

BOARD GENDER DIVERSITY AND SUSTAINABILITY REPORTING: MODERATING EFFECT OF FIRM AGE OF NIGERIAN INDUSTRIAL GOODS FIRMS

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ABSTRACT

The numerous activities and unethical attitude of organizations which have been linked to climate change and other environmental disaster have made disclosure of the impact of organizational activities on the society and the environment imperative. In view of this, this study examined the effect of board diversity on sustainability disclosure, with moderating effect of firm age in the Nigerian industrial goods firms. This study is for a period of 11 years (2009 – 2019). The population of this research work are all the 14 listed industrial firms in Nigeria of which 2 companies were filtered out due to lack of comprehensive data for the period of study indicating 12 listed companies as the sample size. The data were generated from the annual and sustainability reports of the sampled firms using the Global Reporting Initiative (GRI) checklist as a yardstick. One hundred and thirty-two (132) set of reports were analyzed using multiple regression analysis. Results from the data analysis revealed a significant positive effect of board gender diversity on sustainability disclosure. A further analysis revealed a strengthening effect of the moderating variable (firm age) on the relationship between board gender diversity and sustainability disclosure. This study therefore, concluded that firm age significantly moderates the relationship between board gender diversity and sustainability disclosure. This study recommends that more female directors should be encouraged on the boards of Nigerian firms (both young and old) because of their sensitivity to the environment and people generally which usually help them make decisions that will favour the environment and the generality of the people leading to more sustainability activities and disclosure.

Keywords: Board Gender Diversity, Sustainability Disclosure, Firm Age, Global Reporting Initiative (GRI), Nigerian Industrial Goods firms.

1. INTRODUCTION

Besides sustainable economic development such as maintaining a viable business, businesses are also required to be committed to their employees, their customers, their creditors, the local community in which they operate and the society at large. It then means that businesses exist not only to make profit, but also to reach out to the critical stakeholders as well as their immediate environment. This is largely because the unethical activities of organizations leading to the degradation of the land mass and pollution of the environment where these organizations operate has been the source of great concern among the stakeholders. It is this concern that makes reporting the impact of organizations' activities on the social lives of the people and the environment (via sustainability reporting), a top-notch requirement.

Sustainability reporting therefore is the means through which organizations communicate transparently the impact and or consequences of their activities regarding their economic, social and environmental performances to the end users so that they can assess the information which will form the basis of their decision so that users of the information can assess whether the organization is sustainable or not (Gray, Owen, & Adams, 1996). Although, sustainability reporting had largely been a voluntary requirement over the years in Nigeria and some other countries with only a few countries making it a mandatory requirement, which has resulted in low disclosure and compliance rate.

However, for sustainability reporting to become effective, transparent and carry as much information as required, the importance of the input of the Board of Directors (the most influential decision maker in an organization) is very key.

Board of Directors are elected men and women “who have legal, corporate governance rights and duties as it relates to key company decisions” (Holloway, 2022). The Board is a corporate governance mechanism put in place to monitor and oversee the process of reporting (sustainability reporting, financial reporting and others) so as to ensure the survival and success of the organization and the satisfaction of stakeholders (Aifuwa et al 2020). The Board is more effective in discharging her duties when they are diverse. In line with this, Conger and Lawler (2001) asserted that individuals with varying knowledge, skills, attributes, power, information, abilities, time, will and professional experiences, make up the ‘Best Board’. Board diversity therefore aids improved and qualitative strategic decision making, leading to better performance and meeting the identified expectations of stakeholders. Boards could be diverse demographically in terms of nationality, gender, ethnicity, educational background and age (which is the focus of this study) or structurally in terms of CEO duality, board size, directors’ share ownership and board independence (Hoang et al 2016). In fact, according to Beji et al (2020), all forms of diversity (whether structural or demographic) brings about valuable improvement on sustainability issues at all levels in the organization.

In recent times, social pressure has brought about a radical change in the profile of board membership which has brought about increased interest in gender diversity. This is because women gender has been associated with sustainability issues because of their sensitivity and generosity towards the community and how they pay attention and show a caring attitude towards stakeholders generally. Not only that, women directors are known to place high values for welfare and social issues which make them take decisions that favour sustainability actions (García-Izquierdo, et al 2018).

The need to address sustainability issues with great intensity in Nigeria has become imperative because the effect of climate change, pollution (water, land, air and noise), energy use, water sources, green-house gas emission, and flooding (which are all sustainability issues) is very great and the stark reality of poverty level in the country which had been adduced to the cause of the recent incessant kidnapping in the country cannot be overestimated. For instance, there is the river burst of 2012 which submerged vast lands in about 30 states in Nigeria which led to the death of over 400 people and displacing more than 1.3 million other people and resulting in damage worth 17 million US dollars (National Emergency Management Agency, 2012). In addition, people affected and displaced by flood in 2019 were estimated to be about 277,000, and the number rose to about 2,353,000 people in 2020 (Nigerian Hydrological Services Agency (NHSA). The NHSA in their prediction said that more than 27 states of the 36 states in Nigeria were at substantial risk of flood in 2022.

However, despite the ringing of the alarm bells at fever pitch, organizations actions so far do not add up. For instance, despite the harmfulness of waste emission into the atmosphere to humans and the climate, yet many organizations dispose their wastes via emission. This incessant infraction against the society and the environment needs to be addressed vehemently and organizations should be made to become responsible by reducing their climate impact, aligning their operations and financial flows to a net -zero future, avoiding green-washing and reporting the impact of their activities on the society and the environment through sustainability reporting/disclosures. From literatures, the female gender on boards of organizations could help to achieve this uncommon fit (of becoming responsible to all stakeholders and the environment) if given opportunity on the boards of directors majorly because of their natural tendencies that places high values for welfare and social issues.

However, there has been contentious debate on the effect of board gender diversity on sustainability reporting empirically with both significant (Ismail & Latiff, 2019; Helen & Ardi, 2018; Beji, et al., 2020) and insignificant (Adeniyi & Fadipe, 2018) effect. According to Khafid et al (2019), these varying results are evidences of research gap. It is worthy of note that none of these studies moderates the effect of board gender diversity on sustainability reporting with any variable. Note only

that, only few known studies considered the effect of board gender diversity on sustainability reporting in Nigeria (Adeniyi & Fadipe, 2020; Helen, Francis & Ardi, 2018) and none of them moderate the effect of the independent variable on the dependent variable. Hence, the importance of this study to fill these research gaps.

Therefore, in order to fill these research gaps, this study moderates the effect of board gender diversity on sustainability reporting with firm age. The adequacy of firm age as the moderating variable in this study is premised on the fact that older firms engage more women on their boards than younger firms and the more the women on the board, the greater the tendency to engage more in sustainability disclosures. This study therefore, seeks to provide empirical evidence specifically on the effect of board gender diversity on sustainability disclosure moderating role of corporate age in the Nigerian industrial firms.

In order to achieve this study’s objectives, the following hypotheses were formulated and tested:

- H₀₁: Board gender diversity does not affect sustainability disclosure of Nigeria Industrial Goods firms significantly.
- H₀₂: Firm age does not significantly moderate the effect of board gender diversity on sustainability disclosure of the Nigerian Industrial Goods firms.

This study covered the period between 2009 and 2019 because 11 years trend analysis is considered sufficient enough to aid better results and conclusion. The remaining part of the study is organized as follows: literature review, methodology, data analysis, conclusion and finally, recommendations.

2. LITERATURE REVIEW

In this section, relevant literature, concepts, theories and empirical studies were reviewed. The conceptual framework of this study is as shown in figure 1.

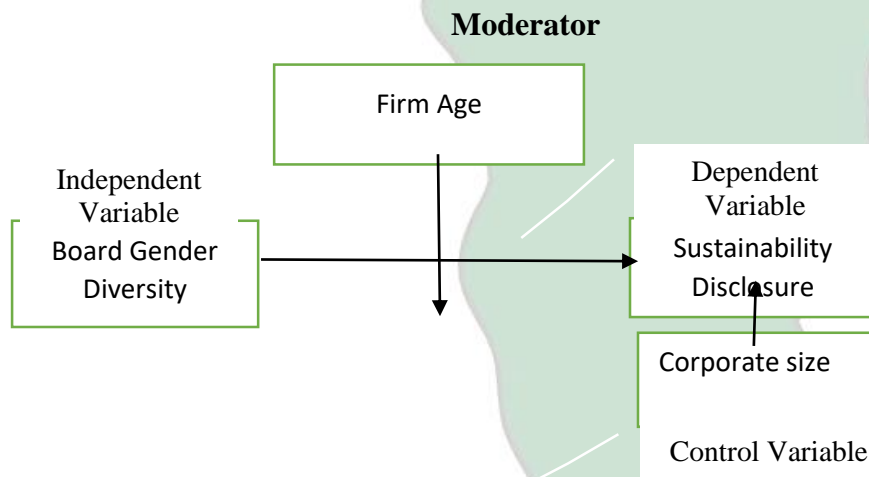


Figure 1: Schematic representation of the conceptual framework

Source: Author’s compilation.

Figure 1 shows the independent variable (Board gender diversity) and its relationship with the dependent variable (Sustainability Disclosure). This relationship is moderated by firm age to either strengthen or weaken the relationship. While corporate size was included as the control variable because from literature (Sonia & Abdelwaheed, 2021), the size of an organization is a determinant of sustainability disclosure.

Sustainability Disclosure or Reporting

Sustainability disclosure or reporting is made of two concepts (Aifuwa, 2020) which are sustainability and disclosure/reporting. Sustainability can be defined as maintaining a balance between the economy, equity and environment. In essence, sustainability requires that economic vitality, social equity and environmental health should be integrated so as to create a diverse, healthy, thriving and resilient societies not only for this generation but also for generations yet unborn (UCLA, 2022). Sustainability means the ability to continue to exist and develop, yet avoiding the depletion of natural resources meant for the future. It is the quality of not depleting the natural resources or being harmful to the environment but rather, supporting a long-term ecological balance. It should be noted that as soil are depleted, human health, vitality and intelligence go with them (Bromfield, 2022). United Nations Brundtland Report (1987) defined sustainability as “meeting the needs of the present generation without compromising the ability of the future generations to meet their own needs”. In other words, the available resources are not infinite, so it should be used carefully and conservatively in order to ensure that the generations to come have enough and the present quality of life is maintained. That is why the Effik proverbs opined that “we do not inherit the land from our ancestors, we borrowed it from our children”. If the land is borrowed from our children, then we need to use it in a way that we can return it to them in good condition. In a nut shell, sustainability is all about our children and grand-children and the world we will leave them.

Sustainability is a concept made up of three pillars; the economic, social and the environment also informally known as profits, people and planet (the 3 Ps) which are aimed at guaranteeing the planet’s integrity and improving the quality of life.



Fig: 2 Pictorial representation of the three pillars of sustainability (adapted from Allen 2021)

Economic Sustainability deals with issues such as profitability, transparent and honest accounting practices, job creation, proper accounting for the ecosystem, engaging in cost-benefit analysis, risk management, proper governance and regulatory compliance among others (Allen 2021). Social sustainability includes all efforts at employee retention via sumptuous packages, human health, security and education, engaging in practices that benefit the consumers, the creditors, and the wider community by engaging in sponsorship, scholarship, and investment in local public projects (Andrew, 2021). Environmental sustainability on the other hand has its focus on the wellness of the environment such as clean water, clean air, reducing greenhouse gas emission, reducing carbon foot print or wasteful practices and improving environment’s well-being generally (Andrew, 2021).

All the three pillars are interwoven such that one can only succeed with the success of the two others and vice versa. That is, economic development sought at the expense of social equity and ecological health cannot lead to an enduring prosperity but rather it will lead to peril. Not only that, efforts to fulfil one of the elements can lead to fulfilling the others. For example, in order to achieve

environmental sustainability, used materials can be recycled which can in turn lead to reduced operating cost (economic sustainability). This is depicted pictorially in pic 2.

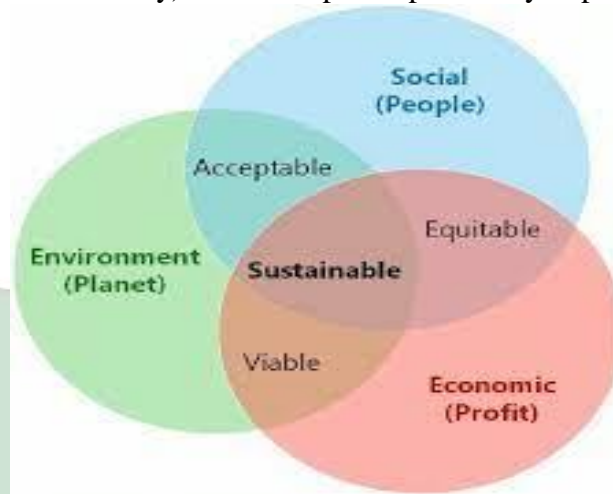


Fig 3: Pictorial representation of the interwoven nature of the 3 Ps (adapted from Adams (2006))

Disclosure/Reporting therefore, is the effort made by organizations to formally report to the public all their activities and their consequences as it relates to the economic, social and the environment in which they operate. The disclosure must contain its economic activities, its social activities and its contributions toward the well-being of its immediate environment (Musa et al 2020).

Sustainability reporting in the context of World Business Council for Sustainable Development (WBCSD, 2002) is a company's public reports that provide internal and external stakeholders with a picture of corporate position and activities on economic, environmental and social dimensions". Whereas, GRI (2006) defined sustainability reporting as "the practice of measuring, disclosing, and being accountable to internal and external stakeholders for organizational performance towards the goal of sustainable development". In essence, sustainability disclosure is a report geared towards internalizing and improving the commitment of organizations to sustainable developmental goals in such a way that can be demonstrated to both their external and internal stakeholders. This means that sustainability reporting is the medium or platform through which organizations communicate their sustainability actions and performances and impacts (whether good or bad) transparently, for stakeholders' consumption. It is the process of publishing sustainability goals and reporting the progress made in achieving those goals in a way that the public will understand organization's contributions to sustainable global economy (Andrew 2021). Summarily, sustainability reporting gives information to the public about an organization's use of resources, the negative and positive effect of organization's operations on the society and the environment, and organizational strategies to become more sustainable going forward.

Board Gender Diversity

Board gender diversity is a subset of Board Diversity. Board Diversity is made up of two concepts, namely board and diversity. Board of directors is a group of people elected to govern or oversee the affairs of an organization and thus represent the interest of the shareholders and stakeholders at large (Accounting tools, 2022).

Diversity on the other hand is the existence of varying characteristics in a group of people ranging from ethnic, social background, gender, religion, race and language (Oxford Dictionary, 2022).

Board Diversity therefore, means making the board less homogenous by cultivating a broad spectrum of demographic attributes (gender, nationality, educational background, age, ethnicity) or structural attributes (CEO duality, board independence, board size, directors' share ownership) in the boardroom for the benefit of the organization (Hoang et al, 2016). According to Makuta (2021), diverse boards are the best boards. Shuan (2022) added that diverse boards create more value for the organization because better decisions are reached when diverse range of people with varying skills,

capabilities, competencies and will, all make their various contributions towards the decision-making process.

One of the common measures to promote heterogeneity in the boardroom is gender diversity. This means to have female representatives on the board. A board with only male directors is not only homogenous, but it will lack the ingenuity of decision making that can only come from the female counterpart. In fact, studies have proved that women have higher cognitive moral reasoning scores and have more ethical perceptions than men (Forth, 2004, Elm et al, 2001). According to Daily and Dalton (2003), female directors provide uncommon perspectives and brings in unique experiences during decision makings.

More importantly, literatures have associated women directors with better sustainability performance. Hussain et al (2018) noted that more women on board is likely to improve sustainability performance and reporting while Donaldson and Preston (1995) asserted that firms with more women on board are found to violate less environmental issues because on a general note, they are more risk-averse than men. According to stakeholders' theory, women possess communal qualities like kindness, sympathy, concern, helpfulness, generosity, social orientation, and sensitivity which tends their decision making towards favouring the environment and recommending more socially responsible actions. While men are prone to strictly fulfilling their tasks, women being social butterflies are prone towards other people (Major & Forcey, 1985). Ashforth and Mael (1989) also opined that women on board engage more in social activities and are more concerned about health and environmental risks than men. Therefore, female directors' presence on the board (even if it is only one) will make a great difference in the area of sustainability practices and reporting in organizations because they are more ethical, and have better communication skills which make them have more concern for their environment and the society in which they operate.

Various studies have supported the stance of female directors in the area of sustainability disclosure such as the study of Liao et al (2015) which confirmed that board gender diversity is related to extensive greenhouse gas emissions disclosure of large companies in the United Kingdom thereby reducing stakeholders' perceived risks, while the study of Saggar and Singh (2017) also linked board gender diversity to the promotion of good governance and increased voluntary sustainability and risk information disclosure in the annual report of listed firms in Indian and others such as Sonia & Abdelwaheed (2021), Amit et al (2021), Riffat et al 2021, Beji et al (2021) etc have all revealed the importance of gender diversity in the content of sustainability disclosure, hence its relevance to this study. In this study, gender diversity is measured by the ratio of women on board to total board members as used in the work of Adeniyi and Fadipe (2018).

Corporate age

Corporate age is the number of years that a company have been established or listed on the stock exchange. Corporate age has been argued to affect sustainability disclosure either positively or negatively over time. Some empirical evidence concluded that younger firms may not have the capacity in terms of financial capabilities to gather, process and disseminate sustainability information as required, which older firms could do without much ado since they have the experience and the wherewithal (Waluyo, 2017). Other empirical studies (Withisuphakorn, & Jiraporn, 2016; Adeniyi, 2020) who disagreed with this postulation opined that younger firms engage in more sustainable actions and report same in order to gain legitimacy, become more visible, build corporate image and attract investors unlike older firms who feel secured with their good will and already built reputation as such become complacent thereby not giving much consideration to sustainable actions nor reports/disclosure.

Not only that, corporate age had also been linked with board gender diversity in that older firms who have had only male directors for a long period of time have started to see the need to include female directors on their board in order to harness the fruits of female impact in their decision making as a result, they had been bringing on board more female directors unlike the younger firms that are majorly gender biased.

Empirical studies have proxied corporate age as years of companies since inception till date Suneerat, (2017); Alina, Daniel, Tomina and Roxana (2018), Adeniyi (2020) because according to them, it was through incorporation that a company is birthed and becomes legal. Others on the other hand have proxied age as years of companies from the date of listing Elif., 2016; Haykir and Celik (2018); Adeniyi (2020) because according to Shumway (2001) in Ilaboya (2016) listing age is better and more economical as it defines the life of a company. It is like when a company is reborn to start operation on a better pedestal. This study therefore, in agreement with the argument of Shumway, proxied corporate age as natural log of number of years of companies from the date of listing on the stock exchange till date of this study.

Theoretical Framework

From literatures, theories in the field of sustainability include agency theory, stakeholders' theory, resource-based theory, legitimacy theory, resource dependence theory, political economy theory, and institutional theory. This study is however, hinged on the stakeholders' theory.

Stakeholders' Theory

Stakeholders' Theory that was first developed by Dr. Freeman Edward in 1984 states that business organizations are not only answerable to their shareholders rather, they are answerable to all their stakeholders such as the government, their creditors, their customers, their employees, their suppliers, their competitors, the financiers, the political groups, the trade unions, the community and environment in which they operate. This is hinged on the fact that business organizations do not only exist for their own benefits, but for the benefits of their stakeholders as well.

Stakeholders' theory emphasized the need for business organizations to be actively involved in the community and environment in which they operate since business sustenance is dependent on the society in which they operate (Ojo, 2012). According to Wang (2017), stakeholders can effectively be engaged when they are provided relevant information which include social and environmental information through sustainability disclosure.

For stakeholders to be effectively engaged through sustainability disclosure, the influence of the board cannot be overemphasized. More especially, when the board is gender diverse (that is the presence of women on board), who are naturally ethically bound, they will encourage more sustainability activities, hence more sustainability disclosure. Antonello et al (2021) opined that women directors are more stakeholders-oriented thus, their presence on the boards helps to both recognize and to also satisfy the interests of the various stakeholders' group which enhances quality sustainability disclosure (Garcia-Sanchez et al., 2019 & Harjoto, et al., 2015). Specifically, Garcia-Sanchez et al., (2019) asserts that more females on board increases sustainability reporting quality in terms of reliability, comparability and balance especially in stakeholders-oriented firms across the countries while Harjoto et al., (2015) noted that gender diversity enhances the ability of firms to satisfy the needs of their various groups of stakeholders thus, increasing CSR performance significantly.

Empirical Reviews

Aisha, Nazli and Maslina (2019) examined the effect of board gender diversity on sustainability reporting in Malaysia. The top 102 Malaysian companies were the population of the study while 98 of them formed the sample size. Content analysis of the companies' annual report were done using the Bursa Malaysia sustainability framework of 2015. The study was for one year (2016). Result of the independent t-test analysis revealed a significant effect of gender diversity on sustainability reporting. The study concluded that female directors do improve companies' sustainability reporting. The major pitfall of this study was that it considered only the top 102 companies unlike the current study that gave equal consideration to all companies in the industrial sector.

Antonella, Anna, Amirreza and Stefano (2021) examined the effect of board gender diversity (BGD) on sustainability reporting activity in Africa and Asia in year 2017. A sample of 366 organizations were drawn from the Bureau Van Dilks Orbis database and the Global Reporting Initiative (GRI) sustainability disclosure database. The result of Econometric analysis of the data revealed that board gender diversity has a significant effect on sustainability reports. The study

concludes that women on organization's boards in Asia and African countries encourages sustainability reporting. However, the study only analyzes a year's data which is cross sectional in nature unlike the current study which is for 11 years and is longitudinal in nature whose result would provide a more in-depth analysis.

Ismail and Latiff (2019) examined the effect of board gender diversity on corporate sustainability practices of public listed organizations in Malaysia. Of the 52 companies that were listed on the Thomson Reuters Eikon™ Data stream, 38 which had complete data for the period of study (2010 – 2016) were selected as the sample of the study. The result of regression analysis revealed a significant effect of board gender diversity on firms' sustainability practices among public listed organizations in Malaysia. Even though the study was intent on studying public listed organizations in Malaysia, sourcing data only from Thomson Reuters Eikon™ Data stream might have disenfranchised the probability of those not listed on Thomson Reuters Eikon™ Data stream from being chosen as sample. Helen, Francis and Ardi (2018) examined the effect of corporate board gender diversity on sustainability reporting in the Nigerian manufacturing firms consisting of 11 sectors. Three of the sectors were chosen as sample size which are consumer goods, conglomerate and industrial goods sector. The dependent variable SR was measured by Economic, Social and Governance (ESG) index while the independent variables is the proportion of women directors to total board population. The result of fixed effect regression analysis revealed a significant positive effect of proportion of women directors on sustainability reporting. The study therefore concludes that women on board favours improved sustainability reporting. However, the study's methodology defect was that it failed to tell its readers the number of years that was considered for the study unlike the current study that categorically stated an 11 years trend for analysis.

Beji, Loukil, Yousfi and Abdelwahed (2020) examined the effect of board gender diversity on corporate social responsibility, empirical evidence from France. The sample of the study were 120 French companies listed in the SBF120 index between 2003 and 2016. The result of regression analysis revealed that the effect of board gender diversity on corporate social responsibility is significantly positive. They concluded that boards that are gender diverse perform better on CSR issues than less diverse boards. However, their study is not consistent with the study of Adeniyi and Fadipe (2018) who examined the effect of Board gender diversity on sustainability reporting in Nigeria. The study's population were the Brewery Manufacturing firms which were 5 in number and 4 of them formed the sample size based on data availability. The source of data were the annual reports and accounts of the companies. Board size, gender diversity and board independence were the independent variables while sustainability reporting was the dependent variable. The period of study were 2 years 2015 – 2016. The result of regression analysis for the panel data revealed that gender diversity does not significantly affect sustainability reporting. They concluded that this may be due to the fact that the number of females on board of directors are too low in the examined firms in Nigeria. The study only used annual report for data collection without considering other means of sustainability disclosure such as stand-alone sustainability reports, and companies' websites (as used in this current study) which may give better information on sustainability disclosure and also which may give a better result.

3. METHODOLOGY

This section of the study deals with the study population, sample size, sources of data collected, methods of data analysis, variables and their operationalization, the models for the study and statistical techniques.

This study's population comprise all the Industrial Goods firms listed on the Nigerian Exchange (NGX) between 2009 and 2019 which are fourteen (14) in total (NGX fact book 2019). However, only twelve (12) out of these fourteen (14) companies have their financial statements and sustainability reports up to date for all the years under consideration in this study (2009 -2019). Accordingly, these twelve (12) firms which is ninety-three (93) percent of the total population that satisfied the study criterion of data availability, therefore, formed the sample of the study as depicted in Table 1.

Table 1.

Sample Size: Listed Industrial firms on the Nigerian Exchange Group (NEG)

S/N	COMPANY	TICKER	Year of Listing	Year of Inc
1.	Austin Laz & C PLC	AUSTINLAZ	2012	1982
2.	Berger Paints Plc	BERGER	1973	1959
3	.Beta Glass Plc	BETAGLAS	1986	1974
4.	Cap Plc	CAP	1979	1965
5.	Cement Co. of North Nig. Plc	CCNN	1993	1962
6.	Cutix Plc	CUTIX	1987	1982
7.	Dangote Cement Plc	DANGCEM	2010	1992
8.	Grief Nigeria Plc	VANLEER	1979	1940
9.	Lafarge Africa Plc	WAPCO	2001	1961
10.	Meyer Plc	MEYER	1979	1960
11.	Portland Paints & Products plc	PORTPAINT	2009	1985
12.	Premier Paints Plc	PREMPOINT	1995	1982

Source: Extract from Nigerian Exchange Group (NGX) Website, 2019.

The study used ex-post facto data and it was obtained from sustainability reports and annual reports of the companies in the Nigerian industrial goods sector within the period 2010 – 2019. The method chosen for the collection of data for the dependent variable is content analysis, as it is a scientific research technique. This study uses the three (3) indicators of sustainability reporting as derived from the GRI G4 indexes which are economic, environmental, and social reporting.

The dependent variable (Sustainability Reporting) was calculated based on the number of indicators that are disclosed (occurrence) or not disclosed (non-occurrence) on the GRI 4 sustainability index. The GRI 4 was considered appropriate because it is a recognized international standard world over. Weighted and unweighted approaches are the two widely used approaches to developing scores for qualitative data on both annual report and sustainability reports. This study employed the unweighted approach to score items on the annual and sustainability reports because the unweighted approach give equal importance to all items of information. A dichotomous procedure of scoring an item as one (1) if disclosure was made and zero (0) if disclosure was not made (as used in the work of Adeniyi and Fadipe (2018) was used to measure the total sustainability disclosure scores for all the organizations. The variables and their measurements are as listed in Table 2.

Table 2

Variable Measurement and Sources

Variable	Symbol	Measurement	Source
Dependent variable			
Sustainability Disclosure	SD	Dichotomous 1 = Disclosed 0 = Not disclosed	Musa, Gold & Aifuwa (2020); Adeniyi & Fadipe (2017)
Independent variable			
Board Gender Diversity	BGD	Percentage of Women on board to total board members	Singh et al (2021); Anazonwu et al (2018) Adeniyi & Fadipe (2018)
Moderating Variable			
Firm Age	AGE	Log (No. of years since listing)	Adeniyi, 2020
Control Variable			
Firm Size	FZ	Log of Assets	Musa et al (2020) Paul, et al (2019)

Source: *Field Survey, 2022*

Model

The model for this study is in two steps which is adapted from Zyed and Sonia (2021) and it is presented as follows:

$$SD_{it} = \alpha + \beta_1 BGD_{it} + \beta_2 FSZ_{it} + \varepsilon \dots \dots \dots (1)$$

$$SD_{it} = \alpha + \beta_1 BGD_{it} + \beta_2 AGE + \beta_3 (AGE*BGD) + \beta_4 FSZ_{it} + \varepsilon \dots \dots \dots (2)$$

Model1 tests the effect of BGD on SR and one control variable FSZ, while model2 tests the moderating effect of AGE on the relationship between BGD and SR.

Where:

SD_{it} = the dependent variable (which represent sustainability disclosure)

BGD = Board Gender Diversity

FSZ = Firm Size

AGE = Log of No. of years since incorporation

α = intercept of the regression

β₁, β₂, β₃, β₄..... = the slope or the co-efficient of the regression

ε = Regression residual or error term which captures the other explanatory variables that are not included in the model explicitly.

In equation (2), AGE*BGD is the interaction variables, moderating the relationship between the dependent and the independent variable. If β₃ is significant at 5% critical level, the AGE is said to be a significant moderator on the relationship between BGD and SR.

4.0 RESULTS AND DISCUSSION

This section focused on analysis and discussion of the results. The analysis carried out include stationarity test, Normality test, Outlier test, pooled Multiple Regression, hausman test and Generalized Linear Model (random and fixed effect model). Some diagnostics test such as residual normality test, Autocorrelation test and Heteroskedasticity test, etc. were also conducted.

Descriptive Statistics

Descriptive statistic of mean, standard deviation, minimum and maximum mean values of the variables used in the study were analyzed for the independent and dependent variables and are presented in Table 3.

Table 3

Descriptive Statistics

<i>Variables</i>	<i>Observations</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Minimum</i>	<i>Maximum</i>
SR	132	0.093	0.0608	0.033	0.593
BGD	132	17.534	13.5315	0	0.5
AGE	132	1.209	0.4362	0	46
FSZ	132	6.815	0.9769	5.478	9.701

Source: *STATA 16 Output (2022)*

Statistical evidence from Table 3 revealed that the tested variable – sustainability disclosure which is measured based on the number of indicators that were disclosed (occurrence) or not disclosed (non-occurrence) on the GRI 4 sustainability index for the 132 observations made from twelve companies from the year 2009 to 2019 has a mean of 9.3%, standard deviation of 6.1%, with minimum and maximum value of 3.3% and 59.3% respectively. This result indicates that more than average sustainability disclosures is being made in the industrial goods sector.

Table 3 also revealed that Board Gender Diversity (BGD) has an average of 17.534, standard deviation of 13.5315 and a minimum and maximum value of 0 and 50 percent respectively. This

implies that there are still some of the industrial firms who has no female representative on their board of directors whereas there are some firms that have females up to half of their boards.

Furthermore, firm size (proxied by log of assets) has a mean value of N680Million, Standard deviation value of N97.7Million and a minimum and maximum value of N548Million and N970Million respectively. This implies a wide dispersion of the mean of size from the standard deviation and this wide dispersion could be owing to the differences in the assets owned by each firm in the industrial goods sector. Some are extremely large e.g Dangote Cement and Lafarge while some are extremely small.

Finally, Table 3 also present the moderating variable (firm age, proxied by the natural logarithm of age at listing) having an average of 1.209, standard deviation of 0.8362, with minimum and maximum value of 0 year and 46 years respectively. This means that variation of age amongst the Nigerian industrial goods firms is huge.

Diagnostics and Robustness Checks

Pre-estimation and post-estimation tests were carried out so as to ensure that all the regression assumptions were met. The normality test was carried out using Shapiro wilk test as shown in table 4.

Table 4
Data Normality Test

<i>Variables</i>	<i>Observations</i>	<i>W</i>	<i>V</i>	<i>Z</i>	<i>Prob>z</i>
SR	132	0.551	46.862	8.663	0.00000
BGD	132	0.923	8.034	4.692	0.00000
AGE	132	0.827	18.051	6.515	0.00000
FSZ	132	0.914	8.954	4.936	0.00000

Source: STATA 16 Output (2022)

Table 4 revealed that the data is not normally distributed, because the P-values of the Z-statistics are statistically significant at 0% confidence interval (1% level of significance). Since it has failed the normality assumption a more generalized estimator will be required for the model according to Guassian theorem (1929) which states that normality problem in a data will not affect the Best Linear Unbiased Estimators (BLUE).

The Variance Inflation Factor (VIF) test was done to confirm the existence of multicollinearity among the independent variables and the result is as shown in Table 5.

Table 5
Test for Multicollinearity

<i>Variable</i>	<i>VIF</i>	<i>1/VIF</i>
BGD	1.20	0.835474
FSZ	1.27	0.789197
AGE	1.07	0.938303

Source: STATA 16 Outputs (2022)

Table 5 revealed that there no multicollinearity among the variables because the VIF are less than 5. The tolerance level is also within the acceptable range of 1. This shows that the independent variables are appropriate and well fitted to the models.

The Ramsey RESET test is used to test the null hypothesis to know whether the model has omitted variables or not using powers of the fitted values of the predicted variable (ER). The result is as shown on Table 6.

Table 6
Omitted variable test (Ramsey RESET test)

Model	F	Prob > F
MODEL1	3.54	0.017
MODEL2	2.76	0.044

Source: Author’s computation (2022)

From the result in Table 6, the F-statistic for model1 and model2 (i.e 3. 54 and 2.76) which gives probabilities of 0.016 and 0.044 respectively are less than 0.05 level of significance for accepting the null hypothesis at 95% confidence interval. Therefore, there is no basis for accepting the null hypothesis and the study concludes that there are other exogenous variables that describe sustainability reporting (SR) which are not included in model1, and model2.

In Table 7, the Cameron & Trivedi’s decomposition of IM-test was used to test the presence or absence of Heteroskedasticity which will necessitate the running of random and fixed effect models for the study.

Table 7
Test for Heteroskedasticity (im test white test for heteroskedasticity)

	MODEL 1			MODEL 2		
	Chi2	df	Prob>chi2	Chi2	df	Prob>chi2
Heteroskedasticity	8.36	5	0.1374	9.26	9	0.4139
Skewness	5.57	2	0.0617	5.61	3	0.1320
Kutosis	1.21	1	0.2714	1.21	1	0.2719
Total	15.14	8	0.0564	16.08	13	0.2450

Source: STATA 16 Outputs (2022)

The result in Table 7 shows that model1 and model2 are free from Heteroskedasticity with P-values 0.1374 and 0.4139 respectively because they are more than 0.05 significant level at 95% confidence interval for accepting the null hypothesis. This implies that the model1 and model2 are homoskedastic.

The Breusch and Pagan Lagrangian Multiplier test for random effect was conducted to test whether there is panel effect or not. The result is as shown on Table 8.

Table 8
Breusch and Pagan Lagrangian multiplier test

Model(SR)	chi ²	Prob > chi ²
MODEL1	20.47	0.0002
MODEL2	20.78	0.0015

Source: STATA 16 Outputs (2022)

From Table 8, the model shows that there is panel effect among the variables in the two (2) Models with the P-values of 0.002 and 0.0015 respectively. The P values for models 1 and 2 are less than 5% significant level at 95% confidence interval for accepting the null hypothesis of no panel effect.

Hausman Specification Test therefore was used to determine the most appropriate regression model to use to test the hypothesis. The result is as shown in table 9.

Table 9
Hausman Specification Test Result

Model(SR)	chi ²	Prob > chi ²
MODEL1	1.19	0.5516
MODEL2	7.14	0.1286

Source: STATA 16 Output (2022)

The result in Table 9 shows that the model1 and model2 are statistically not significant with probability 0.5516 and 0.1286, implying that a random effect model (GLM) will be run on the model1 and model2 respectively.

In this section, the regression results of one dependent variable namely Sustainability Reporting (SR), one independent variable (Board Diversity) and one control variable (Firm Size) and one moderator, Firm Age (AGE) are presented and the analysis of effect follows, between dependent variables and the independent variable cumulatively.

Table 10
Regression Result

	Model 1			Model 2		
	Coef.	z	p> z	Coef.	z	p> z
BGD	0.0013	3.03	0.002	0.0058	3.21	0.001
FSZ	0.0213	2.68	0.007	0.0192	3.00	0.003
AGE	-	-	-	0.0729	3.47	0.001
c.AGE#c.BGD	-	-	-	0.0033	2.56	0.011
Constant	-0.0745	-1.41	0.158	-0.1586	-3.25	0.001
R ²		0.5690			0.7330	
Wald Chi ²		24.59			48.70	
Prob > Chi ²		0.000			0.000	
Observations	132			132		
No. of group	12			12		

Source: STATA 16 Output (2022)

The result of the regression analysis (Generalized Least Squared Regression) of the listed industrial goods firms in Nigeria as shown in Table 10 reveals that the coefficient of determination of the variables for models 1 and 2 are 0.5690 and 0.7330 respectively. This means that 56.9% of the changes in sustainability disclosure can be explained Board Gender Diversity and one control variable (firm size) from model1, 73.3% of the changes in sustainability disclosure can be explained by the Board Gender Diversity (the independent variable), one control variable (Firm Size), and one moderator (Firm Age) from model2. The probabilities for model1 and model2 (0.0000 and 0.0000) implies that the independent variable for model1 and model2 are good predictor of sustainability information.

Also, Table 10 shows that board diversity has a positive effect on sustainability disclosure in model 1, and is statistically significant with probability of 0.002 which is less than 0.05 significant level at 95% confidence interval of accepting the null hypothesis. Therefore, based on the result on Table 10, the study concludes that board gender diversity has a statistically significant effect on sustainability disclosure therefore we reject the null hypothesis (H₀) that board gender diversity does not have significant effect on sustainability disclosure and accept the alternative hypothesis (H₀₁). Attesting to these findings are the studies of Antonella etal (2021), Aisha etal (2019), and Helen etal (2018) while the studies of Adeniyi and Fadipe (2018) negates the findings. From theoretical angle, stakeholders' theory holds true from the result of the study because managerial behavior is motivated by stakeholders to disclosure of sustainability activities and especially when the board is gender diverse.

Also, the result from Table 10 shows that the control variable, firm size has a positive effect on sustainability disclosure in model1 and is statistically significant with probability of 0.007 which is less than the 0.05 significant level.

Model2 examined whether Firm age (AGE) moderates the effect of board gender diversity on sustainability disclosure (SD) in order to validate H₀₂. The result from Table 10 shows that the introduction of the moderator (Firm Age) significantly moderates the effect of the independent variable (Board gender diversity) on the dependent variable (Sustainability Disclosure). In essence,

there is a positive and significant moderating effect of firm age on the relationship between board gender diversity and sustainability disclosure in the Nigerian industrial goods firms with a $P > 0.011$ which is less than the 5% significant level. We therefore, reject the null hypothesis H_{02} that firm age does not significantly moderate the effect of board gender diversity on sustainability disclosure of the Nigerian Industrial Goods firms

5. CONCLUSION AND RECOMMENDATION

The focus of this study is the effect of board diversity on sustainability disclosure moderating effect of firm age in the Nigerian Industrial Goods firms. The study found that board gender diversity has a positive and significant effect on sustainability disclosure. In line with stakeholders' theory and prior studies Antonella et al., (2021), Aisha et al., (2019), and Helen et al., (2018), this study robustly demonstrates that more women on board increases sustainability disclosures.

In addition, the study also found that the introduction of firm age as a moderating variable affect the relationship significantly, and also affect the strength of the direction. The study therefore concludes that there is a positive and significant effect of board gender diversity on sustainability reporting and that the strength of the relationship is increased with the introduction of firm age as the moderator. In essence, the older a firm is, the more they engage female directors and the more the female directors on the board of organizations, the more the Nigerian Industrial Goods firms engage in sustainability disclosures because of the desire to continually portray their goodwill to the stakeholders and especially the community where they operate.

This study therefore, recommends that more female directors should be encouraged in all the firms (both young and old) in Nigeria, female participation and inclusion on the Boards should be made mandatory by law and gender inequality in board representations which has eaten deep into the fabrics of the Nigerian organizational system should be dealt with decisively in order to feel the impact of the female counterpart in all the spheres of businesses, knowing that greater representations of women on the Boards would reduce unethical business practices and increase sustainability practices.

As a policy option, the findings of the study are useful for organizations' board selection process as the results points out the importance of considering more female directors than the obtainable, majorly because female directors, who are social butterflies, will act better in the best interest of the organization and also contribute more to addressing stakeholders' needs via sustainability reporting.

A second implication of this study is that aged firms recognize the importance of women representations on their boards more than the younger firms. This could be due to learning- with-time. The study is therefore useful to younger firms to quickly adapt by establishing policies that will encourage more women on their boards in order to harness the ingenious and insightful contributions of the female directors in terms of best practices and sustainability engagements.

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