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Diversity-of-Board and Environmental Reporting of Listed Manufacturing Companies in Nigeria: The Moderating Effect of Audit Committee

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Abstract: The 2018 Nigerian Code of Corporate Governance demands responsible behaviour and environmental sensitivity from all companies in Nigeria. However, the extent of environmental reporting amongst firms in Nigeria is still low and not a listing requirement despite the trend of disclosure practices by firms around the world. As a step towards addressing this shortcoming, the objective of this paper is to examine the effect of diversity-of-board on environmental reporting of listed manufacturing companies in Nigeria, and further explores the moderating effect of audit committee. Board size, Board independence and directors share ownership was used as a composite index to proxy for Diversity-of-board and Environmental reporting was graded using ISO14031 index. The study has a population of 61 listed manufacturing firms and a sample size of 36 firms which was arrived at using stratified sampling criteria. Through content analysis, secondary data was collected from the annual report of the sampled companies from the period 2002 to 2019. Using descriptive statistics and linear multiple regression, findings from this study revealed that before moderation, diversity-of-board has no significant effect on environmental reporting ($t= -1.80$, $P< 0.001$). However, the study found that audit committee significantly moderates the effect of diversity-of-board on environmental reporting ($t= -3.67$, $P< 0.001$). Since the moderating effect of audit committee on diversity-of-board and environmental reporting is negative the study concludes that both diversity-of-board and audit committee do not strengthen environmental reporting. The study recommended that the financial reporting council of Nigeria should include environmental committee as one of the mandatory committee in the code of corporate governance who will specifically handle environmental issues.

Keywords: Board Diversity, Diversity-of-Board, Structural Diversity, Environmental Reporting, Nigeria

1. Introduction

There is an increasing global concern for the environment and ecosystem in general. This concern emerges mainly from the threat caused by the harmful effects of emissions from environmental pollution and environmental problems resulting from the impact of economic growth due to enormous operation of these businesses. Firms, especially manufacturing companies, contribute a lot to economic growth and development, but in turn cause several pollution (air, water, noise and land) and environmental degradation. These environmental problems caused by industrial activities can no longer be overlooked as stakeholders and regulatory measures taken by critical stakeholders such as the Environmental Protection Agency (EPA), Securities and Exchange Commission (SEC) through Sustainability Reporting Guidelines (2018), and the 2018 Nigerian Code of Corporate Governance demand responsible behaviour and environmental sensitivity from all companies in Nigeria [50, 86].

This clarion call to assess companies' environmental impact and disclosure is aimed at building trust among companies' stakeholders as well as providing a sustainable environment that will be conducive to both human and corporate organisations to operate efficiently [158]. Thus, strong and creative corporate governance structures and applications are very important in solving the prevalent environmental challenges.

In this regard, environmental reporting has emerged and occupies a significant place within firm's strategies as a result of concern for the natural environment. Environmental reporting is a means of promoting transparency and informing stakeholders about organizations short and long-term efforts to conserve the natural environment [39]. Companies globally, now pay more attention to corporate environmental reporting and managers are daily faced with environmental issues in their decision making processes, not only to take into account ethics and social values that should be promoted by companies, but also to ensure sustainable environment that will promote economic success. Stakeholders such as investors, customers, communities, and employees tend to have positive opinion about companies that disclose environmental information willingly. Thus, firms now engage in environmental reporting as a way of gaining competitive business advantage and reputation [94].

Surprisingly, despite the importance of environmental reporting, and society's heightened interest in many parts of the world, environmental reporting remains voluntary and unregulated in Nigeria. The consequence of voluntary regime and lack of regulations mandating the disclosure of environmental information especially in Nigeria, is that there are wide disparities in terms of the quality and quantity of environmental disclosure by entities, industries as well as economic sectors [14]. The variations in the level of disclosure across firms encourage researchers to examine factors behind this notable disparity.

Board diversity which is a combination of people with different factors that set them apart or bind them together is believed to be one of the factors that could be used to encourage or improve ER [105]. Diverse board members provide a variety of skills and expertise Jonson, McGuire, Rasel and Cooper [84] and are able to make hypercritical decisions compared to a homogeneous board [167]. Thus, firms have required heterogeneous boards to improve competitive advantages Galbreath [54] and offer a diverse perspective when making strategic decisions, such as those regarding ER [136]. In line with this view, the Nigerian Code of Corporate Governance [112] indicated that the effective discharge of board and its committee's responsibilities is assured by an appropriate balance of skills and diversity without compromising competence, independence and integrity. In view of this, it is expected that companies with more effective board composition will be particularly diligent in providing information on environmentally-related issues.

Given the benefits associated with having a diversified board, this study adapts Diversity-of-Board (DoB), one dimension of board diversity that has drawn scholar's attention [64, 71, 20] for some time now to measure organisational outcomes. The use of the term DoB in this text refers to dissimilarities among firm boards, and is related to board structure to assess board attributes such as board size; board independence and directors share ownership. The choice of these characteristics is due to their impact on the strength of corporate governance. It is assumed that the strength and influence of the board of directors is closely related to the degree of structural diversity of its members [125].

Thus, this study, unlike prior literature such as Khan [87]; Beji [25]; Yusof [165] that examined the individual board attributes rather than the effect of their combined attributes (diversity-of-board). These structural attributes are fused into a single index to form DoB index. It is expected that the composite index like DoB would give a comprehensive picture of their simultaneous influence on various organisational outcomes. In addition, this study introduced audit committee (AC) as a moderator to know the effect of DoB on environmental reporting of listed manufacturing firms in Nigeria. Section 11. 4 (1) of the Nigerian Corporate Governance Code stipulates that it is desirable for every company to have a board committee responsible for audit [112]. The duties of the audit committee are to review the company's accounting policies, assess the internal control system, and review external reporting systems as well as ensure compliance with regulations [128]. Hence, this study posits that the audit committee may greatly influence the degree of environmental reporting due to its oversight responsibility in ensuring financial and non-financial report such as environmental reports are disclosed to meet the need of stakeholders [57, 95].

From the foregoing discussions, this study is motivated by practical problems in Nigeria due to continuous expansion in economic activities by corporations of which measure regarding the effect on the environment was been reported. For instance, dumping of toxic waste by an Italian firm in Koko, Delta State, pollution activities by manufacturing firms in Lagos State in 2002, the Zamfara State lead poisoning of 2010 and the Niger Delta oil spillage due to oil exploration and exploitation, having so much negative effect on the host environment, ranging from global warming, large emission of greenhouse gases which stirred up stakeholder's interest on corporate environmental reporting, in which developing nations like Nigeria share the same experiences [117, 134].

Similarly, existing studies such as Harjoto, Laksmana and Lee [67], Jizi [85], Beji Yousfi, Loukil and Omri, [25] have examined the effect of individual attributes of DoB on environmental reporting without considering the combined effect of all the attributes, hence creating a research void. Thus, the use of a composite index to proxy for DoB in this study fills this research gap. This approach is similar to Hoang, Cam, Abeysekera and Ma [71] and Hafsi and Turgut [64] who were the pioneer studies that developed DoB composite index. These few studies that employed the composite index (DoB) are neither in Nigeria nor examined the effect on environmental reporting. Also, past empirical studies have ignored the crucial role of audit committee as a moderating factor in corporate strategy research. A number of studies such as Mgbame and Onoyase [105], Osemene, Temitope and Fagbemi, [122] established the effect of board diversity on environmental reporting, yet few studies, to the best of my knowledge such as Isa and Farouk empirically test how audit committee moderates organizational outcomes [78]. This has significantly throws up a gap to be filled by this paper. Also, the inadequacy of corporate governance culture to effectively address the concerns of a wider group of stakeholders needs has provided additional justification for this paper. These were the considerable yawning gap this research work was able to discover in the literature of the previous studies.

In view of the aforementioned, the questions are: how does DoB affect ER of listed manufacturing companies in Nigeria? And to what extent does AC moderate the effect of DoB on ER of listed manufacturing companies in Nigeria? Thus, objective of this study is to examine the effect of DoB on environmental reporting, and to investigate whether AC significantly moderates the effect of DoB on environmental reporting of listed manufacturing firms in Nigeria. Based on the objectives, the following hypotheses were formulated in the null form and tested:

Ho_1: DoB has no significant effect on the environmental reporting of listed manufacturing firms in Nigeria.

Ho_2: AC does not significantly moderates the effect of DoB on environmental reporting of listed manufacturing firms in Nigeria.

This study covers a period of eighteen (18) years from 2002 to 2019 with listed manufacturing companies in Nigeria as the domain. This period was chosen because significant environment issues in Nigeria were noticed. This study domain was chosen because manufacturing companies engage in productive activities that results to adverse environmental impact. The choice of listed companies on Nigerian exchange was because of visibility to the world and access to growth-enabling capital from a broad investor base, which is a major motivating factor that influences firms to engage in environmental disclosure [102]. Another reason is pressure of society stakeholders Brennan and Merkl-Davies [29], which tends to influence corporate environmental disclosure. This study uses ISO 14031 because it provides voluntary standards of disclosure to manufacturing firms, irrespective of their sizes.

The result of this study would have an important policy implication for the regulators such as the Federal Ministry of Environment, Nigerian Exchange (NGX), Security and Exchange Commission (SEC) and Financial Reporting Council of Nigeria (FRC), as the outcome of this study would enable them to legislate and operationalise the practice of environmental reporting. This policy will capture all factors that interplay in the process of conducting business that will ensure transparency and accountability to all stakeholders. This study will benefit board of directors and management of manufacturing corporations in Nigeria as it will enable them to adopt a holistic approach to management, make strong informed decision on the need for environmental reporting that will improve the company's image as well as obtain legitimacy for existence.

This paper is structured into five sections. The rest of the sections are as follows: Section 2 presents the literature review covering the conceptual framework, theoretical framework and a review of empirical studies. Section 3 deals with the methodology adopted to achieve the set objective. Section 4 looks at the analysis and discussion of findings. Finally, section 5 presents the conclusion and recommendations.

2. Literature Review

This section discusses relevant concepts and variables that are used in the study. The variables include environmental reporting and diversity-of-board (board size, board independence, and directors share ownership) and audit committee. This section further presents theories which underpin this study and concludes with a review of related empirical studies.

2.1. Conceptual Framework

The conceptual framework in Figure 1 depicts the effect of DoB on environmental reporting. Also, the framework shows that audit committee moderates the effect of DoB on environmental reporting. This interaction is diagrammatically depicted in figure 1. The figure finally depicts that firm size, firm age, and profitability are control variables.

The concept of "Environmental reporting" can be called differently depending on its purpose and contents. For example, environmental disclosure Alarussi, Selamat, and Hanefah [12], environmental expenditures Cho, Freedman and Patten, [38], environmental reporting [31], sustainability reporting Herda, Taylo, and Winterbotham [68], environmental accounting Donwa [42] and environmental management accounting Sulaiman and Moktar [152] among others. In Prior studies, environmental disclosure information include management of emissions, environmental damage prevention or compensation, the protection of natural assets, and other details on the environment [47, 115, 56].

Accordingly, Roberts [136] viewed ER to consist of a range of subjects which can be widely classified as statements on environmental protection and the use of energy, political arrangement, recruitment data, data concerning health as well as safety and product information, investments related to the environment, research and development related to the environment [130]. Gray [59] defined ER as the preparation, presentation and communication of information relating to an organisation's interactions with the natural environment. Sen, Mukherjee, and Pattanayak [142] see environmental reporting as "an umbrella term that describes various means by which companies disclose information on their environmental activities. Alkhili and Ansi, as cited in Abubakar and Moses, opined that environmental disclosure is the strategic way taken by the management of a corporate body to capture community perception towards their operations by making environmental data available on company's annual report [3]. It is strategic because environmental disclosure in most countries is on voluntary basis, it is the decision of a company to disclose information that relate to environment. Abubakar and Moses [3] further explained that any company that seeks to achieve good performance and sustainability should not ignore the benefits to engage in environmental reporting.

Soliman [151] viewed environmental disclosure as a disclosure of additional information in addition to mandatory information. Companies are expected to divulge information on the effect of their activities on the environment, how do the company intend to remedy such effects, how do they wish to bring development to the community. However, environmental disclosure in some countries is been made mandatory, while some countries environmental disclosure is optional but it however help in greening corporate report. According to Ajibolade and Uwuigbe [8], environmental reporting is an effort by firms to promote effective corporate governance, ensure sustainability through sound business practices. Ejoh, Orok, and Sackey [43] referred to environmental disclosure as the set of information that relates to a company's past, current and future environmental activities.

Setyawan and Kamilla [143] defined environmental disclosure as a report made by the company to the stakeholders on environmental activities undertaken by the company. Disclosure of environmental information in the annual report is to show the level of accountability and corporate transparency to investors and other stakeholders. Also, Panigrati, (2015), as cited in Solomon [149] defined environmental disclosure as information provided for the assessment of company's behavior towards its environment and the economic consequence of such action; it provides financial and non-financial information. Ong, Tho, Goh, Thai, and Teh [120], viewed environmental disclosure as a statement that shows the company's environmental efforts including company's objectives, environmental policies and environmental impacts, this are reported and published annually to the general public.

Adams, de Haan, Terjesen, and van Ees viewed environmental reporting as the process of communicating environmental information about companies' impact, performance and it contribution to ecologically sustainable developments [4]. Thus, the need for companies to periodically, holistically and systematically report on environmental burden caused by their activities and also state efforts made in mitigating these burden, in accordance with general reporting principles of environmental reporting. However, in the context of this study, the definition of ER provided by [4] is preferred because of it broad nature and scope in providing detailed informational need of a wider group of stakeholders.

For diversity-of-boards, it is a metaphor use to refer to an aspect of board diversity that measures differences or dissimilarities in board structure among different company boards. These heterogeneity among board members is expected to enhance board of director's decision making ability Hoang, Abeysekera and Ma [70], and provide a better platform to share a wider range of opinions, beliefs, networks and backgrounds to balance the firm's financial and non-financial objectives and address the demands of different stakeholders with conflicting needs [94, 127]. Within the context of this study, board size; board independence and director share ownership, all of which make up its so-called structural diversity attributes used as a proxy for diversity-of-board. These structural characteristics has been explored mostly by the researchers due to its influence and effectiveness in decision-making process, including decision on environmental reporting because strong discussions on challenging issues require deep observation and understanding, multiple angles and collective experience.

Board size refers to the number of both inside and outside directors that serve on a corporate board. It has been asserted that large board size is more influential than small boards and can help strengthen the link between corporations and their environments [166]. More so, larger boards are often characterised by greater diversity in terms of economic status, financial expertise, experience, as well as capabilities to solve problems, which can improve firm reputation and image [111]. However, small boards do not have the advantage of having the spread of expert advice and opinion around the table that is found with larger board's size [160].

Furthermore, Chaganti, Mahajan, and Sharma [35] opined that smaller board size can be manage better and more often play a role as a controlling function, unlike larger boards that may not be able to function effectively as the board leaves the management relatively free. Stakeholder's theories stated that large boards are representative of diverse interests Kock, Santalo, and Diestre [91] and can increase the firm's involvement in environmental investments. Thus, it is expected that large board will be able to maintain independence from the board and also encourage management to disseminate more information on the environment. Further, large boards could constitute social capital that will lead in balanced decision-taking. According agency theory, large boards often face coordination and communication problems [69; 33]. Black and Kim provided evidence that there is no optimal board size and suggested that, the size of a board depends on either advising or monitoring needs and it changes from firm to firm [27].

Section 275 of the CAMA 2020 mandates public companies in Nigeria to have not least than three independent directors. A board is said to be independent if it has more members of independent non-executive directors to the total board size. The inclusion of independent directors in the company's board brings persons with a wide range of knowledge, expertise, skills and business contacts, and backgrounds. Thus, it is a pointer to effective an efficient monitoring which can improve the quality of decisions on matters that pertain to the environmental performance, ensures legal and ethical behavior as well as strengthening accounting controls in the organization [36]. This is in tandem with the stakeholder's theory where a board with the required number of independent directors would protect the interest of stakeholders [18].

In line with the view of agency theory, Independent directors play an important role in solving agency conflicts between management and different stakeholder [124]. Similarly, the presence of independent directors can also enhance legitimacy by acting as representative of different groups of stakeholders [46].

Directors share ownership which is interchangeably used as managerial ownership is the type of ownership where the executive directors have a certain percentage of ownership in the firms. One strategy to minimize organization agency conflicts is the dual role of managers as managers and owners of the businesses. Director's shareholdings can reduce agency problem, as they see themselves as Co-owners of the business who often times try to maximize the firm's long-term value. Also, directors with the sense of share ownership in the business tend to make environmental-friendly decisions to express their contribution to environmental issues and the society in general, and to obtain the attentions of different interest group [88]. Directors provide environmental information to align their policies and strategies with society's norms and expectations. Moreover, directors in a complex political climate are influenced by different interest groups; they are likely to disclose more environmental information to mitigate political costs [146].

Audit committee is a committee formed for the purpose of overseeing and monitoring internal control system, auditing activities and improves reporting policy in the company [13]. The Nigerian code of corporate governance provides description of the qualifications and functions of the audit committee to include the responsibility to ensure the company adherence to applicable regulations and disclosure policy to serve the stakeholder's needs [112]. Nowadays, the role of the audit committee has been expanded to include monitoring other organisational processes beyond financial reporting because of the significant increase in the number of environmental crises [98]. Thus, according to agency theory, audit committee is delegated to monitor management practices towards transparency including an appropriate level of environmental disclosure, if this role is achieved as required by the international standards, it is expected to enhance the public trust in the financial statement content, bridge the gap of information asymmetry which in turn results in minimizing agency costs [24].

From resource dependency theory angle, larger audit committee are more able to offer better resources and authority to effectively carry out their responsibilities Allegrini and Greco [13], as the committee is expected to bring diversity of opinions, knowledge, experiences to ensure effective monitoring functions [24]. Also, the number of meetings held by audit committee members are an indication of its effectiveness and this can influence environmental reporting. As a rule, the size of audit committee should have equal number of directors and representatives of the shareholders of the company subject to a maximum of six members [62]. Therefore, audit composition must include at least 3 members, whom are non-executive directors. As knowledge is power, this study believe that audit committee members with accounting, financial or law educational background simplifies their function in examination the financial statements to assess compliance with international standards and best practices.

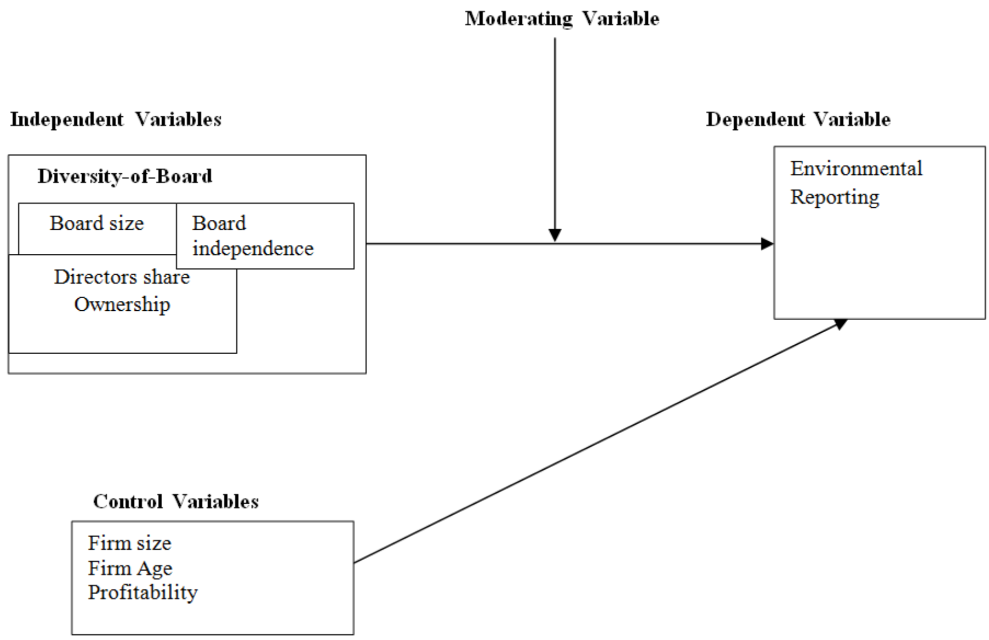
In shedding light on the concept of a moderator variable use in this study, scholars such as Forbes and Milliken [53] opined that researchers should go beyond direct relationships between two variables (dependent and independent) to include third variable effects. In line with this notion, this study believe that audit committee is important in firms decision-making, especially in corporate strategy as it plays a critical role in meeting stakeholder's needs for relevant, clear, and full information. In tandem with this view, Soliman and Ragab [150] have shown evidence that strong, effective and efficient audit committee will strongly influence disclosure of environmentally-related information by management.

The study used three control variables of firm size; firm age and profitability which had been widely used by other researchers in the area of environmental reporting. The justification for employing individual-level control variables is to enhance accuracy and have more confidence about the unique contribution of DoB on ER. More so, those firms under consideration have various distinct characteristics such as size; age and profitability.

There are reasons why firm size is an important consideration in relation to environmental reporting. Firstly, large firms are more visible to the society as they attract public scrutiny, political, and regulatory pressures. Thus, large firms disseminate future oriented environmental information that is driven to address environmental concerns, sustain the competitive edge and increase its market size [37]. This is unlike smaller firms who are more likely to hide crucial information because of their competitive disadvantage within their industry. Therefore, the drive to use corporate governance to enhance environmental reporting can be controlled by firm size.

Also, firm age is an important variable that influences a firm towards expressing its obligations to the environment in which it has achieved a lot over the years [77]. The older firms are more willing to voluntarily show its effort and commitment in ensuring sustainable development towards the environment in which it operates and not just consider its financial obligations toward the shareholders alone [161]. More so, Profitability can be seen as a sign of good management and it is from profit that company's carryout corporate social responsibility and maintains their environment. Hence, the profitability of a company is a determinant of its strength to disclose environmental information.

The conceptual framework in Figure 1 depicts that DoB directly influence ER. In addition to DoB, Audit committee was introduced to moderate the effect of DoB on ER. The conceptual framework in Figure 1 suggests that ER is influenced by firm size, age and profitability (control variables). Thus, the study variables include ER, DoB (mix of board size, board independence and directors share ownership) and Audit committee.



Source: Researcher's compilation (2021).

Figure 1. *Conceptual Framework of the study.*

2.2. Theoretical Review

This study used Stakeholders theory of Freeman [52] and the agency theory of Jensen and Meckling [82] to explain the influence of diversity-of-board on environmental reporting of listed manufacturing firms in Nigeria. Stakeholder theory offered a new perspective by suggesting that shareholder requirements cannot be met without meeting other stakeholders' needs [80]. The Stakeholder theory points forward the tripartite connection that exists between the principal (owner of a firm), agent (managers/board of directors) and stakeholders (suppliers, local community, investors and the public) [7]. The theory's basic proposition is that the corporation's continued existence needs stakeholders support and acceptance must be solicited by adjusting it activities to obtain that approval [49]. In this study, the theory is employ because; a company needs to maintain a cordial relationship by treating all stakeholders with fairness, honesty, and even generosity. This will enable the company to function and carry out its economic activities effectively without any form of litigation or economic sabotage [63].

Another relevant theory in this study is agency theory which describes owners (principal), who delegate authority, to manager (the agent) to run the firm on his or her behalf and the welfare of owners depends on the manager accordingly [82]. The theory explains the connectivity between corporate diversity and environmental reporting by looking at the contractual agreement that exists between an agent (manager) and the owner of the investment. The agents (directors) responsibility is to supervise and monitor the internal affairs of the corporation on behalf of stakeholders [101]. The theory suggests that diversity among board would likely to reduce the chances of agency cost. Based on the unique qualities posses by board members, environmental challenges can swiftly be resolved and this will increase the reputation of the firm [22, 110].

2.3. Review of Empirical Studies

This section examined the effect of diversity-of-board attributes (board size, board independence, and directors share ownership) on environmental reporting. The following are some empirical studies from developed and developing nations that have shown evidence for DoB as one factor that influence ER.

2.3.1. Board Size and Environmental Reporting

One major determinant of board effectiveness is board size. In Malaysia, Buniamin, Alrazi, Johari, and Abd Rahman [30] analysed how board size affect on environmental reporting of 243 Malaysian listed firms' for the year 2005. The authors found that the size of a board influences the level of environmental reporting. Similarly, Akhtaruddin, Hossain, Hossain, and Yao [10] investigated corporate governance attributes and voluntary disclosure of environmental in Malaysian listed firms for the year ended 2002. The study found that board size has positive association with environmental reporting. However, findings from the studies are peculiar to Malaysia and cannot be generalised for companies in other countries such as Nigeria. More so, the scope of studies was only one year and this may not have shown sufficient trend analysis unlike this paper whose scope is 18 years.

Furthermore, Janggu, Darus, Zain and Sawani [81] examined sustainability disclosure among 100 public listed companies in Malaysia from the perspective of agency theory.

The authors found a positive relationship between board size and sustainability reporting. The result agrees Buniamin, Alrazi, Johari and Abd Rahman [32] who discovered positive and significant influence of board size on corporate environmental reporting for the period 2005. These studies were conducted in Malaysia, and the data are cross-sectional in nature. This study contributes to the environmental disclosure literature by conducting a study with data that is longitudinal (panel and time series) in nature. Another study in an Asia country by Tamoi, Faizah, Mustaffa and Yussri [155] assessed board size and environmental sustainability among 100 listed Pakistani companies for the period 2012-2015. Overall, their results indicate that elements of the CG boost disclosures of sustainability. The study revealed how large board size was able to monitor and control management decisions that resulted in a better sustainability disclosure.

In the study of Handajani, Subroto, Sutrisino and Saraswati [66], board attributes and environmental disclosures of listed firms on Indonesian Stock exchange was investigated for the period of 2010-2012. The study result of multiple regression revealed amongst other variables that, board size has a significant effect on environmental disclosure. The study made use of data for only 2 years (2010-2012). This paper will utilise data for 18 years (2002-2019) to validate or invalidate the findings. Isa and Muhammad [79] examined how board characteristics affect environmental disclosure from 2005 to 2014 among six food product firms in Nigeria. The study revealed that environmental disclosure is affected by board size in a direct and significant manner. The study only focused on food product firms listed on the Nigeria stock market. Further research is needed to examine more manufacturing industries, which is the focus of this research.

In the same vein, Lone, Ali and Khan [97] conducted a study in Pakistan for the period 2010 to 2014. From the study, Lone, Ali and Khan [97] used board characteristics as determinants of corporate environmental reporting without considering audit committee as a moderating variable, even though more than one variable was used.

In the same vein, Emmanuel, Uwuigbe, Teddy, Tolulope, and Eyitomi [44] studied how corporate diversity influence environmental disclosure of Nigerian companies in the manufacturing industry. Multiple linear regressions were employed and the result obtained proved that board size has significant and positive influence on the disclosure of environmental information. The outcome from [44] is in agreement with Shamil, Shaikh, Ho and Krishnan [144] (Sri Lanka); Akbas [9] (Turkey); Trireksani and Djajadikerta [157] (Indonesia); Ganapathy and Kabra [55] (India); Mahmood, Kouser, Ali, Ahmad and Salman [99] (Pakistan); Rabi [131] (Jordan); Osemene, Temitope, and Fagbemi [122] (Nigeria). These literatures made used of small sample size, the years and time spans is too small for any meaningful results. The current study contributes to the environmental reporting literature by looking at more sample size that is panel in nature. In contrast, Uwigbe [160], Ienciu [75], Adeniyi and Fadipe, [5] found confirmation that the numbers of board members have no influence management decision in practicing environmental reporting. These studies like any other study did not use a moderator. This necessitated the extension of this paper by using audit committee as a moderating variable.

From agency theory perspective, Aliyu [15] explored how board size can affect environmental reporting of 24 non-financial companies as sample from 2011 to 2015. The study employed panel data technique and confirmed that board size have no influence corporate environmental reporting. However, Rabi [131] used board size as one of the proxy in measuring board characteristics in the study carried out at Jordan. The study revealed that board size has a positive effect on environmental disclosure among 63 listed industrial firms and panel data were obtained from their annual report from 2014 to 2017. Similarly, Gulzar, Cherian, Hwang, Jiang and Sial [61], Masud, Nurunnabi and Bae, [100], Uwigbe [160] concurred with the finding of [131].

On the other hand, Odoemelam and Okafor demonstrated the opposite [114]. The study discovered board size to be insignificant. Study by Rubino and Napoli [137] however contradicts the submission of Aliyu [15], Rabi [131] as [137] found board size to be positive and have significant effect on environmental reporting.

In a related manner, Oluwatoyin, Agbi and Mustapha [118] assessed the characteristic of the board on sustainability reporting of listed non-financial firms in Nigeria from 2010 to 2018. The study used a sample of 30 out of 47 and provided evidence that board size has positive and significant effect on sustainability reporting. The study is on sustainability reporting which is wider in scope. Consequently, this study will be limited to environmental reporting, an aspect of sustainability reporting. Another study in Nigeria by Moses and Ajao [107] explored a sample of 42 out of 169 quoted companies selected through stratified and purposive sampling techniques for 10 years (2010-2019). The authors concluded that the size of a board is significant in influencing environmental sustainability report. Outcome from the study agrees with Salawu et al. (2021) who obtained data from 2012 to 2018 and analysed, also confirmed the influence of board size on environmental disclosure.

2.3.2. Board Independence and Environmental Reporting

For board independence and environmental reporting, Zhang, Zhu and Ding, [167] in their study conducted on a sampled of 500 largest US firms. The authors provided evidence that, independent directors positively influence companies environmental reporting because of their diverse background. However, the outcome from the study is restricted to US due to differences in economic environment, policies and laws with other nations. There is need for a similar study within the context of Nigeria economy to agree or disagree with the finding. The finding from the study is similar to studies conducted by [73, 89, 83]. Conversely, Ho and Wong [72], Michelon and Parbonetti [106] reported negative influence of board independence on environmental reporting.

Furthermore, Solabomi and Uwalomwa looked at the effects of board independence and Environmental Disclosure among listed companies in Nigeria [148]. A judgmental sampling technique was used to select a sample of forty firms from 2006 to 2010. They concluded that nonexecutive directors enhance firms' disclosure which includes environmental information. In related studies, Sharif and Rashid [145], Liao, Luo, and Tang [94], Kaur, Raman and Singhania [92], Muhammad, Xiaoming, Riaz, and Rehman, [108] also found positive influence of independence directors and environmental reporting. In Indonesia, Dissanayake, Tilt and Xydias-Lobo, [41] studied board independence and environment disclosure practice of 38 listed mining companies on Indonesia Exchange for the year 2012. They found insignificant effect of independent directors on environmental information disclosure. In line with the finding, studies by Janggu, Darus, Zain and Sawani, [81], Baba and Abdulmanaf [21], Ezhilarasi and Kabra [51], Lozano, Fuente and Garcías [96] confirmed negative influence of board independence on environmental reporting.

As mentioned earlier, the research by Aliyu discovered significant positive effect of board independence on corporate environmental reporting [15]. The finding agrees with Aman and Bakar who examined sustainability reporting of 260 public companies listed in Malaysia [16]. Also, finding corroborated Ghuslan and Mohd Saleh [58]; Naseer and Rashid [109] who investigated corporate governance (CG) characteristics and environmental reporting (ER) of listed non-financial firms in Pakistan from 2014 to 2015. These studies were conducted in Asia with a jurisdiction distinctively different from Nigeria, thus, the need to replicate similar study in developing country which this paper sorts to.

A study by Adeniyi and Fadipe focused on board diversity and sustainability reporting in Nigeria [5]. Data from listed brewery manufacturing firms were collected and analysed from 2015 to 2016. The study discovered positive and significantly effect of independent directors on sustainability reporting. However, the study focus is brewery industry; therefore, further research is required on a similar topic with more manufacturing industry or different sectors like this study sorts to. In the same vein, Odoemelam and Okafor [114] looked at how corporate governance influence environmental disclosure of 86 listed non-financial firms in Nigeria for the year 2015. The result confirmed that independent directors statistically affect environmental disclosure. The study analysed only one-year annual report data which is cross-sectional in nature. This research will analyse data for 18 years which good enough for a robust outcome. Although, King'ori, Naibei, Sang and Kipkosgei, [90] investigated the effect of board characteristics on environmental sustainability disclosure in Kenya, it was revealed that board independence has positive effect but statistically insignificant on environmental sustainability disclosures. In contrast, Rabi discovered no significant effect of board independence on environmental disclosure [131].

Abubakar and Moses explored corporate governance attributes and environmental disclosure of listed manufacturing companies in Nigeria [3]. Data analysed from a sample of 20 manufacturing companies from 2012 to 2018. Regression analysis result revealed significant positive effect of independent directors on environmental disclosure.

Also, Ozordi, Eluyela, Uwuigbe, Uwuigbe and Nwaze [123] examined the level of board independence on the sustainability reporting using GRI G4 guidelines. The study concluded that board independence has positive and significant effect on sustainability reporting practice of listed Sri Lankan companies. The finding is similar to Meibo and Lawrence [103] who provides evidence that board independence enhances corporate environmental reporting. However, Baalouch, Damak, and Hussainey, [20] confirmed negative and significant effect of independent board members on environment disclosure. Thus, they concluded that board independence adversely influences environment disclosure. On the contrary, Pramodhya, Uppala, Lolitha, Gayan and Anuradha [126], ThankGod, Emmanuel and Clifford [156] disclosed that board independence does not influence environmental information dissemination. The result implies negative and insignificant influence of board independence on environmental disclosure. On the other hand, Okere, Rufai, Okeke and Oyinloye [116] analyse 20 listed Nigerian manufacturing firms from 2013 to 2017. Regression discovered positive and significant effect between independent board members and environmental disclosure in the manufacturing sectors.

2.3.3. Director Share Ownership and Environmental Reporting

Directors share ownership is one possible factor that can influence firm's environmental reporting practice. In view of this, Baker, Bergstresser, Serafeim, and Wurgler [22] examined the effect of managerial share ownership on CSR of companies in Indonesia Stock Exchange. The result revealed that managerial ownership influence CSR reporting. In the same vein, Nussy, [113] found that managerial share ownership has positive influence on corporate social responsibility. However, these studies were conducted in Indonesia with a jurisdiction distinctively different from Nigeria, thus, the need to replicate similar study in Nigeria which this paper sorts to.

According to Suprapti, Fajari and Anwar [154] and Sari, Median and Aprilia [140], Managerial ownership has a beneficial effect on corporate environmental transparency. They found that the higher the managerial ownership, the more environmental knowledge is disclosed. This implies that the greater the managers' ownership in the company, the more they will think about the interests and welfare of shareholders, and because they believe they own the company, they will do everything they can to reveal the company's environment, which will improve the company's image and thus increase the company's shares.

Also, Dian, Wiwiek, Dwi and Indah [40] evaluated 56 manufacturing firms in Indonesia from 2013 to 2015. Result supported the notion that managerial ownership has significant effect on corporate social responsibility disclosure. However, the study was conducted in Indonesia and for a period of two year only, which is not sufficient to obtain a robust outcome. This paper will utilise data for eighteen years from 2002 to 2019 to validate or invalidate the outcome. Omoye and Oshilim studied a sampled of 118 firms on the Nigerian exchange [119]. Analysis reports revealed that managerial shareholding was significant but negatively influence environmental disclosure. However, Data was collected for only five years (2012-2016) as the study does not consider variations that may be envisaged over time, hence the need for another study that will utilise data over a longer period which this paper sort to. The study of Omoye and Oshilim [119] agrees with the findings of Susilo, Saraswati and Rosidi [153], Kurawa and Kabara [93] as they also found negative and no significant effect between the variables.

More so, Arista, Sabroto and Hariadi [19] analysed 37 companies in Indonesia from 2013 to 2016. The research found managerial share ownership to positively influence CSR reporting. Sample of companies in this study is from Indonesia, and the results might not hold true for other countries. The finding from the study is in tandem with the study of Soetedjo, Soewarno, Iswajuni and Amu who found managerial ownerships to be positively significant on corporate social responsibility disclosure [147].

In another study, Sari, Median and Aprilia [140] determined factors affecting corporate environmental Disclosure on Go Public companies listed in PROPER from 2015 to 2019. Findings from the research also confirm negative effect of managerial ownership on corporate environmental practice, indicating that the size of a company's managerial share ownership has little bearing on the company's environmental disclosures.

2.3.4. Audit Committee and Environmental Reporting

Audit committees play a key role by monitoring management decision and performance, enhancing independence of auditors as well as support the board of directors in meeting the responsibilities of formulating business policies [121]. Accordingly, Akhtaruddin and Haron, have sampled 124 public companies in Malaysia [11]. Findings recommended that firms with a higher share board ownership should have high more independent audit committee members. In Ho and Wong [72], the existence of an audit committee is significantly and positively related to the extent of voluntary disclosure in Hong Kong.

Similarly, Mgbame and Onoyase examined corporate governance and environmental reporting of 14 oil and gas companies listed on the Nigeria [105]. The authors revealed positive and significant effect of audit committee independence and environmental reporting. The study is limited by it focus on Oil and Gas firms only. Further research is needed to examine manufacturing sectors. Also, Ratna, Taylor and Tower [133], Samaha, Khlif and Hussainey [138] confirmed positive effect of audit committee on voluntary disclosure (social and environmental disclosure).

In contrast, Akbas examined board characteristics and environmental disclosure in Turkish companies; audit committee is unrelated to the extent of environmental disclosure [9]. The study was carried out using cross-sectional data which is one year. This research paper will use longitudinal data for 18 years. Again, Primary and Rahardja [129]; Eriabie and Odia [48] focused on industrial goods firms and found a positive but insignificant relationship between audit committee and corporate social and environmental disclosures. More research is needed to examine other manufacturing industries which this study sorts to. In a similar manner, Odoemelam and Okafor [114] investigated the environmental disclosure of 86 non-financial firms listed in Nigeria for the period 2015. The result show that audit committee independence was insignificant to environmental disclosure. The study analyzed only one-year annual report data. Using longitudinal data in this paper will fill this gap.

Furthermore, Ika, Nugroho, Achmad and Widagdo [74] examined how corporate governance practices will impact environmental reporting of 102 manufacturing companies listed on the Indonesia from 2015 to 2017. The outcome of regression analysis indicated positive influence of audit committee effectiveness on environmental reporting. To validate further, Bicer and Feneir [28]; Abdi, Homayoun and Kazemi Oloum found audit committee characteristics (size, independence, and financial expertise and gender diversity of the members) to be positive and significant on corporate sustainability reporting [2].

3. Methodology

The study use *ex-post facto* research (after the fact) design because the study is conducted based on the positivism paradigm and quantitative approach. The period of this study is Eighteen years from 2002 to 2019, which provides firm-year of 648 observations. The study population is made of sixty one (61) manufacturing companies listed on the Nigerian Exchange (NGX). Based on the stratified sampling criteria the sample size of 36 firms which comprises 3 companies in the Agricultural sector, 5 Conglomerate, 12 firms in the consumer goods sector, 9 firms in the industrial goods sector, 5 in the Healthcare sector and 2 firms in the Consumer services sector. The rational for these industries arises based on their direct or indirect operational activities perceived to have impact or threat on the natural environment [160]. The industries are as represented in Table 1. The 36 firms represent 59% (61) of the population which is good enough to make inference.

Data for this study were collected from the annual reports of selected manufacturing companies during the eighteen years, from 2002 to 2019, taking into account the time of increased awareness and stakeholder pressure within those periods.

Table 1. *List of accessible manufacturing companies for the study.*

S/N	Company Name	Year of Listing	S/N	Company Name	Year of Listing
1	A. G. Leventis Nigeria Plc	1978	19	Cadbury Nigeria Plc	1976
2	Chellarams Plc	1978	20	Berger Paints Plc	1974
3	John Holt Plc	1974	21	Beta Glass Plc	1986
4	SCOA Nigeria Plc	1977	22	Premier Paints Plc	1995
5	UACN Plc	1978	23	Cutix Plc	1987
6	Champion Breweries Plc	1983	24	DN Meyer Plc	1979
7	Guinness Nigeria Plc	1965	25	CAP Plc	1977
8	International Breweries Plc	1994	26	Neimeth Plc	1991
9	Nigerian Breweries Plc	1973	27	Glaxosmithkline Plc	1977
10	Flour Mills Nigeria Plc	1978	28	Morison Industries Plc	1978
11	Northern Nig. Flour Mills	1978	29	May and Baker	1994
12	Lafarge (WAPCO)	1979	30	Pharmadeko	1974
13	Nigerian Enamelware Plc	1979	31	Livestock Feed Plc	1978
14	P. Z. Cussons Nigeria Plc	1972	32	Okomu Oil Palm Plc	1997
15	Vitafoam Nigeria Plc	1978	33	Presco Plc	2002
16	Unilever Nigeria Plc	1973	34	Academy Press	1978
17	Nestle Nigeria Plc	1979	35	University Press	1979
18	Nascon Allied Indus. Plc	1992	36	BOC Gases	1979

Source: NGX Fact book, (2021).

The dependent variable, environmental reporting is measured using International Organization for Standardization (ISO 14031) as the disclosure index to gauge whether companies engage in environmental reporting practices of particular information in annual company reports [132]. This study uses ISO 14031 because it provides voluntary standards of disclosure to manufacturing firms, irrespective of their sizes. The ISO consist of 60 reportable disclosure items, and each of the items is coded 1 if there is a disclosure and 0 if otherwise. This is in similar with prior studies like Uyagu, Okpanachi, Nyor and Muhammad [159] and Uwigbe [160] who also used dichotomous scale to score disclosure items and regress all the three variables of interest against environmental Reporting (ISO 14031), a dependent variable.

According to Ragini [132], the environmental disclosure index can be measured using weighted or unweighted scores so; in line with [34]; [37], this studies used the unweighted dichotomous index in which all disclosure items are given equal importance to reduce subjectivity. The environmental disclosure index is calculated as follows:

Total number of items appearing in the annual report.

Maximum number of items which should appear in annual reports.

The independent variable in this study is DoB index. The DoB index is fast gaining acceptance in corporate governance literature [64, 70]. The common method of measuring DoB in extant literature is through pluralism [107, 25, 123, 17].

However, often times individual components that make up DoB produce parallel findings; thus, single index like the DoB is considered a useful method to arrive at one conclusion. Thus, to measure DoB index, terciles split method was used to split the sample into terciles for each attribute [26, 64]. The DoB index is divided into terciles with values 0, 1, 2 representing “below average,” “average” and “above average” values respectively. Finally, DoB index is the sum of all ranked attributes that are involved in structural diversity among the board for each firm. A higher value represents higher diversity of boards.

Table 2. *Variables Definition and Measurement.*

Variable/(Proxy)	Type of Variable	Measurement and source
Environmental Reporting (ER)	Dependent variable	This study adopts ISO 14031 disclosures index, and use content analysis to analyse the disclosure items in the annual reports. The items are scored one or zero based on the presence or absence of a disclosure item [159].
Diversity-of-board (DoB)	independent variable	Composite index comprising of board size, board independence and directors share ownership [64].
Audit committee	Moderating Variable	Sum of audit committee attributes including audit committee size, audit committee composition, audit committee educational background and audit committee meetings
Control Variables		
Firm Size (FS)	Control Variable	This is proxied using the natural logarithm of total assets of the firm [164, 63].
Firm Age (FA)	Control Variable	The number of years after the firm is listed [163].
Return on Assets (ROA)	Control Variable	The ratio of net profit before tax to total assets from year 2002 to 2019 [9].

Note: Board Size (BS) = Total number of directors on the board of the organisation [122], Board Independence (BIND) =% of the independent directors to total directors [3], Directors share ownership (DOS) = Proportion of directors with shares within a firm. [19], Audit Committee size (ACS) = This is measured as total numbers of audit committee members divided by 6. [1], Audit Committee Composition (ACC) = This is measured as ratio of outside members to directors on the audit committee, Audit Committee Educational Background (ACEB) = This is measured as proportion of audit committee members that have accounting or legal to does without accounting or legal knowledge, Audit Committee Meetings (ACM) = Number of meetings held by audit committee members in a year. Divided by 6 [78].

Source: Researcher’s compilations (2021).

AC is used as a moderating variable. To measure AC, this study summed up the four variables (Audit Committee size, Audit Committee Composition, Audit Committee Educational Background and Audit Committee Meetings) to create a composite index. Table 2 depicts variables description, measurement and sources of literature.

Two models were employed in this study. Model 1 test the effect of DoB on ER, while model 2 tests whether AC moderates effect of DoB on ER. The variable of interest in model 2 which captures the moderating effect of AC on the effect of DoB on ER is AC*DoB. If β_3 is significant at 5% critical level, then AC is said to be a significant moderator on the relationship between DoB and environmental reporting. The following multiple regression models were considered to test hypotheses for the study to know the dependence of ER (dependent variables) on the composite index of DoB attributes (independent variables).

Model

$$ER_{it} = \alpha_0+\beta_1DoB_{it} + \beta_2FS_{it} +\beta_3FA_{it}+\beta_4ROA_{it} +\varepsilon_{it} \quad (1)$$

$$ER_{it} = \alpha_0+\beta_1DoB_{it}+ \beta_2AC_{it} + \beta_3(AC_{it}*DoB_{it}) + \beta_4FS_{it} +\beta_5FA_{it}+\beta_6ROA_{it} +\varepsilon_{it} \quad (2)$$

Where:

ER= Environmental reporting

DoB = Diversity-of-Board

AC= Audit Committee:

FS = Firm size

FA = Firm age

PF=Profitability

t = time period 2002-2019

α_0 = Constant term,

ε_{it} = Error term,

β_1 - β_5 = Coefficient of the variables.

4. Results and Discussions

The regression analysis was employed to ascertain whether AC significantly moderates the effect of DoB on ER in Nigeria. Before the regression analysis was performed, data was described using he descriptive statistics presented in Table 3.

Table 3. *Descriptive Statistics.*

Variable	Obs	Mean	Std. Dev.	Min	Max
ER	648	0.270	0.115	0.017	0.567
DoB	648	1.216	0.561	0	2
AC	648	3.151	0.332	2.024	4
DoB x AC	648	3.860	1.884	0	8
FS	648	6.901	0.807	5.001	8.975
FA	648	29.387	9.498	3	54
ROA	648	0.093	0.179	-0.939	2.263

Source: Researcher's Compilation 2021.

The descriptive statistic from Table 4 revealed that environmental reporting is low in Nigeria. The average ER in Nigeria is 0.270 (S.D=0.115) representing 27% average. The descriptive statistics depicts that ER ranges from the minimum of 0.017 to a maximum of 0.567. The DoB has an average of 1.216 with 0.561 standard deviations, this depicts that there is a moderate DoB among the listed manufacturing companies in Nigeria. The range of the values of DoB varies from a minimum of 0 to a maximum of 2 representing low DoB and high DoB respectively.

AC has a mean of 3.151 with 0.332 standard deviations suggesting that there is a moderate AC effectiveness among listed manufacturing companies in Nigeria. All things being equal, AC supposed to have a minimum of 0 and maximum of 4 since the most effective for each factor is "1" and the worst is "0". Thus, a mean of 3.151 means that AC of manufacturing companies listed in Nigeria is moderate and varies from the minimum of 2.024 and a maximum of 4.

FS has a mean value of 6.901 (*S.D* = 0.807), and minimum and maximum values of 5.001 and 8.975 respectively. Translating the firm size information to raw numbers, it means that the average FS of quoted manufacturing firms in Nigeria is about ₦7.962 million in Nigeria. FA and ROA have mean value of 29 and 0.090, standard deviation of 9 and 0.158 respectively. The minimum and maximum value of FA is 3 and 54 respectively, while ROA is -0.939 and 0.881 respectively. The maximum of 54 indicates that, the oldest manufacturing company in Nigeria among the sample is about 54 years as at 31st December, 2019 while, the youngest company is 3 years as at January 1, 2002.

4.1. Diagnostics and Robustness Checks

Before the regression analysis was performed, both the pre-estimation and post-estimation tests were carried out to check and ensure that all the regression assumptions were met. First, the assumption of linearity was carried out and reported in appendix B as graph matrix. The graph suggests that all the independent variables linearly relate with ER. Secondly, muticollinearity assumptions were checked using Pearson correlation reported in Table 4.

Table 4. *Correlation Matrix.*

	ER	DoB	AC	FS	FA	ROA
ER	1					
DoB	-0.0344	1				
AC	0.2505	0.1567	1			
FS	0.5094	0.0218	0.3758	1		
FA	0.4964	-0.0204	0.3277	0.3682	1	
ROA	0.0192	0.0265	0.0263	0.0879	0.0599	1

Source: Researcher's Compilation 2021.

The correlation coefficient ranges from -0.0204 to +0.3758. Since all the correlation coefficients are below ± 0.7 which is the threshold for multicollinearity, the study concludes that there is no multicollinearity problem [60]. The assumption of heteroskedasticity was tested using Breusch-pagan test. The results of Breuch-pagan test for heteroskedasticity indicates that the variances are constant (X^2 =1.141, P= 0.2346).

Normality of the error term was also tested with the visual inspection of the histogram of residual (e) with fitted normal curve. The histogram indicates normal distribution of the error term (see histogram in Appendix B). Functional form and omitted variable assumptions were also tested and satisfied. The p-value of _hatsq is 0.178 indicating that the model is correctly specified, while the Ramsey RESET test revealed that the model has no omitted variables (F= 1.92, P= 0.1247). Finally, check of outliers was conducted using cookd and no outlier was found to be present.

4.2. Results of Regression Estimation

The analysis to test the formulated hypothesis was conducted using multiple regressions reported in Table 5. Before presenting the regression results, hausman specification test was performed to decide between fixed and random effect model. The hausman specification test favours fixed effect model in model 1 (X^2= 125.38, P< 0.001) and model 2 (X^2= 131.71, P< 0.001).

Table 5. *Regression Results of Fixed Effect Model.*

ER	Model 1			Model 2		
	Coefficients (β)	**t**	**P>t**	**Coefficients (β)**	**t**	**P>t**
DoB	-0.0084	-1.80	0.073	0.1512	3.52	0.000
AC	-	-	-	0.0296	1.61	0.107
DoB x AC	-	-	-	-0.0496	-3.67	0.000
FS	0.0434	12.38	0.000	0.0462	12.88	0.000
FA	0.0003	0.89	0.372	0.0005	1.59	0.113
ROA	0.0329	2.21	0.027	0.0323	2.21	0.028
Constant	-0.0318	-1.31	0.192	-0.1535	-2.63	0.009
Observations	648			648		
Companies	36			36		
F (4, 626)	47.07			36.68		
Prob >F	0.000			0.000		
R-squared	0.6780			0.6904		
Adj R-squared	0.6672			0.6790		

***, **, * are significance at 1%, 5%, and 10% levels respectively.
Source: Researcher's Compilation 2021.

As reported in Table 5, the adjusted R^2 in model 1 is 0.6672 while the adjusted R^2 in model 2 is 0.6790. This implies that model 1 explains 66.72% of the variation in ER, while model 2 explains 67.90% of changes in ER. The F statistics shows that both models are significantly fit (F= 47.07, P< 0.001 in model 1 and F= 36.68, P< 0.001 in model 2).

In addition, the outcome off the results in Table 5 indicate that DoB have insignificant negative effect on ER of listed manufacturing companies in Nigeria. This implies that DoB has no significant effect on ER as predicted by Ho_1. This result is consistent with Hafsi and Turgut (2013) who found that DoB has no effect on corporate social performance. This conclusion on the face value might look surprising. A deeper look unraveled that structure relating to DoB alone makes no difference on ER. This is also possible for theoretical reasons as DoB tends to respond mostly to agency theory as opposed to stakeholders theory. The code of corporate governance which specifies the kind of diversities also emphasizes agency theory rather than stakeholders perspective. The code of corporate governance minimizes agency cost more and only indirectly affects ER.

Both FS and ROA have positive and significant effect on ER in the short-run. The result indicates that in the short-run, a unit increase in FS results to 0.0434% increase in ER, holding all other factors constant. This effect is consistent even in the long-run as indicated in appendix 2. Also, one percent increase in ROA results to 0.0329% increase in ER *ceteris paribus*. The result is statistically significant at 5% significant level in the long-run as well. Lastly, in model 1, the result indicates that FA has no significant effect on ER both in the short-run and long-run.

Model 2 was employed to examine whether AC significantly moderates the effect of DoB on ER of listed manufacturing companies in Nigeria, hence, test of H_2. The results revealed that AC significantly moderates the effect of DoB on ER of listed manufacturing companies in Nigeria. (t= -3.67, P< 0.001). The result is consistent both in the short-run and in the long-run. Thus, this study accepts (H_O) and concludes that AC significantly moderates the effect of DoB on ER of listed manufacturing firms in Nigeria. The key implication of this finding is the agency theory which is similar to [135]. The monitoring and supervision role by the AC emphasized the disclosure that improves or reduces information asymmetry between shareholders and managers. This attitude is good but, the FRC need to include environmental disclosure in corporate governance so that it will be obligatory for companies to disclose their environmental performance.

The result also implies that board of directors and AC represent fiduciary responsibility of investor's wealth maximization more than wider stakeholders. This is considered a short–coming of the current 2018 code of corporate governance in Nigeria. To correct this, this paper argues for the establishment of environmental committee to substantiate environmental actions. Environmental committee may help the firm build environmental credibility, for example, by demanding environmental reports, the release of environmental audit results, or by encouraging firm participation in government initiatives to improve environmental practices. Also, environmental committee may be responsible for creating or approving corporate environmental policies by ensuring that firms disclose and address environmental concern, invest in clean energy, even if such investments conflict with short-term economic interests. This will be in the best interest of firms in Nigeria because poor environmental performance and reporting can expose the firm to community unrest, fines, regulatory exposure, lawsuits, and reputational loss.

5. Conclusion and Recommendations

ER is among the major issues in corporate reporting due to increasing pressure from communities, non-governmental organisations (NGO) and other major stakeholders to increase sustainable practices. Boards of directors are responsible to implement and monitor such practices. Therefore, this paper examined diversities relating board structures (herein refer to as DoB) and environmental reporting of listed companies in Nigeria. This study also shows how AC significantly moderates the effect of DoB on ER of listed manufacturing firms in Nigeria. Using the sample of 36 listed manufacturing companies in Nigeria, this research found that DoB has no significant effect on ER. This study also found that AC significantly moderates the effect of DoB on ER. Based on the findings, this study recommends that, the perspective of existing codes of corporate governance in Nigeria should be expanded to include other stakeholders. Specifically, the study recommends that environmental committee should be created in the code of corporate governance by FRC, since the audit committees roles are more on fiduciary responsibility and reducing agency cost.

This study makes an important contribution to accounting research by clarifying the concept of ‘DoB which groups all the structural diversities together. This is important to present and future studies and policy makers to have a complete view of the effect of structural diversities on outcomes. This results offer important implication to policy makers by providing evidence that both DoB and AC either separately or jointly does not encourage virtuous behaviour in terms of ER. In view of this, the study recommends for the creation of environmental committee to oversee the supervision and monitoring of environmental performance and reporting. This suggests that environmental committee is a specific or specialised governance mechanism that will consider environmental concern in strategic planning and decision making process.

References

[1] Abdulkadir, U., & Alifiah, M. N. (2020). Review of related literature on the influence of corporate governance attributes on corporate social responsibility disclosure. *Journal of critical reviews, 7* (7), 818-822.

[2] Abdi, M., Homayoun, S., & Kazemi Oloum M. (2020). Investigating the effect of audit committee characteristics on sustainability reporting level. *Iranian Journal of Value and Behavioural Accounting, 5* (9), 335-369.

[3] Abubakar, A., & Moses, S. (2020). Effect of corporate governance attributes on environmental disclosure of listed manufacturing companies in Nigeria. *European Journal of Business and Management, 12* (27), 62-67.

[4] Adams, R., de Haan, J., Terjesen, S., & van Ees, H. (2016). Board diversity: Moving the field forward. *Corporate Governance, 23* (2), 77–82.

[5] Adeniyi, S. I., & Fadipe, A. O. (2018). Effect of board diversity on sustainability reporting in Nigeria: A study of beverage manufacturing firms. *Indonesian Journal of Corporate Social Responsibility and Environmental Management, 1* (1), 43–50.

[6] Ahmad, N. B., Ju Rashid, A., & Gow, J. (2017). Board independence and Corporate Social Responsibility (CSR) reporting in Malaysia, *Australasian Accounting, Business and Finance Journal, 11* (2), 61-85.

[7] Aifuwa, H. O., Embele, K., & Saidu, M. (2018). Ethical Accounting Practices and Financial Reporting quality. *EPRA Journal of multidisciplinary studies, 15* (2), 119-210.

[8] Ajibolade, S. O., & Uwuigbe, U. (2013). Effects of corporate governance on corporate social and environmental disclosure among listed firms in Nigeria. *European Journal of Business and Social Sciences, 2* (5), 76-92.

[9] Akbas, H. E. (2016). The relationship between board characteristics and environmental disclosure: Evidence from Turkish listed companies. *South East European Journal of Economics and Business, 11* (2), 7-19.

[10] Akhtaruddin, M., Hossain, M. A., Hossain, M. & Yao, L. (2009). Corporate governance and voluntary disclosure in corporate annual reports of Malaysian listed firms, *Journal of Applied Management Accounting Research, 7* (1), 1-19.

[11] Akhtaruddin, M., & Haron, H. (2010). Board ownership, audit committees effectiveness and corporate voluntary disclosures. *Asian Review of Accounting, 18* (1), 68–82.

[12] Alarussi, A. S., Selamat, M. H., & Hanefah, M. M. (2009). Determinant of voluntary financial and environmental disclosure through the internet by Malysian listed companies. *Asian Review of Accounting, 17* (1) 59-76.

[13] Allegrini, M., & Greco, G. (2013). Corporate boards, audit committees and voluntary disclosure: evidence from Italian listed companies. *Journal of Management and Governance,* 17 (1), 187-216.

[14] Aljifri, K. A., Alzarouni, C. N. G., & Tahir, M. I. (2014). The association between firm characteristics and corporate financial disclosures: Evidence from UAE Companies. *International Journal of Business and Finance Research*, *8* (2), 101-123.

[15] Aliyu, U. S. (2018). Board characteristics and corporate environmental reporting in Nigeria. *Asian Journal of Accounting Research, 4* (1), 2–17.

[16] Aman, Z., & Bakar, N. S. (2018). The influence of the board of directors’ characteristics on corporate sustainability reporting by Malaysian public listed companies. *Journal of Humanities, Language, Culture and Business*, *2* (7), 41-55.

[17] Anazonwu, H. O., Egbunike, F. C., & Gunardi, A. (2018). Corporate board diversity and sustainability reporting: A Study of selected listed manufacturing firms in Nigeria. *Indonesian Journal of Sustainability Accounting and Management*, *2* (1), 65–78.

[18] Arayssi, M., Dah, M., & Jizi, M. (2016). Women on boards, sustainability reporting and firm performance. *Sustainability Accounting, Management and Policy Journal*, *7* (3), 376–401.

[19] Arista, D., Sabroto, B., & Hariadi, B. (2019). Effect of managerial share ownership, public share ownership, and slack resource on CSR reporting. *International Journal of Business, Economics and Law, 18* (5), 109-118.

[20] Baalouch, F., Damak, S., & Hussainey, K. (2019). A study of the determinants of environmental disclosure quality: Evidence from French listed companies. *Journal of Management and Governance. 23*, 1–33.

[21] Baba, B. U., & Abdulmanaf, K. B. (2017). Board governance mechanisms and sustainability disclosure: A moderating role of intellectual capital. *Asian Journal of Multidisciplinary Studies, 5* (10), 163–189.

[22] Baker, M. P., Bergstresser, G. Serafeim, & Wurgler, J. A. (2018). Financing the response to climate change: The pricing and ownership of U.S. green bonds. *Working paper*, available at: https://ssrn.com/ abstract=3275327.

[23] Bangun, N., Juwita, O., & dan Krisnawati, B. T. (2012). Pengaruh Kepemilikan Manajerial, Kepemilikan Institusional, dan Profitabilitas terhadap Pengungkapan Corporate Social Responsibility pada Perusahaan yang Terdaftar di BEI. *Jurnal Akuntansi, 12*, 717-738.

[24] Bedard, J., & Gendron, Y. (2010). Strengthening the financial reporting system: Can audit committees deliver? *International Journal of Auditing, 14* (2), 174-210.

[25] Beji, R., Yousfi, O., Loukil, N., & Omri, A. (2020). Board diversity and corporate social responsibility: Empirical evidence from France. *Journal of Business Ethics*, 1-23.

[26] Ben-Amar, W., Francoeur, C., Hafsi, T. & Labelle, R. (2013). What Makes Better Boards? A Closer Look at Diversity and Ownership, *British Journal of Management*, *24* (1), 85–101.

[27] Black, B., & Kim, W. (2012). The effect of board structure on firm value: A multiple identification strategies approach using Korean data. *Journal of Financial Economics,* (104), 203-226.

[28] Bicer, A. A., & Feneir, I. M. (2019). The impact of audit committee characteristics on environmental and social disclosures: Evidence from Turkey. *International Journal of Research in Business and Social Science 8* (3), 111-121.

[29] Brennan, N. M., & Merkl-Davies, D. M. (2014). Rhetoric and argument in environmental reporting: the dirty laundry case. *Account Audit Account Journal 274*, 1–11.

[30] Buniamin, S., Alrazi, B., Johari, N. H. & Abd Rahman, N. R. (2008). An investigation of the association between corporate governance and environmental reporting in Malaysia", *Asian Journal of Business and Accounting, 1* (2), 65-88.

[31] Buniamin, S. (2010). The quantity and quality of environmental reporting in annual report ofpublic listed companies in Malaysia. *Issues in Social and Environmental Accounting, 4* (2), 115-135.

[32] Buniamin, S., Alrazi, B., Johari, N. H. & Abd Rahman, N. R (2011). Corporate governance practices and environmental reporting of companies in Malaysia: finding possibilities of double thumbs up, *Journal Pengurusan*, *32* (2011), 55-71.

[33] Bushman, R. M., & Smith, A. J. (2001). Financial accounting information and corporate governance. *Journal of Accounting and Economics, 32* (1-3), 237-333.

[34] Chaklader, B., & Gulati, P. A. (2015). A study of corporate environmental disclosure practices of companies doing business in India. *Glob Bus Rev 162*, 321–335.

[35] Chaganti, R. S., Mahajan, V. & Sharma, S. (1985). Corporate board Size, composition and corporate failures in retailing industry. *Journal of Management Studies 22* (4), 400-417.

[36] Chang, Y. K, Oh, W. Y., Park, J. H., & Jang, M. G. (2017). Exploring the relationship between board characteristics and CSR: empirical evidence from Korea. *Journal of Business Ethics 140* (2), 225–242.

[37] Chiu, C. L., Zhang, J., Li, M., Wei, S., Xu, S., & Chai, X. (2020). A study of environmental disclosures practices in Chinese energy industry. *Asian Journal of Sustainability and Social Responsibility,* 5 (9), 2-21.

[38] Cho, C. H., Freedman, M., & Patten, D. M. (2012). Corporate disclosure of environmental capital expenditures: A test of alternative theories. *Accounting, auditing & Accountability Journal, 25 (4)*, 486-507.

[39] Comyns, B. (2016). Determinants of GHG reporting: An analysis of global oil and gas companies. *Journal of Business Ethics, 136* (2), 349–369.

[40] Dian, A., Wiwiek, D., Dwi & Indah R. A. (2018). Managerial ownership, corporate social responsibility disclosure and corporate performance. *Management of Sustainable Development Sibiu, Romania*, *10* (2), 67-71.

[41] Dissanayake, D., Tilt, C., & Xydias-Lobo, M. (2016). Sustainability reporting by publicly listed companies in Sri Lanka. *Journal of Clean Production, 129*, 169–182.

[42] Donwa, P. (2011). Environment accounting and host community agitation in Nigeria: the petroleum industry experience, *International Review of Business Research Papers*, *7* (5), 98-108.

[43] Ejoh, N. O., Orok, E. O. & Sackey, J. A (2014). The development of environmental accounting and disclosure practice of manufacturing companies in Nigeria. *Journal of Economics and Sustainable Development, 5* (12), 70-79.

[44] Emmanuel, O., Uwuigbe, U., Teddy, O., Tolulope, I., & Eyitomi, G. A. (2018). Corporate diversity and corporate social environmental disclosure of listed manufacturing companies in Nigeria. *Journal of Management, 16* (3), 229–244.

[45] Elkington, J. (1997). Triple bottom line reporting: Looking for balance, *Australian Accountant, 69* (2), 18-21.

[46] Elmagrhi, M. H., Ntim, C. G., & Wang, Y. (2016). Antecedents of voluntary corporate governancedisclosure: A post-2007/08 financial crisis evidence from the influential UK combined code. *Corporate Governance: The International Journal of Business in Society, 16* (3), 507-538.

[47] Ernst & Ernst, (1978). *Social responsibility disclosure: 1978 Survey*. Ernst & Ernst.

[48] Eriabie, S., & Odia, J. (2016). The influence of corporate governance attributes on corporate social and environmental disclosure quality in Nigeria. *ESUT Journal of Accountancy, 7* (1), 228 – 235.

[49] Elijido-Ten, E. (2004). Determinants of environmental disclosures in a developing country: an application of the stakeholder theory. *In Fourth Asia Pacific interdisciplinary research in accounting conference*, *Singapore*, 4- 6.

[50] Etale, L. M. & Otuya, S. (2018). Environmental responsibility reporting and financial performance of quoted oil & gas companies in Nigeria. *European Journal of Business and Innovation Research, 6* (6), 23 – 34.

[51] Ezhilarasi, G., & Kabra, K. (2017). The impact of corporate governance attributes on environmental disclosures: Evidence from India. *Indian Journal of Corporate Governance, 10* (1), 24–43.

[52] Freeman, R. E. (1984). Strategic management: A stakeholder approach. Pitman, Boston.

[53] Forbes, D. P., & Milliken, F. J. (1999). Cognition and corporate governance: understanding boards of directors as strategic decision-making groups. *Academy of Management Review*, *24* (3), 489-505.

[54] Galbreath, J. (2016). When do board and management resources complement each other? A study of effects on corporate social responsibility. *Journal of Business Ethics, 136* (2), 281–292.

[55] Ganapathy, E., & Kabra, K. C. (2017). The impact of corporate governance attributes on environmental disclosure: Evidence from India. *Indian Journal of Corporate Governance 10 (*1), 25-43.

[56] Gerged, A. M. (2021). Factors affecting corporate environmental disclosure in emerging markets: The role of corporate governance structures. *Business Strategy and the Environment*, *30* (1), 609-629.

[57] Ghassan, I. A., Oweidat, A. I., & Saleh, N. M. (2020). Audit committee versus other governance mechanisms and the effect of investment opportunities: evidence from Palestine, *Corporate Governance, 20* (3), 527-544.

[58] Ghuslan, M. I., & Mohd Saleh, N. (2017). The influence of board characteristics on sustainability. *Journal of Contemporary Issues and Thought*, *7*, 33-47.

[59] Gray R. H. (2005). Environmental Reporting, *Kaikeigaku Jiten (Dictionary of Accounting)* Y. Jinnai (eds) (Tokyo: Aoki Shoten) (in Japanese) ISBN 4-250-20508-8.

[60] Gujarati, D. N. & Porter, D. C. (2009). *Basic Econometrics*, McGraw-Hill Irwin, Boston.

[61] Gulzar, M. A., Cherian, J., Hwang, J., Jiang, Y., & Sial, M. S. (2019). The impact of board gender diversity and foreign institutional investors on the corporate social responsibility (CSR) engagement of Chinese listed companies. *Sustainability (Switzerland), 11* (2), 1–19.

[62] Habbash, M. (2010). *The effectiveness of corporate governance and external audit on constraining earnings management practices in the UK*. Unpublished Ph.D Dissertation, Durham University.

[63] Habbash, M. (2016). Corporate Governance and Corporate Social Responsibility Disclosure: Evidence from Saudi Arabia. *Social Responsibility Journal*, *12* (4), 740–754.

[64] Hafsi, T., & Turgut, G. (2013). Boardroom diversity and its effect on social performance: Conceptualization and empirical evidence. *Journal of Business Ethics*, *112* (3), 463-479.

[65] Haladu, A. (2016). Arguments for adopting only environmentally sensitive firms. *International Journal of Management Research and Review, 6* (9), 1204–1212.

[66] Handajani, L., Subroto, B., Sutrisino, T., & Saraswati, E. (2014). Does board diversity matter on corporate social disclosure? An Indonesian evidence. *Journal of Economics and Sustainable Development, 5* (9), 8-26.

[67] Harjoto, M., Laksmana, I., & Lee, R. (2015). Board diversity and corporate social responsibility. *Journal of Business Ethics, 132* (4), 641–660.

[68] Herda, D. H., Taylo, M. E., & Winterbotham, G. (2013). The effect of board independence on the sustainability reporting practices of large U.S firms. *Issues in Social and Environmental Accounting, 6 (3/4), 178-197.*

[69] Hermalin, B. E., & Weisbach, M. S. (2003). Boards of directors as an endogenously determined institution: a survey of the economic literature. *Economic Policy Review 9* (1), 7-26.

[70] Hoang, T. C., Abeysekera, I., & Ma, S. (2018). Board Diversity and Corporate Social Disclosure: Evidence from Vietnam. *Journal of Business Ethics*, *151* (3), 833–852.

[71] Hoang, T. Cam., Abeysekera, I. & Ma, S. (2016). Board diversity and corporate social disclosure: evidence from Vietnam. *Journal of Business Ethics, 27* (2), 1-20.

[72] Ho, S., & Wong, K. (2001). A study of the relationship between corporate governance structure and the extent of voluntary disclosure, *Journal of International Accounting, Auditing and Taxation*, *10*, 139-156.

[73] Huang, C. (2010). Corporate governance, corporate social responsibility and corporate performance. *Journal of Management and Organization*, *16* (5), 641–655.

[74] Ika, S. R., Nugroho, J. P., Achmad, N., & Widagdo, A. K. (2020). The impact of corporate governance on environmental reporting: Evidence from the Indonesian manufacturing industry. *IOP Conference Series: Earth and Environmental Science, 739* (2021), 1-8.

[75] Ienciu, I. A. (2012). The relationship between environmental reporting and corporate governance characteristics of Romanian listed entities. *Journal of Accounting and Management Information System, 11* (2), 267-294.

[76] International Organisation for Standardization (2002). ISO 14031, *Environmental performance evaluation*. Retrieved from http://www.altech-roup.com/ftp/EPEarticle.pdf.

[77] Innocent, O. C., & Okafor, G. T. (2018). Firm attributes and corporate environmental performance: Evidence from quoted industrial firms on Nigerian Stock Exchange. *Scholars Journal of Economics, Business and Management (SJEBM)*, *2* (5), 854–863.

[78] Isa, M. A., & Farouk, M. A. (2018). The effect of diversity-in-board, and the audit committee composition on earnings management for low and high leveraged banks in Nigeria. *Journal of Accounting, Finance, and Auditing Studies, 4* (1), 14-39.

[79] Isa, M. A., & Muhammad, S. (2015). The impact of board characteristics on corporate social responsibility disclosure: Evidence from Nigerian food product firms. *International Journal of Management Science and Business Administration, 1* (12), 34-45.

[80] Jamali, D. (2008). A stakeholder approach to corporate social responsibility: A fresh perspective into theory and practice. *Journal of business ethics, 82* (1), 213-231.

[81] Janggu, T., Darus, F., Zain, M. M., & Sawani, Y. (2014). Does good corporate governance lead to better sustainability reporting? An analysis using structural equation modeling. *Procedia-Social and Behavioral Sciences*, *145*, 138–145.

[82] Jensen, M. C., & Meckling, W. H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*, *3* (4), 305–60.

[83] Jo, H., &. Harjoto. M. A. (2012). The causal effect of corporate governance on corporate social responsibility. *Journal of Business Ethics, 106*, 53-72.

[84] Jonson, E. P., McGuire, L., Rasel, S., & Cooper, B. (2020). Older boards are better boards, so beware of diversity targets. *Journal of Management & Organization, 26* (1), 15-28.

[85] Jizi, M. (2017). The influence of board composition on sustainable development disclosure, *Business Strategy and the Environment, 265*, 640-655.

[86] KPMG, (2015). The KPMG survey of corporate responsibility reporting. Available from: www.kpmg.com/sustainability.

[87] Khan, I., Khan, I., Asim Afridi, A. (2021). Does board diversity matter for the quality of CSR Disclosure? Evidence from the financial sector of Pakistan. *Revista Brasileira de Gestão de Negócios*, *23* (1), p. 104-126.

[88] Khan, A., Muttakin, M. B., & Siddiqui, J. (2013). Corporate governance and corporate social responsibility disclosures: Evidence from an emerging economy. *Journal of Business Ethics, 114* (2), 207–223.

[89] Khan, M. H. U. Z. (2010). The effect of corporate governance elements on corporate social responsibility (CSR) reporting: Empirical evidence from private commercial banks of Bangladesh. *International Journal of Law and Management, 52* (2), 82-109.

[90] King'ori, P. G., Naibei, I. K, Sang, H. W. & Kipkosgei, A. K. (2019). Impact of envrionmental sustainability reporting on board characteristics of listed firms in Kenya. *International Journal of Economics, Commerce and Management, 7* (9), 416-43.

[91] Kock, C., Santalo, J., & Diestre, L. (2012). Corporate governance and the environment: what type of governance creates greener companies? *Journal of Management Studies, 49* (3), 492–514.

[92] Kaur, S., Raman, V. A., & Singhania, M. (2016). Impact of corporate characteristics on human resource disclosures. *Asian Review of Accounting*, *24* (4), 390–425.

[93] Kurawa, J. M., & Kabara, A. S. (2014). Effect of corporate governance on voluntary disclosure by firms in the downstream sector of the Nigerian petroleum industry, *Proceedings of World Business Research Conference, April* 21–23.

[94] Liao, L., Luo, L., & Tang, Q. (2015). Gender diversity, board independence, environmental committee, and greenhouse gas disclosure. *British Journal of Accounting Review, 47* (4), 409–424.

[95] Lisic, L. L., Neal, T. L., Zhang, I. X., & Zhang, Y. (2015). CEO power, internal control quality, and audit committee effectiveness in substance versus in form. *Contemporary Accounting Research, 33* (3), 1199–1237.

[96] Lozano, M. B., Fuente, J. A., & Garcías, I. M. (2017). The role of the board of directors in the adoption of GRI guidelines for the disclosure of CSR information. *Journal of Cleaner Production, 141* (1), 737–750.

[97] Lone, E., Ali, A., & Khan, I. (2016). Corporate governance and corporate social responsibility disclosure: evidence from Pakistan. *Corporate Governance 16* (5), 785–797.

[98] Martinov-Bennie, N., Soh, D., S., B., & Tweedie, D. (2015). An investigation into the roles, characteristics, expectations and evaluation practices of audit committees. *Managerial Auditing Journal, 30* (8/9), 727-755.

[99] Mahmood, Z., Kouser, R., Ali, W., Ahmad, Z., & Salman, T. (2018). Does corporate governance affect sustainability disclosure? A mixed methods study. *Sustainability, 10* (1), 1–20.

[100] Masud, M. A, K., Nurunnabi, M., & Bae, S. (2018). The effects of corporate governance on environmental sustainability reporting: empirical evidence from South Asian countries. *Asian Journal of Sustainability and Social Responsibility,* 3 (3), 1-27.

[101] McIlkenny, P., & Ben-Amar, W. (2015). Board effectiveness and the voluntary disclosure of climate change information. *Business Strategy and the Environment, 24* (8), 704–719.

[102] Meng, X. H., Zeng, S. X., & Tam, C. M. (2013). From voluntarism to regulation: a study on ownership, economic performance and corporate environmental information disclosure in China. *Journal of Business Ethics 116*1, 217–232.

[103] Meibo, H., & Lawrence, L. (2018). Board governance and sustainability disclosure: a cross-sectional study of Singapore listed companies, *Sustainability, 10*, 2578; doi: 10.3390/su10072578.

[104] Mgbame, C. A. M., & Mgbame, C. O. (2018). Discretionary environmental disclosures of corporations in Nigeria. *International Journal of Disclosure and Governance, 15* (4), 252-261.

[105] Mgbame, C. O., & Onoyase, O. J. (2015). The effect of corporate governance on the extent of environmental reporting in the Nigerian oil industry. *International Journal of Business and Social Science, 6* (10), 203–210.

[106] Michelon, G., & Parbonetti, A. (2012). Stakeholder engagement: corporate governance and sustainability disclosure. *Journal of Management and Governance, 16* (3), 477–509.

[107] Moses, O. O., & Ajao, O. S. (2021). Corporate governance and environmental sustainability reporting: The Nigerian Perspective. *International Journal of Scientific and Research Publications, 11* (4), 487-497.

[108] Muhammad A. N, Xiaoming, S., Riaz, S., & Ur Rehman, R. (2017). Board Attributes and Financial Performance: The Evidence from an Emerging Economy. *The Journal of Developing Areas, 51* (3), 281–297.

[109] Naseer, M., & Rashid, K. (2018). The Relationship between Environmental Reporting and Corporate Governance: Empirical Evidence from Pakistan (Online First), *Intech Open*, DOI: 10.5772/intechopen.75228.

[110] Ngu, B. S. & Amran, A. (2018). Board diversity and materiality disclosure in sustainability reporting: A proposed conceptual framework. *International Academic Journal of Economics, 5 (*1), 105-118.

[111] Ntim, C. G. (2015). Board diversity and organizational valuation: Unravelling the effects of ethnicity and gender. *Journal of Management & Governance*, *19* (1), 167–195.

[112] Nigeria code of corporate governance (2018). Retrieved from: https://nambnigeria.org/Nigeria_Code of_Corporate._Governance_2018.pdf

[113] Nussy, T. M. (2013). Corporate governance dan etnisitas terhadap pengungkapan Corporate Social Responsibility. *Jurnal Keuangan dan Perbankan*, *17* (1), 1–10.

[114] Odoemelam, N. & Okafor, R. G. (2018). Influence of corporate governance on environmental disclosure of listed non-financial firms in Nigeria. *Indonesian Journal of Sustainability Accounting and Management, 2* (1), 25–49.

[115] Ofoegbu, G. N; Odoemelam, N. & Okafor, R. G. (2018). Corporate board characteristics and environmental disclosure quantity: Evidence from South Africa (integrated reporting) and Nigeria (traditional reporting), *Cogent Business and Management*, *5* (1).

[116] Okere, W., Rufai, O., Okeke, O. C., & Oyinloye, J. B. (2021). Board characteristics and environmental information disclosure of listed manufacturing firms in Nigeria. *Journal of Business and Entrepreneurship, 9* (2), 82-93.

[117] Okoye, E. I., & Adeniyi, S. I. (2018). Company age and voluntary corporate social disclosure in Nigeria: A Study of Selected Listed Manufacturing Firms on the Nigerian Stock Exchange. *Academic Journal of Economic Studies 4* (2), 138–145.

[118] Oluwatoyin, A. A., Agbi, S. E., & Mustapha, L. O. (2021). Board characteristics and sustainability reporting of listed non-financial firms in Nigeria. *Journal of Finance and Accounting. 9* (5), 182-189.

[119] Omoye, A. S., & Wilson-Oshilim, U. D. (2018). Antecedents of Environmental Disclosure in Nigeria. *Accounting & Taxation Review*, 2 (2), ISSN: 2635-2958 (Online).

[120] Ong, T. T., Tho, H. S., Goh, H. H., Thai, S. B., & Teh B. H. (2016). The relationship between environmental disclosure and financial performance of public listed companies in Malaysia: Empirical review. *International Journal of Business Management, 10* (4), 461-467.

[121] Otuya, S., Donwa, P. A., & Egware, N. (2017). Earnings management and quality of corporate governance in Nigeria: A review of executive compensation and audit committee characteristics. *Journal of Accounting and Financial Management, 4* (4), 1-15.

[122] Osemene, O. F., Temitope, O., & Fagbemi, T. O. (2019). A study of the relationship between corporate governance and environmental reporting in Nigeria listed consumer goods companies. *Fountain University Osogbo Journal of Management (FUOJM), 4 (3), 1 – 22.*

[123] Ozordi, E. Eluyela, D. F., Uwuigbe, U., Uwuigbe, O. R. & Nwaze, C. E (2020). Gender diversity and sustainability responsiveness: evidence from Nigerian fixed money deposit banks. *Problems and Perspectives in Management, 18* (1), 119-129.

[124] Peter, G. F., & Romi, A. M. (2015). The association between sustainability governance characteristics and the assurance of corporate social responsibility. *Auditing Journal of Practice & Theory, 34 (*1), 163-198.

[125] Prado-Lorenzo, J. M., & Garcia-Sanchez, I. M. (2010). The role of the board of directors in disseminating relevant information on greenhouse gases. *Journal of Business Ethics, 97* (3), 391-424.

[126] Pramodhya, B. T. A., Uppala, S. H., Lolitha E. E. A., Gayan D. D. M., & Anuradha R. K. A. (2018). Impact of corporate governance on level of sustainability reporting of Sri Lankan listed companies. *Journal of Accounting and Business Research, 1* (1).

[127] Post, C., Rahman, N., & Rubow, E. (2011). Green governance: Boards of directors' composition and environmental corporate social responsibility. *Business & Society*, 50, 189–223.

[128] Putri, D. A., Azhar & Erlina. (2017). *Analysis of the factors that influence timeliness of financial statement submission in consumption industrial companies listed in Indonesian stock exchange (IDX)*. Retrieved form https://www.researchgate.net

[129] Primary, A. G., & Rahardja, G. (2013). Effect of good corporate governance and environmental performance on environmental disclosure: Empirical Study on Manufacturing and Mining Company Listed in Indonesia Stock Exchange and Incorporated in PROPER Year 2009-2011). *Journal of Accounting Diponegoro volume, 2* (3), 1-14.

[130] Qian, W. & Chen, X. (2021). Corporate environmental disclosure and political connection in regulatory and leadership changes: The case of China. *The British Accounting Review*, 53 (1), 100935.

[131] Rabi, A. M. (2019). Board characteristics and environmental disclosure: Evidence from Jordan. *International Journal of Business and Management*; *14* (2), ISSN 1833-3850 E-ISSN 1833-8119.

[132] Ragini (2012) Corporate disclosure of intangibles: a comparative study of practices among Indian, US, and Japanese companies. *VIKALPA 373*, 51–72.

[133] Ratna, N., Taylor, G., & Tower, G. (2015). Investigating social and environmental disclosure practices by listed Indian textile firms. *Journal of Developing Areas, Tennessee State University, College of Business, 49* (6), 361-372.

[134] Rahman, M. S. (2013). Auditor's compromise blocks good corporate governance. *The Daily Star 5th July*.

[135] Raimo, N., Vitolla, F., Marrone, A., & Rubino, M. (2020). Do audit committee attributes influence integrated reporting quality? An agency theory viewpoint. *Business Strategy and the Environment*. Advance online publication. https://doi.org/10.1002/bse.2635.

[136] Roberts, C. B. (1991). Environmental disclosures: A note on reporting practices in mainland Europe. *Accounting, Auditing and Accountability Journal*, *4* (3), 62-71.

[137] Rubino, F. & Napoli, F. (2020). What impact does corporate governance have on corporate environmental performance? An empirical study of Italian listed firms. *Sustainability, 12*, 5742, 2-21.

[138] Samaha, K., Khlif, H., & Hussainey, K. (2015). The impact of board and audit committee characteristics on voluntary disclosure: A meta-analysis. *Journal of International Accounting, Auditing and Taxation, 24,* 13–28.

[139] Salawu, M. A., Muhammed, T. D., Garba, A., & Salisu, M. (2021). Effect of board characteristics on social and environmental disclosure of listed environmentally sensitive firms in Nigeria. *Gusau Journal of Accounting and Finance, 2* (3), 1-16.

[140] Sari, M., Median, W., & Aprilia, D. A. (2021). What are the affecting factors on environmental disclosure on the companies? *Mediastima, 27* (1), 57-66.

[141] Securities and Exchange Commission. (2018). Sustainability reporting guidelines.

[142] Sen, M., Mukherjee K. & Pattanayak, J. K. (2011). Corporate environmental disclosure practices in India. *Journal of Applied Accounting Research, 12* (2), 139 – 156.

[143] Setyawan, H., & Kamilla, P. (2015). Impact of corporate governance on corporate Environmental disclosure: Indonesian evidence. *International conference on trends in Economics, humanities and management*. 13-18.

[144] Shamil, M. M., Shaikh, J. M., Ho, P. L., & Krishnan, A. (2014). The influence of board characteristics on sustainability reporting: Empirical evidence from Sri Lankan firms, *Asian Review of Accounting, 22* (2), 78-97.

[145] Sharif, M., & Rashid, K. (2014). Corporate governance and corporate social responsibility (CSR) reporting: empirical evidence from commercial banks (CB) of Pakistan. *Quality & Quantity*, *48* (5), 2501–2521.

[146] Shirodkar, Beddewela, E., & Richter, U. H. (2016). Firm-level determinants of political CSR in emerging economies: evidence from India*. Journal Business Ethics, 1*–16.

[147] Soetedjo, S., Soewarno, N., Iswajuni,. & Amu, S. (2018). The effect of ownership structure on corporate social responsibility disclosures. In Proceedings of the *Journal of Contemporary Accounting and Economics Symposium* 2018 on Special Session for Indonesian Study (JCAE 2018) - Contemporary Accounting Studies in Indonesia, 91-97.

[148] Solabomi, O. A., & Uwalomwa, U. (2013). Effects of corporate governance on corporate social and environmental disclosure among listed firms in Nigeria. *European Journal of Business and Social Sciences, 2* (5), 76-92.

[149] Solomon, P. J. (2020). Environmental disclosure and financial performance of listed Oil and Gas companies in Nigeria: A review on literature. *IOSR Journal of Business and Management, 22* (9), 58-66.

[150] Soliman, M. M., & Ragab, A. A. (2014). Audit commsittee effectiveness, audit quality and earnings management: An empirical study of the listed companies in Egypt. *Research Journal of Finance and Accounting*, *5* (2), 155-166.

[151] Soliman, M. (2013). Firm characteristics and the extent of voluntary disclosure: The case of Egypt. *SSRN Electronic Journal, 4* (17), 71–81.

[152] Sulaiman, M., & Moktar, N. (2012). Ensuring sustainability: A preliminary study of environmental management accounting in Malaysia. *International Journal of Business and Management Science, 5* (2), 85-102.

[153] Susilo, H. Saraswati, E., & Rosidi, (2019). Corporate governance and profitability on corporate social disclosure. *South East Asia Journal of Contemporary Business, Economics and Law, 19* (5), 122-137.

[154] Suprapti, E., Fajari, F. A., & Anwar, A. S. H. (2019). Pengaruh Good Corporate Governance Terhadap Environmental Disclosure. *Jurnal iIlmu iAkuntansi*, 215–226.

[155] Tamoi, J., Faizah, D., Mustaffa M. Z., & Yussri, S. (2014). Does good corporate governance lead to better sustainability reporting? an analysis using structural equation modeling. *Procedia - Social and Behavioral Sciences, 145*, 138 – 145.

[156] ThankGod, C. N., Emmanuel, A. L. I., & Clifford, O. O. (2021). Board characteristics and environmental disclosure of quoted oil and gas firms in Nigeria: The moderating role of firm size. *International Journal of Innovative Finance and Economics Research 9* (4), 51-62.

[157] Trireksani, T. & Djajadikerta, H. G. (2016). Corporate governance and environmental disclosure in the Indonesian mining industry, *Australasian Accounting, Business and Finance Journal, 10* (1), 18.

[158] Votsi, N. E. P., Kallimanis, A. S., & Pantis, I. D. (2017). An environmental index of noise and light pollution at EU by spatial correlation of quiet and unlit areas. *Environmental Pollution, 221*, 459–469.

[159] Uyagu, B. D., Okpanachi, J., Nyor, T., & Muhammad, L. M. (2017). Effect of firm characteristics on environmental reporting practices of listed manufacturing firms in Nigeria. *Nigerian Journal of Management Sciences, 6* (1), 139-148.

[160] Uwigbe, U. (2011). *Corporate environmental reporting practices: a comparative study of Nigerian and South African firms*. An unpublished PhD thesis submitted to the department of accounting, Covenant University, Ota, Ogun State.

[161] Welbeck, E. E., Yaw, M. G., Owusu, G. M., Bekoe, R, A., & Kusi, J. A. (2017). Determinants of environmental disclosures of listed firms in Ghana. *International Journal of Corporate Social Responsibility*, 2 (11), DOI: 10.1186/s40991-017-0023.

[162] Williams, S. (2001). Intellectual capital performance and reporting practice related? *Journal Intellect Cap 23*, 192–203.

[163] Yahaya, O. A., Tanko, M., & Muhammad, L. M. (2017). Effects of corporate characteristics on earnings quality of listed deposit money banks in Nigeria. *KASU Journal of Management Sciences*, *8* (1), 47-64.

[164] Yahaya, O. A., & Andow, H. A. (2015). Capital structure and firm's financial performance: Panel evidence of listed conglomerate firms in Nigeria. *Kaduna Business Management Review*, *2* (1), 1-25.

[165] Yusof, S. M., Nordin, N. A., Jais, M., & Sahari, S. (2019). Impact of board diversity on corporate social responsibility on Malaysian Public Listed Companies. *International Journal of Academic Research in Business and Social Sciences*, *9* (7), 1049–1069.

[166] Zarah N. (2000). Realising corporate social responsibility in Malaysia: A view from the accounting profession. *Journal of Corporate Citizenship*. *3* (2) 101-114.

[167] Zhang, J. Q., Zhu, H., & Ding, H. (2013). Board composition and corporate social responsibility: an empirical investigation in the post sarbanes-oxley era. *Journal of Business Ethics, 114* (3), 381–392.