Innovations

Corporate board characteristics and financial performance of listed firms in Nigeria

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Abstract

This study examined the effect of corporate board characteristics on the performance of Nigerian listed firms. It employed Tobin's Q as a dependent variable which is used to measure firm performance while Board size, Independence, diligence, gender diversity, and ethnicity were the independent variables used to measure board characteristics. Due to the fact that this is a secondary in nature, data were extracted from the annual reports and accounts of 110 Nigerian listed firms from 2011 to 2020. In order to achieve a robust analysis, the fixed effect panel regression analysis was used. The results revealed that board size has a negative and significant effect on firm performance, both board independence and gender diversity have a negative and insignificant impact on firm performance, board diligence has an insignificant but positive impact on firm performance, while board ethnicity has a positive and significant influence on firm performance. The study recommended that board size should be carefully monitored by shareholders and in order to achieve a balanced according to expected results, board independence should be continuously maintained and periodically reviewed, a maximum of 6 board meetings excluding emergency meetings be held annually; board members should consist of at least half gender diversity, while, ethnic heterogeneity should be allowed on the boards of Nigerian firms for equity, fair representation, and relative peace.

Keywords: *1.Corporate board, 2.Gender Diversity, 3.Ethnic Diversity 4.Tobin's Q*

Introduction

Corporate governance is simply a way and manner in which a company is managed, directed and controlled. Its relevance cannot actually be overemphasized in the modern day businesses. The relevance of corporate governance was made more manifest as a result of sharp practices which resulted to financial crisis and engulfed global businesses in the past. Numerous corporate scandals around the world like Enron and WorldCom, have heightened curiosity for recent researches across the world on corporate governance. It is likened that poor corporate governance enhances corruption; lack of shareholder trust and transparency and eventually, the collapse of the financial sectors which are often referred to as corporate scandals. Due to these numerous corporate scandals, lots of fresh rounds of debates on the effectiveness of corporate governance laws, codes, and guidelines across jurisdictions have ensued (Karkowska, & Acedanski, 2020; Mishra & Kapil, 2018;Baulkaran & Bhattarai, 2020).

In Nigeria, the Securities and Exchange Commission (SEC) issued the code of corporate governance (2003) for publicly quoted firms in the country. The code highlights the role of the board of directors in promoting good corporate governance. In 2010, the Nigerian code was revised to reflect the guidelines in similar codes in other jurisdictions and align with global best practices. On this basis, all publicly quoted firms in Nigeria and any firms seeking to raise funds through the capital market by way of introduction or issuance of securities through the Nigerian Stock Exchange (NSE) should maintain sound corporate governance or explain why there is a divergent view. Hence, the code is not mandatory as there are no penalties for non-compliance. The code recommends among other things that, a company should have structured and rigorous annual review of the board of directors, committees, and individual directors. In the case of bank operations, the Central Bank of Nigeria (CBN) established the Code of Corporate Governance for Banks in Nigeria Post Consolidation in 2006. Again, the Financial Reporting Council of Nigeria (FRCN) announced the Nigerian Code of Corporate Governance 2018, which was made mandatory for all public and private entities concerned.

Recently, the issue of corporate governance has become a tropical concern where literature are inquisitive to explaining the extent of board influence on corporate performances. (Assenga, Aly & Hussainey 2018). Others seek to ascertain the effectiveness of different board attributes on shareholders' interests with other performance indicators (Karkowska, & Acedanski, 2020). Some literature had established and succeeded in exploring the board of directors' effectiveness on performance indices (Baulkaran & Bhattarai, 2020). A unique feature in these previous studies is the fact that they primarily focused on few characteristics relating to board composition such as board size and representation by outsiders. Hence, there are huge gaps in literature and this study researched along this line to abridge some gaps.

Literature Review

Agency Theory

Theories have emerged in explaining the relationship that subsists between corporate board characteristics and firm performance. The agency perspective is based on the principal and agent relationship. The 'Wealth of Nations which was ascribed to Adam Smith in 1776 was the source of Agency theory, although the concept was popularized by Jensen & Meckling (1976). According to the promoters of this theory, to make judgments as an owner and take or exercise adequate care in the administration of a firm, a manager must have direct ownership of the firm. By monitoring and overseeing the activities of the management in order to improve business performance, the board of directors represents the interests of the company's owners and stakeholders. In a modern corporation, ownership (principal) is separated from Management (agent), giving rise to conflict resolution costs between the owners (principal) and the agents. This conflict of interest can be resolved by stating their respective rights (Jensen & Meckling, 1976). Agency theory assumes that managers are self-centered and operate in their own best interests, with little regard for the maximization of shareholders' wealth. Governance mechanisms have been suggested by various scholars as a means to address agency problems. One of the corporate governance strategies used to control the conflict of interest between managers and shareholders is board monitoring. Enhanced board supervision through meetings, as well as control of other board traits including skills, expertise, and experiences, lessen moral hazard and the information asymmetry problem between the company and its shareholders (Fama & Jensen, 1983). According to agency theory, a larger board of directors increases the firm's value.

Stakeholder Theory

Edward Freeman(1984) promoted the stakeholder theory which linked the relationship that exists between a firm and stakeholders. According to Freeman (1984), stakeholders are groups or individuals who can exert influence or are being influenced by the achievement of the organization's objectives. The board of directors looks after the interests of a variety of stakeholders, including those concerned with social, environmental, and ethical issues (Freeman, 1984; Donaldson & Preston, 1995; Freeman *et al*., 2004). Since companies and society are linked, it is expected that businesses serve a greater social

purpose than its responsibilities to shareholders (Kiel & Nicholson, 2003). This theory opines that managers must satisfy a range of stakeholders who can affect the firm's outcomes.

Empirical Review

Board Size on performance

Board size has to do with the numbers of members of the Board of Directors. Some scholars argued for a larger board size, while some advocate for smaller board size. Empirical studies show a mixed conflicting argument as to which board size enhances firm performance. In view of the above, divergent findings have emanated. The negative and positive association between corporate board size and performance are noticeable in the works of Palaniappan (2017), who investigated whether certain board characteristics influenced the financial performance of Indian manufacturing firms. Data for the study were gathered from 275 NSE-listed firms between 2011 and 2015 and analyzed using a multiple regression model. The study discovers a statistically significant but negative relationship between board size and Tobin's Q, ROA, and ROE. Abdeljawad and Masri (2020) investigated the link between board characteristics and firm performance in Palestine. They analyzed 141 firm-year observations sampled data obtained from all firms listed on the Palestine Stock Exchange (PSE) from 2012 to 2014. However, the generalized least square estimators were employed. The findings showed that board size, independence, and academic background all negatively affect firm performance.

Contrary, Mishra and Kapil (2018) used a sample of 391 Indian companies listed on the National Stock Exchange from 2010 to 2014 to investigate the relationship between board characteristics and firm performance. The study found a significant and positive relationship between board size and firm performance as measured by (Tobin's Q). Also, in the research of Sobhan (2021) which adopted a group of 20 non-banking financial listed companies in Bangladesh from 2012 to 2018; found a positive and significant link between board size and firm performance (ROA).Freihat, Farhan and Shanikat (2019), investigated the impact of board characteristics on firm performance in Jordan, using a sample of 44 manufacturing companies listed on the Amman Stock Exchange from 2011 to 2014, and found that board size had no significant effect on Tobin's Q. As a result, board size and board independence has no significant effect on firm performance. El-Maude, et al. (2018) examined the impact of board size, composition, and meetings on the financial performance of listed consumer goods companies in Nigeria for 10 years, with a sample of 10 companies. They found no significant link between board size and financial performance (ROA).

Board Independence on performance

Board Independence is a term used to qualify the ratio of non-executive directors (NEDs) to the total number of directors in an organization. According to Fama and Jensen (1983), NEDs fulfill their monitoring duty well because of competitive and efficient managerial labour markets both within and outside the firm. A higher ratio of NEDs on corporate boards will increase financial performance. The stewardship theory opined that managers are the company's stewards and act in their directors' best interests (Manna, *et al.*2016). As a result, independent directors adversely impact company performance (Kyere and Ausloos, 2020). On the other hand, the lack of secret information from executive directorsrenders it difficult for independent directors to efficiently supervise their agencies and exacerbates agency conflicts (Kyere &Ausloos, 2020; Saravanan, *et al*. 2021).However, some empirical studies have discovered that increasing the number of NEDs affects performance either positively or negatively. In the study of, Eniola and Alo (2020), on the effect of board characteristics and firm performance of listed non-financial firms in Nigeria using a sample of 20 firms from 2013 to 2018. They found that board independence has a positive significant effect on firm performance as measured by ROA.Ololade (2021), found on the other hand that board independence has a negative and insignificant effect on the Return on Assets of Nigerian listed consumer goods firms. The findings are consistent with stewardship theory, which holds that inside directors (managers) have a better understanding of the business and are better placed to govern than outside directors, and can thus make superior decisions

that enhance the firm's superior performance. Alshetwi (2017) used a sample of 329 Saudi non-financial listed firms from 2013 to 2015 to investigate the relationship between board size, independence, and firm performance. No link was found between board independence, board size, and firm performance (ROA).

Board Meeting on performance

Board meetings are ways whereby directors deliberate on corporate issues and make strategic decisions targeted at the achievement of corporate objectives. While board meetings provide advantages such as more time for directors to discuss, set strategy, and monitor management, they also have costs such as managerial time, travel expenses, and directors' fees (Vafeas, 1999). The evidence from empirical studies undertaken by various scholars on the association between board meetings and firm performance is equivocal. According to Mishra and Kapil (2018), the number of board meetings conveyed a good signal to the market, resulting in increased firm value. Ashraf, *et al*. (2018),Abdeljawad and Masri (2020),and Freihat, *et al.* (2019) divulged that Board meetings have a significant positive effect on performance indicators. Ololade (2021) examined the impact of corporate governance on the financial performance of Nigerian consumer goods firms for five (5) years. It was found that board meetings have a positive but insignificant impact on the ROA. Similarly, Brick and Chidambaran (2010) found a positive relationship between board meetings and firm value. Extant literatures buttress the fact that the frequency with which the board of directors meets strengthens their supervisory responsibility. Unlike the study of, Hanh et al. (2018) which examined the influence of board meeting frequency on the financial performance of 94 firms listed on the Ho Chi Minh Stock Exchange Vietnam from 2013 to 2015, but however, found that that board meetings have a negative association with firm performance as measured by ROA, ROE, and ROS. The quality of the meetings is a key aspect that can affect firm performance. Mayur & Saravanan (2017) examined the impact of board size, composition, and frequency of board meetings on the performance of 40 Indian incorporated banks and found no significant association between performance and board meeting frequency.

Board Gender Diversity on Performance

The empirical evidence on board gender diversity and business performance in developed and emerging markets has remained inconclusive. According to some well-documented empirical studies, board gender diversity is positively related to firm performance (Ololade, 2021; Sobhan, 2021). Terjesen et al. (2015) used a sample of 3,876 public firms from 47 countries and found that firm with more female directors improve firm performance as assessed by Tobin's Q and return on assest (ROA). Again, Martin-Ugedo, Minguez-Vera, and Rossi (2019) used a sample of 1,393 firm-years to compare the relationship between females on the board of directors and firm performance in Italy and Spain. They concluded that having females on the board of directors has a positive impact on firm performance in both countries. Gulamhussen and Santa (2015) discovered that female directors on boards have a positive impact on bank performance in a sample of big banks from OECD nations. Similarly, Garcia-Meca et al. (2015) found that board gender diversity has a positive influence on bank performance, as evaluated by Tobin's Q and ROA, using a sample of 159 banks in nine countries from 2004 to 2010.

Mastella, et al. (2021) investigated the impact of board gender diversity on the performance and risk of Brazilian companies. Employing the OLS, quantile, and panel data regression on data of 150 publicly traded companies from 2010 to 2018. It found that Board gender diversity has a positive relationship with firm performance. Brahma et al. (2020) investigated the association between gender diversity, specific female characteristics, and financial performance of FTSE 100 enterprises in the United Kingdom from 2005 to 2016. The pooled OLS regression, fixed-effect, and GMM were employed for data analysis. The study discovered a positive and significant association between gender diversity and firm performance as evaluated by Tobin's Q and ROA. In the study of, Ozdemir (2020) which seek to established a relationship between board diversity and firm performance in the tourism industry in the United States. It considered the estimated two-way fixed-effects regression on a panel data set of 279 firm-year observations. The study revealed that board diversity was positively related to firm performance (Tobin's Q).

Almarayeh (2021) investigated the relationship between board gender diversity, board remuneration, and firm performance in Jordan. It adopted a 510 firm-year observations from 2009 to 2018. It employed the ordinary least squares regression and the generalized least squares estimation method. It was revealed that gender diversity on boards has no impact on firm performance.

Board Ethnicity Diversity on performance

Ethnic diversity refers to the diversity of social and cultural identities among people who share a common geographical region, occupation, or market context. Personal association with groups is referred to as ethnic identity, and research has shown that it has a considerable impact on people's key life events. These affiliations include race, language, religion, history cohort, and work specialization, among others (Cox, 2001). In Nigeria, the study classified board members of Northern Nigeria origin as Hausa-Fulani, and those from South-South and South-East as Igbos, while those from South-West are classified as Yoruba. There are divergent views on the relationship between corporate board ethnic diversity and firm performance. Some studies found positive relationships, some negative relationships, while some found no relationship between ethnic diversity and firm performance.

Kabara and Moddibo (2020) investigated the contribution of ethnically diverse corporate boards to firm performance. It analyzed a sample of 67 Nigerian listed non-financial firms from 2012 to 2017. It made use of descriptive statistics, correlation, and the modern 2-Step System-GMM estimator. The study found that ethnic diversity has a positive and significant effect on firm performance (Tobin's Q). On the other hand, ethnic diversity showed a negative insignificant effect on performance (ROA). In the study of, Ogboi, Aderimiki, and Enilolobo (2018), it was revealed that ethnic diversity has a positive and significant association with company performance as assessed by Tobin's Q, but a positive and insignificant relationship with firm performance (ROA). Omoye and Eriki (2013) examined board ethnic diversity and firm performance in Nigeria. The ratio of the three major tribes (Hausa, Yoruba, and Igbo) to the overall board size was used to measure ethnic diversity on the board. A cross-sectional OLS multiple regression analysis was utilized to analyze 96 selected quoted companies on the Nigeria Stock Exchange. It had a negative and insignificant relationship between ethnic diversity and firm performance as measured by return on equity (ROE).

Data and Methods of Analysis

Source and sample of data

The audited annual reports and accounts of Nigerian listed firms from 2011 to 2020 were used in this study. Specifically, the study data were extracted from a database of Machame Ratios® available on the webpage www.machameratios.com. The study sample consists of 110 listed firms selected using the sample filtering technique based on the criteria that the firm must have continuous data from 2010 to 2020, and should be listed on the Nigerian stock exchange as of December 2020 (thus, judgmental). The 110 listed companies consists of 1,090 firm-year observations that met the criteria for inclusion in the sample size.

Methods of Analysis

An ex-post-facto research design is used in this study. The Descriptive statistics, correlation, and ordinary least square (OLS) pooled regression analyses were used to evaluate the panel data. The mean, standard deviation, minimum, and maximum, descriptive statistics were employed to show direction of investigating the explanatory and dependent variables of interest, as well as verify data normality. The links between the variables were further examined using correlation analysis. Panel regression analysis was also used to investigate the cause-effect relationship between the dependent and explanatory variables, as well as to test the hypothesis. To check for inconsistencies with the basic assumptions of the OLS regression, diagnostic tests such as multi-collinearity, heteroscedasticity, Fixed and Random-effect, as well as the Hausman specification test, were performed.

Table 1 Summary of Operational Definitions of Research Variables

Variable	Measurement
Dependent	
Financial Performance Tobin's Q	Market capitalization divided bytotal assets
Independent	
Board Size (BSIZE)	Log of the total number of board members
Board Independence (BDI)	The ratio of the total number of non-executive directors to board size
Board Diligence (BD)	The logarithm of the number of board meetings held in a financial year
Board Gender Diversity (BGD)	The ratio of the total number of women directors to board size
Board Ethnicity (BETHNICITY)	Dummy of 1 if ethnically heterogeneous and 0 if otherwise
Control	
Firm Size (FSIZE)	Log of Total Assets
Firm Age (FAGE)	log of the number of years since listing

Source: Researcher's compilation (2022)

Model Specification

The study adapted Andres and Vallelado (2008) model, which was modified to suit our study

$$Tobin's\ Q_{it} = \beta_0 + \beta_1 BSIZE_{it} + \beta_2 BDI_{it} + \beta_3 BDs_{it} + \beta_4 BGD_{it} + \beta_5 BETHNICITY_{it} + \beta_6 FSIZE_{it} + \beta_7 FAGE_{it} + \varepsilon_{it}$$

where:

Tobin's Q = Market capitalization divided by total assets
BSIZE = Logarithm of total number of board members
BDI = Ratio of total number of non-executive directors to board size
BD = Logarithm of number of board meetings in a financial year
BGD = Ratio of total number of women directors to board size
BETHNICITY = Dummy of 1 if board is ethnically heterogeneous and 0 if otherwise
FSIZE = Logarithm of total assets
FAGE = Logarithm of number of years since listing
ε_{it} = Error Term
β_0–β_5 = Parametric Coefficients
i = Firm Observation
t = Time Observation

Data Presentation

Descriptive Analysis

The descriptive statistics for both the independent and dependent variables are examined in this section. The mean, standard deviation, maximum, and minimum values of each variable are investigated.

Table 2: Descriptive Statistics

VARIABLES	MEAN	SD	MIN	MAX	NO OBS
TOBQ	1.22	1.10	0.04	8.99	1075
BODS	9.54	3.10	4	21	1090
BODI	66.71	14.22	7.69	112.5	1090
BMET	4.83	1.46	1	16	1090
BOGD	13.31	12.31	0	100	1090
ETHC	0.49	0.50	0	1	1087
FSIZ	7.36	0.96	5.24	9.94	1081
FIRA	24.60	13.59	2	56	1081

Source: Author (2022)

From the above(table 2), the mean of firm performanceas measured by Tobin Q (TOBQ) for the sample firms was 1.22 with a standard deviation of1.10. Firm performance has a maximum value of8.99and a minimum value of0.04. Board size (BODS) had a mean of9.54and a standard deviation of3.10 with a minimum and maximum members of 4 and 21 respectively. We find that board independence (BODI) had a mean of66.71and a standard deviation of 14.22. The mean of board diligence (BMET) was 4.83 and a standard deviation of 1. We also find that the meanboard gender diversity (BOGD) was13.31 and a standard deviation of 12.31,while board ethnicity (ETHC) had a mean of 0.49and a standard deviation of 0.50. For the control variables, we find that on average firm size (FSIZ) was 7.36 and a standard deviation of 0.96. We also discovered that firm listing age had a mean of 25 and a standard deviation of 14.

Hypotheses

Five null hypotheses were formulated based on the independent variables. The Pooled OLS regression was used to test the hypotheses.

Normality Test

Ordinary least squares regression assumes that the data is normally distributed. In other words, the observations follow a normal (Gaussian) distribution. As a result, it is assumed that the population from which the samples are drawn is normally distributed. The null hypothesis, on the other hand, is that "the sample distribution is normal." The distribution is non-normal if the test is valid (significant). We follow the results of Mendes and Pala (2003) who found that Shapiro-Wilk test was the most powerful test regardless of distribution and sample size and it should be used when testing for normality. As a result, we performed a residual normality test, as indicated in table 3 below.

Table 3: Normality Test

VARIABLES	NO OBS	W	V	Z	PROB<Z
TOBQ	1075	0.62	258.04	13.79	0.00
BODS	1090	0.96	25.71	8.07	0.00
BODI	1090	0.99	9.61	5.62	0.00
BMET	1090	0.89	74.28	10.71	0.00
BOGD	1090	0.97	22.34	7.72	0.00
ETHC	1087	0.99	0.07	-6.53	1.00
FSIZE	1081	0.97	20.26	7.48	0.00
FIRA	1081	0.94	39.58	9.14	0.00

Source: Author (2022)

The dependent variables of Tobin Q (prob>z = 0.00000) are not normally distributed, as shown in table 3 above, because the probability of the z-statistics indicated by the Shapiro-Wilk test is significant at a 1% significant level. The same can be said of the independent variables of board size (prob>z = 0.00000), board independence (prob>z = 0.00000), board diligence (prob>z = 0.00000), board gender diversity (prob>z = 0.00000) as well as the control variables of firm size (prob>z = 0.00000) and firm listing age (prob>z = 0.00000). But the independent variable of board ethnicity (prob>z = 1.00000) is normally distributed because the probability of the z-statistics as revealed by the Shapiro-Wilk test isinsignificant at a 1% or 5% significant level.However, we proceed with the ordinary least square regression but carefully interpret the probability statistics against the t-statistics in line with the recommendation of Guajarati, (2004).

Correlation Analysis

Alternatives to the Pearson technique are warranted when non-normal distributions are revealed by the normalcy of residua test results. In non-normal bivariate distributions, Fowler (1987) found that Spearman's r is more powerful than Pearson's r. The ranking order is responsible for the contraction of outliers towards the center of the distribution giving rise to the power benefit of Spearman's r (Gauthier, 2001).Bishara & Hittner (2012) noted that the Spearman's versus Pearson's robustness test hasnot been much scrutinized empirically. Since the residua have a non-normal distribution, the Spearman Rank Correlation approach is used to determine the possible association between the variables in this study.

Table 4: Research Summary of Spearman Rank Correlation analysis

VARIABLES	TOBQ	BODS	BODI	BMET	BOGD	ETHC	FSIZE	FIRA
TOBQ	1.00							
BODS	-0.14	1.00						
BODI	0.04	**0.01**	1.00					
BMET	-0.04	0.24	0.01	1.00				
BOGD	-0.07	0.10	-0.02	0.18	1.00			
ETHC	-0.11	-0.14	-0.06	-0.06	0.08	1.00		
FSIZE	-0.07	0.51	-0.09	0.26	0.21	-0.23	1.00	
FIRA	0.10	0.05	0.09	0.09	0.02	-0.17	0.10	1.00

Author's computation (2021) using STATA version 14

In the case of the correlation between corporate board characteristics and firm performance, the above results indicate a negative and weak relationship between firm performance and board size (-0.14). There is a **positive and weak** relationship between firm performance and board independence (0.04). There is a **negative and weak** relationship between firm performance and board diligence (-0.04). Firm performance and board gender diversity have a **negative and weak** relationship (-0.07). There is a **negative and weak** relationship between firm performance and board ethnicity (-0.11). For our control variable, there is a **negative and weak** relationship between firm performance and firm size (-0.07). There is a **positive and weak** relationship between firm performance and firm listing age (0.10). However, regression findings will be required to evaluate our hypotheses to establish the cause-effect relationship.

Regression Analyses

However, because the data comprised both time series (2011 to 2020) and cross-sectional features (110 listed firms in Nigeria), we utilized a panel regression analysis to evaluate the cause-effect relationship between the dependent and independent variables, as well as to test the hypotheses. The panel data regression and OLS pooled results obtained are presented and discussed below.

Table 5: Regression Result

	TOBQ Model (Pooled OLS)	TOBQ Model (FIXED Effect)	TOBQ Model (RANDOM Effect)
C	1.95 {0.000} ***	9.36 {0.000} ***	4.61 {0.000} ***
BODS	-0.03 {0.055}	-0.03 {0.027} **	-0.02 {0.125}
BODI	-0.00 {0.530}	-0.00 {0.719}	-0.00 {0.260}
BMET	-0.00 {0.980}	0.01 {0.623}	0.00 {0.775}
BOGD	-0.00 {0.994}	-0.00 {0.773}	-0.00 {0.386}
ETHC	-0.20 {0.004} **	0.15 {0.048} **	0.08 {0.277}
FSIZ	-0.07 {0.139}	-1.05 {0.000} ***	-0.40 {0.000} ***
FIRA	0.01 {0.001} **	-0.01 {0.368}	-0.01 {0.296}
F-statistics/Wald Statistics	4.76 (0.00) ***	14.77 (0.00) ***	46.53 (0.00) ***
R- Squared	0.03	0.10	0.09
VIF Test	1.24		
Heteroscedasticity Test	91.65 (0.00) ***		
Hausman Test		174.58 (0.0000) ***	

Note: (1) bracket {} are p-values
(2) **, *, implies statistical significance at 5% and 1% levels respectively**

The R-squared value of 0.03 in table 5 above demonstrates that the independent and control variables in the models jointly explained about 3% of the systematic fluctuations in firm performance proxied by Tobin Q in the pooled firms across the period of interest. The unexplained portion of firm performance can be attributed to the exclusion of other independent variables that potentially affect firm performance but were not included in the error term. The F-statistic value of 4.76 and the related P-value of 0.00 indicate that the OLS regression model is statistically significant at the 1% level, indicating that the regression model is legitimate and may be used for statistical inference. However, we proceed to check for post regression errors to further validate the OLS regression estimate.

Multicollinearity and Collinearity Test

When the independent variables are not independent, correlation becomes a problem. When the degree of correlation between the variables is exceedingly high (perfect correlation), fitting the model can be difficult. As a result, multicollinearity emerges when the explanatory variables in a regression model are perfectly correlated, indicating that the independent variables have a strong relationship. We use the variance inflation factor (VIF) technique to identify the existence or lack of multicollinearity in this investigation, as in most other relevant studies. A VIF cut-off of 10 indicates that a VIF is considered high. This is in line with Gujarati's (2004) recommendation that the mean VIF should be less than 10. Table 5 reveals a mean VIF value of 1.24, which is within the benchmark value of 10, indicating that there is no multicollinearity in the model and that no independent variable should be dropped from the models.

Test for Homoscedasticity

The Breusch Pagan module in Stata 14 is used to run this test. The assumption of homoscedasticity states that if the errors are heteroscedastic then it will be difficult to trust the standard errors of the least square estimates. Hence, the confidence intervals will be either too narrow or too wide. Table 5 above shows that the OLS results had heteroscedasticity issues because the probability value was significant at 1% [91.65 (0.0000)]. Our sampled firms are not homogeneous, as evidenced by the presence of heteroscedasticity in the model. As a result, to capture the impact of each firm's heteroscedasticity on the results, a robust or panel regression approach will be required. We used the panel regression approach in this investigation, which included both fixed and random effect models.

Fixed and Random Effect Regression

In this study, we performed a two-way random and fixed effects panel at a 0.05 level of significance using the Wallace and Hussain estimator of component variances.

The F-statistic and Wald-statistic values for fixed and random effect regression, respectively [14.77 (0.00) and 46.53 (0.00), show that both models are valid for drawing inference because they are both statistically significant at 1%. In the case of the coefficient of determination (R-squared), it was observed that [{10%; 9%}] systematic variations in firm performance proxied by Tobin's Q were explained jointly by the independent and control variables in the models respectively. When compared to the OLS pooled regression, this means that more variation in company performance was explained. The Hausman test was used to choose between the two-panel regression estimation findings, and it is based on the null hypothesis that the random effect model is preferable to the fixed effect model. The p-value of the Hausman test (0.0000) indicates that we should reject the null hypothesis and accept the alternative hypothesis at a level of significance of greater than 5% or 1%. As a result, we should base our conclusions and recommendations on the fixed effect panel regression results. This also means that the fixed effect results are statistically more appealing than the random effect findings. As a result of the above, discussing the fixed effect results became critical in evaluating our hypotheses.

Test of Hypotheses

Hypothesis 1: ***Board size has no significant effect on the performance of listed firms in Nigeria***

From our test results obtained in table 5 above, the fixed effect regression shows that board size has a beta coefficient of -0.03 and a P-value of 0.027. We reject the null hypothesis and accept the alternate hypothesis because the P-value of 0.027 is less than the desired 5% level of significance. Board size as an independent variable to firm performance appears to have a negative and significant influence on firm performance. Hence, board size has a significant effect on the performance of listed firms in Nigeria.

Hypothesis 2: ***Board independence has no significant effect on the performance of listed firms in Nigeria***

We find from table 5 above that the computed fixed effect regression beta coefficient for board independence is -0.00 while its P-value is 0.719. Since its probability value is greater than the desired level of significance of 5%,we accept the null hypothesis and reject the alternate hypothesis. Board independence as an independent variable to firm performance appears to have a negative and insignificant influence on firm performance. Hence, board independence has no significant effect on the performance of listed firms in Nigeria.

Hypothesis 3: ***Board diligence has no significant effect on the performance of listed firms in Nigeria***

The results obtained from the fixed effect regression in table 5 above shows that board diligence has a coefficient of 0.01 with a P-value of 0.623. We accept the null hypothesis and reject the alternate hypothesis because the P-value of 0.623 is greater than 5% desired level of significance. Board diligence

as an independent variable to firm performance appears to have a positive and insignificant influence on firm performance. Hence, board diligence has no significant effect on the performance of listed firms in Nigeria.

Hypothesis 4: ***Board gender diversity has no significant effect on the performance of listed firms in Nigeria***

The fixed effect regression in table 5 above shows that board gender diversity has a coefficient of -0.00 and a P-value of 0.773, which indicates that the P-value is not statistically significant at 5% level of significance because it is greater than 0.05. We accept the null hypothesis and reject the alternate hypothesis. Gender diversity as an independent variable to firm performance appears to have a negative and insignificant influence on firm performance. Hence, board gender diversity has no significant effect on the performance of listed firms in Nigeria.

Hypothesis 5: ***Board ethnicity has no significant effect on the performance of listed firms in Nigeria***

The results obtained in table 5 above from the fixed effect regression shows that board ethnicity with a coefficient of 0.15and a P-value of 0.048 appears to have a positive and significant influence on firm performance. Since the P-value of 0.048 is less than or equal to 0.05 we reject the null hypothesis and accept the alternate hypothesis. Hence, board ethnicity has a significant effect on the performance of listed firms in Nigeria.

Discussion of Findings

This research x-rayed the effect of corporate board characteristics on the performance of Nigerian listed firms. Only a few findings in the literature disagreed with the present viewpoints of this study. However, it was discovered after our rigorous analysis that board size has a significant negative impact on firm performance in Nigeria. The negative coefficient between board size and firm performance indicate that an addition of one member to the board of directors of a listed firm in Nigeria will result in a significant decline in firm performance (Tobin's Q) by -3% during the period under consideration. As a result, board size has a significant impact on the performance of Nigerian listed firms. We find consistency with Abdeljawad, *et al* (2020). We, however, differ with the findings of Mishra & Kapil (2018).

Board independence does seem to have a negative and insignificant effect on firm performance. This result implies that an independent board of directors of listed firms in Nigeria insignificantly decreases firm performance as measured by Tobin's Q during the study period. We document that board independence has an insignificant negative effect on the performance of Nigerian-listed firms. Our findings supports the findings of, Ololade (2021), and Freihat et al (2019).

Board diligence appears to have a positive but insignificant influence on firm performance. Our study reveals that frequent board meetings of listed firms in Nigeria insignificantly improve firm performance as measured by Tobin's Q during the study period. We contradict Hanh, *et al* (2018).

Furthermore, board gender diversity appears to have a negative and insignificant influence on firm performance. The negative coefficient between board gender diversity and firm performance implies that an addition of a female member on the board of directors of listed firms in Nigeria insignificantly decreases firm performance (Tobin's Q) by -0.00 during the period under consideration. Hence, board gender diversity has no significant effect on the performance of Nigerian listed firms. We disagree with Mastella,*et al.* (2021), Brahma, *et al.* (2020), Ozdemir (2020), and Terjesen et al. (2015), who discovered that firms with more female directors outperform firms with fewer female directors on a market-based (Tobin's Q) and accounting (return on assets) measures.

The fixed effect regression model results indicate that board ethnicity seems to have a positive and significant effect on firm performance. This result implies that the ethical background of board members of Nigerian listed firms will significantly improve firm performance as measured by Tobin's Q during the

study period. As a result, board ethnicity has a significant effect on the performance of Nigerian listed firms. This is consistent with the findings of Kabara & Modibo (2020), and Ogboi et al (2018).

Conclusion

This research has extensively analyzed the effect of corporate board characteristics on the performance of Nigerian listed firms. It covers a wide period of 10 years from 2011 to 2020. Having performed pre-regression analysis, which includes descriptive statistics, a correlation matrix, and residual normality analysis, it considered the panel Ordinary Least Squares Regression analysis, followed by diagnostic tests to see if it violated the basic Gauss Markov Theorem and assumptions (Woodridge, 2002). It also performed post-regression test such as multicollinearity and homoscedasticity tests. A critical examination of all the diagnostic tests revealed that the model failed the normality assumption of the OLS estimates. However, we carefully interpret the p-value of the fixed effect since Hausman had recommended fixed effects as the most appropriate over random effects. Our findings show that board size has a negative and significant effect on firm performance. Board independence and gender diversity both have a negative and insignificant impact on firm performance. Board diligence has an insignificant but positive impact on firm performance. Board ethnicity has a positive and significant influence on firm performance.

We have successfully established a relationship between corporate board characteristics and the performance of Nigerian-listed firms. We conclude, in particular, that board size has a significant negative effect on firm performance in Nigeria. This implies that adding one member to the board of directors of a Nigerian listed firm will significantly reduce firm performance as measured by Tobin's Q during the period under consideration. However, we find that board ethnicity appears to have a positive and significant influence on firm performance. This result implies that the ethical background of board members of Nigerian listed firms will significantly improve firm performance as measured by Tobin's Q during the study period. However, we also conclude that board independence, and board gender diversity appears to have a negative and insignificant influence on firm performance.

We further found evidence that gender diversity, board independence, and board diligence are not statistically significant predictors of market-based performance measures. This discovery has far-reaching implications for policy and literature. The market, rather than direct regulation, enforces Nigeria's Code of Governance for Listed Firms. It is assumed that requiring corporations to disclose their corporate governance practices will allow shareholders to compare them to a benchmark of the guidelines and form an opinion about the value of such practices. In an efficient market, the shareholders' assessment would be reflected in share prices that adjust to reflect whether the practices maximize value. Share price movements, in turn, would put pressure on directors to implement good corporate governance practices in order to keep their company's access to the financial markets. Not only do the dynamics in the market environment account for the mixed-findings in corporate governance studies but also the economic and political factors in the economy of the country where the research is being carried out.

We recommend that board size be carefully analyzed by shareholders and balanced according to expected results, board independence be continuously maintained and periodically reviewed, and a maximum of 6 board meetings excluding emergency meetings be held annually; board members should consist of at least half gender diversity, and finally, ethnic heterogeneity be allowed on the boards of Nigerian firms for equity, fair representation, and relative peace.

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