SIAR-Global Journal of Economics, Finance & Accounting (GJEFA)
www.siarpublications.org ISSN: 3121-987X
info@siarpublications.org Vol. 1 Issue 1 July.-Aug. 2025

Board Characteristics and Environmental Disclosure Quality of Quoted Oil and Gas Firms in Nigeria

Confidence Joel IHENYEN, PhD[1]; Perelayefa George OWOTA,PhD[2]; Werinipre OTOBO[3]

Department of Accounting, Faculty of Management Sciences, Niger Delta University, Wilberforce Island Bayelsa State. Corresponding author's email Ihenyenconfidence99@gmail.com

Abstract

This paper has investigated how board attributes affect the quality of environmental disclosure by Nigerian oil and gas companies during 2014-2023. Using the methods of panel regression and with the Hausman test as a guide, the Random-Effects model was established as the best estimator. The data analysis confirms that board size positively influences environmental disclosure, statistically significant, which requires larger boards to improve transparency due to various expertise and accountability pressures. On the contrary, the independence of the boards, how frequently the boards meet, and the extent of executives domination do not show any meaningful relationships with disclosure quality, implying that these governance provisions are not as effective in Nigerian environment. Generally, the evidence suggests that some governance features have a positive impact on disclosure but others are more symbolic and do not provide substantive improvements to environmental reporting, and thus represent institutional and regulatory weaknesses that limit the usefulness of independence and diligence in the formation of sustainability practices. The researchers recommend that environmental disclosure standards must be formally integrated into the corporate governance codes, with a sanction measure to enforce non-compliance, and thus forcing firms to reinforce their system of governance to uphold reporting expectations.

Keywords: *Board characteristics, Environmental disclosure, Governance, Nigeria*

1. Introduction

Companies' capacity to meet stakeholder expectations for transparency and sustainability is heavily dependent on good corporate governance. With rising concerns about environmental degradation and dangers, corporate boards in developing nations like Nigeria are subject to more stringent evaluations. There has been some discussion about the social responsibility of businesses whose operations have an adverse impact on the environment, and more specifically around the question of whether or not these businesses are held accountable for their actions (Chukwu & Nkak, 2020).

Being open and honest about environmental dangers and how to mitigate them is an important part of being ecologically responsible. Corporate environmental disclosure has become increasingly important for businesses to inform stakeholders about their environmentally conscious practices and the effects of their operations on the environment (Cormier, Lapointe-Antunes & Magnan, 2015), as stated in Abubakar, Jacob and Aza (2021).Customers, governments, regulators, nongovernmental organisations (NGOs), communities, investors, banks, employees, and the broader public are all worried about the consequences of oil and gas firms on the environment. Some examples of these effects include the release of greenhouse gases, the disposal of hazardous waste, and the release of substances that deplete the ozone layer.

No one fully understands the impact of board qualities on environmental disclosure in Nigeria, despite the fact that corporate boards are tasked with overseeing social responsibility and business decisions. An effective board of directors will have members with diverse backgrounds and areas of expertise, and they will work to create policies that benefit both shareholders and the company as a whole. Because it involves assembling a group to manage day-to-day operations of a company for the benefit of both the company and society at large, corporate governance is likewise a matter of public concern.

Some studies find that boards with more female members and larger board sizes perform better, while others find that board independence is irrelevant in Nigeria. This is due to the fact that the existing literature presents conflicting conclusions. In addition, most empirical studies have only covered a short time frame, typically ending in 2019 or 2020, therefore they haven't explained what happens beyond 2020 when sustainability pressure increases. When it comes to environmental disclosures, the lack of consistency and quality raises fundamental questions about why Nigerian boards have failed to live up to stakeholder and regulatory expectations. To address this knowledge vacuum, this research looks at the relationship between board features and the quality of environmental disclosure across a ten-year period (2014–2023).

2. Literature Review and Hypnosis Development

Conceptual Framework

This study's conceptual framework shows how the traits of a board affect the quality of environmental disclosure by oil and gas businesses in Nigeria that are listed on the stock exchange. The framework is based on the idea that the board of directors, as the highest decision-making body, is very important in deciding how much a company should do to make its environmental reporting clear and socially acceptable.

Environmental disclosure is an important part of corporate sustainability reporting. It shows how conscious a company is of the environment, how well it follows the rules, and how committed it is to being open and accountable. The paradigm posits that efficient board processes augment the legitimacy, dependability, and comprehensiveness of such disclosures.

Independent Variables (Board Characteristics)

Board Size (BSIZE): The number of directors on the board is what board size means. It is assumed that a bigger board will have more skills, points of view, and knowledge that can help with better decision-making and supervision on environmental concerns. Empirical data (Abubakar et al., 2021; Oni & Ishola, 2025) indicates that larger boards correlate with more environmental disclosure, attributable to their enhanced ability for oversight and policy enforcement.

Board Independence (BIND): The number of non-executive or independent directors on the board shows how independent the board is. Independent directors are supposed to be neutral observers of management, which lowers agency conflicts and improves the quality of environmental reporting. Research, including Wisdom et al. (2021) and Olanrewaju et al. (2021), indicates that independent boards frequently want greater openness and accountability in sustainability disclosures.

Executive Directors (EXED): Executive directors are board members who also run the firm. Even if they know a lot about how the firm works, too much control from management might make the quality of disclosures worse. When matched with independent directors, executive members can provide operational insights that enhance the depth and accuracy of environmental reporting (Grace & Ndubusis, 2018).

Board Meetings (BMEET): Board meetings show how often directors meet in person to talk about business matters, such as environmental policies and sustainability. Frequent meetings show that there is active monitoring, quick policy assessment, and a willingness to listen to the concerns of stakeholders. Hanen, Bassem, and Jabr (2020) discovered that increased frequency of board meetings enhances governance and disclosure efficacy.

The Dependent Variable

Environmental Disclosure (ENVD): This shows how much and how well companies share information about their environmental performance, policies, and effects. It could entail controlling emissions, managing waste, releasing effluent, protecting biodiversity, and using less energy. Good environmental disclosure shows that a company has good governance, follows the rules, and meets the needs of its stakeholders (Obiora et al., 2022).

Theoretical Foundation

Agency Theory and Stakeholder Theory are the two main ideas that support the framework. According to Agency Theory, good board processes lower agency costs by making sure that managers act in the best interests of shareholders through clear and complete disclosures (Jensen & Meckling, 1976). Independent directors and frequent board meetings function as oversight mechanisms to alleviate information imbalance between management and shareholders. Stakeholder Theory (Freeman, 1984) asserts that organisations have responsibilities not alone to shareholders, but also to a broader array of stakeholders, including employees, regulators, communities, and the environment. Consequently, board structures that encompass diversity, independence, and participation are more inclined to address environmental and social issues through enhanced disclosure procedures.

Based on the literature and theoretical viewpoints that were looked at, the idea is that board characteristics (size, independence, executive directors, and meeting frequency) have an effect on how well oil and gas companies disclose information on the environment. Boards that have the right size, have a good mix of members, and meet often are better equipped to enforce ethical and sustainable practices, which makes disclosures more clear.

Hypotheses Development

Several studies have examined the relationship between board characteristics and the quality of environmental disclosure among firms in emerging economies, particularly in Nigeria.

Oni and Ishola (2025) investigated the impact of board independence, board size, board ownership, firm growth, firm size, leverage, profitability, and environmental disclosure using data from thirteen publicly quoted oil and gas companies in Nigeria covering 2015–2024. Employing the ordinary least squares (OLS) regression model, their findings revealed a negative association between environmental disclosure and leverage, while board independence, board size, board ownership, firm growth, firm size, and profitability exhibited positive and significant relationships with environmental disclosure.

Similarly, Obiora, Onuora, and Chukwuemeka (2022) analyzed the effect of board quality on sustainability disclosures of listed firms in Nigeria and South Africa. Using effluent disclosure as a proxy for environmental disclosure and gender diversity, board size, and independence as indicators of board characteristics, their panel least squares regression revealed that greater gender diversity, larger boards, and increased board independence significantly enhanced effluent disclosure. The study utilized data from fact books, annual reports, and sustainability statements obtained from the Johannesburg Stock Exchange (JSE) and the Nigerian Exchange (NGX) Group.

In another related study, Wisdom, Rufai, Obiajulu, and Josephine (2021) assessed the relationship between board characteristics and environmental disclosure among twenty listed Nigerian manufacturing companies from 2013–2017. Using OLS regression, they established a positive and significant correlation between board independence and environmental disclosure. The study concluded that firms with larger and more internationally diverse boards tend to be more transparent in their environmental reporting, thereby improving corporate governance credibility and stakeholder confidence.

Olanrewaju, Yunusa, and Mahmoud (2021) examined how board mechanisms influence the quality of environmental disclosure among Nigerian oil and gas companies between 2012 and 2019. Their panel corrected standard error (PCSE) regression indicated that board independence, gender diversity, and board competence significantly enhance environmental disclosure quality. However, board size and nationality showed no significant effect.

Abubakar et al. (2021) also explored the influence of board attributes on environmental disclosure quality within the industrial goods sector (2010–2019). Their multiple regression results revealed a positive and statistically significant relationship between board size and the level of environmental disclosure, suggesting that larger boards provide a wider range of expertise and are more likely to promote transparency.

In a similar vein, Chukwu and Nkak (2020) analyzed the environmental disclosure practices of eleven consumer goods companies between 2010 and 2018. Their regression results demonstrated that board diversity and size significantly and positively influence environmental disclosure, while board independence exhibited no significant relationship.

Likewise, Hanen, Bassem, and Jabr (2020) examined 82 publicly traded firms to determine the effect of board features on governance, environmental, and ethics disclosures. Their findings revealed that while board size was positively associated with corporate environmental disclosure, board independence, female representation, and board meeting frequency exerted a statistically significant influence on overall disclosure practices.

Grace and Ndubusis (2018) compared listed firms in Nigeria and South Africa using a multivariate regression model to examine how board characteristics relate to environmental disclosure. They found a stronger and statistically significant association between board characteristics and environmental disclosure among South African firms compared to Nigerian firms, attributing the disparity partly to sample imbalance and contextual governance differences.

Furthermore, Abu and Raya (2017), using logistic regression, reported a significant relationship between corporate governance attributes and the quality of corporate environmental disclosures, emphasizing that governance mechanisms play a key role in shaping disclosure behavior.

Drawing from the theoretical perspectives and empirical findings of prior research, the following null hypotheses are proposed for this study:

H_1: Board size does not significantly influence the quality of environmental disclosure among quoted oil and gas companies in Nigeria.

H_2: Board independence does not significantly influence the quality of environmental disclosure among quoted oil and gas companies in Nigeria.

H_3: Executive directors do not significantly influence the quality of environmental disclosure among quoted oil and gas companies in Nigeria.

H_4: Board meetings do not significantly influence the quality of environmental disclosure among quoted oil and gas companies in Nigeria.

Theoretical Connection

The development of these hypotheses is grounded in **Agency Theory** and **Stakeholder Theory**. Agency Theory posits that effective monitoring by independent and well-structured boards reduces managerial opportunism and enhances the quality of voluntary disclosures, including environmental information. In contrast, Stakeholder Theory emphasizes the moral and strategic responsibility of firms to disclose relevant environmental information to satisfy the expectations of diverse stakeholders—such as regulators, investors, communities, and environmental advocates. Together, these theoretical perspectives suggest that the composition, independence, and activeness of the board play a pivotal role in shaping corporate environmental reporting behavior. Hence, the hypotheses proposed seek to empirically establish how board mechanisms influence environmental disclosure among quoted oil and gas companies in Nigeria.

3. Methodology

This paper has a research design that can be defined as ex post facto because we cannot control the independent variables in the current situation. The target group is comprised of five quoted oil and gas companies on the Nigerian Exchange (NGX). The audited annual reports included the data on the fiscal years 2014 to 2023. The companies that make the sample are Seplat Energy, Oando Plc, Conoil Plc, Eternal Plc, and MRS Oil.

Model Specification

The model is specified as:

ENVD= β0 + β1BSIZ + β2BIND + β3EXED + β4MEET + ε
Where:
ENVD = Environmental Disclosure Quality
BSIZE = Board Size
BIND = Board Independence
EXED = Executive Directorship
BMEET = Board Meeting

Estimation Technique

Panel regression will be employed. Hausman test will determine the suitability of fixed or random effects models.

4. Results

Data Analysis

Table 4.1: Descriptive Statistics

	ENVD	BSIZ	BMEET	EXED	INDNE
Mean	0.920000	10.40000	5.900000	2.640000	3.000000
Median	1.000000	11.00000	5.000000	3.000000	2.000000
Maximum	1.000000	14.00000	13.00000	4.000000	6.000000
Minimum	0.000000	8.000000	4.000000	2.000000	1.000000
Std. Dev.	0.274048	1.761261	2.168889	0.562792	2.118914
Skewness	-3.096281	0.009056	1.851266	0.126568	0.390053
Kurtosis	10.58696	1.785319	6.060243	2.214422	1.342975
Jarque-Bera	199.8119	3.074540	48.07050	1.419187	6.988117
Probability	0.000000	0.214967	0.000000	0.491844	0.030377
Sum	46.00000	520.0000	295.0000	132.0000	150.0000
Sum Sq. Dev.	3.680000	152.0000	230.5000	15.52000	220.0000
Observations	50	50	50	50	50

Source: Eview Output

The Table 1 discloses the descriptive statistics of ENVD (environmental disclosure), BSIZ (board size), BMEET (board meetings), EXED (executive directors), INDNE (independence). The Disclosure on the Environment (ENVD) shows the Mean of 0.92, Standard deviation of 0.27. It means that, on average, about 92 per cent of the disclosure items are covered, but with a variation, as shown by at least 0 of some firms. The skewness of 3.09 and the kurtosis of 10.59 indicate a significantly non-normal distribution that is characterised by a concentration of high disclosure levels and a small tail of low disclosure.

The Board Size (BSIZ) shows the Mean= 10.4 directors, a range of 8 to 14. These numbers indicate that these boards are of moderate size and are in close relation to the recommendations provided in corporate governance codes.

Board Meetings (BMEET) reveals the Mean the number of meetings per annum=5.9, maximum=13. The difference suggests that although all firms meet the minimum statutory level, others meet more often, which implies a difference in the level of diligence by the board.

Executive Directors (EXED) reveals the Mean=2.64, which means that executive directors have a fairly small percentage of the board compared to non-executive directors.

Independence (INDNE) shows the Mean = 3.0, ranging from 1 to 6. The heterogeneity in compliance with independence requirements in the sample is reflected in this dispersion.

Table 4.2 Correlation Matrix

Covariance Analysis: Ordinary
Date: 10/04/25 Time: 04:29
Sample: 2014 2023
Included observations: 50

Correlation Probability	ENVD	BSIZ	BMEET	EXED	INDNE
ENVD	1.000000 -----				
BSIZ	0.405906 0.0034	1.000000 -----			
BMEET	0.123607 0.3924	0.406028 0.0034	1.000000 -----		
EXED	0.338743 0.0161	0.848261 0.0000	0.187256 0.1929	1.000000 -----	
INDNE	0.281161 0.0479	0.820272 0.0000	0.626141 0.0000	0.598978 0.0000	1.000000 -----

Source: Eview Output

The table 2 reveals the positive correlation between ENVD and BSIZ is statistically significant (0.406, 0.0034) and it would suggest that bigger boards are related to higher environmental disclosure.

ENVD is positively (albeit non-significantly) correlated with BMEET (0.124 = -0.392), which means that the frequency of meeting cannot be a strong predictor of disclosure levels.

The positive correlation between ENVD and EXED (0.339 0.016) is highly significant, and it shows that boards that represent the executive more are more likely to publish more information on the environment.

The positive correlation between ENVD and INDNE (0.281, 0.048) is also less strong yet, statistically significant, which also indicates that independent directors can contribute to better disclosure credibility.

Multicollinearity check reveals that there are strong correlations between the variables that comprise the board, that is, BSIZ and EXED (r=0.85) and BSIZ and INDNE (r=0.82) which, when used in regression analyses, may lead to multicollinearity, inflating standard errors and destabilising the coefficient estimates.

Taken together, the results indicate a positive correlation between the size of boards and the existence of independent directors and executive directors with effective environmental disclosure, though, this association is to be treated with caution based on the interrelationships that are being strong among the board variables.

Table 4.3 Regression Results

Period random effects test equation:
Dependent Variable: ENVD
Method: Panel EGLS (Cross-section random effects)
Date: 10/04/25 Time: 04:38
Sample: 2014 2023
Periods included: 10
Cross-sections included: 5
Total panel (balanced) observations: 50
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.124497	0.342989	0.362977	0.7187
BMEET	-0.015727	0.023130	-0.679945	0.5009
BSIZ	0.120020	0.057026	2.104636	0.0424
EXED	-0.117327	0.131649	-0.891210	0.3787
INDNE	-0.016723	0.035692	-0.468527	0.6422

Effects Specification

	S.D.	Rho
Cross-section random	0.000000	0.0000
Period fixed (dummy variables)		
Idiosyncratic random	0.240047	1.0000

Weighted Statistics

R-squared	0.321256	Mean dependent var	0.920000
Adjusted R-squared	0.076154	S.D. dependent var	0.274048
S.E. of regression	0.263406	Sum squared resid	2.497778
F-statistic	1.310704	Durbin-Watson stat	0.401130
Prob(F-statistic)	0.251922		
	Unweighted Statistics		
R-squared	0.321256	Mean dependent var	0.920000
Sum squared resid	2.497778	Durbin-Watson stat	0.401130

Source: E-view Output

Table 4.3 shows the output of a Random-Effects regression. There is a statistically significant positive coefficient of 0.120 ($p < 0.05$) in board size (BSIZ), which suggests that greater board size correlates with better quality environmental disclosure. This observation is in line with the hypothesis that larger board size improves oversight ability, and greater compliance with disclosure standards. Conversely, the coefficient of board meeting frequency (BMEET) is 0.016 ($p > 0.10$), which implies that the frequency of board meetings does not have much effect on environmental reporting. Likewise, with executive directors (EXED), the coefficient is -0.117 ($p > 0.10$); the relationship is not positive, but statistically not significant, so more executive dominance does not, necessarily, lead to transparency. Board independence coefficient (INDNE) = -0.017 ($p > 0.10$) shows no significance of the negative effect, and questions the importance of independent directors in promoting disclosure in the Nigerian setting. The model accounts for about 32 percent of the environmental disclosure variance (R2 =0.32) with the cumulative F -test being unimportant (p= 0.25), indicating a low explanatory power.

Table 4.4 Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section and period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	3	1.0000
Period random	0.000000	4	1.0000
Cross-section and period random	7.573727	3	0.0557

Source: E-view Output

Hausman test was utilized to differentiate between Fixed Effects and Random Effects estimators. The test value ($\chi^2 = 7.57$, $p = 0.0557$) did not reject the null hypothesis that no systematic difference exists between the two estimators, thus confirming the choice of the Random-Effects model as more efficient and appropriate in this analysis.

Discussion of findings

The empirical results show that board characteristic has mixed impacts in relation to the quality of environmental disclosure among oil and gas companies in Nigeria. The high positive impact of board size is supported by previous research (Abubakar et al., 2021; Hanen et al., 2020) suggesting that larger boards present a wider range of expertise and create a higher accountability pressure on stakeholders. On the other hand, the non-triviality of the association between board meeting frequency and disclosure is consistent with Chukwu and Nkak (2020), who identified that diligence, through the measurement of the meeting frequency, does not necessarily increase the quality of reporting. The small role of board independence contradicts with the expectations of the agency theory but not with the findings of the Nigerian firms (Chukwu & Nkak, 2020), indicating that the role of the independent directors can be limited by the cultural, institutional, or political context. Lastly, the fact that executive dominance is not supported points to the governance problems where managers interests can supersede the goals of transparency.

5. Conclusion and Recommendations

In conclusion, the results highlight the significance of board size in enhancing the disclosure results and challenge the practicality of the board independence and meeting frequency in the Nigerian oil and gas industry. This paper has investigated how board attributes affect the quality of environmental disclosure by Nigerian oil and gas companies during 2014-2023. Using the methods of panel regression and with the Hausman test as a guide, the Random-Effects model was established as the best estimator. The data analysis confirms that board size positively influences environmental disclosure, statistically significant, which requires larger boards to improve transparency due to various expertise and accountability pressures. On the contrary, the independence of the boards, how frequently the boards meet, and the extent of executives domination do not show any meaningful relationships with disclosure quality, implying that these governance provisions are not as effective in Nigerian environment. Generally, the evidence suggests that some governance features have a positive impact on disclosure but others are more symbolic and do not provide substantive improvements to environmental reporting, and thus represent institutional and regulatory weaknesses that limit the usefulness of independence and diligence in the formation of sustainability practices.

From the analytical output, the following recommendations are proposed:

1. Enhance board composition: To improve sustainability oversight, regulatory authorities like the Nigerian Exchange (NGX) and the Securities and Exchange Commission (SEC) need to implement the best board sizes, defined as the optimal balance between diversity and functional capacity.
2. Encourage diversity beyond the numerical level: Independence and board meeting frequency were not significant, and those criteria cannot be forgotten. Rather, regulators must focus on the quality of independent directors by conducting specific training, ethical accountability, and preventing political interference.
3. Director training: Directors and boards need to be provided with regular training on sustainability, as well as be exposed to international best practices in disclosure (e.g., GRI Standards, ISSB guidelines) so that independence and diligence can become effectively functional not merely symbolic.
4. Mandate sustainability reporting: The environmental disclosure standards must be formally integrated into the corporate governance codes, with a sanction measure to enforce non-

compliance, and thus forcing firms to reinforce their system of governance to uphold reporting expectations.

References

Abubakar, G. R., Jacob, A. & Aza, S. M. (2021). Board attributes and environmental disclosure quality of quoted industrial goods companies in Nigeria, *International Entrepreneurship and Management Journal*, Volume 2(4):123-

Chikwelu, M. M. & Emmanuel, I. O. (2023). Board characteristics and environmental disclosure of listed oil and gas firms in Nigeria and South Africa. Journal of Global Accounting, 9(2), 20 – 35

Chukwu, G. J. & Nkak, P. E. (2020). Board attributes and environmental disclosure quality of listed consumer goods firms in Nigeria. *GOUni Journal of Faculty of Management and Social Sciences* (8/1) 14-26.

Grace N. O., Ndubuisi O., & Regina G. O., (2018) Corporate board characteristics and environmental disclosure quantity: Evidence from South Africa (integrated reporting) and Nigeria (traditional reporting), *Cogent Business & Management*, 5:1, 1551510.

Hanen, K., *Bassem, S., & Jabr, A., (2020).* Impact of board characteristics on governance, environmental and ethical disclosure. Department of Accounting, College of Business Administration, Majmaah University, AlMajma'ah, Saudi Arabia, and *Anis Jarboui* University of Sfax, Sfax, Tunisia.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics, 3*(4), 305–360.*

Obiora, F., Onuora, J. K. K. & Chukwuemeka, I. S. (2022). Impact of board quality on sustainability disclosure of quoted firms in Nigeria, Journal of Accounting and Financial Management, Vol 8. (2); 79-95.

Olanrewaju Issa, S., Yunusa PhD, N., & Mahmoud Hamman, A. (2021). Board mechanisms and environmental disclosure quality of listed oil and gas firms in Nigeria. *Gusau Journal of Accounting and Finance*, *2*(2), 17. https://doi.org/10.57233/gujaf.v2i2.65

Oni, A. S. & Ishola, O. P. (2025). Board attributes and environmental disclosure in Nigeria: Evidence from Oil and Gas Industry, *Journal of Accounting and Financial Management*, 11. (7); 209-229.

Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. Academy of Management Review, 20*(3), 571–610.*

Wisdom, O., Rufai O., Obiajulu, C. O. & Josephine B. O. (2021). Board characteristics and environmental information disclosure of listed manufacturing firms in Nigeria. *Journal of Business and Entrepreneurship*, Vol. 9, (2), 82-93.

