



CORPORATE GOVERNANCE ATTRIBUTES AND FIRM-SPECIFIC FEATURES AS DETERMINANTS OF SUSTAINABILITY INITIATIVES OF LISTED FINANCIAL AND NON-FINANCIAL COMPANIES IN NIGERIA

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Abstract - As a result of the low attention given by companies towards sustainability initiatives, this study aims to examine the influence of corporate governance mechanisms and firm-specific attributes on sustainability initiatives among listed companies in Nigeria from 2016 to 2021. The data analysis is based on all firms recognized by the world corporate social responsibility consensus rater (CSRHUB) in Nigeria. The data were analyzed using panel regressions. The Breusch/Pagan test was performed. In addition, the study performed robust random and fixed effect tests, the fixed generalized least square, the panel-corrected standard error, and the Driscoll and Kraay standard error in testing the hypotheses. The results from models 5, 6, and 7 are consistent, showing that board independence, size, and age positively influence sustainability initiatives. In contrast, board size and firm leverage are negatively related to sustainability initiatives. However, the findings show that board gender diversity does not significantly affect sustainability initiatives.

Keywords: corporate governance mechanism, board size, board independence, firm attributes, sustainability initiatives, Nigeria.

1. INTRODUCTION

Institutionalized corporations have been tasked by the United Nations with fulfilling the Sustainable Development Goals by 2030 [1]. In response, numerous sustainability concepts encouraging firms to contribute to environmental and social well-being have been incorporated into the revised Nigerian Code of Corporate Governance (2018). In addition, the Central Bank of Nigeria, which regulates the industry, issued sustainability principles to guide the reporting of financial institutions and other enterprises' sustainability efforts [2].

Nigeria has just undergone its most severe recession in two decades; however, with the easing of pandemic restrictions and the implementation of anti-shock policies, economic recovery is expected to gradually begin in 2021. As a result of the fall in oil prices, Nigeria was extremely susceptible to global economic upheaval. The World Bank estimates that by the year 2021, oil will have accounted for more than 80 per cent of exports, 30 per cent of banking sector lending, and 50 per cent of government revenues. In 2018, it was estimated that 40 per cent (83 million) of Nigerians were poor and 25 per cent (53 million) were at risk of poverty due to unforeseen circumstances. This means that by 2023, an additional 12 million Nigerians are projected to live in poverty. [3].

Consistent with the foregoing, Nigeria's economic prognosis remains highly unclear, given the mode of recovery being threatened by volatility in the oil industry, including an unanticipated shock in oil prices, and difficulties in the financial sector [4]. Without the backing of business organizations in the sectors of the economy, a strong recovery will require the policy reaction of Nigeria's authorities. Human capital development in Nigeria ranks 150 out of 157 countries in the World Bank's 2020 Human Capital Index, in spite of the country's current socioeconomic improvements (The World Bank, 2021). Regrettably, there is a dearth of hard data on what drives Nigerian corporations to implement sustainability initiatives (SI). Previous empirical investigations on the effects of SI have mostly ignored



developing countries, particularly those in sub-Saharan Africa (Bour *et al.*, 2019; Macneil *et al.*, 2022).

Consequently, among the few conducted investigations in developing economies are those of Aksoy *et al.* (2020), and Crisóstomo *et al.* (2020). A deficiency of empirical research on the potential effects of SI in Sub-Saharan Africa persists. In Nigeria, for instance, the function of board composition that include board size (BSZE), board gender diversity (BGD), and board independence (BOIND) is not studied sufficiently (Bashiru *et al.*, 2022). The board of directors is responsible for making executive rules and ensuring that they are actively implemented, as they oversee the day-to-day management process and internal affairs. The board of directors determines organizational strategy and oversees its execution by providing direction to upper management. Accordingly, as proven by Bashiru *et al.* (2022) and Aksoy *et al.* (2020), internal factors of the organization like size, age, and leverage may also play a key role in SI in Nigeria.

In addition, companies have begun to see corporate governance mechanism (CGM) as a comprehensive instrument for increasing the company's worth by monitoring performance regarding sustainability (Adedeji *et al.*, 2020; Montiel & Delgado-Ceballos, 2014; Warren-Myers, 2013). As one of the fastest-rising economies, Nigeria listed enterprises make it more important to understand how CGM and SI connect. Companies in a variety of countries, such as South Africa, Australia, the United States, and the United Kingdom, also actively engaged in sustainability programs [12]. Though businesses operate in a wide variety of economic, ecological, social, and governmental contexts, it is important to explain the specific factors that influence each company's sustainability approach. The importance of understanding the role of corporate boards in constructing responsiveness for corporate sustainability cannot be underestimated. Therefore, sustainability activities include learning about business policies, organizational structures, and economic, environmental, social, and governance practices that advance corporate social responsibility [CSR] (Hamid & Othman, 2019).

It is also widely held that corporate governance mechanism (CGM) represents the pinnacle of openness and honesty in business [14]. For companies to succeed and be held accountable, disclosure regulations are vital [15]. In light of the foregoing, several institutions (including government agencies, stock market regulators, the media, and academia) have advocated for greater openness and sustainability in business as a means of evaluating how well firms manage risks. Hence, achieving organizational success is guided by corporate governance (CG), which consists of a collection of frameworks and procedures for goal-setting, progress monitoring, and evaluation.

In light of the previous studies, the motivation of this study is to empirically examine the significance of CGM which include BSZE, BGD, and BOIND, and firm-specific attributes (FA) that comprises company size (CSZE), company age (AGE), and company leverage (LEV) in the decision to engage in SI among publicly traded Nigerian listed firms. This is because of its importance on procedures for progress monitoring, and evaluation of essential governance and firm-specific attributes on sustainability practices [16]. This study builds its assumptions on institutional, legitimacy and stakeholder theories. The theories are bolstered by the findings that show a favourable link between independence of the board, size of company, age of company and SI. Surprisingly, the number of board members and leverage shows a negative link with SI. As documents by the research findings the representation of women on the board had no effect on SI.

1.1 Sustainability Initiatives

Sustainability initiatives practically require integrating sustainable development objectives into the business's daily operational activities, which includes; encouraging social justice, raising economic effectiveness, and enhancing environmental performance [17]. Initiatives to encourage business sustainability have been created to regulates environmental management, as confirmed by the Sustainability Reporting Guidelines, the Global Reporting Initiatives (GRI), ISO 14001, and the United Nations Global Compact (UNGC), (Aksoy *et al.*, 2020). Yet achieving a sustainability initiatives stability between social, environmental, and economic concert at the firm's management level is extremely challenging [18].

Some studies, such as Friedland and Jain (2022), Clark & Brown (2015), Goranova and Ryan (2015), have discussed the concepts of CG and CSR relationships and edges with one another. As revealed by



Olayinka (2022), CGM had an optimistic and substantial connection with the SI of selected quoted firms in Nigeria. However, various empirical studies have examined the impact of CGM as predictors of SI on the financial and non-financial sectors. Despite some obstacles to develop sustainability initiative practices in Africa, little empirical research has focused on the variables that motivate businesses to adopt such practices [22].

In Turkey, Aksoy *et al.* (2020) investigate the factors that affect the SI of Turkish manufacturing firms that are included in the Borsa Istanbul Sustainability Index. Stakeholder theory served as the foundation for assumptions about SI with firm-specific traits and board features. According to their research, the SI of Turkish firms is positively influenced by the size of the business board and the percentage of independent directors. These findings relate to the diverse expertise sets for independent directors of the company in relation to the environmental policies and sustainability efforts as part of the corporate strategy. On the other hand, financial performance relates with SI, and female directors have no impact on SI [7].

What motivates businesses to invest in SI was investigated by Artiach *et al.* (2010) in the United States. To assess the internal firm features that are linked to high-level SI, they compared industry leaders in SI with more conventional organizations. Their findings reveal that value-driven businesses have greater size, more promising futures, and greater returns on equity. But, they are inconsistent in asserting that a company's liquidity or leverage has any appreciable bearing on SI [24].

Additionally, Atoyebi and Okpe (2021) conduct an empirical analysis of the impact of sustainability reporting on the bottom lines of Nigerian manufacturing firms. These findings demonstrate that economic and environmental performance positively and significantly affect the economic performance of listed industrial organizations, based on data from the yearly reports of the sampled companies. Similarly, Asuquo *et al.* (2018) found little evidence that sustainability performance disclosure affects the financial performance of Nigerian breweries. Their research shows that the selected brewery companies' ROA is unaffected by economic, social, and environmental disclosures. Accordingly, the sustainability practices of publicly traded oil and gas firms in Nigeria is investigated by Bashiru *et al.* (2022). The studies reveal that the size of the board, the proportion of women on the board, and the number of independent board members have significant effects on SI. There was an optimistic link between company size and SI, but a negative connection between leverage and profitability. The previous study focused mostly on the short-term financial impact of SI, which may be negatively impacted by the expense of implementing sustainable practices. Rebuilding production facilities from the ground up can be expensive, but it is sometimes important to adopt sustainable operations and reduce environmental pollution and hazards [27]. Since SI helps companies maintain good relations with their constituents, it pays off in the long run (Aksoy *et al.*, 2020). Therefore, SI may not immediately increase profits for the company.

Previous studies have looked into the root origins and implications of SI by employing a wide range of theoretical lenses. Frequently used theories include resource dependency theory, stakeholder theory, institutional theory, and legitimacy theory (Crisóstomo *et al.*, 2020; Bashiru *et al.*, 2022; Johnson-Rokosu & Olanrewaju, 2016). Although many different types of previously evaluated publications exist in the fields of CG and SI, Literature reviews have revealed the necessity for further research on CG and SI (Jain & Jamali, 2016; Aguilera *et al.*, 2015; Brown *et al.*, 2011). This evaluation focuses on peer-reviewed studies published between 2000 and 2018 that address CG procedures and their effect on CSR initiatives.

In light of the aforementioned, Jain and Jamali (2016) examined the various firm owner types and formal and informal institutional mechanisms operating within the organization. Directors' demographic diversity, board structures, and directors' social capital and resource networks had equally been researched at the group level. However, they also look at CEOs on an individual level to learn about their demographic and sociopsychological characteristics. To better understand the impact of CG systems on SI, they advise that future research use a multi-theoretical lens, incorporating qualitative and quantitative methodologies. As such, Aguilera *et al.* (2015) gave internal governance measures a lot of weight (i.e., the board of directors, controlling owners, and managerial incentives).



This literature generally discounts the significance of external CG practices in preventing managers from engaging in harmful actions that harm shareholders and the organization as a whole. Finally, they propose a roadmap for future research in CG that will result in more complete blending of internal and external forms of governance. Also, it argues that different combinations of external and internal governance mechanisms are needed to determine what constitutes effective CG toward SI (Aguilera *et al.*, 2015). The principles around which CG is built include accountability, openness, justice, and corporate responsibility [32]. Therefore, it is highly persuasive that board composition (board size, board independence, and board gender diversity) as well as firm-specific attributes (company size, company age, and leverage) be investigated for their potential role in explaining the relationship between CG and SI, as proposed by Zaman *et al.* (2020).

1.2 Inferences for Theories

This research employed institutional, legitimacy and stakeholder theories to investigate the effect of governance mechanisms and firm-specific attributes in SI. Stakeholder theory emphasizes that a company is accountable to not just the providers of funds but numerous stakeholders as well as the society and location where it exists [33]. According to Freeman and McVea (2005), 'stakeholders are any group or individual who can affect or is affected by the achievement of an organization's objectives'. Hence, stakeholders play dynamic roles in the survival and development of a company. Beneath stakeholder theory, Khuong *et al.* (2021) and Michelon and Parbonetti (2012) contended that good CGM enhances firm-stakeholder relationships by nurturing SI. They further consider good governance and SI as complimentary features for better stakeholder management. As a result, SI can be used by firms for environmental preservation and societal benefit.

Therefore, by examining the factors that influence SI among listed companies recognized by CSRHUB in Nigeria, this research helps to fill out the existing theoretical framework. As buttress further by Nguyen *et al.*, (2023) that stakeholder theory offers a link between governance mechanism and sustainability initiatives for positioning long-standing management-stakeholder objectives. Similarly, legitimacy theory posits that more sustainability practices will be needed with the outside community if a company operates longer (Suchman, 1995). Hence, Findings from this study may be relevant to these organizations and regulatory bodies, such as the central bank of Nigeria, since institutional theory provides emphasis on coercive, normative and mimic pressures on organizations to adhere to the regulatory agencies [37]. In addition, the Nigerian stock exchange, as standard-setters will benefit since they highlight the need for satisfying disclosure guidelines to intensify public awareness of the value of sustainability practices in Nigeria.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The hypothesis development of this research covers BSZE, BOIND, BGD as well as CSZE, AGE, and LEV with the SI, and it starts with BSZE and SI below.

2.1 Board Size and Sustainability Initiatives

An active board of directors might lead to a better concert and public perception, as well as the proactive application of SI. The size and complexity of a company's operations dictate the number of people who should serve on its board of directors (Aksoy *et al.*, 2020). According to stakeholder theory (ST), a larger board gives stakeholders a greater influence on SI, as well as ensuring bureaucratic fairness and effective business decisions (Freeman & Evan, 1990; Friedman & Miles, 2002). Previous research has shown that the size of the board affects SI. For example, Majeed *et al.* (2015) and Tjahjadi *et al.* (2021) found a favorable correlation between board size and environmentally responsible policies. Similarly, other existing studies shows that board size has raise environmental SI (Alabdullah *et al.*, 2019; Trireksani & Djajadikerta, 2016; Raimo *et al.*, 2021). On the contrary, Hussain *et al.* (2018), Nwude and Nwude, (2021), demonstrated that board size is inversely associated with SI. However, Simon *et al.* (2020) documented that board size had no significant effect on environmental SI among listed manufacturing firms in Nigeria. In line with ST and prior studies that show board size helps in promoting fairness by ensuring stakeholders are more directly represented in corporate decisions and SI. Accordingly, this study proposes that:

H1: There is a positive relationship between board size and SI



2.2 Board Independence and Sustainability Initiatives

According to the stakeholder theory, independent directors should have a favorable effect on SI since they are less likely to be influenced by shareholders' and supervisors' interests than executive boards (Hussain *et al.*, 2018). In addition, as outsiders to the board, they feel a greater obligation to the interests of many different groups. The stakeholder theory (ST) as confirmed by Freeman and McVea (2005), that firms are open systems that its impact are affected by other actors both inside and outside the system. It coincides with Lone *et al.* (2016) argument that ST helps independent directors in lessening conflicts of curiosity between the company's management and stakeholders.

Prior research by Ahmad *et al.* (2017), Asri *et al.* (2013), and Mousa *et al.* (2018) have linked independent directors to greater SI. In addition, Hörisch *et al.* (2020), documented that board's ability to maximize the value of its stakeholders depends on its ability to maintain its independence. Many Malaysian companies have CSR initiatives, but some studies have found no evidence that independent directors have a significant impact on these efforts [51]. Similarly, Akbas (2016) discovered lack of connection between board independence and environmental sustainability policies. Though, Haniffa and Cooke's (2005) research, for example, finds that executive directors report higher CSR in Malaysian businesses than was found in the preceding evaluation. This is disputed by Pucheta-Martínez *et al.* (2019), who argue that the independence of the board has no bearing on SI. Because of this, it is assumed that boards with a higher percentage of independent directors attempt harder to incorporate SI into corporate policy. Therefore, the following hypothesis is formulated:

H2: *There is a positive relationship between board independence and SI.*

2.3 Board Gender Diversity and Sustainability Initiatives

Since women are more likely to be affected by environmental and societal concerns and to have a more optimistic outlook on ethical issues, their representation on corporate boards may have a favorable effect on SI (Cancela *et al.*, 2020; Chams & García-Blandón, 2019; Zaid *et al.*, 2020). Due to economic and social differences as well as male dominance, the role of women in the boardroom is an important part of CG. Accordingly, their participation on the board affects its long-term viability [58]. Legitimacy theory (LT) is the most extensively used theory to explain the differences in gender and the degrees of CSR activities, as claimed by Rashid (2018). Gender diversity on boards has been shown to increase board control, improve monitoring of company decision-making, and strengthen stakeholder interactions concerning corporate social responsibility (CSR) efforts (Ain *et al.*, 2021; Al Fadli *et al.*, 2019; Issa *et al.*, 2022; Simionescu *et al.*, 2021). It has been shown in numerous studies, including those by Bannò *et al.* (2021), Naveed *et al.* (2021), and Ben-Amar *et al.* (2017), that the presence of women has a salutary effect on social and environmental performance, hence raising SI. Additionally, Glass *et al.* (2016) examine how firms' corporate environmental strategies change when led by women in positions of authority. Their findings show that the gender balance of top management has an effect on business strategy and that the proportion of female CEOs is inversely associated with green efforts. To evaluate the effects of having board members from both sexes, Suci *et al.* (2021) provide a comparative analysis. Their findings do not seem to support the idea that more females on boards lead to better SI, and they do not establish any negative connection between the lack of women on boards and a company's SI either. In line with the foregoing, the following hypothesis is formulated:

H3: *There is a positive relationship between board gender diversity and SI.*

2.4 Company Size and Sustainability Initiatives

Prior studies predict that SI will be significantly impacted by a company size (Aksoy *et al.*, 2020; Amran *et al.*, 2015). In general, authorities and other interested parties pay more attention to large companies because of their greater visibility (Artiach *et al.*, 2010). Additionally, bigger firms have more financial resources to cover the cost of CSR initiatives [69]. An optimistic association between the firm's size and SI has been documented by several empirical studies, (Sroufe & Gopalakrishna-Remani, 2019; Malik *et al.*, 2020; Ghazali, 2007). Similarly, Pham *et al.* (2021), Ja'afar *et al.* (2021), Elijido-Ten and Tjan (2014), De Villiers *et al.* (2014), and Uwuigbe *et al.* (2018) found that the size of a company has a significant impact on sustainability practices vis-à-vis social and environmental issues. Nevertheless, Thomas and Indriaty (2020) found that company size was insignificant with SI.



As buttressed further by De Villiers *et al.* (2014), they also found no substantial link between the dimensions of a corporation and its environmental sustainability.

Concerning the above, institutional theory confirm that larger organizations are more susceptible to sustainability procedures than smaller companies [37]. Numerous scholars, like Aguilar-Fernández and Otegi-Olaso (2018) and Schnackenberg and Tomlinson (2016), have underpinned the above assertion that larger corporations have more stakeholders, meaning they are held to a higher standard of transparency and accountability. Firms are compelled to participate in sustainability practices because their business model is developed toward sustainable innovation and prioritizes the interests of debt holders over those of less influential stakeholders. In line with the above argument, the following hypothesis is formulated:

H4: *There is a positive relationship between company size and SI.*

2.5 Company Age and Sustainability Initiatives

There is a correlation between the age of the organization, the rate at which it adopts sustainability rating indices, and the length of time it takes to put those indices into practice (Trencansky, *et al.*, 2014). According to their findings, older companies have longer implementation times than younger ones. ST considers the expectations of various stakeholder groups and their influence on corporate policies [81].

Studies such as Basuony *et al.* (2014) and Godos-Díez *et al.* (2011) revealed a significant positive relationship between firm age and SI practices. They claim that more prominent and older firms positively affect productivity, which leads to improved SI practices. Although Trencansky *et al.* (2014) concluded that the effect of company age on sustainability score, covered by the majority of sustainability perspectives, is statistically insignificant. This has been confirmed by Younis and Sundarakani (2020), who documented that firm age has no relationship with SI. In Nigeria's context, a survey conducted by Benjamin *et al.* (2017) agrees that age is significant and certainly connected to the environmental sustainability practices of listed manufacturing firms at a 1per cent confidence level with p-values of 0.000 each. It implies that if a firm's age increases, its environmental sustainability practices will also increase. The LT posits that more sustainability practices will be needed with the outside community if a company operates longer. Based on the above argument, the following hypothesis is formulated:

H5: *There is a positive relationship between company age and SI*

2.6 Leverage and Sustainability Initiatives

A company's debt levels can be used as a proxy to influence the company's numerous financial interest groups. From the perspective of the various stakeholders, it is obvious that there are a wide variety of monetary and other interested parties [86]. The ST posit that actions have also been developed based on connections between leverage and SI. Companies with a high level of debt spread voluntary information and rules of behavior to save costs and, by extension, capital expenditures [87]. Leverage's association with SI has been demonstrated by studies such as Nazari *et al.* (2015) and Hussan (2016). They affirmed that leveraged companies face increased in financial risk and, as a result, report more sustainability data.

Furthermore, Nwude and Nwude (2021), and Yang and Lai (2021) state firmly that there is a relationship between financial leverage and SI. However, Uwuigbe *et al.* (2018) found that firms' financial leverage (as measured by their debt-to-equity ratio) significantly correlates negatively with the level of environmental disclosure made by companies. It is believed that companies with larger debt loads require thorough sustainability processes to meet the necessities of money lenders and other investors [91]. Therefore, as the firm's leverage rises, we expect it to prioritize the needs of its debt holders over those of its other less influential stakeholders. In line with the above, the following hypothesis is formulated:

H6: *There is a positive relationship between company leverage and SI*

3. DATA AND METHODOLOGY

The study's population covers all corporations listed on the Nigerian Stock Exchange (NSE). As of December 2021, there are 168 listed entities on the NSE (NSE Daily official listing, March 1, 2022).

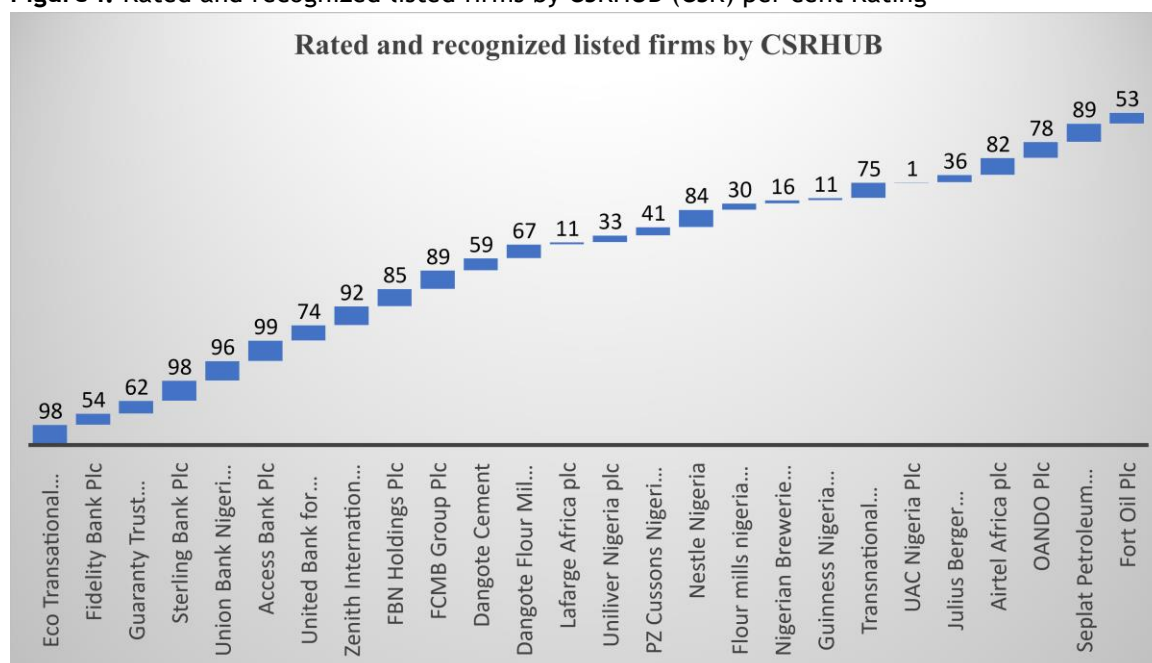


However, this study considers the quoted companies in Nigeria that are rated and ranked by the CSRHUB, a consensus rater amongst all sectors of economic, social, and governance (ESG) due to their enormous contribution to the field of CSR globally. The time frame for the research is six (6) years, from 2016 to 2021. An assessment of companies' roles in promoting environmentally friendly practices has been conducted, as we deem it necessary to study the effect of sustainability initiatives on all sectors. This study adopted a purposive sampling technique in drawing its samples. The purposive sampling procedure necessitates focusing on entities with precise structures that could offer information on a study issue [92]. Consequently, twenty-six (26) corporations in Nigeria have taken a stance on corporate social responsibility, which forms the sample of this study. As shown in Figure I below, Access Bank has the highest percentage contribution to CSR at 99per cent, followed by Ecobank and Starling Bank with 98per cent. In addition, Guarantee Trust and Fidelity have a lower rate of 62per cent and 54per cent, respectively.

In addition, Seplat Petroleum has the highest percentage of 89 contributions to CSR in the oil and gas industries, followed by Nestle plc with 84per cent in the consumer goods industries. However, despite the long years in operation and societal patronage, Guinness Nigeria plc, Lafarge Africa plc, and UAC Nigeria plc have the lowest contributions to CSR with 11per cent, 11per cent, and 1per cent, respectively. Therefore, there is a need to investigate the effect of sustainability practices among the listed companies in Nigeria.

Prior studies such as Hamid and Ibrahim (2020), Mohammed *et al.* (2016), Nwobu *et al.* (2017), and Uwuigbe *et al.*, (2018) focused on either the selected deposit money banks, manufacturing enterprises, insurance companies, oil and gas, respectively, which covers the financial or non-financial sectors of the listed firms in Nigeria. Hence, this study focuses on the quoted companies rated and ranked by the World CSR Consensus Rating in Nigeria, including all sectors. Therefore, we drew upon the annual reports and financial statements of sample companies for our research. In addition to employing multivariate panel regression analysis, we also use descriptive statistics to help us understand the relationships between our research variables.

Figure I. Rated and recognized listed firms by CSRHUB (CSR) per cent Rating



Source: CSRHUB (11, 2021)

3.1 Variables Measurement

The unweighted disclosure index is used to measure SI, which is the dependent variable for this study. In line with prior studies such as Bashiru *et al.* (2022), Waheed *et al.* (2021), and Jamil *et al.* (2021) also utilized the unweighted disclosure index to measure the degree of the SI as



dichotomous variable. If a company disclosed SI items in its annual report, it would be counted as ‘1’, while companies that did not reveal an item would be recorded as ‘0’ [97]. Total score values for SI disclosure are aggregated from all sub-scores of SI, including 14 economic dimensions, 12 social dimensions, 15 environmental dimensions, and 15 governance dimensions. The disclosure model scoring is additive, and unweighted indexes are calculated. The disclosure indexes comprising 56 sustainability indicators were utilized. The total amount of scores is computed by dividing the firm’s scores by the total number of potential points.

Six independent variables were used, composed of governance mechanisms and firm-specific operating attributes. The governing mechanisms encompass board size (BSZE), board independence (BOIND), and board gender diversity (BGD). Hence, Ain et al. (2021), Abu Qa’dan and Suwaidan (2019), Hussain et al. (2018), Issa et al. (2022), Nwude and Nwude (2021) all agree that BSZE can be quantified by counting the number of board members. Consistent with Pavić Kramarić et al. (2018), this study measured board size as a natural logarithm of the total members on the board. The Board of Directors’ Independence (BOIND) is defined as the percentage of independent non-executive directors (INED) to the total number of directors on the board (Al Amosh & Khatib, 2021; Jizi & Nehme, 2018; Nwude & Nwude, 2021 Rashid, 2018). Board gender diversity was measured as the percentage of women on the board of directors relative to the total number of board members (Ain et al., 2021; Chams & García-Blandón, 2019; Nwude & Nwude, 2021; Orazalin & Baydauletov, 2020). Whereas, the operating attributes consist of company size (CSZE), company age (AGE), and leverage (LEV). When calculating CSZE, natural logarithms of the firm’s total assets were used (Ain et al., 2021; Crisóstomo et al., 2020; Malik et al., 2020; Wu et al., 2020). The number of years that a company has been in operation was used to calculate AGE (Issa et al., 2022; Wu et al., 2020). Total debt is divided by total assets to get the LEV (Crisóstomo et al., 2020; Li et al., 2018; Nwude & Nwude, 2021; Wu et al., 2020).

3.2 Description of the Model

The purpose of this research is to evaluate governance mechanism and firm-specific attributes over 6 years as predictors of SI for publicly traded firms in Nigeria. As a result, the research employed an equation-based panel regression model:

$$Slit = B0it + B1BSZEit + B2BOINDit + B3BGDit + B4CSZEit + B5AGEit + B6LEVit + \dots \mu it \dots \dots \dots i$$

Where:

- B0- symbolizes the beta coefficient value of the panel model regression
- B1- B6 indicate beta coefficients of the descriptive variables for the study
- μ represent the regression model’s error term
- BSZE = number of directors on the board, BOIND = ratio of independent directors, BGD = ratio of female directors, CSZE = company size, AGE = years since the firm was established, and LEV = leverage. *i* signifies the number of firms, and *t* implies the number of years.

Table 1 presents the operational measurements and sources of variables used in the equation.

Table 1. Operational measurement of variables

Dependent Variables	Code	Measurement	sources
Sustainability Initiatives	SI	Total score values for Sustainability disclosure are aggregated from all sub-scores of SI	Sustainability reports or Annual report
Independent Variables			
Board size	BSZE	The number of directors on the board.	Annual report
Board independence	BOIND	The number of independent directors to the total number of board members.	Annual report



Board gender diversity	BGD	Percentage of females to the total number of board members	Annual report
Company size	CSZE	Measured as a natural log of total assets.	Annual report
Company Age	AGE	The age of the firm	Annual report
Leverage	LEV	Measured as total debt to total assets.	Annual report
μ		error term	

Source: Author's Compilation

4. Results

The results of the study's descriptive statistics, correlation analysis, and Multivariate regression are presented below.

Table 2 presents the summary of descriptive statistics below,

Table 2. Summary of descriptive statistics

Variable	Mean	Std. dev.	Min	Max
SI	0.369	0.062	0.268	0.555
BSZE	2.534	0.279	1.792	3.091
BOIND	5.404	3.333	0.000	20.000
BGD	2.872	0.602	0.693	4.017
CSZE	3.012	0.077	2.828	3.180
AGE	3.699	0.582	1.946	4.585
LEV	0.709	0.195	0.291	1.066

In this section, Table 2 shows the descriptive statistics for the study variables for the 26 firms that have been validated by CSRHUB. The mean and standard deviation are shown in columns 2 and 3, while minimum and maximum scores are shown in columns 4 and 5. It is found that the companies have on the average SI score of 36.9, a minimum and a maximum of 26.8 and 55.5 respectively. Further, BSZE on average has a mean value of 2.53 with minimum of 1.79 and maximum of 3.09 for directors serving on the corporate boards. The average number of independent non-executive directors serving on the boards is 5.404, with the number of independent and non-executive directors limited to 20. Though certain companies lack independent non-executive directors. Roughly, for gender diversity, it is shown that females on average represent 2.872 on the board.

Additionally, the CSZE, measured as a natural log of total assets as cited in Malik *et al.*, (2020), has an average value of 3.012 in logs of million Naira. The average age of sample firms is 3.699 in logs of years. From the descriptive statistics, we may infer on average that companies used 70.9 per cent leverage to fund their operations, which could affect the overall level of SI. The SI may change if a company increases its reliance on debt financing to fund its operations. Table 3 presents the correlation analysis of the study variables below,

Table 3 Pearson correlation analysis

Variables	1	2	3	4	5	6	7	VIF
1. SI	1.000							
2. BSZE	0.025	1.000						2.18
3. BOIND	0.194**	0.365***	1.000					1.77
4. BGD	-0.054	-0.094	0.144	1.000				1.09
5. CSZE	0.108	0.559***	-0.178	-0.274*	1.000			2.67
6. AGE	0.142**	0.111	0.381***	0.113*	-0.212*	1.000		1.32
7. LEV	-0.063	0.297***	-0.271	-0.190*	0.605***	0.017*	1.000	1.80

Note: Prob>Chi² 0.0051 ***, ** and * indicate, 1per cent, 5per cent and 10per cent significance levels, respectively



Table 3 displays the explanatory and predictive variables' correlation matrix. The positive and significant associations between SI and the study's governance features were found for BOIND and AGE. The correlation coefficient between SI and BOIND is 19.4per cent and 14.2per cent between SI and AGE. Both coefficients were significant at 5per cent significance level. This indicates that the SI is positively affected by an increase in the proportion of independent non-executive directors and Age. Similarly, BSZE is positively associated with BOIND, CSZE and LEV at 1per cent significance level respectively. We further note that BOIND is positively associated with AGE at 1per cent significance level. Similarly, BGD is positively associated with AGE, but equally negatively associated with CSZE and LEV at 10per cent significance level.


We also note that CSZE is positively associated with LEV at 1per cent level but negatively associated with AGE at 10per cent level of significance. Lastly, AGE is equally positively associated with LEV at 10per cent significance level. This study also uses the variance inflation factor (VIF) to better examine multicollinearity. According to Green *et al.* (2010), Hair *et al.* (2014) and Olive, (2013) multicollinearity is deemed to exist if the VIF value is more than the threshold of 10. The VIF shows that they are all within the acceptability threshold. Table 3 above shows all the relationships among the variables of interest are less than or equal to 0.61; hence, there is no multicollinearity issue between the predictors [109].

4.1 Multivariate regression results

To avoid biased statistical inference in presenting the results, this study performed the Breusch-Pagan/Cook-Weisberg test to check for heteroscedasticity, and the results indicate its presence. Also, the Wooldridge test was conducted to detect potential autocorrelation in the model, and the results proved the existence of this issue. This is confirmed by the results of random and fixed effects of models 1 and 2 in Table 4, which shows that the regression outcomes of BSZE, BGD, AGE and LEV are insignificantly associated with SI. Similarly, the robust test of random effect (model 3) and robust fixed effect (model 4) in Table 4 have confirmed this insignificant effect. Therefore, in handling these econometric problems of heteroscedasticity and autocorrelation, various techniques are used that include: the Feasible Generalized Least Square (FGLS) model developed by Parks (1967), the Panel Corrected Standard Errors (PCSEs) model introduced by Beck *et al.*, (1995), and the Driscoll and Kraay Standard Error (SCC) model developed by Huber (1967) and modified by White (1980). As suggested by Hoechle (2007), this study used the FGLS, PCSE, and SCC in order to produce an appropriate robust standard error estimates for the study model. Table 4 presents the different kinds of regression analysis conducted on the variables for the study below,

Table 4. Multivariate Regression Analysis

VAR	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
	(Std.Err)	(Std.Err)	(Std.Err)	(Std.Err)	(Std.Err)	(Std.Err)	(Std.Err)
	p-value	p-value	p-value	p-value	p-value	p-value	p-value
BSZE	-0.042	-0.012	-0.042	-0.012	-0.067	-0.067	-0.067
	(0.027)	(0.032)	(0.043)	(0.047)	(0.024)	(0.015)	(0.014)
	0.116	0.697	0.327	0.796	0.006***	0.000***	0.000***
BOIND	0.004	0.002	0.004	0.002	0.005	0.005	0.005
	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.001)	(0.001)
	0.049**	0.478	0.087*	0.571	0.006***	0.000***	0.000***
BGD	0.008	0.007	0.008	0.007	-0.005	-0.005	-0.005
	(0.010)	(0.012)	(0.012)	(0.016)	(0.008)	(0.008)	(0.011)
	0.412	0.584	0.493	0.676	0.510	0.497	0.622
CSZE	0.342	0.528	0.342	0.528	0.374	0.374	0.374
	(0.128)	(0.292)	(0.146)	(0.278)	(0.097)	(0.077)	(0.075)
	0.008***	0.073*	0.019**	0.069*	0.000***	0.000***	0.000***



AGE	0.023 (0.017)	0.088 (0.066)	0.023 (0.016)	0.088 (0.074)	0.019 (0.009)	0.019 (0.005)	0.019 (0.002)
	0.165	0.184	0.153	0.244	0.036**	0.000***	0.000***
LEV	-0.012 (0.035)	0.013 (0.040)	-0.012 (0.035)	0.013 (0.036)	-0.062 (0.032)	-0.062 (0.026)	-0.062 (0.019)
	0.733	0.748	0.730	0.724	0.051**	0.018**	0.003***
Cons	-0.679* (0.380)	-1.557 (0.798)	-0.679 (0.413)	-1.557 (0.854)	-0.626 (0.268)	-0.626 (0.200)	-0.626 (0.165)
	0.074	0.053*	0.010*	0.080*	0.019**	0.002***	0.001***
Obs.	156	156	156	156	156	156	156
R ²	0.078	0.105	0.078	0.105	0.128	0.137	0.137
Prob	0.046	0.029	0.034	0.250	0.046	0.000	0.000

Note: ***, **, and * indicate, 1per cent, 5per cent, and 10per cent significance levels, respectively.

Table 4 displays the results of three models that include the feasible generalized least square (FGLS), the panel corrected standard error (PCSE), and Driscoll and Kraay Standard Error (SCC) which are depicted in models 5, 6, and 7, respectively. However, Fairchild and MacKinnon (2009) and de Heus (2012) posits that R-square value can be very low to 4.6per cent. Thus, the R-square value from these models indicate that 13per cent variations in the study model are explained by the explanatory variables, demonstrating the fitness of the study model.

Furthermore, the regression results of FGLS, PCSE, and SCC (i.e. models 5, 6, and 7) are comparatively similar, which shows that the coefficient value of the relationship between BSZE and SI are negatively significant at 1per cent level ($b = -0.067$, $p = 0.000$). This indicate that the number of directors on the board does not influence SI, **leading to reject hypothesis H1**, which predicts that increase in the number of directors on the board positively affect SI. Similar results were reported by Htay *et al.* (2012), Hussain *et al.* (2018), Nwude and Nwude (2021), who found a negative relationship between board size and SI. However, the result is contrary to stakeholder theory, which assumes that a larger board gives a greater influence on SI, thereby ensuring bureaucratic fairness and effective business decisions. Likewise, the result is inconsistent with the findings of Alabdullah *et al.* (2019) and Raimo *et al.* (2021), who established that board size and environmental SI are positive and significantly related.

Moreover, the findings reported in Table 4 shows that the coefficients of board independence (BOIND) and SI from both models 5, 6, and 7 are positive and significantly related at 1per cent level ($b = 0.005$, $p = 0.000$), **leading to accept hypothesis H2**. This indicates that the proportion of independent non-executive directors on the board positively influence SI among Nigerian listed firms. This finding supports stakeholder theory that independent directors can provide effective monitoring of management activities and safeguards the shareholders and stakeholders' interest. Equally, findings from prior studies documents that independent directors are associated with greater SI (Ahmad *et al.*, 2017; Asri *et al.*, 2013; Mousa *et al.*, 2018). On the contrary, findings from Naciti (2019) demonstrates a negative correlation between BOIND and SI among the world's 500 largest companies.

Besides, the findings of Board gender diversity (BGD) and SI as reported in table 4, indicates that both models 5,6, and 7 are negatively insignificant at all levels with model 5 ($b = -0.005$, $p = 0.510$), model 6 ($b = -0.005$, $p = 0.497$) and model 7 ($b = -0.005$, $p = 0.622$) This indicate that the number of female directors on the board does not influence SI, **leading to reject hypothesis H3**, which predicts that presence of women directors on the board positively influences SI among Nigerian listed companies. However, the result is contrary to legitimacy theory, which assumes that due to economic and social differences and male dominance, the role of women in the boardroom is an important part of CG, as their participation on the board affects its long-term viability [54]. Equally, findings from prior studies such as Glass *et al.* (2016) and Suci *et al.* (2021) documents that BGD is negatively associated with SI. However, the result is inconsistent with the findings of Al-jaifi *et al.*



(2023), Bannò *et al.* (2021), and Naveed *et al.* (2021), that the presence of women improves environmental and social performance and raises the overall degree of SI.

Correspondingly, that the coefficient value of the relationship between CSZE and SI are positively significant at 1per cent level ($b = 0.374$, $p = 0.000$) for both models 5, 6, and 7. This indicates that the size of the influences SI, **leading to accept hypothesis H4**, which predicts that company size positively influences SI. Similar result was reported by Al-jaifi *et al.* (2023) Pham *et al.* (2021) and Ja'afar *et al.* (2021), that company size positively influences SI. This finding supports the institutional theory (IT) as DiMaggio and Powell (2000) confirm that larger organizations are more susceptible to sustainability procedures than smaller companies. As under pinned by scholars, such as Aguilar-Fernández and Otegi-Olaso (2018) and Schnackenberg and Tomlinson (2016), on the above assertion that larger corporations have more stakeholders to influence SI. However, the result is inconsistent with the findings of Thomas and Indriaty (2020) who found that company size was insignificant with SI.

Furthermore, the coefficient value of the relationship between Age and SI as shown in table 4, models 5, 6, and 7 indicates positive and significant association at 5per cent and 1per cent levels ($b = 0.019$, $p = 0.036$) for model 5 and ($b = 0.019$, $p = 0.000$) for models 6, and 7 respectively. This indicates that age of a company has an influence on SI, **leading to accept hypothesis H5**, which predicts that Age positively influences SI. This result supports the legitimacy theory which postulates that more sustainability practices will be needed with the outside community if a company operates longer. It implies that if a firm's age increases, its environmental sustainability practices will also increase [119]. The result is also consistent with prior studies such as Al-jaifi *et al.* (2023), Basuony *et al.* (2014) and Godos-Díez *et al.* (2011) revealed a significant positive relationship between firm age and SI practices. Even though Younis and Sundarakani's (2020) study established that firm age has no relationship with SI.

Regarding the company leverage, the coefficient value of the relationship between LEV and SI as shown in table 4, models 5, 6, and 7 are negatively significant at 5per cent and 1per cent levels ($b = -0.062$, $p = 0.051$), ($b = -0.062$, $p = 0.018$), and ($b = -0.062$, $p = 0.003$) respectively. This indicate that leverage of firms does not influence SI, **leading to reject the hypothesis H6**, which predicts that leverage positively influences SI. Similar result was also documented by Prior studies such as Al-jaifi *et al.* (2023) Bashiru *et al.* (2022) and Uwuigbe *et al.* (2018). This finding contradicts the stakeholder theory which presume that larger debt loads necessitate more thorough sustainability processes to meet the necessities of money-lenders and other investors (Orazalin & Baydauletov, 2020). The result is also inconsistent with Yang and Lai (2021), Nwude and Nwude (2021), who found that there is a correlation between financial leverage and SI.

5. DISCUSSION AND CONCLUSION

Using multivariate regression analysis, this study attempts to empirically use governance mechanism and firm-specific attributes to explore their effect on SI of companies rated and ranked by CSRHUB in Nigeria between 2016 and 2021. The sample size is 156 observations. The research works toward a conclusion about the impact of governance mechanism and firm-specific attributes on SI. Six (6) hypotheses were formed on the impacts of BSZE, BOIND, and BGD as well as firm-specific variables including CSZE, AGE, and LEV on SI, and data was composed utilizing panel data from the annual reports and accounts of registered financial and non-financial firms. The institutional, legitimacy and stakeholder theories provided the basis for the hypothesis by making predictions about the beneficial effects of the independent variables on SI.

The multivariate result shows that the IT, LT and STs are supported because the company's CSZE, BOIND and AGE have meaningful influence on SI. CSZE, BOIND, and AGE are associated favorably with SI. Hence, the results of this study lend credence to IT, ST and LT. Therefore, the level of SI rises as the number of independent directors grows. This is due in large part to the independent directors' wide range of professional backgrounds and perspectives. The independent directors' increased engagement with stakeholders leads them to view SI as a corporate policy with the potential to improve communications with the surrounding community, boost the company's profile, and yield



tangible advantages. As a result, major firms provide a lot of money and a better chance to admire fiscal restraint in expanding sustainability practices due to the years they have been in operation and the amount of expertise they have amassed.

Negative and statistically significant effects of BSZE and LEV on SI are also shown, which indicate that the higher the number of board members, the lower the SI. Similarly, the higher the amount of company's debt, the lower the amount to be utilized as SI. However, the research did not find evidence for the hypothesis that BGD improves SI. Based on our findings, we conclude that governance mechanism such as BOIND as well as company-specific attributes like CSZE and AGE, significantly influence the CSRHUB rankings and ratings of listed companies in Nigeria.

5.1 Practical and Social Implications

The findings of this study should convince businesses that increasing the number of independent members on their boards is a fruitful way to boost SI and speed up the process of sustainable growth. Additionally, size of a company determines its expansion of sustainability practices, which could consequently be attributed to the years in operation (AGE) and the amount of expertise they have accumulated. Finally, this work has important implications for regulation and policy. Consequently, policy makers and regulators can use the study's findings to propose a board structure that will guarantee the adoption of SI that is good for society and the environment.

5.2 Limitations and Suggestions for Future Study

There are limitations to this study that must be taken into account. In the first place, the study exclusively looks at Nigerian companies that CSRHUB has analyzed and ranked. Therefore, it would be inappropriate to take a broad view of the study's findings to all firms trading on the Nigerian Stock Exchange as well as African continents. Since most Nigerian businesses are not covered by sovereign sustainability databases like Thomson Reuters, and the Dow Jones Sustainability Indices, we can only provide data for the years 2016-2021. The Internet has made it possible for many companies to distribute sustainability reports to the public. Data for this study was painstakingly extracted from the company's annual financial report as well as other publications and companies' websites. Even though this study only observed the influence of some corporate governance mechanism and other firm-specific attributes that might affect SI. Future research could look at other factors, such as foreign shareholding and sustainability committees, as potential predictors of SI. The factors that affect SI in both developed and developing nations can be compared and contrasted. Despite its flaws, the study contributes to the body of knowledge by demonstrating that increasing the number of independent directors boosts SI, larger companies equally provide better SI and the number of years in operation by companies improves their SI.

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