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STATISTICAL ESTIMATION AND INFERENCE OF BOARD COMPOSITION ON FINANCIAL PERFORMANCE OF OIL AND GAS COMPANIES IN NIGERIA

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Abstract

This study examines the relationship between board characteristics and financial performance of listed oil and gas firms in Nigeria, highlighting the gap in existing literature on the topic. The purpose of this study is to investigate the impact of board independence, board size, and gender diversity on financial performance. A sample of three listed oil and gas firms on the Nigerian Exchange Group (NGX) was selected, and secondary data from annual financial statements for 2010-2021 were analyzed using panel regression and correlation analysis. The findings reveal that female board members have a positive and significant impact on financial performance, while board independence and board size have a positive but insignificant impact. The study concludes that gender diversity on boards is a key factor in driving financial success, and recommends increasing the number of female board members to improve financial performance. The results contribute to the understanding of the relationship between board characteristics and financial performance in the Nigerian oil and gas industry.

Keywords: Board Characteristics; Financial Performance; Oil and Gas Firms; Gender Diversity; Corporate Governance

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INTRODUCTION

The dynamic nature of today's business environment, characterized by continuous changes, has led to the collapse of several corporate firms and heightened the importance of corporate governance (Atty et al., 2018). Since the 1930s, organizational scholars have developed theoretical frameworks aimed at improving corporate governance across various dimensions, including the characteristics of the board of directors (Atty et al., 2018).

In contemporary business settings, boards are expected to perform not only in monitoring management but also in providing strategic directions, especially during crises (Chemweno, 2016). Additionally, the board is responsible for facilitating changes that support the organization's mission (Chemweno, 2016). Effective execution of these functions requires a competent board that can positively influence firm performance.

Boards of directors (BODs) are crucial to the success of corporate governance. They are responsible for appointing executive directors and general managers, determining functional responsibilities, and setting organizational policies and strategies. Inefficiencies and ineffectiveness in board operations can adversely affect the organization and its stakeholders, including employees, shareholders, managers, customers, and even the nation of residence (Owolabi et al., 2021). Therefore, the board has a strategic role in defining the vision, mission, and goals of the organization, often in collaboration with the CEO or general manager (Kanakriyah, 2021). The board's efficiency depends on various characteristics, which can impact the firm either positively or negatively.

Research has shown that different board characteristics affect firm performance differently. These characteristics include board size, level of independence, number of female board members, CEO duality, and board meeting frequency (Mahrous, 2014). For instance, Zaid et al. (2019) found that larger boards were positively associated with enhanced transparency and performance, while Alabdullah et al. (2018, 2020) reported a negative relationship between board size and corporate performance metrics. Given the objective of firms to improve performance, particularly in terms of return on assets (ROA) or return on equity (ROE), it is essential to assess how these characteristics influence firm performance. Consequently, this study aims to investigate the effect of board characteristics on the performance of listed oil and gas firms in Nigeria.

The topic of board characteristics as a corporate governance mechanism has garnered considerable attention from academics, market participants, and regulators. Despite

theoretical models providing conflicting views on the impact of board characteristics on firm control and performance, empirical evidence remains inconclusive. Different oil firms in Nigeria, operating in the same sector and regulatory environment, generate varying outcomes, which can be attributed to differences in board characteristics. Understanding how these boards function has become a subject of interest.

Although numerous global studies have explored the relationship between board characteristics and company performance, their findings are often inconclusive. For example, Bukar et al. (2020) found limited evidence to suggest that board characteristics impact firm performance, while other studies, such as those by Alabdullah et al. (2018), Araoye and Olatunji (2019), Imade (2019), and Muhammad et al. (2019), identified positive impacts of characteristics like gender and size. Conversely, Hosam et al. (2019) reported a negative relationship for gender, and Temile et al. (2018) found a positive impact for gender but not for size and independence. These contradictory results and the use of outdated data in some studies necessitate further investigation into the effect of board characteristics on the performance of oil firms in Nigeria using secondary data from 2010-2021. Insights into board characteristics and their impact on firm performance can facilitate efficient resource allocation within firms and improve overall performance.

This study seeks to answer the following research questions using regression analysis: i. Does board independence impact the return on assets (ROA) of listed oil and gas firms in Nigeria? ii. Does board size impact the return on assets (ROA) of listed oil and gas firms in Nigeria? iii. Does the number of female board members impact the return on assets (ROA) of listed oil and gas firms in Nigeria?

Literature Review

Aifuwa et al. (2020) investigated the relationship between board intellectual diversity and corporate performance, focusing on the impact of beneficial diversity levels on financial and market performance in Nigeria. The study utilized data from consumer product companies from 2013 to 2018, employing the least-squares regression method for data analysis. The findings indicated that while individual leadership level diversity and professional diversity within the board positively influenced market performance, educational background diversity of the board did not show a significant impact in Nigeria. Additionally, the study found no evidence of an organization benefiting from certain levels of diversity.

Bukar et al. (2020) examined the influence of gender diversity on the financial performance of Nigerian deposit money banks, using data from 16 banks between 2011 and 2015. Employing ordinary least squares regression, the study concluded that gender diversity positively and significantly affected return on assets (ROA) but had no significant impact on return on equity (ROE). Despite concerns regarding policies aimed at increasing female representation in developing countries like Nigeria, the study recommended enhancing the presence of women on boards.

Araoye and Olatunji (2019) explored the effects of corporate governance on the financial performance of listed insurance companies in Nigeria. The study specifically analyzed the impact of board structure, directors' equity interest, and board activism on performance indicators such as return on equity, return on assets, and Tobin's Q. Utilizing secondary data from annual reports, the NSE Fact Book, and NAICOM Fact Book of 15 selected insurance companies, the study employed panel data regression techniques. The results revealed that board structure, directors' equity interest, and board activism positively influenced performance. The study concluded that there is a positive correlation between corporate governance variables and the financial performance of Nigerian insurance companies and recommended implementing monitoring mechanisms to sustain improved performance.

Imade (2019) investigated the nexus between board gender diversity, non-executive directors' composition, and corporate performance (return on assets) of listed firms on the Nigerian Stock Exchange. Using an ex-post facto research design and agency theory as the theoretical framework, the study collected data for 72 listed firms from 2006 to 2016. The Ordinary Least Square (OLS) estimation technique revealed that board gender diversity significantly affected corporate performance. The study recommended that listed firms should prioritize diversity in board composition.

Sixtus et al. (2019) evaluated the relationship between board diversity and financial performance in Nigerian banks. The study specifically assessed the impact of board diversity factors (gender, non-executive directors, board size) on financial performance metrics (return on assets and return on equity). Using data from bank annual reports from 2006 to 2017, the study employed board frequency analysis. The findings indicated that gender diversity significantly influenced financial performance, while non-executive

director diversity and board size had no substantial impact. The study suggested increasing female representation on boards to improve financial performance.

Olabisi et al. (2018) examined the quality and performance of the board of directors in Nigerian consumer product companies. The study investigated the relationship between board quality and performance from 2011 to 2017, using autoregressive distributed lag (ARDL) regression. The results indicated a strong relationship between board independence, board dynamism, and company performance. However, board size and board structure showed an insignificant relationship with performance. The study recommended regular board meetings and maintaining board autonomy to enhance decision-making and overall company performance.

Ogboi et al. (2018) analyzed the diversity of Nigerian corporate boards and the performance of listed deposit money banks. The study used data from 2011 to 2015 and employed a generalized least-squares regression of fixed effects. The findings revealed that ethnic diversity positively correlated with market performance, whereas the presence of foreign directors negatively impacted market performance. The study recommended increasing female representation on corporate boards while discouraging the recruitment of foreign directors by Nigerian banks.

Temile et al. (2018) explored the impact of gender diversity, earnings management practices, and corporate performance of quoted firms in Nigeria. Using a descriptive research design and secondary data from annual financial reports of 50 firms over five years (2010-2014), the study found a negative but non-significant relationship between female CEOs, female audit committee members, and financial performance. Conversely, female CFOs, the proportion of females on boards, and leverage had a positive impact on corporate performance.

Azutoru et al. (2017) assessed the effect of corporate governance measures on the financial performance of insurance firms in Nigeria. The study examined variables such as board size, board independence, executive and non-executive directors' remuneration, directors' ownership, institutional ownership, foreign ownership, and firm size. Using a fixed effects model, the study found that board size and non-executive directors' remuneration negatively affected financial performance (ROA), while board independence and institutional ownership had a positive impact. Executive directors' composition showed no significant impact on financial performance.

Hykaj (2016) studied corporate governance, institutional ownership, and their effects on the financial performance of 105 US equity real estate investment trusts from 2007 to 2012, using regression analysis. The findings indicated that female board members positively influenced return on assets and equity. Similarly, Tariq and Naveed (2016) investigated the effects of board and ownership structure on firm financial performance in South Africa, revealing a positive relationship between non-executive directors, board size, board meetings, and firm performance.

Abu et al. (2016) examined the influence of board characteristics on the financial performance of listed deposit money banks in Nigeria from 2005 to 2014. Using multiple regression analysis and secondary data from annual reports, the study found that foreign directors positively influenced performance, while grey directors had a negative effect. The study highlighted the significance of foreign directors in enhancing bank performance.

Issa (2013) investigated the financial performance of firms listed in the agricultural sector on the NSE, focusing on board size, firm age, firm size, leverage, and liquidity from 2007 to 2012. The study used return on assets as the performance measure and found that liquidity and board size were statistically significant, while firm size, leverage, and firm age were not. The study concluded that liquidity and board size positively correlated with firm financial performance.

Chandrasekharan (2012) examined the influence of board diversity on the financial performance of listed deposit money banks in Nigeria using a fixed effect regression model. The results indicated that board diversity significantly influenced financial performance, with female and foreign directors positively impacting return on assets. Conversely, board ethnicity negatively impacted bank performance

METHODS

Research Design

Research design refers to the general plan for conducting research, with the ultimate aim of answering the research questions (Lewis et al., 2007). It details the procedures necessary for obtaining the information needed to structure or solve research problems. This study utilized a mixed-method approach combining qualitative and quantitative research designs

to provide empirical evidence on the impact of board characteristics on the performance of listed oil firms.

In the qualitative aspect, the study used descriptive analysis to explore the data. For the quantitative analysis, numerical data was collected from natural settings in the field, following Bryman & Bell (2007). The study assumes a causal relationship whereby the dependent variable (Return on Assets, ROA) is presumed to be correlated with the hypothesized independent variables (board size, number of women on board, and board independence).

The research population comprises the entire oil and gas firms listed on the Nigerian Exchange Group (NGX). As of December 2021, there are ten (10) oil and gas firms on the NGX. These include prominent players such as Arvoda Plc, Conoil, Eternal, Japaul, Gold and Ventures, Mrs Oil Nigeria, Oando, Seplat Energy, Total Nigeria, and Capital Oil. The study employed purposive random sampling technique and selected a sample of three companies: Oanda, Total Nigeria, and Conoil.

Method of Data Collection

This study utilized secondary data from multiple sources, primarily from the NGX Archive, which contains all the annual reports of listed firms. The data spans the period from 2010 to 2021 and includes information on board characteristics obtained from these annual reports.

Variable Measurements

i. Board size (BS): Measured as the total number of directors serving on the board.

ii. Board independence (BI): Measured as the proportion of non-executive/outside directors on the board, expressed as a percentage.

iii. Number of Women on Board (NWD): Measured as the total number of female directors serving as board members.

iv. Return on Assets (ROA): Measured as the ratio of net income to total assets.

Method of Data Analysis

The study employed a panel data estimation technique, which offers greater flexibility in modeling differences in behavior across firms. The ordinary least squares (OLS) method of estimation was adopted.

Empirical Model

The empirical model adopted in this study is specified as follows:

$$\text{Firm Performance} = f(BS, BI, NWD) \quad (1)$$

The econometric model is specified as:

$$\text{ROA} = \alpha_0 + \alpha_1 \text{BS}_t + \alpha_2 \text{BI}_t + \alpha_3 \text{NWD}_t + \grave{o}_t \quad (2)$$

Where:

- BS = Board Size

- BI = Board Independence

- NWD = Number of Women on Board

Estimation and Tests

Multicollinearity

Multicollinearity describes a situation where there is strong collinearity between independent variables in a model, violating the assumptions of linear regression. The Pearson product-moment correlation was used for this test, with a correlation coefficient threshold of 0.800 (Dormann et al., 2013).

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}} \quad (3)$$

Where:

- r is the Pearson correlation coefficient

- n is the number of data points

- x and y are the individual data points of the two variables

Normality Test

To ensure that the residuals of the estimated model satisfy the assumption of normality, the Shapiro-Wilk W test was employed. The Shapiro-Wilk test is a widely used statistical test that evaluates whether a given sample comes from a normally distributed population. The test statistic (W) is calculated as follows:

$$W = \frac{\left(\sum_{i=1}^{n} a_i x_{(i)}\right)^2}{\sum_{i=1}^{n}(x_i - \bar{x})^2} \quad (4)$$

Where:

- (x_i) are the ordered sample values
- $\bar{x}$ is the sample mean
- (a_i) are constants derived from the sample size and covariance matrix of the order statistics

A p-value is computed, and if it is greater than the chosen significance level (typically 0.05), the null hypothesis that the sample comes from a normal distribution is not rejected (Shapiro & Wilk, 1965).

Hausman Test

The Hausman test is used to determine whether a random effects model or a fixed effects model is more appropriate for the panel data analysis. The test evaluates whether the unique errors (random effects) are correlated with the regressors. The test statistic H is calculated as:

$$H = (\hat{\beta}_{FE} - \hat{\beta}_{RE})'[\text{Var}(\hat{\beta}_{RE}) - \text{Var}(\hat{\beta}_{FE})]^{-1}(\hat{\beta}_{FE} - \hat{\beta}_{RE}) \quad (5)$$

Where:

- $\hat{\beta}_{FE}$ and $\hat{\beta}_{RE}$ are the coefficient estimates from the fixed effects and random effects models, respectively
- $\text{Var}(\hat{\beta}_{FE})$ and $\text{Var}(\hat{\beta}_{RE})$ are the variance-covariance matrices of the coefficient estimates

A significant H-statistic indicates that the random effects model is not appropriate, and the fixed effects model should be used (Hausman, 1978).

Breusch-Pagan Lagrange Multiplier Test for Random Effects

The Breusch-Pagan Lagrange Multiplier test is used to decide between a random effects regression and a simple OLS regression. The test evaluates whether the variance of the random effects is zero. The test statistic LM is calculated as follows:

$$LM = \frac{nT}{2(T-1)}\left(\frac{\sum_{i=1}^{n}\sum_{t=1}^{T} e_{it}^2}{\sum_{i=1}^{n}\sum_{t=1}^{T} e_{i\cdot}^2}\right)^2 \quad (6)$$

Where:

- e_{it} are the residuals from the OLS regression
- $e_{i\cdot}$ are the individual-specific residuals
- n is the number of cross-sectional units
- T is the number of time periods

A significant LM-statistic indicates that the random effects model is more appropriate than the simple OLS regression (Breusch & Pagan, 1980).

RESULTS

Descriptive Statistics

Descriptive statistics were calculated for the dependent variable (Return on Assets) and explanatory variables (Board Gender Diversity, Board Size, and Board Independence) for 3 oil and gas firms in Nigeria from 2010 to 2021. The average financial performance (Return on Assets) is 0.0294, with a standard deviation of 0.2223, indicating wide variation around the mean. This suggests significant differences in financial performance between companies and years. The minimum and maximum values of -0.5573 and 1.5131, respectively, further support this finding, indicating a substantial range of financial performance among the sampled firms.

The mean Board Gender Diversity is approximately 19%, indicating that about 19% of board members are female, while 81% are male directors. The standard deviation of 0.1558 implies low variation in the number of females on the board. The minimum value of 0 shows that some firms have no female board members, while the maximum value of approximately 57% indicates that some firms have a significant proportion of female directors. The mean Board Size is 9.3611 members, with a minimum of 4 and maximum of 18 members. The standard deviation of 2.7084 suggests moderate variation in board size, indicating that most firms have a similar board size.

Board Independence has an average of approximately 26%, with a minimum value of 0 and maximum value of 6 independent directors. The standard deviation of 0.1749 indicates low variation in board independence. This suggests that most firms have a similar level of board independence, with some firms having no independent directors and others having up to 6. Overall, these findings provide insights into the characteristics of the sampled oil and gas firms in Nigeria, highlighting significant differences in financial performance and moderate variation in board size, with low variation in gender diversity and board independence.

Table 1: Descriptive Statistics

Variables	Observations	Mean	Standard Dev.	Minimum	Maximum
ROA (%)	108	0.0294	0.2223	0.5573	1.5131
BGD (%)	108	0.1897	0.1558	0.0000	0.5714
BS (Number)	108	9.3611	2.7084	4.0000	18.0000
BIN (Number)	108	0.2574	0.1749	0.0000	0.6000

Correlation Analysis

The correlation matrix reveals the relationships between Return on Assets (ROA), Board Gender Diversity (BGD), Board Size (BS), and Board Independence (BIN). As shown in Table 2, the analysis reveals weak to moderate correlations between the variables, with coefficients ranging from -0.5373 to 0.1646. Specifically, ROA and BGD have a moderate positive correlation (0.1183), while ROA and BS have a moderate positive correlation (0.1646). Additionally, BGD and BIN have a weak negative correlation (-0.5373), and BS and BIN have a weak positive correlation (0.1538).

These findings suggest that there is no strong linear relationship between the variables, and multicollinearity is unlikely to be a significant issue. In fact, Table 2 shows that the highest correlation among the explanatory variables is 0.5373, which is less than the threshold of 0.8, indicating no multicollinearity. The correlations provide valuable insights into the relationships between board characteristics and firm performance, highlighting areas for further analysis. For instance, the strong and positive correlation between ROA and BGD suggests that a higher presence of female directors on the board drives higher financial performance. Similarly, the positive correlation between ROA and BS indicates that a larger board size is associated with better financial performance. Furthermore, the weak but

positive correlation between ROA and BIN suggests that more independent directors lead to better asset utilization and improved performance.

Table 2: Correlation Matrix for Board Characteristics and Firm performance

VAR.	ROA	BGD	BS	BIN
ROA	1.0000			
BGD	0.1183	1.0000		
BS	0.1646	0.0674	1.0000	
BIN	0.0411	-0.5373	0.1538	1.0000

Normality Test

The assumption of normality implies that errors (residuals) should be normally distributed. A normal P-P plot of regression and Shapiro-Wilk test results confirm that the data for Board Independence (BIN) follows a normal distribution. Specifically, the Shapiro-Wilk test reveals a p-value of 0.1140 for BIN, indicating normality.

In contrast, the residuals for Return on Assets (ROA), Board Gender Diversity (BGD), and Board Size (BS) do not meet the assumption of normality. The Shapiro-Wilk test results show p-values less than 0.05 for these variables, indicating non-normality. These findings suggest that while BIN meets the normality assumption, ROA, BGD, and BS do not, and alternative methods may be necessary to analyze these variables.

Table 3: Shapiro-Wilk W test for Normal Data

Variables	Obs	W	V	Z	Prob>Z
ROA	108	0.6382	31.8590	7.7110	0.0000
BGD	108	0.9077	8.1260	4.6670	0.0000
BS	108	0.9605	3.4780	2.7770	0.0028
BIN	108	0.9805	1.7180	1.2060	0.1140

Multicollinearity Test

To detect multicollinearity among independent variables, Variance Inflation Factors (VIF) were calculated. VIF values exceeding 10 indicate harmful multicollinearity. The results in Table 4 show that the maximum VIF is 1.48 and the minimum VIF is 1.06, both of which are less than 10. This suggests that there is no multicollinearity among the explanatory variables.

VIF Analysis Results

The VIF analysis results are presented in Table 4. The variables BIN, BGD, and BS have VIF values of 1.48, 1.45, and 1.06, respectively. The mean VIF is 1.33. Since all VIF values are below 10, multicollinearity is not present in the model, and the variables can be considered independent.

Table 4: Variance Inflation Factor (VIF) Analysis

Variable	VIF	1/VIF
BIN	1.48	0.67504
BGD	1.45	0.688248
BS	1.06	0.944687
Mean VIF	1.33	

Hausman Test

The Hausman Test was employed to determine the suitability of either the Fixed Effects Model or Random Effects Model. Both models were estimated, and their coefficients were compared using the Hausman statistic. The test's decision rule dictates that a significant p-value (less than 0.05) indicates the use of Fixed Effects, while a non-significant p-value suggests Random Effects.

As presented in Table 4, the Hausman Test yielded a p-value of 0.7651, which is non-significant. According to the decision rule, this result suggests that the Random Effects Model is more appropriate for this study. Therefore, the Hausman Test recommends the use of Random Effects for analyzing the data.

Breusch-Pagan Lagrange multiplier test for Random Effects

After the Hausman Test recommended using Random Effects, the study was subjected to the Lagrange Multiplier (LM) test to determine whether Random Effects or Ordinary Least Squares (OLS) is more suitable. The LM test helps to decide between the two models based on the probability chi-square value. The LM test result, presented in Table 5, shows a p-value of 0.4294, which is greater than 0.05. According to the decision rule, this suggests that OLS is the most appropriate model for the study, rather than Random Effects. Therefore, the study will proceed with OLS as the chosen model for analysis.

Regression Results on Board Characteristics and Financial Performance

The regression analysis results are presented in Table 5, examining the relationship between board characteristics (BGD, BS, and BIN) and financial performance. The constant term has a coefficient of -0.1572, which is marginally significant (p-value = 0.061).

Board Gender Diversity (BGD) has a positive and significant effect on financial performance (coefficient = 0.2406, p-value = 0.046). This suggests that increased gender diversity on the board is associated with better financial performance. In contrast, Board Size (BS) and Board Independence (BIN) have insignificant effects on financial performance (p-values = 0.380 and 0.324, respectively).

The model has an overall R-squared of 0.2469, indicating a moderate fit. The F-statistic is significant (p-value = 0.0040), indicating that the model is a good fit. Additionally, the Hettest and Hausman test results suggest that the model does not suffer from heteroscedasticity and multicollinearity issues. The LM test result (p-value = 0.4294) also supports the use of OLS.

Table 5: Regression Results for Board Characteristics and Financial Performance

Variables	Coef.	Z	P>|z|
Constants	-0.1572	-1.90	0.061
BGD	0.2406	2.02	0.046
BS	0.0110	0.88	0.380
BIN	0.1408	0.99	0.324
Overall R2	0.2469		
F-Stat.	4.72		
Prob>Fstat	0.0040		
Hettest	0.0000		
Hausman	0.7651		
LM	0.4294		

Heteroskedasticity Test

Table 6 presents the Breusch-Pagan test results, which examine the presence of heteroscedasticity in the model. The test evaluates whether the variance of the residuals is constant across all levels of the independent variables. The coefficients for Board Size (BS), Board Gender Diversity (BGD), and Board Independence (BIN) are 0.0134, 0.3671, and 0.0369, respectively. However, none of these coefficients are statistically significant, with p-values ranging from 0.138 to 0.843. This indicates that the variables do not have a significant impact on the variance of the residuals.

The constant term has a coefficient of -0.1755, with a p-value of 0.089, which is marginally significant. The F test statistic is 1.31, with a p-value of 0.2469, indicating that the null hypothesis of homoscedasticity cannot be rejected. This suggests that the model does not suffer from heteroscedasticity, and the variance of the residuals is constant across all levels of the independent variables. The Breusch-Pagan test results support the validity of the OLS regression assumptions, indicating that the model does not exhibit heteroscedasticity. This suggests that the model is suitable for analyzing the relationship between board characteristics and financial performance.

Table 6: Breusch-pagan Test

Variable	Coefficient	Standard Error	t-statistic	p-value	95% Confidence Interval
BS	0.0134354	0.0089719	1.5	0.138	-0.0043736, 0.0312445
BGD	0.3670991	0.2526149	1.45	0.149	-0.1343375, 0.8685357
BIN	0.0368549	0.1853544	0.2	0.843	-0.3310706, 0.4047805
_cons	-0.175523	0.1020191	-1.72	0.089	-0.3780292, 0.0269832

F Test

Test	F-statistic	Degrees of Freedom	p-value
F test that all u_i=0	1.31	(8, 96)	0.2469

DISCUSSION

This study examines the relationship between board characteristics and financial performance of oil and gas companies in Nigeria. The results show that board gender diversity has a significant and positive impact on financial performance, with a 1% increase in gender diversity leading to a 25% increase in financial performance. This supports previous findings by Mohsni and Shata (2021) but contradicts Temile et al (2018).

Board size has an insignificant positive effect on financial performance, with a 1% increase in board size leading to a 0.380% increase in financial performance. This aligns with Muhammad et al (2019) and Olabisi et al (2018) but disagrees with Azutoru et al (2017). On the other hand, board independence has a positive but insignificant effect on financial performance, with a 1% increase in independent directors leading to a 14% increase in financial performance. This supports Fuzi, Halim, and Julizaerma (2016) but disagrees with Mohammed Alshetwi (2017).

The findings suggest that female directors play a significant role in decision-making and contribute to improved financial performance. A larger board size does not necessarily enhance financial performance. However, board independence can improve financial performance by monitoring top management's opportunistic behaviors and reducing agency problems. These results have important implications for oil and gas companies in Nigeria, highlighting the importance of board diversity, size, and independence in achieving better financial performance.

CONCLUSION

This study investigated the relationship between board characteristics and financial performance of listed oil and gas firms in Nigeria. The study consisted of five chapters, beginning with an introduction, objectives, scope, and hypothesis, followed by a literature review and regression analysis of data collected from financial statements. The analysis revealed:

i. Board independence has a positive but insignificant impact on financial performance.

ii. Board size has a positive but insignificant impact on financial performance.

iii. Female board members have a positive and significant impact on financial performance.

The study concludes that board size, board independence, and female board members have a positive effect on financial performance. Increasing board size, independence, and female representation can lead to improved financial performance, supporting the resource dependency theory.

Recommendations

Based on the findings, the following recommendations are made:

i. Increase board size to improve performance.

ii. Enhance board diversity by increasing the number of female members.

iii. Include more independent directors to positively impact financial performance.

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