around 195 observations in the leadership level accounting for approximately 25% compared to only 16% of firms in the failed level. These findings depict that companies on the failed level had little to no plan set to tackle sustainability concerns, implying the firms on this category either have a poor attitude or are unconcerned about the environmental degradation. CEO Duality on overall indicate about 22% of the sampled companies had their CEOs also serving as chairman, suggesting that majority of the companies examined clearly distinguish function for the CEOs and chairman of the board with only a few of the sampled companies concentrated excessive powers in a single individual.

Furthermore, pertaining to activist investors, those in the leadership category had a mean value of 44.33%, indicating that activist investors held approximately 44% of the shares of the firms, having a standard deviation of 22.608. With 260 observations, the range of shares owned was between 3.69% and 97.89%. However, the mean value for the failed group is 31.57%, implying that activist investors own about 32% of shares in companies at this level, with a standard deviation of 22.709. The lowest and highest percentages of shares owned were 3.08 and 99.81%, respectively. Total observations were 1,395 with missing values for some firms, a mean of 44% and a standard deviation of 25.977. The lowest and highest percentages of shares owned were 3.08 and 99.81%, respectively. Therefore, this implies the level of oversight and control that investors have over the company's management for each of the levels.

As for the control variables, average firm size in turnover had about $15m, with the smallest being around $6m and the largest being around $20m. This implies that the firms in our sample are of relatively larger size. Profitability measured by ROA showed the average firms on the failed level was around 4.47, with a range of −19.07 to 40.76 compared to the average for firms on the leadership level, which was 5.52, with a low of −2.66 and a high of about 62.79. This indicates that companies with the higher level of scores were more profitable than those in the lower level of scores. Finally, industry revealed on overall, 1,004

Table 3 Descriptive analysis for the independent variables

Variables	*Categories*	*Obs*	*Mean*	*SD*	*Min*	*Max*
Bsize	Leadership	270	10.93	3.484	5	25
	Management	321	11.19	3.058	5	20
	Awareness	270	10.31	2.777	4	19
	Disclosure	138	9.61	2.601	5	20
	Fail	473	9.16	2.694	3	18
	Overall	1,472	10.18	3.052	3	25
Bind	Leadership	270	62.667	21.248	8	100
	Management	321	63.911	22.032	10	100
	Awareness	270	65.493	22.645	0	100
	Disclosure	138	67.323	23.069	0	100
	Fail	473	46.862	20.972	0	100
	Overall	1,472	58.814	23.279	0	100
Gender diversity	Leadership	270	22.033	14.903	0	57
	Management	321	23.999	12.819	0	57
	Awareness	270	24.939	12.592	0	62.5
	Disclosure	138	23.406	13.430	0	58.33
	Fail	473	16.375	14.940	0	62.5
	Overall	1,472	21.305	14.356	0	62.5
InAct	Leadership	260	44.330	22.608	3.69	97.89
	Management	307	51.727	25.328	7.94	99.81
	Awareness	263	53.182	26.399	3.32	99.70
	Disclosure	131	46.575	27.411	3.36	99.81
	Fail	434	31.572	22.709	3.08	97.21
	Overall	1,395	43.868	25.977	3.08	99.81
Logtover	Leadership	270	15.865	1.565	11.381	19.217
	Management	321	15.419	1.329	11.652	18.563
	Awareness	270	15.091	1.206	9.694	18.625
	Disclosure	138	14.708	1.906	6.397	17.911
	Fail	469	14.359	1.338	9.762	19.690
	Overall	1,468	15.035	1.526	6.397	19.690
ROA	Leadership	270	5.517	6.371	−2.66	62.79
	Management	321	5.129	3.811	−8.08	18.20
	Awareness	270	5.00	4.126	−6.57	26.18
	Disclosure	138	5.361	5.082	−11.30	20.05
	Fail	473	4.469	4.776	−19.07	40.76
	Overall	1,472	4.986	4.855	−19.07	62.79
			Dichotomous variables			
CEO Duality		Yes (1)	Percent	No (0)	Percent	Total
	Leadership	79	25	191	16.54	270
	Management	59	18.6	262	22.68	321
	Awareness	48	15.1	222	19.22	270
	Disclosure	39	12.3	99	8.57	138
	Fail	92	29	381	32.99	473
	Overall	317	22	1,155	78	1,472
Suscmtee		Yes (1)	Percent	No (0)	Percent	
	Leadership	195	24.68	75	11	270
	Management	236	29.87	85	12.46	321
	Awareness	168	21.27	102	14.96	270
	Disclosure	65	8.23	73	10.7	138
	Fail	126	15.95	347	50.88	473
	Overall	790	54	682	46	1,472
Industry		High impact (1)		Low impact (0)		
	Leadership	194	19.30	76	16.24	270
	Management	221	22.01	100	21.37	321
	Awareness	186	18.52	84	17.95	270
	Disclosure	84	8.37	54	11.54	138
	Fail	319	31.8	154	32.9	473
	Overall	1,004	68	468	32	1,472

Source: Authors computation

firm observations accounting for more than two-thirds of the companies examined operate in a highly impactful sector. However, of these firms, only 194 attained the leadership level which is roughly around 19% of companies in the highly impactful sector compared to the number of companies that were scored failed level (approximately 32%). This is highly discouraging since one would expect to discover companies in this sector to outperform others highly enough and serve as role models for those who have yet to adopt best practices. The implication is that, despite increasing stakeholder pressure and demand for sustainable best practices, a significant number of companies in high-impact industries continue to exhibit little concern for environmental issues.

6.3 Description of the industry distribution

Table 4 presents a detailed description of the different industry sector classification in accordance with Global Industry Classification Standard of September 2018.

6.4 Correlation matrix

Table 5 presents the Spearman correlation matrix. The table revealed scores had positive, low and significant linear associations with each of the explanatory and control variables. Specifically, it showed positive, low significant association at 1% significant level for board size (BSize, $r = 24\%$ approx.), board independence (Bind, $r = 26\%$ approx.), gender diversity (Gender, $r = 18\%$ approx.), Susctee ($r = 38\%$ approx.) while at 10% significant level for CEODual ($r = 5\%$ approx.), similarly, at 1% significant level, it revealed positive low linear and significant association with investor activism, i.e. (InAct, $r = 26\%$); ROA ($r = 8\%$ approx.) and logtover ($r = 39\%$). Meanwhile, the matrix revealed no significant linear association between scores and industry. Our post estimation tests revealed no high correlations exists among the independent variables, suggesting the absence of multicollinearity as the variance inflation factor (VIF) presented in Table 6 had a mean value of 1.23 below the stipulated threshold of 10 (Hair *et al.*, 2009) indicating multicollinearity is not a cause for concern in the study.

Furthermore, on the recommendation of Ullah *et al.* (2018), further sensitivity analysis was carried out to rule out endogeneity bias which is found to be peculiar with panel data estimations. While the study used Mundlak's approach (Mundlak, 1978; Wooldridge, 2010), the chi test statistics revealed 22.35 significant at 1%, indicating endogeneity is actually a cause of concern. This prompted the researcher to estimate an advanced regression model termed extended regression models for endogenous covariates for ordered probit newly introduced by STATA distinct from the primary model previously estimated (StataCorp, 2021a). The extended model addresses

Table 4 Industry distribution

Industry	*GIS sector*	*Freq.*	*Percent*	*Cum.*
Energy	10	23	6.25	6.25
Material	15	51	13.86	20.11
Industrials	20	61	16.58	36.68
Consumer discretionary	25	41	11.14	47.83
Consumer staples	30	32	8.70	56.52
Health care	35	19	5.16	61.68
Financials	40	48	13.04	74.73
Information technology	45	26	7.07	81.79
Communication service	50	24	6.52	88.32
Utilities	55	26	7.07	95.38
Real estates	60	17	4.62	100.00
Total		368	100.00	

Table 5 Spearman correlation matrix

	Scores	*BSize*	*Bind*	*Gender diversity*	*CEODual*	*Suscmtee*	*InAct*	*ROA*	*logtover*	*Industry*
Scores	1.000									
BSize	0.241***	1.000								
Bind	0.263***	0.071***	1.000							
Gender diversity	0.175***	0.164***	0.424***	1.000						
CEODual	0.050*	−0.029	0.033	−0.157***	1.000					
Suscmtee	0.381***	0.217***	0.126***	0.083***	−0.070***	1.000				
InAct	0.255***	0.144***	0.454***	0.291***	0.001	0.123***	1.000			
ROA	0.075***	−0.049*	0.038	0.093***	0.033	0.017	0.148***	1.000		
logtover	0.389***	0.368***	0.192***	−0.009	0.223***	0.197***	0.090***	−0.003	1.000	
Industry	0.037	−0.104***	−0.042	−0.082***	−0.061**	0.094***	−0.036	0.127***	−0.062**	1.000

Notes: *t* statistics in parentheses $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

endogeneity bias in regression models and treat them as though it was never present (StataCorp, 2021b).

6.5 Random effect ordered regression model

Table 7 reports the estimation results for the panel ordered regression models. Recall, however, that the first model estimated before testing for endogeneity bias cannot be relied upon since it presents inconsistent estimates. As such, relying on such model could be misleading (Ullah *et al.*, 2018). In line with recommendation, the extended regression model estimated after treating the endogeneity bias is interpreted for the current research. Regarding model goodness of fit, the Akaike information criterion (AIC) and Bayesian information criterion (BIC), as well as the Wald chi-square with a Prob > chi2 = 0.0000, are reported, all indicating the goodness of fit of our model. Robustness check was tested using STATA option vce(robust), and the result was robust as the coefficient and significant levels remained unchanged using both normal standard errors and robust standard errors. We, therefore, present the ordered probit regression models before endogeneity treatment and after endogeneity treatment in Table 7. Furthermore, when estimating data using this type of regression analysis, only the sign of the

Table 6 Variance inflation factor

Variable	*VIF*	*1/VIF*
Bind	1.50	0.667575
Gender diversity	1.37	0.731705
logtover	1.34	0.744729
InAct	1.29	0.772728
BSize	1.29	0.774279
CEODual	1.11	0.901284
Suscmtee	1.10	0.909096
ROA	1.04	0.961588
Industry	1.04	0.963778
Mean VIF	1.23	

Table 7 Ordered regression models

	Before endogeneity	*After endogeneity*
	Ordered probit model	Ordered probit ERModel
Scores		
BSize	0.086***	0.6648***
	(2.61)	(28.22)
Bind	0.023***	0.0062***
	(4.34)	(3.20)
Gender diversity	−0.004	0.0023
	(−0.56)	(0.75)
CEODual	0.001	0.1605
	(0.00)	(1.45)
Suscmtee	1.474***	1.1830***
	(6.15)	(12.19)
lnAct	0.010**	0.0034*
	(2.15)	(1.83)
ROA	0.0339*	0.0405*
	(2.30)	(1.93)
logtover	0.5505***	0.7428***
	(4.89)	(17.76)
Industry	0.334	0.5428***
	(1.17)	(5.31)
cut1_cons	10.73***	7.58***
	(7.64)	(23.49)
cut2_cons	11.66***	8.21***
	(8.26)	(25.40)
cut3_cons	13.07***	9.18***
	(9.20)	(28.06)
cut4_cons	14.80***	10.36***
	(10.34)	(30.78)
sigma2_u _cons	5.33***	5.426***
	(8.19)	(8.42)
N	1,393	1,393
n	353	353
Years	4	4
Log Likelihood	−1,423.80	−4,017.28
Wald Chi^2(12)	146.87***	1,027.62***
AIC	2,875.60	8,072.551
BIC	2,948.95	8,172.096
Pseudo R^2	0.3392	–
Corr(e.Bsize, e.Scores) [1]	–	−0.6506***
		(−22.26)

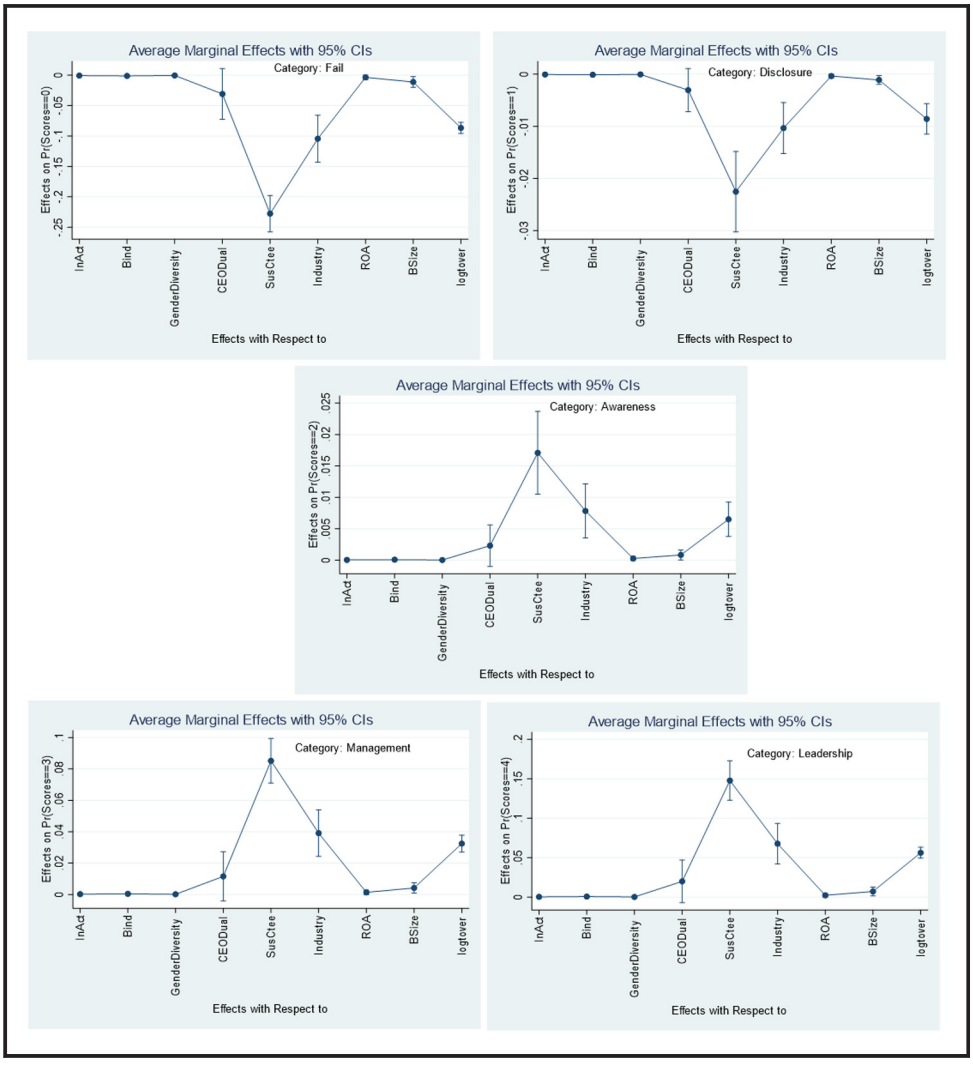
Notes: *t* statistics in parentheses $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

coefficients can be interpreted directly from the regression models and not its magnitude. To interpret as such, positive signs (+) refer to more likely or higher chance of occurrence and negative signs (−) imply less likely or lower chance of occurrence. Therefore, we claim that a percent rise (reduction) in the explanatory variable will impact the dependent variable more (less) often. The magnitude of the coefficients, on the other hand, can therefore be inferred using the marginal effect (Wooldridge, 2010; Alkhawaldeh *et al.*, 2021). More so, when marginal effects comprise several categories, interpretation might be confusing (Wulff, 2015; Seroka-Stolka and Fijorek, 2020). Hence, researchers suggest that further interpretation could be simplified with the aid of a graphical presentation which our study depicted as margins plot (Figure 1) (Table 8).

6.6 Results interpretation

The results from the extended regression model for ordered probit analysis (Table 7) is relatively consistent with our expectations except for the variable CEO Duality, which

Figure 1 Margins plot



revealed a contrary expectation. As for the CG attributes, Bsize revealed positive and significant ($\beta = 0.6648$, $p < 0.01$) association with the scores, suggesting an increase in the number of board of directors, the more likely the firm will adopt extensive sustainability practice. Our result is indicative that larger board size influences extensive sustainability practice. We, therefore, accept *H1* that larger board size positively influences extensive corporate sustainability practice in line with the findings of Hashim *et al.* (2015), Nasih *et al.* (2019) and Correa-Garcia *et al.* (2020). To ascertain the magnitude of coefficient, we interpret that a unit increase in the number of board members, the more likely the firm will be in higher category score (leadership, management or awareness levels) but the less likely they would be in the lower category score of either failed or disclosure levels. The findings here are in line with the agency assumption that a highly diversified board will contribute to better leadership and management oversight role, which may subsequently impact greatly by improving board independence (Jan *et al.*, 2021). Board independence equally showed positive and significant relation with scores ($\beta = 0.0062$, $p < 0.01$). Hence, we accept *H2* that board independence positively and significantly influences extensive corporate sustainability practice. This builds up on the literatures of Hashim *et al.* (2015), Crifo *et al.* (2019), Kılıç and Kuzey (2019), Nasih *et al.* (2019) and Tibiletti *et al.* (2021). In this aspect,

Table 8 Average marginal effect after endogeneity treatment

Scores	*Failed*	*Disclosure*	*Awareness*	*Management*	*Leadership*
BSize	−0.0112**	−0.0011**	0.0008**	0.0042**	0.0072**
	(−2.49)	(−2.58)	(2.05)	(2.50)	(2.53)
Bind	−0.0012***	−0.0001***	0.0001***	0.0005***	0.0008***
	(−3.20)	(−3.05)	(2.65)	(3.24)	(3.17)
Gender diversity	−0.0004	−0.0000	0.0000	0.0002	0.0003
	(−0.75)	(−0.76)	(0.73)	(0.75)	(0.75)
CEODual	−0.0309	−0.0031	0.0023	0.0116	0.0200
	(−1.45)	(−1.45)	(1.37)	(1.45)	(1.45)
Suscmtee	−0.2276***	−0.0225***	0.0171***	0.0853***	0.1478***
	(−14.86)	(−5.73)	(5.09)	(11.79)	(11.58)
InAct	−0.0006*	−0.0001*	0.0000*	0.0002*	0.0004*
	(−1.85)	(−1.71)	(1.87)	(1.86)	(1.80)
ROA	−0.0036*	−0.0004*	0.0003	0.0014*	0.0024*
	(−2.27)	(−1.95)	(1.63)	(1.89)	(1.95)
logtover	−0.0867***	−0.0086***	0.0065***	0.0325***	0.0563***
	(−18.81)	(−5.76)	(4.68)	(11.80)	(15.83)
Industry	−0.1044***	−0.0103***	0.0078***	0.0391***	0.0678***
	(−5.32)	(−4.13)	(3.58)	(5.16)	(5.19)
N	1,393	1,393	1,393	1,393	1,393

Notes: *t* statistics in parentheses $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

we interpret the marginal effect to imply as the number of independent directors increases, the more likely the company will score higher and the less likely they will score lower.

Furthermore, gender diversity which had a coefficient (β = 0.0023), was not significant, suggesting and confirming our hypothesis that gender diversity has no association with extensive corporate sustainability practice. Although, this is contrary to the general CG code advanced in most countries. However, this could be attributable to the fact that the bulk of the organizations sampled were heavily skewed toward male gender. Thus, we accept *H3*, and our findings are similar to the result obtained in the study of Ullah and Nasim (2021). Concerning sustainability committee which revealed significant positive (β = 1.1830, $p < 0.01$) association with scores confirming the hypothesized argument that having a sustainability committee, the more likely company will score or be in higher level and less likely they fall in lower level. Hence, we accept *H4* that presence of sustainability committee has significant positive influence on extensive corporate sustainability practice. Our findings build up on Ruhnke and Gabriel (2013) and Kılıç and Kuzey (2019). We interpret the magnitude based on marginal effect that setting up a committee to address sustainability-related issues will more likely influence firm to adopt extensive sustainability practice and earn higher score levels but less likely to be in a lower level of scores. Furthermore, this finding supports the coercive institutional isomorphism hypothesis that external constraints might have a significant impact on the adoption of environmental management accounting (Latif *et al.*, 2020). As a result, compel businesses to adopt voluntary practices like sustainability reporting to demonstrate their desire and concern for environmental challenges. Additionally, the findings may be linked to legitimacy tenets, which suggest that organizations will try to persuade stakeholders of their activities by forming teams to address societal concerns to demonstrate that the company values societal norms and well-being to legitimize their actions and gain wider acceptance in society. CEO Duality however showed no association with the scores.

Investor activism (InAct) revealed positive and significant (β = 0.0034, at 10%) association with scores implying activist investors influences extensive corporate sustainability practices. From the sign of the coefficient, the percentage of shares held by the institutional investor will more likely influence the firm to adopt extensive sustainability practice.

Regarding the magnitude of the coefficient, we interpret that a unit increase (decrease) in the percentage of shares held by activist investor will more likely cause firms to score higher category (leadership, management or awareness levels) but less likely to be in the lower level of scores (failed or disclosure level). In this respect, we accept *H6* that investor activism positively influences extensive corporate sustainability practice. Our findings complement the results of García-Sánchez *et al.* (2020), who documented that institutional investors drive corporate transparency in terms of contribution to sustainable development goals, but contradicts the result of Rashid (2021) who found that institutional shareholding and CSR have a negative relationship, likewise Ullah and Nasim (2021) who found no link between large shareholding and environmental innovation.

Overall, these findings confirm the institutional theory that coercive pressure can arise when stakeholders exert significant pressures through rules, regulations, fines and punishments. It also adds to the earlier discussion that when activist investor groups see their interests diverge from what management pursues, investors may take a position that is harmful for the company, such as disposing off their shares, resulting in a loss in share value or reputational damage. As such, organizations would rather implement broad practice to meet stakeholder demand as a preventative measure. Furthermore, the research findings is indicative of the role played by institutional investors in that the higher the stakes of the institutional investors in a company, the more they involve in daily business and coordinate firms' activities to align with stakeholders needs. As for the control variables, we observed positive and significant association for firm size and industry at 1% significant level while profitability was positively significant at 10%. Therefore, we accept *H7*, *H8* and *H9*. In line with legitimacy theory, we conclude larger firms to avoid public scrutiny would more likely adopt extensive sustainability practice and protect corporate image. Similarly, we note that large organizations have greater financial resources than medium or small firms, as a result, the cost of producing disclosure for them will be lower due to economies of scale. From the perspective of institutional theorist, we conclude organizations operating within the same industry would mimic the practice of industry leaders and react to stimuli generated by both their internal and external environments. In addition, we present the margins plot (Figure 1) to simplify the interpretation inferred from the marginal effect result based on literature recommendations.

7. Conclusion, significance of the study and limitation

7.1 Conclusion

Corporate sustainability practice is receiving increasing attention lately. The study looked at CG characteristics, activist investors' involvement in influencing extensive corporate sustainability practices and geographical variances in the level of sustainability practices. To understand the determinants of the extent of corporate sustainability practice, legitimacy theory, agency theory and institutional theory are used as complementary theoretical approaches. By using extended ordered probit regression model on 368 companies from different industry sectors and geographical locations, the study finds that the extent of sustainability practice differs between firms operating in different geographical locations, and that the extent of the practice by firms in the developed economies is in a much-advanced level compared to those from the emerging climes. Although, the extent of adoption is on the increase for both economies. Furthermore, we found CG and activist investors play a crucial role in the extent of corporate practices generally, firm size and profitability influence adoption of extensive sustainability practice and the industry sector in which a firm operates is a significant determinant of the extent of their sustainability practice adoption.

7.2 Significance of the study

Our study is of significance in that it contributes to existing knowledge by providing insightful explanation regarding the extent of corporate sustainability practices. Results of

our investigation provide background to understand the vital role played by activist investors in driving corporate adoption of extensive sustainability practice. Besides, the increasing number of companies responding to CDP and consequent improvement in their scores indicates corporate commitment to ensuring a sustainable future. The study adds to the discussion on attributes of CG critical for sustainability practice. The findings have implication for investors and regulatory authorities across the globe. When making investment selections, institutional investors must carefully analyze the company's sustainability policies. Regulatory authorities, on the other hand, need to develop mechanisms to assist firms in continuing to adopt sound sustainability practices all over the world. They must also scrutinize firm sustainability strategies and policies to ensure that they are properly drafted, accurately determined, verified and fully implemented.

7.3 Limitation and suggestions for future research agenda

This study is not without limitations. The study used CDP scores to enhance the internal validity of the research. However, the study could not confirm the external validity since the companies sampled are relatively larger firms with global coverage. Hence, we suggest future studies can examine medium or small-scale firms. However, extreme caution must be exercise when dealing with such firms at local level as the findings from this study should not be generalized for them.

Note

1. The correlation estimates corr(e.Bsize,e.Scores) is the endogeneity detected in the study model. It shows the estimate of the correlation between the error from the selection equation and the error from the outcome equation. The estimate is significant, so we reject the hypothesis that there is no endogenous selection. It is equally negative; hence, we conclude that the unobserved factors that increase the likelihood of being in the sample tend to occur with unobserved factors that decrease the score of the firm. Detailed explanation can be found in the Stata reference manual 2021. The implication is that BSize, which has a strong relationship with the error term in terms of scores, is an endogenous variable. Prior to its correction, earlier regression models yielded incorrect estimates from which erroneous inferences could be derived if they were relied upon. In this regard, after identifying BSize as an endogenous variable, we used a logtover proxy for firm size as an instrumental variable to control for the endogeneity, as suggested by (Ullah *et al.*, 2019, p. 23), who mentioned that to use a variable as an instrument, it should be highly correlated with the endogenous explanatory variable but not with the error term. Since company size is substantially connected with board size, we selected it as the instrumental variable because it is unlikely to alter scores through the error term.

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