JOURNAL OF GLOBAL ACCOUNTING
11(3) June, 2025.
ISSN (Online): 1597–7641; ISSN (Print): 1597-8273
https://journals.unizik.edu.ng/joga

BOARD CHARACTERISITCS AND CARBON EMISSION DISCLOURE OF LISTED OIL AND GAS FIRMS IN NIGERIA

Nestor Ndubuisi Amahalu[1] Grace Chinelo Ndulue[2] Obumneme Obiora Okafor[3]
[1,2&3]*Department of Accountancy, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria.*
Emails: nn.amahalu@unizik.edu.ng[1], gracechinelo2@gmail.com[2], oo.okafor@unizik.edu.ng[3]

***Correspondence**:* gracechinelo2@gmail.com

CITATION: Amahalu, N.N,, Ndulue, G.C. & Okafor, O.O. (2025). Board characterisitcs and carbon emission discloure of listed Oil and Gas firms in Nigeria, *Journal of Global Accounting*, 11(3), 40 - 57. Available:https://journals.unizik.edu.ng/joga

ABSTRACT

This study ascertained the effect of board characteristics on carbon emission disclosure of listed oil and gas firms in Nigeria for twelve years period spanning from 2012-2023. Specifically, three objectives were formulated. Purposively, nine (9) listed oil and gas firms constituted the sample size of this study between 2012 and 2023. Ex-Post facto research design and content analysis were adopted while secondary data were extracted from the annual reports and accounts of the sampled firms and were analysed using E-Views 10.0 statistical software. This study utilised inferential statistics via Pearson correlation and Panel Least Square (PLS) regression analysis. Findings from the empirical analysis showed that gender diversity has a significant and positive effect on carbon emission disclosure (β_1= 0.149741; P-value = 0.0094); board size has a significant but negative effect on carbon emission disclosure (β_2= -0.132279; P-value = 0.0000); board independence has a significant and positive effect on carbon emission disclosure (β_3= 0.329993; P-value = 0.0000). The study concludes that the components of board characteristics considered in this study are important variables in influencing on carbon emission disclosure of listed oil and gas firms in Nigeria. It was recommended amongst others that independent directorship should be encouraged in organizations since independent directors bring a wealth of benefits to a company board, including objectivity, strategic insight, effective governance, and improved stakeholder confidence. Their role is crucial in fostering a healthy corporate culture and supporting sustainable, long-term success.

Key words: *Board Size, Board Independence, Carbon Emission Disclosure, Gender Diversity.*

INTRODUCTION

In recent times, corporate governance has attracted interest among scholars. Due to the collapse of multinational companies that were regarded as too big to fail such as Enron, Dot-Com, Bubble, Tyco, Xerox, Ocean Bank, Parmalat, Cadbury and so on. This led to loss of investors confident in the capital market especially the oil and gas industry. In order to restore stakeholders' confidence, there was need to introduce a code of corporate governance that

would regulate the activities of the board of directors that have become so powerful. In the USA, the Sarbanes-Oxley Act was enacted in 2002 also known as the "Public Company Accounting Reform and Investor Protection Act" which regulates the public company boards, management and public accounting firms. In Nigeria, there were sectoral corporate governance code such as code of Corporate Governance for the Telecommunication Industry 2016, code of Corporate Governance for Banks and Discount Houses in Nigeria 2014, code of Corporate Governance for Public Companies in Nigeria 2011, code of Good Corporate Governance for Insurance Industry in Nigeria 2009 and Code of Corporate for Licensed Fund Operators 2008. In 2018, the Nigeria Code of Corporate Governance was introduced to institutionalize corporate governance best practices in Nigeria companies as a key driver to corporate accountability and business prosperity (Ndu, Ifurueze & Amahalu, 2024).

The boards of directors are agents to the company. They are made up of persons who oversee the activities of a company. The primary purpose of the board is to monitor and advise the top management in the discharge of their responsibilities to the owners (Sylvanus, Okoye, Amahalu & Mbonu, 2024). A board of directors is a group of people who jointly supervise the activities of an organization, which can be either a for-profit business, nonprofit organization, or a government agency. Such a board's powers, duties, and responsibilities are determined by government regulations (including the jurisdiction's corporation's law) and the organization's own constitution and bylaws. These authorities may specify the number of members of the board, how they are to be chosen, and how often they are to meet (Ubeh, Okoye, Nwoye & Amahalu, 2024). As a characteristic, Board members should be dedicated and committed to their roles. They should attend meetings regularly, prepare in advance, and be willing to invest time and effort in their responsibilities. A secondary characteristic is Accountability. A high-performing board holds itself accountable for its decisions and actions (Amahalu, Aruna & Orji-Okafor, 2024).

Climate change is one of the biggest environmental challenges society faces in the 21st century. As companies and their industrial production processes have a huge stake in the overall level of global GHG emissions, curbing these emissions can be seen as a central part of a firm's corporate responsibility agenda (Aruna, Orji-Okafor & Amahalu, 2024). Carbon dioxide gas can be toxic and very harmful to humans, it increases the temperature of the Earth's atmosphere, it causes the global warming effect that has bad effects on the Earth. One of the most significant barriers to widespread deployment of carbon management technologies is high cost, transportation challenges, storage considerations, uncertain public support, lack

of capacity within the organisation, including inadequate funds for adaptation, and an organisational culture that limits or prevents decision-making on adaptation (Aderobaki, Amahalu & Adeniyi, 2024).

The decision dilemma facing corporate managers is that they cannot only focus on value creation ignoring the impact of its operation on the atmosphere. On the other hand, managers' financial obligations restrict them to take projects that can only meet social obligations without reasonable economic outcome (Isicheli, Ozoji & Amahalu, 2024). Growing scientific evidence shows that carbon management is a serious challenge and uncontrolled global warming will cause enormous damage. Therefore, given the importance of any board, it is vital to identify and assess their characteristics such as board size, board gender, board independence and its consequent effect on carbon emission disclosure.

Objectives

The main objective of this study is to ascertain the effect of board characteristics on carbon emission disclosure of listed oil and gas firms in Nigeria. The specific objectives were to:

1. determine the effect of gender diversity on carbon emission disclosure of listed oil and gas firms in Nigeria.
2. ascertain the effect of board size on carbon emission disclosure of listed oil and gas firms in Nigeria
3. assess the effect of board independence on carbon emission disclosure of listed oil and gas firms in Nigeria.

LITERATURE REVIEW

Board Characteristics

Board characteristics is the concept derived from the attributes or incentives variable that plays a significant role in monitoring, controlling managers and can be described as a bridge between company management and shareholders (Sylvanus, Okoye, Amahalu, Obi & Ozoji, 2024). To understand the role of the board, boards characteristics consist of a team of individuals, who combine their competencies and capabilities that collectively represent the pool of social capital for their firm that is contributed towards executing the governance function (Ndu, Ifurueze & Amahalu, 2024). Thus, the board characteristics means directors and managers in a vastly more complex environment, increasingly accountable to and influenced by multiple stakeholders and pressured from all sides for better reporting on

corporate health and behaviors (Agweda, Okoye, Amahalu, Egolum & Obi, 2024). The ability of an organization to be able to withstand economic challenges and perform well is believed to be dependent on the unique attributes of its board of directors. The board is the supreme decision-making unit in the company, as the board of directors has the responsibility to safeguard and maximize shareholder's wealth, oversee firm performance, and assess managerial efficiency .

Board Gender Diversity

Board gender diversity is the proportion of female directors to the total number of directors on the board (Amahalu, Abiahu, Nweze & Obi, 2017). Board gender diversity is a significant aspect of corporate governance; it is defined as the presence of female directors on the board of directors of corporations (Amahalu, Okoye, Obi & Iliemena, 2019). Gender diversity focuses on the percentage and number of women on boards (Mbonu, & Amahalu, 2021b). Board gender diversity means equal or balanced representation of people of different genders in the workplace or other contexts and/or organizations. The extent to which a person's gender identity, role, or expression differs from the cultural norms prescribed for people of a particular sex (Mbonu & Amahalu, 2021a). Okudo & Ndubuisi (2021) state that it is the proportion of males to females in an organization that can affect the way in which they interact and behave with one another at the work place, and thereby impact the social and cultural environment. Board gender diversity Consists of a fair and equitable representation of people of different genders, usually referred to as an equitable ratio of men and women. Gender diversity on corporate boards studies and promotes gender diversity in fields traditionally dominated by men. It helps firms attracting and retaining talented women, being especially relevant as more women join the labor force all over the world (Onyeozili, Okoye, Amahalu & Obi, 2022). In the view of Arioglu (2020), women on board demonstrate greater responsibilities, more philanthropically incline and more likely to trade economic performance for corporate social responsibilities. Appointments of women on the board are expected to bring about diversity of opinions and perspective to board deliberations; especially when it relates to sustainability disclosure (Okocha, Okoye, Amahalu, & Obi, 2022).

H_{o1}: Gender diversity has no significant effect on carbon emission disclosure of listed oil and gas firms in Nigeria

JOURNAL OF GLOBAL ACCOUNTING
11(3) June, 2025.
ISSN (Online): 1597–7641; ISSN (Print): 1597-8273
https://journals.unizik.edu.ng/joga

Board Size

Board size refers to the total number of directors on the board of each sample firm which is inclusive of the CEO and Chairman for each accounting year. This will include outside directors, executive directors and non-executive directors (Okafor, Egbunike & Amahalu, 2022). Board size is the number of directors that make up the board (Udo, Oraka & Amahalu, 2022). An optimal board size should include both the executive and non-executive directors (Onyeka & Amahalu, 2022). The effectiveness in structuring the board is important for governing the company. Board size has been found to vary between one country and another as every country has different cultures. This means that there has no optimal and standard board size among the companies in the world (Chukwuka, Okegbe, Amahalu & Obi, 2022). According to a study by The Wall Street Journal, the smallest board size has an average of 9.5 board directors. Large boards are defined as those with 14 or more board directors. Overall, companies have an average of 11.2 board directors (Ejembi, Ijeoma, Amahalu & Obi, 2022). Bylaws can set the number of board members, how the board is elected (for example, by a shareholder vote at an annual meeting), and how often the board meets. While there is no set number of members for a corporate board, many pursuing diversity as well as cohesion settles on a range of 8 to 12 directors (Modozie & Amahalu, 2022).

H_{o2}: *Board size has no significant effect on carbon emission disclosure of listed oil and gas firms in Nigeria*

Board Independence

An independent director is a member of a board of directors who does not have a material or pecuniary relationship with company or related persons, except sitting fees (Okudo, Amahalu Obi & Okafor, 2022). Board independence is the proportion of non-executive directors (NED) to the number of directors. Non-executive directors are not employees of the firm. They advise management on strategy and operations based on their professional experience. Modozie and Amahalu, (2022) define board independence as the proportion of independent non-executive directors to the number of directors on the board. Independent directors are engaged to supervise the activities of the executive directors and top management (Okoye, Amahalu, Okoye & Obi, 2022). They ensure that the interest of the directors does not conflict with that of the owners (shareholders). In addition, they are expected not to have material interest in the company, because this might influence their independent stance. Shareholders react favorably to the appointment of outside directors and react negatively to the demise of outside directors (Amahalu, Ezechukwu & Okudo, 2022).

JOURNAL OF GLOBAL ACCOUNTING
11(3) June, 2025.
ISSN (Online): 1597–7641; ISSN (Print): 1597-8273
https://journals.unizik.edu.ng/joga

Independent outside directors is members of a firm's board of directors who are unaffiliated with the company itself. In contrast to insiders, outside directors are thought to be more objective and bring a different perspective to the management of a firm (Amahalu, Okoye & Nnadi, 2023). Board independence is the proportion of independent non-executive directors on corporate boards, calculated from the number of independent members divided by the number of members on the board (Amahalu & Okudo, 2023).

H_{o3}: *Board independence has no significant effect on carbon emission disclosure of listed oil and gas firms in Nigeria*

Audit Committee Size

In order to perform their role effectively, audit committees should have adequate resources and authority to discharge their increasing responsibilities. Mbonu and Amahalu (2023) argue that the larger the audit committee, the more likely it is to uncover and resolve potential problems in the financial reporting process, because it is likely to provide the necessary strength and diversity of views and expertise to ensure effective monitoring. This suggests that audit committee size is an integral factor for firms in delivering meaningful corporate reporting. However, it can also be argued that as the number of audit committee members increases, each may be comforted by the presence of others and free riders emerge (Amahalu, Okoye, Obi & Iliemena, 2019). In addition, larger audit committees are also likely to suffer from process losses and diffusion of responsibility (Amahalu & Osonwa, 2023). The Smith Report (2003) recommends a minimum of three non-executive directors. According to SEC Code of Corporate Governance 2011, the audit committee should consist of not less than three directors of which independent directors should have the majority, and the committee is chaired by independent nonexecutive director.

Carbon Emissions Disclosure

Emissions are basically chemicals in exhaust gases that are harmful to air quality, mainly carbon monixide (CO), hydrocarbons (HC), and nitrogen oxides (NO). Carbon emission is the release of carbon into the atmosphere (Okudo & Amahalu, 2023). Emission is an amount of something, especially a gas that harms the environment, that is sent out into the air (Amahalu & Moedu, 2023). A carbon price is a cost applied to carbon pollution to encourage polluters to reduce the amount of greenhouse gas they emit into the atmosphere (Amahalu & Okudo, 2023). A carbon price is the method widely agreed to be the most efficient way for

JOURNAL OF GLOBAL ACCOUNTING
11(3) June, 2025.
ISSN (Online): 1597–7641; ISSN (Print): 1597-8273
https://journals.unizik.edu.ng/joga

nations to reduce global warming emissions. To Nzekwe, Okoye, P.V.C., & Amahalu, 2021), it is a cost applied to carbon pollution to encourage polluters to reduce the amount of greenhouse gases they emit into the atmosphere: it usually takes the form either of a carbon tax or a requirement to purchase permits to emit, generally known as carbon emissions trading.

Board Gender Diversity and Carbon Emission Disclosure

The heterogeneity in terms of nationality is beneficial for the company as it gives a positive impact to the financial performance measures, while gender and education heterogeneity is proven otherwise. According to Tom-West, Okoye and Amahalu (2021), women on boards are linked to corporate social responsibility (CSR) and that CSR is linked to financial performance. However, in the mediation test, CSR appears to fully mediate the link between women on boards and financial performance. Increased board gender diversity has a positive impact on a firm's financial performance. It shows that increased female representation on the board can promote improved corporate governance which could be achieved through increased diversity in director experience and opinion. Companies should consider a larger share of women on board as long as their presence may positively influence firm performance. Further, increased diversity may enhance productivity, creativity, and innovation. Oshiole, Elamah and Amahalu (2020) highlighted that gender diversity in top management positively affects firm performance, and that certain corporate decisions pertaining to acquisitions and equity offering yield higher announcement returns, when they are taken by women rather than men. Oppositely, stock market react negatively to increases in board diversity because companies perform worse after they appoint female directors but companies are not any less profitable after appointing female directors to the board than they were prior to the appointment (Amahalu, Ezechukwu & Obi, 2017).

Theoretical Framework

Agency Theory

Agency theory is an economic theory that views the firm as a set of contracts among self-interested individuals. An agency relationship is created when a person (the principal) authorizes another person (the agent) to act on his or her behalf. Agency theory was developed by Jensen and Meckling (1976). They suggested a theory of how the governance of a company is based on the conflicts of interest between the company's owners (shareholders), its managers and major providers of debt finance; the shareholders want to increase their income

and wealth. Their interest is with the returns that the company will provide in the form of dividends, and also in the value of their shares; the managers are employed to run the company on behalf of the shareholders. However, if the managers do not own shares in the company, they have no direct interest in future returns for shareholders, or in the value of the shares. Managers have an employment contract and earn a salary; the major providers of debt have an interest in sound financial management by the company's managers, so that the company will be able to pay its debts in full and on time.

Stakeholder Theory

Stakeholder theory is a view of capitalism that stresses the interconnected relationships between a business and its customers, suppliers, employees, investors, communities and others who have a stake in the organization. The theory argues that a firm should create value for all stakeholders, not just shareholders. Freeman's theory suggests that a company's real success lies in satisfying all its stakeholders, not just those who might profit from its stock.In 1984, R. Edward Freeman originally detailed the Stakeholder Theory of organizational management and business ethics that addresses morals and values in managing an organization. Stakeholder theory describes how a healthy company never loses sight of everyone involved in its success. Stakeholder theory says that if it treats its employees badly, a company will eventually fail. If it forces its projects on communities to detrimental effects, the same would likely happen. A company cannot ignore any of its stakeholders and truly succeed. Stakeholder theory posits that there might be short-term profits, but as stakeholders become dissatisfied, and feel let down, the company cannot survive.

Empirical Review

Augustine (2020) investigated the effect of corporate board characteristics on the financial performance of Nigerian quoted firms 2011-2016. The study employed the random-effects and fixed-effects generalized least squares (GLS) regression to test the six hypotheses formulated for the study, while controlling for firm size and firm age. The study found that board size, CEO duality and gender diversity were negatively linked with return on capital employed (ROCE).

Okon (2020) examined the relationship between board characteristics and company performance (measured by turnover) in Nigeria. The study used multiple regression technique on 90 sampled firms listed on the Nigerian Stock Exchange from 2010 to 2012. The study

showed that board size and financial expertise are positively and significantly related to turnover.

Li, Fu, Han and Liang (2023) examined the relationship between corporate social responsibility (CSR) and financial performance (FP). The study collected data on listed companies in China from 2014 to 2020 in order to demonstrate whether CSR is positively or negatively correlated with financial performance and studied the relationship using media attention as a moderating variable. Through a regression analysis, it was found that (1) companies with good CSR performance show a high level of FP; (2) the higher the media's attention on the company, the better the CSR performance.

Adejola, Omonuk and Ojuola (2024) examined the effect of sustainability reporting on financial performance of Nigerian listed agriculture and natural resource companies. Using return on assets (ROA) as a proxy for corporate financial performance, the study's particular goals were to ascertain if reporting on economic and social sustainability had an effect on the financial performance of the sampled industries. The annual reports of nine (9) chosen firms were the source of the data from 2014 to 2023. Using the E-Views statistical program, the panel least squares regression approach was used to assess the data. The study found that the financial performance of the examined firms is negatively and insignificantly impacted by reporting on economic and social sustainability. The study concluded that sustainability reporting had no significant effect on the performance of Nigerian listed agriculture and natural resources firms.

MATERIALS AND METHOD

Ex-post facto research design was employed in this study. This study was treated as *ex-post facto* research since it relied on historical data. The population of the study consist of all the nine (9) Oil and Gas firms listed on the Nigerian Exchange (NGX) Group as at 31st December, 2023. They are: Ardova Plc, Conoil Plc, Eterna Plc, Japaul Gold and Venture Plc, MRS Oil Nigeria Plc, Oando Plc, Seplat Energy Plc, Total Nigeria Plc, and Capital Oil Plc.Since the entire population size will be sampled, hence, no need for sample size.The data used in this study were collected mainly from secondary source. These data were obtained for eleven (11) years annual reports and account from 2012-2023 of the sample Oil and Gas firms.

JOURNAL OF GLOBAL ACCOUNTING
11(3) June, 2025.
ISSN (Online): 1597–7641; ISSN (Print): 1597-8273
https://journals.unizik.edu.ng/joga

Table 1 Variable Description

Variable	Proxies	Acronym	Measurement
Independent Variable (Board Characteristics)			
	Board Gender Diversity	BGD	Number of Female Directors / Number of the Board of Directors
	Board Size	BS	Logarithm of the total number of Directors
	Board Independence	BI	Number of Independent Directors / Number of the Board of Directors
Dependent Variable			
	Carbon Emission Disclosure	CED	Total Carbon Emission Score Disclosed / Maximum Number of Carbon Emission Score that a firm could Disclose

The volume of carbon emission disclosure emission will be measured by content analysis to find the degree of volume of carbon emission that would be disclosed in Sustainability Reports. Disclosure of carbon emission is measured by scoring a maximum score of 18 (see appendix A) and the minimum score is 0. Each item is worth 1 if the company discloses all of the information in the report so that mean company score is 18. Score on each company then totaled and divided by 18. The carbon emission disclosure checklist, adapted from Global Reporting Initiative standards can be seen in appendix A. A non-weighted (binary) index was devised to examine the narrative sections of the annual and stand-alone sustainability reports (for example, chairman or director's statement, review of sustainability activities and discussions) for each entity. If the entity disclosed a certain item at least once, the score was assigned as 1, and 0 otherwise. Hence, carbon disclosure Index (CDI), including 18 items, was identified to measure the extent of carbon disclosures provided by the entities. The carbon disclosure score will be calculated by dividing the items disclosed to a maximum number of items that a firm could disclose. The total CDI score was calculated as:

$$CDI = \frac{\text{Items disclosed}}{\text{Maximum number of items that a firm could disclose (that is, 18 items)}}$$

This study adapted and modified the model of Okocha, Okoye, Amahalu, & Obi, (2022):

$$ERD = \beta o + \beta_1 GDV_{it} + \beta_2 BDSZ_{it} + \beta_3 ACFE_{it} + \mu_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots \text{Eqn 1.}$$

Where :

ERD = Environmental Remediation Disclosure

JOURNAL OF GLOBAL ACCOUNTING
11(3) June, 2025.
ISSN (Online): 1597–7641; ISSN (Print): 1597-8273
https://journals.unizik.edu.ng/joga

GDV = Gender Diversity

BDSZ = Board Size

ACFE = Audit Committee Financial Expertise

Consequent upon the adapted model, the following regression equation wasill be constructed:

$CED_{it} = \beta o + \beta_1 BGD_{it} + \beta_2 BS_{it} + \beta_3 BI_{it} + \mu_{it}$ ..... Eqn 2.

Where:

β_o = Constant term (intercept)

β_{it}= Coefficients of Board Characteristics for firm í in period t

μ_{it} = Error term/unexplained variable(s) of firm í in period t

CED_{it} = Carbon Emission Disclosure of firm í in period t

BGD_{it} = Board Gender Diversity of firm í in period t

BS_{it} = Board Size of firm í in period t

BI_{it} = Board Independence of firm í in period t

RESULT AND DISCUSSIONS

Table 2 Pearson Correlation Matrix

	CED	BGD	BS	BI
CED	1.0000			
BGD	0.3087	1.0000		
BS	0.1449	0.5312	1.0000	
BI	0.1010	0.3780	-0.1365	1.0000

Source: E-Views 10.0 Pearson Correlation Output, 2025

The Pearson correlation analyses in table 2 shows that there is a positive relationship between BGD (0.3087), BS (0.1449), BI (0.1010) and CED.

JOURNAL OF GLOBAL ACCOUNTING
11(3) June, 2025.
ISSN (Online): 1597–7641; ISSN (Print): 1597-8273
https://journals.unizik.edu.ng/joga

Test of Hypotheses

Table 3: Panel Least Square Regression Analysis between BGD, BS, BI and CED

Dependent Variable: CED
Method: Panel Least Squares
Date: 07/14/24 Time: 06:45
Sample: 2012 2023
Periods included: 12
Cross-sections included: 9
Total panel (balanced) observations: 108

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.554407	0.167685	3.306249	0.0013
BGD	0.149741	0.056594	2.645900	0.0094
BS	-0.132279	0.027186	-4.865686	0.0000
BI	0.329993	0.052174	6.324853	0.0000

R-squared	0.521190	Mean dependent var	2.833333
Adjusted R-squared	0.507378	S.D. dependent var	0.374415
S.E. of regression	0.262791	Akaike info criterion	0.201418
Sum squared resid	7.182147	Schwarz criterion	0.300756
Log likelihood	-6.876588	Hannan-Quinn criter.	0.241696
F-statistic	37.73508	Durbin-Watson stat	1.495028
Prob(F-statistic)	0.000000		

Source: E-Views 10.0 Regression Output, 2025

The resultant output of the regression analysis shows that :

CED = 0.554407 + 0.149741BGD -0.132279BS + 0.329993BI

The research model represents the relationship between board gender diversity, board size, board independence and carbon emission disclosure. The model shows that board gender diversity (β_1=0.149741) and board independence (β_3=0.329993) positively relate with carbon emission disclosure, while board size (β_2=-0.132279) has a negative relationship with carbon emission disclosure. The research model also demonstrated that there is a significant relationship between BGD, BS, BI and CED as indicated by the t-statistics and probability values of x_1 = 2.645900, and 0.0094; x_2 = -4.865686, 0.0000; x_3 = 6.324853, 0.0000. The adjusted R-squared of 0.521190 delineates that BGD, BS and BI have 52.12% influence on CED, while 47.88% is contained in the error terms as part or\f the variables that are not considered in this study.

Decision:

Since the Prob(F-statistic) = 0.000000 is less than the critical value of 0.05, thus, H_1 was accepted and H_0 rejected. Conclusively, the study upholds that board characteristics have a significant effect on carbon emission disclosure of listed oil and gas firms in Nigeria.

JOURNAL OF GLOBAL ACCOUNTING
11(3) June, 2025.
ISSN (Online): 1597–7641; ISSN (Print): 1597-8273
https://journals.unizik.edu.ng/joga

The specific findings of this study are that:

i. Gender diversity has a significant and positive effect on carbon emission disclosure of listed oil and gas firms in Nigeria at 5% level of significance (β_1= 0.149741; P-value = 0.0094).

ii. Board Size has a significant but negative effect on carbon emission disclosure of listed oil and gas firms in Nigeria at 5% level of significance (β_2= -0.132279; P-value = 0.0000).

iii. Board Independence has a significant and positive effect on carbon emission disclosure of listed oil and gas firms in Nigeria at 5% level of significance (β_3= 0.329993; P-value = 0.0000).

CONCLUSION AND RECOMMENDATIONS

The following recommendations were made in line with the findings and conclusion of this study:

i. Since gender diversity in the workplace brings fresh talent, varied skillsets and new ideas. and that innovation happens by thinking differently and being different, thus the idea of gender diversity should be tenaciously upheld by firms . As organisations assemble diverse teams, they prime themselves for creativity, improve decision-making and reduce groupthink

ii. To reverse the negative relationship between board size and carbon emission disclosure, firms should smaller board size of between 6 to 8, since smaller board reduces complexity and facilitates effective control, thus it implies that there is no need for a large board to supervise management performance. Instead, a smaller board size might positively affect firm performance.

iii. Independent directorship should be encouraged in organizations since independent directors bring a wealth of benefits to a company board, including objectivity, strategic insight, effective governance, and improved stakeholder confidence. Their role is crucial in fostering a healthy corporate culture and supporting sustainable, long-term success

REFERENCES

Adejola, P.A., Omonuk, J.B., & Ojuola, O.K. (2024). Sustainability reporting and financial performance of listed agriculture and natural resources firms in Nigeria. *International Journal of Social Sciences and Management Review, 07*(02), 16-32.

Aderobaki, V.A., Amahalu, N.N. & Adeniyi, S.I. (2024). Effect of employee welfare and occupational health and safety reporting on audit quality of listed firms in Nigeria, *Journal of Global Accounting*, 10(1), 62 – 74

Agweda, F.E., Okoye, E.I., Amahalu, N.N., Egolum, P.U. & Obi, J.C. (2024). Environmental disclosure and market value added of listed industrial goods firms in Nigeria, *Journal of Global Accounting*, 10(4), 69 – 84

Amahalu, N.N., & Moedu, V.O. (2023). Triple bottom line reporting and financial performance of quoted oil and gas firms in Nigeria. *International Journal of Research Publication and Reviews, 4*(4), 1172-1180.

Amahalu, N.N., & Okudo, C.C. (2023). Environmental cost disclosure and productivity of quoted oil and gas firms in Nigeria. *International Journal of Multidisciplinary Research and Growth Evaluation, 4*(3), 684-690.

Amahalu, N.N., & Okudo, C.C. (2023). Firm characteristics and cash holdings of quoted conglomerates in Nigeria. *Scholarly Journal of Management Sciences, 2*(3), 111-126

Amahalu, N.N., & Osonwa, N.C. (2023). Board characteristics and market value added of listed service firms in Nigeria. *International Journal of Research, 10*(4), 141-153

Amahalu, N.N., Abiahu, M.F.C., Nweze, C.L., & Obi, J.C. (2017). Effect of corporate governance on borrowing cost of quoted brewery firms in Nigeria (2010-2015). *EPH - International Journal of Business & Management Science, 2(3), 31-57*

Amahalu, N.N., Aruna, F.E. & Orji-Okafor, T.G. (2024). Debt financing and environmental research and development disclosure of listed Oil and Gas firms in Nigeria, *Journal of Global Accounting*, 10(1), 144 – 155

Amahalu, N.N., Ezechukwu, B. O., & Obi, J.C. (2017).Corporate social responsibility and financial performance of quoted deposit money banks in Nigeria. *Asian Journal of Science and Technology, 08*(12), 7183-7191

Amahalu, N.N., Ezechukwu, B.O., & Okudo, C.L. (2022). Intellectual capital and market value added of listed insurance companies in Nigeria. *International Journal of Science Academic Research, 03*(10), 4528-4533

Amahalu, N.N., Okoye, P.V., Obi, J.C., & Iliemena, R.O. (2019). Effect of board diversity on financial performance of quoted natural resources firms in Nigeria. *Journal of Global Accounting, 6*(2), 36-56

Amahalu, N.N., Okoye, P.V.C., & Nnadi, C.P. (2023). Effect of Board Diversity on Financial Performance of Quoted Hospitality Firms in Nigeria. *International Journal of Research in Commerce and Management Studies (IJRCMS) 5*(1), 28-38.

Amahalu, N.N., Okudo, C.C., & Eyide, M.U. (2023). Determinants of cash holdings: Evidence from listed pharmaceutical companies in Nigeria. *Research and Analysis Journals 6*(06), 05-11

Aruna, F.E., Orji-Okafor, T.G. & Amahalu, N.N. (2024). Debt financing and environmental sustainability disclosure of listed Oil and Gas firms in Nigeria, *Journal of Global Accounting*, 10(2), 1 - 15.

Augustine, G. (2020). Impact of corporate board characteristics on the financial performance of Nigerian quoted firms 2011-2016. *International Journal of Business & Law research, 8*(1), 144-155.

Chukwuka, L., Okegbe, T.O., Amahalu, N.N., & Obi, J.C. (2022). Firm characteristics and corporate reserve of quoted oil and gas firms in Nigeria. *International Journal of Research. 9*(1), 299-309

Ejembi, O.A., Ijeoma, N.B., Amahalu, N.N., & Obi, J.C. (2022). Corporate governance and fraud management of quoted commercial banks in Nigeria. *International Journal of Management Studies and Social Science Research, 4*(1), 182-190

Isicheli, N.S., Ozoji, A.P. & Amahalu, N.N. (2024). Financial leverage and market value added of listed industrial goods firms in Nigeria, *Journal of Global Accounting*, 10(2), 515 – 527

Li, J., Fu, T., Han, S., & Liang, R. (2023). Exploring the impact of corporate social responsibility on financial performance: the moderating role of media attention. *Sustainability*, *15*(6), 5023.

Mbonu, C.M., & Amahalu, N.N. (2021a). Effect of firm characteristics on capital structure of insurance companies listed on Nigeria stock exchange *International Journal of Management Studies and Social Science Research, 3*(5), 217-228

Mbonu, C.M., & Amahalu, N.N. (2021b). Effect of board diversity on borrowing cost of listed conglomerates in Nigeria. *American Research Journal of Humanities Social Science (ARJHSS), 04*(10), 62-73

Mbonu, C.M., & Amahalu, N.N. (2023). Strategic management and environmental disclosure of listed consumer goods companies in Nigeria. *International Journal of Research Publication and Reviews, 4*(6), 2658-2668.

Modozie, E.C., & Amahalu, N.N. (2022). Effect of board structure on sustainability reporting of listed industrial goods firms in Nigeria. *International Journal of Management Studies and Social Science Research, 4(*1), 204-215

Ndu, B.C., Ifurueze, M.S. & Amahalu, N.N. (2024). Firm attributes and cash holdings of listed pharmaceutical firms in Nigeria, *Journal of Global Accounting*, 10(3), 273 - 304.

Nzekwe, O.G., Okoye, P.V.C., & Amahalu, N.N. (2021). Effect of sustainability reporting on financial performance of quoted industrial goods companies in Nigeria. *International Journal of Management Studies and Social Science Research, 3*(5), 265-280.

Okafor, O.O., Egbunike, P.A., & Amahalu, N.N. (2022). Determinants of environmental disclosure of quoted oil and gas firms in Nigeria. *International Journal of Management Studies and Social Science Research, 4*(1), 77-88

Okocha, O.H., Okoye. P.V.C., Amahalu, N.N., & Obi, J.C. (2022). Board characteristics and cash value added of quoted deposit money banks in Nigeria. *International Journal of Research, 9*(1), 164-178.

Okon, T. (2020). Board characteristics and company performance in Nigeria. *International Journal of Financial Research, 7*(2), 247-255.

Okoye, P.V.C., Amahalu, N.N., Okoye, J.N., & Obi, J.C. (2022). Effect of ownership structure on sustainability reporting assurance practice: evidence from quoted oil and gas firms in nigeria.Journal of Accounting, 11(1), 19-31.

Okudo, A.G., & Ndubuisi, N.A. (2021). Corporate governance and carbon disclosure practices of quoted manufacturing firms in Nigeria. *International Journal of Contemporary Research and Review, 12* (07), 20420-20433

Okudo, C.L; & Amahalu, N.N. (2023). Effect of environmental accounting on profitability of listed oil and gas firms in Nigeria. *International Journal of Advanced Academic Research, 9*(3), 47-61.

Okudo, CL., Amahalu, N.N., Obi, J.C., & Okafor, O.O. (2022). Relevance of accounting ethics in preparing a reliable accounting report of manufacturing firms in Anambra State, Nigeria. *International Journal of Education, Business and Economics Research (IJEBER) 2*(5), 136-149.

Onyeka, C.M., & Amahalu, N.N. (2022). Board diversity and market value added of quoted conglomerates in Nigeria. *International Journal of Management Studies and Social Science Research, 4*(1), 102-112.

Onyeozili, C.Z., Okoye, E.I., Amahalu, N.N., & Obi, J.C. (2022). Effect of firm characteristics on capital structure of deposit money banks listed on Nigeria stock exchange. *International Journal of Advances in Engineering and Management (IJAEM), 4*(1), 815-827

Oshiole, S., Elamah, A.F., & Amahalu, N.N. (2020). Effect of environmental cost disclosure on profitability of listed oil and gas firms in Nigeria. *International Journal of Academic Research in Accounting, Finance and Management Sciences 10*(2), 157-170.

Sylvanus, A.N., Okoye, P.V.C., Amahalu, N.N. & Mbonu, C. (2024). Intellectual capital and financial performance of manufacturing firms in Nigeria, *Journal of Global Accounting*, 10(2), 480 - 497.

Sylvanus, A.N., Okoye, P.V.C., Amahalu, N.N., Obi, J.C. & Ozoji, A.P. (2024). Effect of board characteristics on asset quality: evidence from commercial banks, *International Review of Financial Studies*, 1(1), 1 – 19

Tom-West, R., Okoye, P.V.C., & Amahalu, N.N. (2021). Intellectual capital and economic value added of quoted information communication and technology firms in Nigeria. *International Journal of Management Studies and Social Science Research, 3*(5), 281-294.

Ubeh, P.C., Okoye, E.I., Nwoye, U.J. & Amahalu, N.N. (2024). Board Diversity and Financial Leverage of listed Commercial Banks in Nigeria (2012 - 2022), *Journal of Global Accounting*, 10(1), 75 – 94

Udo, C.U., Oraka, A.O., & Amahalu, N.N. (2022). Female directors and corporate sustainability of quoted conglomerates in Nigeria. *International Journal of Management Studies and Social Science Research, 4*(1), 131 – 143

JOURNAL OF GLOBAL ACCOUNTING
11(3) June, 2025.
ISSN (Online): 1597–7641; ISSN (Print): 1597-8273
https://journals.unizik.edu.ng/joga

APPENDIX

Table 1: Carbon Management Disclosure Checklist

Climate Change: risks and opportunities	CC1- Assessment/description of the risks (regulatory, physical or general) relating to climate change and actions taken or to be taken to manage the risks
	CC2- Assessment/description of current (and future) financial implications, business implications and opportunities of climate change
GHG Emission	GHG1- Description of the methodology used to calculate GHG emissions (e.g. GHG protocol or ISO)
GHG Emission	GHG2- Existence external verification of quantity of GHG emission- if so by whom and on what basis
	GHG3- Total GHG Emissions – metric tons CO2-e emitted
	GHG4- Disclosure of scopes 1 and 2, or scope direct GHG emissions
	GHG5- Disclosure of GHG emissions by sources (e.g. coal, electricity, etc.)
	GHG6- Disclosure of GHG emissions by facility or segment level
	GHG7- Comparison of GHG emissions with previous years
Energy Consumption	EC1- Total energy consumed (e.g. tera-joules or peta-joules)
	EC2- Quantification of energy used from renewable sources
	EC3- Disclosure by type, facility or segment
GHG Reduction and Cost	RC1- Detail of plans or strategies to reduce GHG emissions
	RC2- Specification of GHG emissions reduction target level and target year
	RC3- Emissions reductions and associated costs or savings
	RC4- Cost of future emissions factored into capital expenditure planning
Carbon Emission Accountability	AEC1- Indication of which board committee (or other executive body) has overall responsibility for actions related to climate change
	AEC2- Description of the mechanism by which the board (or other executive body) reviews the company's progress regarding climate change

Source: Global Reporting Initiative Standards, 2025