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BOARD DIVERSITY AND INTEGRATED REPORTING PRACTICE OF LISTED OIL AND GAS FIRMS IN NIGERIA: DOES INSTITUTIONAL OWNERSHIP MATTER?

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Abstract

This research explores how institutional ownership influences the connection between board diversity and integrated reporting (IR) practice. Utilizing multiple panel regression estimators for seven (7) oil and gas companies in Nigeria from 2020 to 2024, the research employed a census sampling method to choose all firms listed on the Nigerian Exchange Group (NGX) as December 31, 2024. The research showed that board financial expertise positively influences IR practice; board group diversity does not significantly affect IR practice, whereas institutional ownership negatively impacts the IR practice of the sampled firms. Furthermore, the research reveals that institutional ownership negatively moderates the relationship between board financial expertise and IR practice, while positively moderating the relationship between board group diversity and IR practice in Nigerian listed oil and gas companies. The study concluded that institutional ownership influenced the relationship between board diversity and the IR practices of the sampled companies in Nigeria, according to the findings. Consequently, it is recommended that the number of non-executive directors on the board possessing accounting expertise, professional credentials, and significant work experience be augmented to improve the implementation of IR. The management needs to offer a way to educate stakeholders, particularly institutional investors, on the significance of IR practice for company value. This approach can enhance the culture of voluntary adoption of IR and improve their reputation among investors. Lastly, oil and gas companies in Nigeria must promote collaboration with shareholders, particularly institutional investors, to guarantee efficient implementation of IR.

Keywords: board diversity, integrated reporting practice, board financial expertise, institutional ownership, firm age

1. Introduction

Businesses now have a broader global perspective than just an economic one because of their influence on the social and environmental spheres. Stakeholders are looking for more information, especially about the non-financial parts of company data. Globalization and the rise of non-financial regulations have made it necessary for businesses to assume responsibility for both their financial and non-financial governance,

as well as for vital areas like corporate accountability, transparency, resource scarcity now and in the future, population growth, and environmental issues. A vital component of the business's operations and operations is the sharing of information.

Typically, financial and non-financial records are prepared independently, which causes stakeholders to become confused (Umar et al., 2025). Furthermore, the traditional annual financial and non-financial reports are primarily concerned with the past and neglect to take into account future objectives or important impending risks. Similar to this, investors' and other important stakeholders' information needs are always changing.

Business partners, managers, investors, and other stakeholders increasingly need a true history of the firm's health as its value transcends traditional financial metrics. This is so they can understand the company's overall performance and make well-informed decisions. For that reason, combining financial and non-financial data would improve understanding of lasting sustainability viewpoint, increase comparability across multinational corporations, and lessen threats to organizational reputation (Arrubla et al., 2017). However, there are some problems when financial and non-financial data are shared in collective reporting.

Combining financial and non-financial information, for example, is a form of voluntary reporting in which businesses might decide to only unveil good news in their non-financial disclosures, while the data in their mandatory financial reports must fully and accurately depict the business financial status. what's more, it might not easy to evaluate the financial and non-financial data supplied by businesses due to a lack of reporting standards requiring them to use integrated reporting.

Implementing integrated reporting (IR), which includes required reporting as well as standard compliance or explanatory reports, can help address these problems. According to the International Integrated Reporting Council (2013), IR also links firm approach, governance, risk management, future outlook, and communication effectiveness to financial and non-financial data.

The purpose of company directors was to protect the interests of shareholders, improve corporate transparency, and ensure greater information disclosure, especially with different director compositions (Usman & Yahaya, 2023).

Diversity on boards is a crucial component in this respect, as it enables businesses to reveal information voluntarily (Abubkar et al., 2023; Latif et al., 2020; Savindya & Rajapakse, 2021). A diverse board of directors will provide a range of perspectives for business-related decision-making, boosting the likelihood of enacting new policies that could increase the company's worth (Musa et al., 2020).

Alfredo et al. (2018) assert that a diverse board of directors can improve the efficacy of business leadership by avoiding an emphasis on making decisions alone. Because a well-functioning board will ensure full disclosures and minimize data manipulation, board diversity can affect the quality of earnings. This study focused on how board diversity, including group diversity and financial expertise, affects IR while taking institutional ownership's moderating effect into account.

Institutions may support openness, thorough information disclosure, and the integration of investor relations (IR) tactics due to the idea that institutional ownership influences the relationship between board diversity and IR. The relationship between IR

usage and business performance may be strengthened by the presence of sizable institutional investors.

According to Amel-Zadeh and Serafeim (2018), these investors may advocate for the adoption of IR in businesses because they think it will improve decision-making and resource allocation, which will ultimately result in improved financial results. These institutional investors may also offer crucial resources and knowledge, assisting businesses in implementing IR successfully and optimizing its potential advantages (Rivera-Arrubla et al., 2017). These elements suggest that the ownership of institutions may have an impact on the connection between IR practices and board diversity in Nigeria. Thus, the article explores how institutional ownership influences board diversity and investor relations practices for Nigerian listed oil and gas companies.

The article is organized in five sections. The first introduction; second literature review and hypotheses development; third methodology; fourth results discussion and finally conclusions and recommendations.

2. Literature Review and Hypotheses Development

Stakeholder theory, according to Freeman (1984), identifies the groups to which the organization must answer. By attending to stakeholders' current needs and demands, especially those that impact the resources used for the organization's operational activities, businesses can strengthen their relationships with stakeholders (Ghozali and Chairiri, 2007).

As a result, the company's survival depends on the support of its stakeholders. Its clear illustration that board members can occasionally also be stakeholders and may object to measures that could compromise the caliber of board operations makes this theory significant to the study. According to the stakeholders' theory, depending on how they carry out their duties, the board's operations may be productive or unproductive. This is due to the possibility that they will eventually become stakeholders in the company.

Board Financial Expertise and Integrated Reporting

Members of boards typically have a variety of backgrounds and educational backgrounds. It is anticipated that the inclusion of people with professional, financial, and accounting backgrounds will significantly increase the efficacy of corporate governance and the board of directors' oversight responsibilities (Fayad et al., 2022).

Specifically, board expertise refers to their abilities and knowledge that support the board's ability to oversee and improve the caliber of financial reporting (Vitolla et al., 2019). Board expertise refers to their abilities and knowledge in order to encourage businesses to implement integrated reporting (Mawardani & Harymawan, 2021).

The educational background of board members and the caliber of integrated reporting were found to be positively correlated (Songini et al., 2022). Comparable outcomes were confirmed by Umar et al. (2025), who also emphasized the significance of these boards' proficiency in integrated reporting and information exchange. Without any backing from sociopolitical or economic theories, Erin and Adegboye (2020) discovered a weak correlation between integrated reporting practices and board financial expertise.

Furthermore, a study conducted by Hichri (2022) found that directors with accounting and finance backgrounds did not significantly improve integrated reporting's transparency. These differing results may be attributed to variations in the factors

influencing economic and social settings, as well as legal aspects, resulting in differences in board expertise and ultimately in disclosure practices.

Nevertheless, board members with an accounting or finance background are more likely to influence the dissemination of pertinent, high-quality information. Thus, the following hypotheses are put forth in this study:

H1: Board financial expertise has no significant impact on IR practice.

H2: Institutional ownership has no moderating role on board financial expertise and IR practice.

Board Group Diversity and Integrated Reporting

A key component of corporate governance is the board of directors, which shapes each company's governance strategy. The variety of board structures is indicative of the improvement of accounting data at the board level. Additionally, a diverse board of directors is necessary. From a demographic standpoint, board diversity is observable in individual characteristics like gender, age, nationality, and ethnicity (Triyonowati et al., 2022).

Since they are better at independent thought and show less industry networking than their male counterparts, many previous studies have demonstrated that female directors on corporate boards are more independent and involved in oversight (Akbar et al., 2019). In addition, female directors are less likely than their male counterparts to accept opportunistic behavior and typically show higher risk aversion (Sellami et al., 2020). Because of this, these female directors are often very good at safeguarding the interests of shareholders.

The same is true for women, who have been observed to be more proactive than men in improving corporate reporting due to their increased awareness of reputational harm and potential legal ramifications (Harris et al., 2019). Women therefore often discuss how their involvement limited the manipulation of earnings (Umer et al., 2020). Because there are more independent female directors on boards, Pidani et al. (2020) argue that companies often receive fewer earnings management reports.

Atif et al. (2020) found that female directors are more diligent about attending board meetings, and they participate in them at a significantly higher rate than male directors. Additionally, they discovered that the likelihood of CEO turnover is decreased when there are female directors on the board. Furthermore, previous research confirmed that a more diverse board resulted in fewer instances of tax evasion and financial misrepresentation (Umar et al., 2025).

According to Umar et al. (2025), companies that operate in less competitive and poorly regulated markets benefit more from gender diversity in governance frameworks. The majority of studies identified female representation on the board as a determinant of board diversity, according to the reviewed literature. Diversification primarily pertains to various attributes, including gender, age, race, foreign nationality, and education, as mentioned at the start of the review. Thus, formulate the following hypotheses:

H3: Board group diversity has no significant impact on IR practice.

H4: Institutional ownership has no moderating role on board group diversity and IR practice.

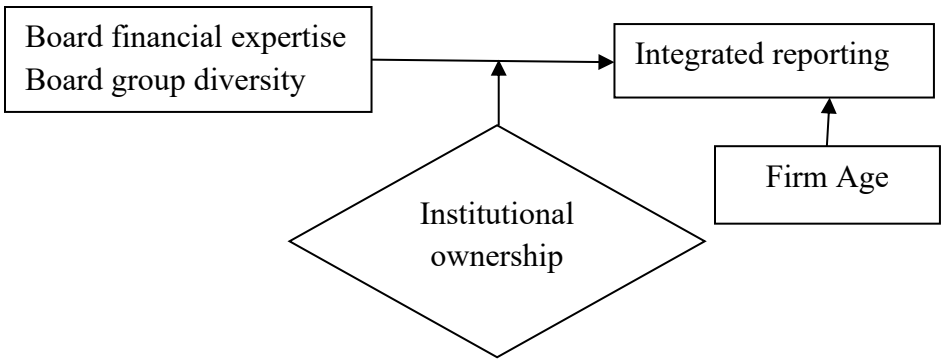


Figure 1: Conceptual Framework
Source: Researcher's Compilation, 2025

3. Methodology

A multivariate regression model was used in this study to evaluate the suggested hypotheses. All seven oil and gas companies that were listed on the Nigerian Exchange Group (NGX) as of December 31, 2024—Aradel Holdings Plc, Conoil Plc, Eterna Plc, Japaul Gold & Ventures Plc, Oando Plc, Sepalt Energy Plc, and Total Energies Marketing Nigeria Plc—are included in the research population. The sample size is determined by the census sampling method because, between 2020 and 2024, there are no more than 30 firms in total. The Corporate Governance Rating System (CGRS, 2022) was developed at this time to encourage listed companies to implement the system, according to the justification.

Integrated reporting is measured using three categories: background (7 items), assurance and reliability (3 items), and form (3 items) (Umar et al., 2025). A binary variable was employed to assess the data, assigning a value of "1" when the item was included in the company's annual report and "0" in other cases. Thus, a highest score of 13 is allocated to these regions (Appendix). Refer to table 1 below: IR = Actual number of all category's items disclosed in corporate reporting/Total items of the score index.

Table 1

Measurement of Variables

Acronyms	Variables	Measurement	Source
		Dependent Variable	
IR	Integrated reporting	Measured by scoreboard index	Umar, et al. (2025); Qaderi, et al. (2022)
		Independent Variables	
BFX	Board Financial Expertise	Percentage of directors who have accounting and audit experience to total directors on the board	Erin and Adegboye (2020); Alfero, et al. (2018)
BGD	Board Group Diversity	Measure by Blau Index (Blau, 1977). Full model will be discussed below.	Ararat et al. (2012); Triyonowati, et al. (2022)
		Moderating Variable	
INOW	Institutional Ownership	Percentage of shares held by the institutional investors to total shares of the firm.	Mohd Ali, et al. (2023)
		Control Variable	
FAG	Firm Age	Number of years of incorporated	Bathula (2008)

Source: Author 2025

The Blau Index

A statistical tool for assessing the degree of diversity within a group is the Blau index, sometimes referred to as the index of heterogeneity (Triyonowati et al., 2022). Sociologist Peter Blau created the index in 1977. The index is between 0 and 1. where 1 denotes the least amount of diversity from a different board category and 0 denotes no diversity at all. We measured board diversity in three categories based on this study. These are the following: foreign directors, female directors, and young directors. In every category, we take at least one measurement. The selection is clearly shown in the table below:

Table 2

Categories of Diversity

Category	Measurement
AGE	Proportion of Directors who have ≤ 45 Years in the board.
GENDER	Proportion of Female Directorship in the board.
FOREIGN	Proportion of Foreign Directors in the board

Source: Developed by the Author (2025)

Consequently, the study calculates the proportions of young, female, and foreign directors. Blau's calculations take the square root of each category and then add the squared result of the proxy value for foreign directors, female directors, and young directors. In

conclusion, subtract the sum from 1. The Blau index is computed using the following formula:

Bi = 1 – $\sum_{i=1}^{k} P\, i^2$. Description: Bi = Blue index; Pi = propose councils of each category; k = Number of categories of each attribute.

To standardize the calculation of Blau index, each board diversity category is divided by total members in the board to maximize theoretical value ((k-1)/k), then sum the proportion of the categories (Triyonowati, et al., 2022). Longitudinal panel data is used to form multiple panel regression models, which is used to encapsulate the hypotheses of this paper.

$IR_{it} = \alpha + \beta_1 BFX_{it} + \beta_2 BGD_{it} + \beta_3 INOW_{it} + \beta_4 FAG_{it} + e$ …….. i

$IR_{it} = \alpha + \beta_1 BFX_{it} + \beta_2 BGD_{it} + \beta_3 INOW_{it} + \beta_4 BFX*INOW_{it} + \beta_5 BGD*INOW_{it} + \beta_6 FAG_{it} + e$ .. ii

Whereas, IR is integrated reporting, BFX represents board financial expertise, BGD is board group diversity, and INOW is institutional ownership.

4. Results and Discussion

Table 3

Descriptive Statistics

	Obs.	Min	Max	Mean	Std. Deviation
IR	35	0.14	0.55	0.363	0.105
BFX	35	0.11	0.57	0.219	0.110
BGD	35	0.23	0.80	0.608	0.185
INOW	35	0.22	0.65	0.336	0.124
FAG	35	10.00	50.00	35.34	12.10

Source: STATA Output 13

The descriptive statistics in Table 3 indicate that the average IR for listed oil and gas companies is 0.363. The lowest value among the values is 0.14, while the highest value is 0.55. This suggests, according to the IIRC framework, that some companies reported relatively few non-financial items. An average of 22% of directors from the sampled firms had knowledge of accounting and finance during the study period, suggesting that a lower percentage of board members were likely to have been financial experts during this time.

The board diversity group's values range from 0.23 to 0.80. This indicates that while some companies boast 80% of directors who are neither young, female, or foreign, a small percentage of companies only have 23% of their directors who do not fit into the categories of youth, gender, or foreign directors. Institutional ownership is 0.65 at the highest level and 0.22 at the lowest. According to this, institutional investors ought to own at least 22% of the stock in Nigerian oil and gas firms. Last but not least, the firm age ranges from 10 to 50 years, meaning that some firms have been in business for 10 years while others have been in business for up to 50 years.

Table 4

Correlation Matrix

	IR	BFX	BGD	INOW	FAG	Tolerance/VIF
IR	1					
BFX	0.678	1				0.665/1.50
BGD	-0.407	-0.340	1			0.448/2.23
INOW	-0.814	-0.552	0.536	1		0.334/2.99
FAG	-0.406	-0.369	-0.161	0.507	1	0.461/2.17

Source: STATA Output 13

Table 4 demonstrates that there is a negative correlation between IR and firm age, institutional ownership, and board group diversity. This implies that the likelihood of the company engaging in IR practice is reduced by a larger percentage of young, female, and foreign directors on the board, as well as by institutional investors and firm age. The only factor that positively correlates with the IR of Nigerian publicly traded oil and gas companies is the board's financial expertise. The majority of the relationships between the independent variables in this study are negative; the only positive relationships are those between institutional ownership and firm age and board group diversity.

Furthermore, the study's variance inflation factor (VIF) and tolerance values fall below 1 and 5, respectively. In order to avoid drawing erroneous conclusions from multicollinearity, this is done. Pro> chibar2 = 0.0035 and chibar2 (01) = 7.29 in the Lagrangian Multiplier test of Model I indicate that Random Effect regression is the best model to report. However, model II had Fixed Effect regression, with Hausman test Ch2 and Pro>Ch2 having statistically significant levels of 27.87 and 0.0001, respectively.

Table 5

Panel Regression Results of Models

Model I				**Model II**		
Variables	**Coef.**	**T-value**	**P-value**	**Coef.**	**T-value**	**P-value**
Constant	0.4114	6.43*	0.000	0.8042	3.98**	0.001
BFX	0. 2689	2.37**	0.018	1.4804	2.68*	0.014
BGD	0.0305	0.44	0.663	-0.6902	-3.0	0.007
INOW	-0.5017	-3.54*	0.000	-1.7156	-2.49	0.021
BFX*INOW				-5.4886	-2.47*	0.022
BGD*INOW				2.8313	3.32**	0.003
FAG	-0.0002	-0.23	0.816	-0.0004	-0.46	0.648
R^2 (Within)			**0.1634**			**0.4855**
Wald ch^2			**35.00**	**F Statistics**		**3.46**
Prob> ch^2			**0.0000**	**Prob> F**		**0.0146**

Source: STATA Output 13.0 NOTE: * and ** indicate 1% and 5% significant levels respectively; the figures attached with asterisk represent the coefficient, while the z-value is presented in bracket in parenthesis.

$IR_{it} = 0.4114 + 0.\ 2689(BFX_{it}) + 0.0305(BGD_{it}) - 0.5017(INOW_{it}) - 0.0002(FAG_{it})$

This study produced two models in section three: The first model testing the relationship between independent variables and dependent variable, while the second model testing the moderating role of institutional ownership on the relationship between independent variables and dependent variable.

The study's regression analysis results are shown in Table 5, which shows that board diversity can predict the IR practice of publicly traded oil and gas companies in Nigeria. The cumulative impact of board diversity on the IR practice of listed oil and gas companies in Nigeria is reflected in the R2 value of 0.1634, which indicates a total contribution of 16% and suggests that the explanatory variables impacted the IR practice. Given that the Wald ch2 equals 35.00 and is significant at 1% (P-value=0.0000), it can be accomplished that model (i) fits the variables used in the analysis quite well.

$IR_{it} = 0.8042 + 1.4804(BFX_{it}) - 0.6902(BGD_{it}) - 1.7156(INOW_{it}) - 5.4886(BFX*INOW_{it}) + 2.8313(BGD*INOW_{it}) - 0.0004(FAG_{it})$

Furthermore, an R2 value of 0.4855 indicates the overall relationship between the moderating effect of institutional ownership on board diversity and IR practice of Nigerian listed oil and gas companies. With a 49% overall contribution, this shows that the explanatory factors had an impact on the IR practice. It also suggests that institutional ownership may moderate the link between board diversity and the IR practice of Nigerian listed oil and gas companies. Therefore, model (ii) fits the variables used in the study well, as indicated by the F-Statistics of 3.46, which is significant at the 1% level (P-value=0.0146).

Taking into account the first hypothesis (H1), which claimed that "board financial expertise has no significant influences on IR practice." With a coefficient of 0.2689 and a t-value of 2.37, the relationship between board financial expertise and IR practices of Nigerian listed oil and gas companies is positive and significant at the 5% level. This demonstrates that listed oil and gas companies' IR practices in Nigeria are positively impacted by the board's financial expertise in a statistically significant way. It demonstrates that adding a director with financial experience to the board will increase the IR practice of Nigerian listed oil and gas companies by 27%, indicating that having financial expertise on the board can enhance these companies' IR cultures. Therefore, the study rejects hypothesis one.

The connection between board diversity and the IR practice of Nigerian listed oil and gas companies was statistically moderated by institutional ownership, even though it had a negative direct impact on IR practice as indicated in table 5 model (i). The coefficient is -5.4886 and the t-value is -2.47 with regard to the moderating effect of institutional ownership on the relationship between board financial expertise and IR practice; this suggests a negative significance at 5% (p=0.022).

The connection between board financial expertise and institutional ownership has a detrimental effect on IR practice. This implies that the influence of average directors with financial information on IR practice is adversely impacted by institutional ownership. Therefore, the capability of board financial expertise to influence the IR practice will decrease as the percentage of institutional investors increases. This suggests that a higher level of institutional ownership may hurt the board's ability to successfully encourage management to participate in IR. Consequently, the second hypothesis (H2) stating that

"Institutional Ownership does not moderate the relationship between board financial expertise and IR practice" is accepted.

Additionally, there is no statistical significance at any level (p=0.663) for the diversity of the board group, with beta and t-values of 0.0305 and 0.44, respectively. This suggests that the IR practices of the sampled firms are not statistically significantly impacted by the diversity of board groups. It implies that the diversity of the board group hasn't improved IR practice. This is surprising because it's generally accepted that a diverse board of directors leads to experience and better skills, which lead to compliance with the ongoing trend of accounting changes. Therefore, according to the result, the third null hypothesis (H3) is accepted.

Furthermore, the connection between board group diversity and institutional ownership greatly improves the IR practices of Nigerian publicly traded oil and gas companies. With a beta value of 2.8313 and a t-value of 3.32, the connection between institutional ownership and board group diversity is statistically significant at any 1% level (p=0.003). It suggested that board members may be encouraged to pursue successful IR practices in oil and gas companies by the involvement of institutional investors, especially when it comes to increasing board diversity.

This suggests that institutional ownership has a moderating effect on the association between board group diversity and the firms' IR practices. The study showed that the connection between institutional investors and board diversity increases the possibility of IR practices in the companies under investigation. Their strong understanding of the responsibility associated with their role may be the cause of this. As a result, evidence is provided to refute the established hypothesis four (4), which claims that "the relationship between board group diversity and IR practice is not moderated by institutional ownership." Consequently, the fourth (4) hypothesis is also rejected.

5. Conclusion and Recommendations

The study looked at how board diversity and the IR practices of Nigerian listed oil and gas companies are associated to institutional ownership. The statistical results showed that the connection between board diversity and the sample firms' IR practices is influenced by institutional ownership. While group diversity among board members has no discernible effect on the IR practices of Nigerian listed oil and gas companies, individual financial expertise on the board has a significant positive impact on IR practice.

Furthermore, in Nigerian listed oil and gas companies, institutional ownership has positively impacted the connection between board group diversity and IR practice while also having a negative moderating effect on the connection between board financial expertise and IR practice.

In light of the aforementioned conclusion, it is advised that the board enhance the implementation of IR by adding more non-executive directors with professional qualifications, substantial work experience, and accounting expertise. This is because there is a greater chance of improving the caliber of corporate reporting when there are more experts on the board.

In order to inform stakeholders—especially institutional investors—about the importance of IR practices in raising the value of the company, management should

provide resources. This strategy can improve their reputation with investors and strengthen the culture of voluntarily implementing IR.

Even though it had a negative effect, institutional ownership had an effect on how board diversity and the firms' IR practices related to each other. To ensure that IR is implemented effectively, Nigerian oil and gas companies should encourage cooperation with stakeholders, especially institutional investors.

The moderating influence of institutional ownership on board diversity and IR practice was the main goal of this study. Unspecified ownership structure types may have an impact on the IR relationship and board diversity. The fact that the study only included a sample of seven oil and gas companies is another limitation that might limit the findings' generalizability to other sectors.

It's possible that the findings won't apply to other sectors. It suggested that future studies could use foreign ownership, government ownership, or both as moderating factors. Research may also consider production firms, financial firms, or non-financial companies.

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Appendix 1

CATEGORIES	ITEMS
Background: - Whether the reports presented an introduction that outlined the following information:	- Objectives - Motivations behind the adoption - Manager responsible for the process - Key consumers - Title - Compliance with disclosure standards - Level of CEO commitment.
Assurance and Reliability: - Whether the company conducted the following:	- An internal audit report - Third party verification - Whether the organization received awards and acknowledgments for integrated reporting practice.
Form: - By reviewing the report summary:	- Accessibility - Number of pages - Readability and clarity.

Source: Umar et al. (2025)