

# THE INTERNATIONAL JOURNAL OF BUSINESS & MANAGEMENT

## How Much Can Board Attributes Influence Sustainability Performance of Firms? West African Evidence

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### **Abstract:**

*This empirical study investigated the extent to which board attributes influence sustainability performance. In more specific terms, it examined the magnitude to which board size and board independence, respectively, influence social, economic and environmental sustainability performance. The study employed ex-post facto annual information published by 21 industrial goods firms listed on Nigerian Exchange (NGX) Group from 2012 to 2021. The study hypotheses were tested using ordinary least squares regression techniques. Findings from this study revealed that board size has a significant negative influence on social and environmental sustainability performance, while board independence has a significant positive influence on environmental sustainability performance. It is, therefore, concluded that board attributes significantly influence sustainability performance. Consequently, this study recommends, among others, that: there is a need to build the corporate Board in such a way that there would be a higher proportion of non-executive (outside) directors than executive (inside) directors, as this would enhance environmental sustainability performances of the companies and moderately lower number of directors should be kept in the Board for more efficient and effective decision process.*

**Keywords:** Board characteristics, solid waste management, staff strength, job growth, sustainability

### **1. Introduction**

The modern Board is conceived to be highly relevant to the achievement of sustainable development. They are seen to play essential roles in influencing organizational sustainability and economic development at both national and international levels. The role of the Board has increased over time in history with the rate of increase in corporate scandals and financial crises that led to an increase in global bankruptcy cases and economic recessions (Iliemena & Okoye, 2019; Githaiga & Kosgei, 2023). In other words, the global business world cannot speak success without the Board in the spotlight.

Historically, the improvement in sustainability reporting and other corporate issues revolving around the sustainability of firms increased recently in line with the heightened role of the Board. This is unlike what was obtainable in the 1980s when the Board played very little and amidst environmental issues like emissions and wastes resulting from industrialization, constituted major harms to existence (Iliemena, 2020; Almaqtari, Elksheik, Al-Hattami, & Mishra, 2023). Gardazi, Hassan and Johari (2020), in their studies, opined that the propensity of the Board of Directors to societal concerns can largely impact sustainable development goals through its influence in the areas of climate change strategy and decisions.

Presently, in 2023, organizational performance emphasis has transcended to a level where it is measured based on net value creation, which is driven primarily by sustainability. An organization that creates value is, therefore, noted by Jiani (2009) as that which "creates added value for its shareholders, satisfies customer's demand, takes into account the opinion of employees and protects the environment..." In this regard, research shows that past failures of corporate organizations, including multinational companies and domestic firms, especially banks (see cases of defunct Oceanic Bank, Intercontinental Bank, etc.), have originated from Board failures (Cahit & Ali, 2016; CBN, 2019). Even though an attempt was made to increase the rate of corporate sustainability, regulatory measures have been instituted by the Central Bank of Nigeria (CBN), Nigerian Exchange (NGX) Group, Financial Reporting Council of Nigeria and other regulatory Bodies in Nigeria, which has further broadened the role of the Board in this regards, there is need to determine the extent to which board characteristics influence the overall performance of the firms in achieving sustainability. There have been contradictory research views on what the ideal board number should be for a recorded impact on corporate performance. A lot of studies have examined the impact of the board characteristics on financial performance measures rather than in relation to firm sustainability measures (Cahit & Ali, 2016; Iwora & Lesley, 2014; Lekaram, 2014; Omankhanlen, Taiwo & Okorie, 2013; Ezejiofor & Nzewi, 2012; Fauzi & Locke, 2012; Abiola, 2012; Klein, Shapiro & Young, 2005; Brown & Caylor, 2004). While some of these studies have been noted to be outdated (Klein, Shapiro & Young, 2005; Brown & Caylor, 2004),

some others emanated from other countries (Lekaram, 2014; Nyamongo & Temesgen, 2013; Fauzi & Locke, 2012). However, generally, most works on boards and corporate performance recorded more evidence from the banking sector, while very little evidence exists in the manufacturing sector. The recent study by Almaqtari, Elksheik, Al-Hattami and Mishra (2023) was anchored on stakeholder theory, agency theory and legitimacy theory, while the recent work by Githaiga and Kosgei (2023) generated its evidence from East Africa. This present study, therefore, seeks to provide an answer to the question of the extent to which board attributes influence sustainability performance anchored on the stewardship theory and focusing on West Africa. In an attempt to provide this empirical evidence, the researchers absorbed the industrial goods firms in Nigeria, with specific aims to:

- Ascertain the extent to which board size influences social and economic sustainability performance.
- Evaluate how much board independence influences environmental sustainability performance.

## 2. Theory

### 2.1. Theoretical Viewpoint of the Role of the Board in Sustainability Performance

In the light of the stewardship theory, agency cost is non-existent as there is an assumed consensus in the interests of both managers and shareholders, thus reducing the task of monitoring the management by the Board to ensure they are upholding the pursuit of increasing shareholders' wealth. By this time saving on monitoring, the Board is presumed to have more time to emphasize policy decisions and formulation of strategies, especially as it affects the aspects of sustainability and sustainable development.

This study finds the stewardship theory relevant in explaining the relationship between Board attributes and sustainable performance because of the additional attention it paid to Board independence, which is a measure of Board attributes. The stewardship theory highlights the greater responsibilities of the Executive Directors (ED) in effective Board decision-making processes as it presumes the EDs to have better knowledge of the business than the independent directors. It is, therefore, assumed that the general performance of the business is related to the decisions of the EDs (who are considered insiders) rather than the decisions that would be made by the independent directors (who are considered outsiders). By implication of this theory, Board independence has no positive influence on sustainable performance as the theory assumes a firm would record better performance when it has a greater proportion of EDs on the Board. The Directors would, therefore, exercise due diligence to earn a good reputation from the shareholders.

The Performance Improvement (PIT) theory further buttresses the point of the stewardship theory. Since the EDs have good insider knowledge and good relationships with the shareholders, they would not want anything that would tarnish their reputation. Therefore, since there is now an increased concern among the shareholders on sustainability reporting and performance, the EDs would be so motivated to institute policies and strategies and monitor performances in this regard, especially as they are assumed to be more interested in earning good performance for the shareholders and good reputation from the shareholders. The point of the PIT theory is that to earn a good reputation, a firm must take every necessary step towards sustainability, including sustainability reporting. The sustainability performances of the companies will then reward the firm with a good reputation from the general stakeholder groups (Iliemena, 2020). In other words, customers will be willing to increase their patronage; investors will be happy that their investments are being judiciously used in making environmental impacts, which further means that their investments are safe. The Board, therefore, would be willing to formulate policies to improve sustainability performances.

#### 2.1.1. Board Attributes

The board of directors, hereinafter referred to as the Board, is a committee of persons appointed by shareholders of a public company to make strategic decisions and oversee management. Gardazi, Hassan and Johari (2020) view the Board as the backbone of the corporate governance structure, charged with the responsibility of protecting the interest of the stakeholders through decision and operational support. Corporate governance, in general, is the process through which organizations are managed and controlled. It is the holistic system and processes that govern institutions through the Board by ensuring that rules and regulations are duly followed. The composition and structure of the board are usually measured in terms of gender, independence, size, duality of the CEO (Chief-Executive Officers), educational qualifications, age or tenure (number of years on the Board), nationality, etc. This study considers board size and board independence as the attributes that have a higher influence on decisions and strategies emanating from the Board.

Board size is viewed as the total number of both executive and non-executive directors on the board. Board size is the number of members on the Board (Disli, Yilmaz & Mohammed, 2022; Aksoy, Yilmaz, Tatoglu & Basar, 2020). There has been a long debate on the right board size for improved decision-making. Some of the studies had previously reported that the larger board size has positive and negative impacts on the decision-making processes (Githaiga & Kosgei, 2023; Gardazi, Hassan & Johari, 2020). Somewhat contrary to this, some other studies posit that the larger the number on the board is, the higher an organization is likely to go in achieving sustainable performance since the greater number of persons on the board, the greater level of "experience, knowledge, expertise and a high level of value..." (Chen, Firth, Choe & Lee, 2003). Some other schools of thought argue that the small number of directors on the board makes decision-making faster and also makes management manipulation of the Board impossible (Lekaram, 2014; Disli *et al.*, 2022). This study measures board size by the number of executive and non-executive directors serving on the board. Board size is expected to have no significant influence on sustainability performance.

Among the Board of directors who form the members of the board, there are some directors who are known as independent. An independent director is a non-executive director entitled to only sitting allowance in the Board and has no pecuniary relationship (within the past 2years before his appointment- in the Nigerian legal context) with the

organization, management, shareholders or any other party. Board independence is essential in ensuring the board's effectiveness through monitoring the agent and internal operations (Sandhu & Singh, 2019). Board independence is considered fundamental to subjective and uninfluenced decision-making processes in areas of policies and strategies that would help ensure environmental sustainability. Past literature asserts that Board independence is essential in ensuring effective leadership through monitoring and internal operations (Sandhu & Singh, 2019). Independent boards play an important oversight function in corporate management, and the growing sustainability awareness has broadened the scope of such a role (Ngwakwe, Ganda & John, 2014). The incorporation of the independent directors into the Board is encapsulated in the Companies and Allied Matters Act (CAMA), 2020, Securities and Exchange Commission's (SEC's) Code of Corporate Governance, Nigerian Code of Corporate Governance (NCCG), 2018, etc. Studies by Ngwakwe, Ganda and John (2014) compared the sustainability role of the Independent Board in both South Africa and Nigeria and reported that the sustainability involvement of the Board was stronger and more practical among South African companies than in Nigeria. This outcome might have changed over time from 2014 as 6 years have passed since their research outcome was reported and based on this apparent weakness of the Board in terms of independence, Nigeria released an amended CAMA (2020), which in section 275 (1) mandated public companies to have a minimum of three (3) independent directors as members of the Board. To be on the safer side and avoid the chances of bias, this study hypothesizes the stance of this previous outcome that Board independence in Nigeria has no significant influence on sustainable performance. Of the extant studies, some had reported a significant and positive relationship between sustainability performance and the proportion of independent directors on the Board (Aksoy, Yilmaz, Tatoglu & Basar, 2020; Kumari, Makhija, Sharma & Behl, 2020), while some others found an insignificant relationship between the independence of the board and sustainability (Nguyen & Thanh, 2022).

### 2.1.2. Sustainability Performance

Sustainability performance is an aspect of firm performance that promotes sustainable development. Sustainable development is viewed by Iliemena, Uagbale-Ekatah and Madawa (2023) and Iliemena, Amedu and Goodluck (2022) as a development that bridges the gap between economic growth, environmental protection and other related issues. Other related issues here include: issues concerning the social effects of a company's operations and corporate governance affairs of the company. The major concern here revolves around the performance of the Economic, social, environmental, and governance activities that would promote sustainable development and the reporting of the performances to the stakeholders using recognized standards and guidelines. Sustainability, in the view of Bowman (2011), is the ability of a business organization to maintain its status over a long period of time with little or no harm to the environment. Sustainable performance measures the contribution of a company to environmental and social well-being. The metrics to measure sustainable performance are built around economic sustainability performance, social sustainability performance, environmental sustainability performance and the recently included Governance sustainability. Our earlier studies published a complete breakdown of performance expectations under each of the performance categories (Iliemena, Wobo, Goodluck, 2023; Iliemena, 2020; Iliemena, Ijeoma & Uagbale-Ekatah, 2023). This study focuses on three major areas of performance: Staff strength (social sustainability measure), Job growth (Economic sustainability measure), and Solid waste management (Environmental sustainability measure).

By the stewardship theory, Stakeholder theory and Legitimacy theory, every business organization has some moral and legal duties to its environment and not only the shareholders (owners). The employees are presumed by this study to have the first moral claim, followed by customers and then the local communities. This informed our choices of the above metrics for sustainable performance. However, the stewardship theory and Performance Improvement theory are adopted as the most suitable theory to back up the assumptions of this study.

### *2.2. Empirical Reviews*

The wealth of literature existing in line with our concepts of study includes the most recent study by Almaqtari, Elksheik, Al-Hattami, and Mishra (2023), which examined the impact of board characteristics on environmentally friendly production of 8,094 companies in Europe and Asia over the period 2016 to 2021. Using panel data regression analysis with fixed effect models, findings show that board attributes (measured using board size, board independence and industry expertise) have a significant impact on environmentally friendly production generally, while the impact of board diversity was positive in Europe while the impact was negative in Asia. This study was anchored on other theories, but Stewardship theory and findings might be different from a different theoretical perspective. Similarly, Githaiga and Kosgei (2023) studied the influence of board characteristics on sustainability reporting in East Africa using financial expertise, board size, independence and gender diversity to measure the attributes of the Board. The study generated its evidence from 79 listed firms from 2011 to 2020. The method of analysis was three-panel data estimation models (fixed effect, random effect and generalized method of moments). Evidence indicates that board financial expertise, gender diversity and board independence have a significant positive relationship with sustainability reporting, while board size was found to have a significant negative effect on sustainability reporting.

Furthermore, Disli, Yilmaz and Mohammed (2022) evaluated the effect of board attributes measured using gender diversity, independence, Board size and Board activity on sustainability performance. The population of the study was 439 publicly-listed non-financial companies spread across 20 countries between 2010 and 2019 using Refinitiv performance scores for environmental, governance and social sustainability performances. The method of analysis was the dynamic panel two-step method of moment estimator. Results from this study showed that there is a positive relationship between board independence and some aspects of sustainability performance (environmental and governance performances), while board size has a negative with only governance sustainability performance. Gardazi, Hassan and Johari (2020), in

their study, examined the relationship between the attributes of the board (independence, CEO duality, board size and diversity) on environmental and social sustainability performances of companies in the energy sector. Evidence from this study suggests that maintaining a balance in board composition would ensure the implementation of environmentally friendly policies and initiatives towards achieving sustainable development. This study is, however, criticized for its conceptual approach to this essential study. Lekaram (2014) explored the relationship between board attributes (Board size and board independence) on firm performance using the sample of listed manufacturing firms in Nairobi Security Exchange from 2007 to 2012. The result of the panel data regression analysis revealed that board size has an inverse relationship with firm performance. The findings from this study also show that a higher proportion of independent directors only leads to improved financial performance. The study, however, measured firm performance using return on asset, Tobin's Q and return on equity, which are both measures of financial performance. This necessitates a similar study based on sustainable performance measures. The study by Omankhanlen, Taiwo and Okorie (2013) investigated the governance challenges that hinder the growth of banks in Nigeria using primary data. The correlation analysis from the study revealed that instability of the board, insider dealings, ownership crises, board squabbles, and board tenure are the root causes of board failure and, hence, bank failure. These tendencies could be controlled by the proper constitution of the Board in terms of size and independence. However, further empirical evidence is needed to establish this. Ezejiofor and Nzewi (2012) investigated the role of the board in ensuring financial stability and efficiency of banks. For this purpose, a survey of 32 branches of commercial banks was conducted and data were gathered using the questionnaire. The data analyzed using Z-test statistics indicated that board rotation and CEO tenure moderation significantly influence accountability, transparency and ethical practices. This study also failed to explain how these relationships affect sustainable performance, even though it is still out of date. These and more weaknesses of extant studies necessitate a more robust study to cover the aspect of sustainable performance using secondary data.

### 2.3. Design and Modeling the Relationship between Board Size and Sustainability Performance

This study employed an *Ex-post facto* research design in exploring the relationship between board attributes and sustainable performance. The scope of ten (10) years from 2012-2021 was covered. The reason for choosing this time frame is the availability of published annual reports and accounts of the selected companies. The population of the study consists of the twenty-seven (27) Industrial goods quoted on the floor of Nigeria Stock Exchange as of 31<sup>st</sup> December 2017, while the purposive sampling technique produced 21 companies (proportionately 78% of the population) used as a sample of the study. Secondary data were used in this study as obtained from the annual financial statements and sustainability reports of the companies for the relevant years. The unique model for this study was formulated as follows:

$$\begin{aligned} \text{SFS}_{it} &= \beta_0 + \beta_1 \text{BSIZE}_{it} + E_{it} & - & - & - & 1 \\ \text{SWM}_{it} &= \beta_0 + \beta_1 \text{BID}_{it} + E_{it} & - & - & - & 2 \end{aligned}$$

Where:

$\beta_0$  = Constant term (intercept)

$\beta_1$  = Coefficients of board attributes to be estimated for firm  $i$  in period  $t$

$E_{it}$  = Error term/unexplained variable(s) for firm  $i$  in period  $t$

SFS = Staff strength / Job growth (Social and Economic Measures)

SWM = Solid Waste Management (Environmental Measures)

BSIZE = Board Size

BID = Board independence

## 3. Discussion

### 3.1. Data Presentation

The summary descriptive statistics for the 10years panel data is presented below with results of the tests for skewness, Kurtosis and Jarque-Bera:

	SFS	SWM	BSIZE	BID
Mean	3.700000	3.816000	4.700000	3.200000
Median	4.000000	3.970000	5.000000	3.000000
Maximum	4.000000	4.800000	5.000000	4.000000
Minimum	3.000000	2.990000	4.000000	2.000000
Std. Dev.	0.283046	0.027432	0.003046	0.002456
Skewness	-0.872872	0.009527	-0.872872	-0.111111
Kurtosis	1.761905	1.825374	1.761905	2.555556
Jarque-Bera	1.908541	0.575046	1.008541	0.002881
Probability	0.000093	0.030119	0.385093	0.949860
Sum	37.00000	38.16000	47.00000	32.00000
Sum Sq. Dev.	2.100000	3.543040	2.100000	3.600000
Observations	10	10	10	10

Table 1: Descriptive Statistics

Source: E-Views 9.0

Keys: SFS = Staff Strength/Job Growth, SWM= Solid Waste Management, BSIZE= Board Size, BID= Board Independence

The table above presents the summary descriptive statistics for both the dependent and independent variables. It, thus, shows the mean, median, maximum and minimum values, and standard deviations for measures of Board attributes and sustainability performance.

### 3.2. Interpretation and Discussion of Regression Result for Hypothesis 1

$H_0^1$ : Board size has no significant influence on staff strength and job growth rate.

$$SFS_{it} = \beta_0 + \beta_1 BSIZE_{it} + E_{it}$$

<b>Dependent Variable: SFS</b> <b>Method: Least Squares</b> <b>Date: 29/05/23 Time: 08:12</b> <b>Sample: 2012 2021</b> <b>Included observations: 10</b>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.714286	1.508479	3.788110	0.0053
BSIZE	-0.428571	0.319438	-1.341641	0.0015
R-squared	0.783673	Mean dependent var		3.700000
Adjusted R-squared	0.581633	S.D. dependent var		0.483046
S.E. of regression	0.462910	Akaike info criterion		1.474288
Sum squared resid	1.714286	Schwarz criterion		1.534805
Log-likelihood	-5.371442	Hannan-Quinn criter.		1.407901
F-statistic	1.800000	Durbin-Watson stat		1.678571
Prob(F-statistic)	0.001547			

Table 2: Ordinary Least Square Regression Showing the Level of Influence of Board Size on Staff Strength and Job Growth Rate

Source: Researchers' Computation with E-View 9

$$Sfs_{it} = B0 \ 5.71 - 0.429\beta_1 size_{it} + 0.05E_{it}$$

Table 2 above shows the results of the regression of model 1 SFS. The coefficient of BSIZE has a *t-statistic* equal to -0.428571 and a *p-value* equal to 0.0015. This implies that BSIZE negatively but in a significant proportion influences SFS. This being the case, it can then be interpreted as that a unit increase in board size will reduce social and economic sustainability performance by 0.429 while a unit decrease in board size will increase social and economic sustainability performance by 0.429. The adjusted R-squared of the SFS model is equal to .783, which indicates that 78% of the variation in SFS is explained by the regression variables. Hence, the explanatory variables included in this regression are good predictors of SFS. The Durbin-Watson value of 1.678571 indicates the absence of an auto-correlation problem in the hypothetical model. The value for the F-statistic is 1.800000 with a significant p-value of 0.001547, which endorses the validity and stability of the model. Prob (F-statistic) value of 0.001547 is less than the critical significance level of 5%. This invariably means that there is a significant negative relationship between board size, staff strength and job growth rate (SFS) of industrial goods companies in Nigeria. This implies that Board size has a significant negative influence on the social and economic sustainability performance of Industrial goods companies in Nigeria. This agrees to the findings of Fauzi and Locke (2012), which found that board size and management structure and process had significant relationships with operating performance. Also, Githaiga and Kosgei (2023), in their study, similarly reported that Board size has a significant negative relationship with firm sustainability. These recent findings, therefore, somewhat support the research outcome by Lekaram (2014), which showed that board size has an inverse relationship with firm performance. Contrary to our outcome here, the result of the study carried out by Disli *et al.*(2022) reported a positive relationship between Board size and sustainability.

In general, our result here is in line with the findings earlier reported by most extant studies in this regard. The general implication that can be drawn from our result is that a larger Board size delays decision-making processes and policy formation. This could be associated with the prolonged debate and conflicts that usually erupt from 'public' discussions and deliberations. However, the cause of this revealed that the negative influence of Board size on sustainability performance is outside the scope of this current study.

### 3.3. Interpretation and Discussion of Regressed Result for Hypothesis Two

$H_0^2$ : Board independence has no significant effect on solid waste management.

$$SWM_{it} = \beta_0 + \beta_1 BID_{it} + E_{it} \quad - \quad - \quad - \quad 2$$

<b>Dependent Variable: SWM</b> <b>Method: Least Squares</b> <b>Date: 29/05/23 Time: 08:33</b> <b>Sample: 2012 2021</b> <b>Included observations: 10</b>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.262222	0.995815	2.271729	0.0427
BID	0.485556	0.305862	1.587498	0.0211
R-squared	0.639554	Mean dependent var		3.816000
Adjusted R-squared	0.544499	S.D. dependent var		0.627432
S.E. of regression	0.580333	Akaike info criterion		1.926426
Sum squared resid	2.694289	Schwarz criterion		1.986943
Log-likelihood	-7.632131	Hannan-Quinn criter.		1.860039
F-statistic	2.520149	Durbin-Watson stat		1.097662
Prob(F-statistic)	0.021062			

Table 3: Ordinary Least Square Regression Showing the Effect of BID on SWM

Source: Researchers' Computation with E-View 9

$$Swm_{it} = 2.26\beta_0 + 0.486\beta_1bid_{it} + 0.05E_{it} - \dots$$

Table 3 shows the results of the regression of model SWM. The R-squared statistic measures the success of the regression in predicting the values of the dependent variable. The adjusted R-squared of the SWM model is equal to .639, which indicates that 63.9% of the variation in SWM is explained by the regression variables. Hence, the explanatory variables included in this regression are good predictors of SWM. The Durbin-Watson value of 1.097662 indicates the absence of an auto-correlation problem in the model of this study.

The coefficient of BID has a t-statistic equal to 0.485556 and a p-value equal to 0.0211. This implies that BID significantly and positively influences Solid Waste Management. In other words, a unit increase in the proportion of independent directors on the Board will increase environmental sustainability performance by 0.486, which is also significant at 2%. In line with this, an earlier and recent study by Almaqtari *et al.* (2023) investigated the impact of board characteristics on environmentally friendly production and reported that board attributes (measured using board size, board independence and industry expertise) have a significant impact on environmental sustainability performance. In their study, Githaiga and Kosgei (2023) reported that board independence has a significant positive relationship with sustainability. Further in line with our study, Disli *et al.* (2022) found that board independence has a positive influence on some aspects of sustainability performance, which includes environmental sustainability performance. Gardazi, Hassan and Johari (2020) reported that maintaining a balance in the number of executive and non-executive directors will lead to an increase in sustainability performance. Contrary to these results, Lekaram (2014) reported that a higher proportion of independent directors only leads to improved financial performance and not sustainability performance.

Summarily, our result here is in line with the earlier results of previous studies carried out even outside West Africa and outside Africa. The general implication of this is that non-executive directors (outside) bring more experience from diverse fields of endeavors to the board. Also, their judgment from an outsider's viewpoint is highly necessary for achieving environmental sustainability. Therefore, it would not be wrong to say that more independent directors are needed on the Board to facilitate the achievement of sustainability and sustainable development.

## 4. Conclusion

### 4.1. Conclusion and Recommendations

For the purpose of emphasis, results generated from this study show that: Board size significantly influences social and economic sustainability performance and that Board independence has a significant influence on environmental sustainability performance. Emanating from this, our study concludes that board attributes have a statistically significant influence on social, economic and environmental sustainability performance. The following recommendations are made in line with the findings and conclusion of this study:

- A Corporate Board should contain the least possible number of directors that would ease decision-making processes, as evidence shows that the higher the number of directors on the board, the lower the social and economic performance of companies.
- There is a need to build the corporate Board in such a way that there would be a higher proportion of non-executive (outside) directors than executive (inside) directors, as this would enhance the environmental sustainability performance of the companies. Evidence has also shown that when the proportion is higher (Board independence), it will, in effect, increase the sustainability performance of the firms.
- Regulatory authorities should ensure that industrial goods firms in Nigeria comply strictly with corporate governance codes as it relates to Board composition and appropriate sanctions should be meted on erring firms. This will surely encourage more firms towards sustainability and sustainable development.

#### 4.2. Limitation/Suggestion for Further Study

This evidence originated from Nigeria with an extended focus on only the Industrial goods sector. This could have implications for the general applicability of our findings. Future studies may attempt to compare results across different countries. Also, as this current study covered a scope of 10 years from 2012 to 2021, future studies may attempt to extend this scope with advancement in years as results may change over certain periods due to changes in legislation and economic and political instability. As this study found that a larger number of directors on the Board has negative implications for sustainability performance, further studies may be conducted to find out the reasons for this.

#### 5. Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

The authors hereby declare that generative Artificial Intelligence technologies were not used in developing the content of this research work.

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