Research Article

BOARD STRUCTURE AND PERFORMANCE OF DEPOSIT MONEY BANKS IN NIGERIA

[1], * Adetula Samuel Lanrewaju and [2]Adepoju Ebenezer Adedayo

[1]Department of Accounting, College of Social and Management Sciences, Achievers University Owo, Nigeria.
[2]Wema Bank Plc, Opposite Olowo palace, Idimisasa Rd. Owo, Nigeria.

ABSTRACT

The study explores how of board structure affects the corporate performance in Nigeria. The study was conducted within the context of deposit money banks and data were gathered from the financial statement of listed DMBs in Nigeria for eleven years spanning from 2011 to 2020. The study employed panel data regression and Panel VAR analysis. The result found that board structure affected Nigerian deposit money banks' operational performance in the static model. Board structure also affected Nigerian deposit money banks' efficiency. Significantly, board structure predicted operational performance. Similarly, board structure could anticipate deposit money bank efficiency in the future. Board structure had a statistically significant effect on operational and efficiency of Nigerian deposit money institutions. Thus, the board structure significantly influenced the operational and efficiency performance of Nigerian deposit money banks over time and could be used to predict their future performance.

Keywords: Board structure, Operational performance, efficiency performance, Deposit money banks.

INTRODUCTION

Multiple definitions of performance by researchers and practitioners make it a difficult topic. Tudose (2016) noted that performance could be financial or operational, depending on corporate goals. Performance measures how well a corporation uses its main business resources to make money. Company performance measures its ability to maximize cost of operations, utilise resources efficiently, and generate shareholder value. High performance shows management resource usage efficiency and benefits the economy (Naser and Mokhtar, 2004). Financial performance is an organization's endeavor to fulfill its goals or be productive (Karaye, *et al.,* 2014). Financial performance assesses an organization's revenues, earnings, and value, which increases share price (Mwangi and Murigu, 2015). Financial performance can be assessed now or over time. It can also be used to compare similar companies or marketplaces. Erasmus (2018) suggested that liquidity and profitabiity measurements helped stakeholders evaluate a firm's financial health. Performance determines a company's value, hence it's crucial (Ongore and Kusa, 2018). This is because financial success affects an organization's long-term viability. Financial performance is an organization's efficient and effective use of resources to meet its goals, which increases share price, sales, market share, profitability, earnings, and cash flows and meets stakeholder expectations (Ibrahim, 2015). Many studies have examined the drivers of performance in developed and emerging nations, including corporate governance. Clark (2018) defines corporate governance as a management and oversight system that expressly states stakeholders' rights and responsibilities and a company's decision-making norms. However, Susoiu (2016) claimed that corporate governance goes beyond corporate management and includes equitable, effective, and transparent administration to attain certain aims. It organizes, runs, and manages a business to meet long-term strategic goals to satisfy shareholders, suppliers, employees, and customers, comply with legal and regulatory requirements, and serve the local community and environment.

This complements Susoiu's (2016) research, which found that effective corporate governance should help local businesses access international capital and that foreign enterprises gain from portfolio diversity on investment options. Braga-Alves and Shastri (2011) also stated that excellent corporate governance was essential for business performance, investor rights, investment climate, and economic development. However, poor corporate governance encourages unethical and corrupt behaviour among bank owners and managers, disregards shareholder rights, unfairly treats shareholders, ignores stakeholder interests, and allows insiders to abuse their power, eroding financial transparency, discipline, and dishonesty among the few self-interest groups in the sector. Empirical studies and theoretical frameworks link corporate governance with performance. Sarpong-Danquah, *et al.,* (2018), Akdogan and Boyacioglu (2018), and others found that corporate governance improved performance. Guoa and KGA (2012) and others discovered a correlation between bad corporate governance and low performance. This implies that corporate governance sophistication affects company performance. The relationship between corporate governance and performance was demonstrated through agency theory and empirical studies. The hypothesis shows a conflict of interest between shareholders and managers. Managers may conduct organizations in ways that don't maximize shareholder wealth (Oyejide and Soyibo, 2018). Corporate governance checks and balances shareholders and management and reduces agency issues to align principal and agent interests and ensure banks are managed for investors (Yeganeh, *et al.,* 2017). The above suggests a link between corporate governance and deposit money bank performance. Only empirical evidence can reach this judgment. Therefore, the study examined the effect of board structure on deposit money bank performance using operational and efficiency performance as proxies. In view of this, the study hypothesised that board structure has no significant effect on the performance of deposit money banks in Nigeria.

Corresponding Author: Adetula Samuel Lanrewaju,
1Department of Accounting, College of Social and Management Sciences, Achievers University Owo, Nigeria.

To test this hypothesis and full the objective of the study, the remaining part of the study is classified as follow; section two details the relevant literature, section three documents the methods and data collection, section four discusses the analysis and result and section proffers the conclusion and recommendation.

2. LITERATURE REVIEW

The section comprise of the conceptual review, empirical review and theory underpinning the study. In view of this, Lidyah, *et al.,* (2019), Olayiwola (2021) among others state that the board of directors promotes the company's goals to improve decision-making and manage the relationship between shareholders and operations. Operational performance is measured by return on assets (ROA), net profit divided by total assets. Ahmed and Hamdan (2015) found that increased return on assets improves operating performance. It shows management's ability to get deposits at fair prices and invest them in lucrative businesses (Ahmed, 2019) while bank efficiency shows how banks can cut costs to boost profits. It is often believed that low bank productivity and efficiency equal high cost-to-income ratios (CIR), and vice versa. In addition to this, the study presents some of the relevant literature reviewed for this study which include but not limited to Almadi (2016) studied board structure and firm financial performance in Saudi Arabia. Data were sourced from annual reports (2014-2015) were used. Bivariate correlations, hierarchical multiple regression, and moderated OLS regression were used in the study. Directors linked to political, social, and administrative institutions improved Saudi Arabia's listed companies' financial performance. Study finds Saudi companies may face communication and economic conflicts if board is dominated by directors with significant equity ownership. Okoth and Coşkun (2016) studied corporate governance's impact on company performance in Turkey. The study focused on the BIST 100 index of non-financial companies from 2009 to 2013. Board index positively impacted economic value added but negatively impacted return on equity. Revealed by OLS regression results. The board index had no impact on return on assets. The models' results discrepancy emphasizes the importance of using appropriate techniques for estimating firm performance. Corporate governance's impact on performance varied based on performance proxies, as concluded by the study. The study did not specify sample size criteria. Sanyolu *et al.,* (2017) studied the impact of corporate governance on financial performance of Nigerian listed deposit money banks from 2007-2016. Pooled least square regression used for data analysis. The study found a negative link between board size, audit committee size, firm size, and return on assets. The analysis found a small positive connection between board independence and banks' return on assets.

Onuorah and Imena (2016) studied financial reporting and corporate governance in Nigerian businesses. The concern was how corporate governance factors affected financial reporting in Nigerian companies. Selected businesses included finance, oil and gas, brewing, and beverage industries. Regression analysis used in 2006–2015 study. Corporate governance indicators positively affect financial reporting quality. Study links Nigeria's financial reporting to corporate governance effectiveness. Appiadjei *et al.,* (2017) studied firm performance and board gender diversity. The study also found a relationship between age and female board representation similar to a trigonometric function. Companies' initial entry into the capital market caused board gender percentages to vary. Study: ROE increased by 21.6 for each % increase in women on board. Net profit margin increased by 21.6% as women on boards increased. Increasing female board ratio by one unit resulted in an 18.2% increase in net profit margin. Weakness: No diagnostic test conducted to validate model, potential bias in result estimate.

Udeh, *et al.,* (2017) studied corporate governance's effect on financial performance in Nigeria. Shareholders theory was foundational for the research. Data collected from public financial statements of selected banks from 2003 to 2014. OLS regression was used to analyze the data. Board composition had a small negative impact on ROCE from 2003-2008 and 2009-2014. Corporate governance had little effect on financial performance. Zahroh and Hamidah studied corporate governance's impact on business performance in 2017. Board size, independence, outside directors, audit committee size, meetings, audit quality, and CGPI measured corporate governance, while return on assets measured performance. Result found that audit committee meetings, audit quality, board size, and CGPI had no significant impact on performance. However, board independence, leverage, and firm size had a significant positive effect. Corporate governance impacted Indonesian firm performance in multiple ways. One flaw in the study was the improper filtering of the sample size selection procedure. Chen, *et al.,* (2017) studied the correlation between female independent directors and high dividend payouts. Study used panel data regression for estimation. Companies with more female directors pay higher dividends. Study links board gender composition to favorable dividends. Only poorly governed companies saw a significant increase in dividend payout due to board gender composition, suggesting that female directors used dividends for governance. Bias in regression likely due to omission of pre-estimation result. Okoye *et al.,* (2017) studied the link between corporate governance and financial sustainability of microfinance companies in Nigeria from 2011 to 2015. Only Nigerian national and state-level microfinance banks were studied. Discrete techniques, correlation analysis, and regression analysis were used for data investigation. No connection found between corporate governance practices and financial stability. Board size positively correlated with financial stability. Study: Gender-friendly policies needed for microfinance banks to increase women on boards and gain benefits. Regulatory bodies should enforce corporate governance code for Nigerian microfinance banks and punish those that don't comply.

Herdjiono and Sari (2017) studied the impact of ownership, audit committee size, and board size on financial performance of Indonesian manufacturing companies. The study analyzed 39 Indonesian companies listed on the Indonesian Stock Exchange using linear regression. Institutional ownership, managerial ownership, and audit committee size had no impact on financial performance, but board size had a positive impact. Study found that board size and director performance improved financially, but institutional ownership, managerial ownership, and audit committee mechanisms did not improve company performance. No panel data regression used due to data from 39 companies over four years, a weakness.

Sow and Tozo (2019) showed corporate governance influences Chinese company performance and earnings management. Data from 2,098 Chinese listed firms' 2008-2014 annual reports. Earnings management proxy: discretionary accruals. ROE, ROA, and Tobin's Q ratios measure firm success. Estimation employed fixed effects regression and pooled OLS. Independent directors and larger boards improve performance, whereas CEO duality and board size hurt it. Better earnings came from smaller boards. Board size affected Chinese corporate performance. The Chinese company culture valued financial reporting honesty and earnings management was detrimental to performance. Ramaiah *et al.,* (2019) examined Indian corporate governance and firm performance. The study measured performance with market-to-book value and Tobin's Q. Panel data regression estimated 94 companies' 2001-2018 data. Corporate governance affects firm performance. Indian companies must adopt

top corporate administration practices to boost financial performance and execution. Study results didn't support goals.

Ethiopian stock company financial performance and corporate governance were examined by Wondem and Batra (2019). The ROA and ROE measured financial success. Study estimated using panel data regression. Gender diversity on the board increased return on assets, but board meeting attendance did not. Board size, frequency, and leadership style decreased ROA, according to the study. Return on equity was negatively affected by board meeting frequency, gender diversity, and director attendance. Return on equity correlated with board size and leadership style. Ethiopian share businesses' corporate governance must change with the business environment. Study conclusions were thorough and aligned with goals. Corporate governance affected firm performance and stock returns, according to Dash and Raithatha (2019). From 2006 to 2015, PROWESS collected annual firm-level performance, governance, monthly stock return, and market capitalization data from Indian listed enterprises. The dynamic panel data model with system GMM found that corporate governance increased business performance. Corporate governance didn't deliver above-average profits because stock prices already incorporated it in. Successful trading strategy no longer supports corporate governance.

Warrada and Khaddam (2020) examined Jordanian enterprises' performance and corporate governance. Data from 11 Amman Stock Exchange Jordanian bank annual reports (2015-2018) was collected. Descriptive analysis, correlation coefficient, and multiple regression were used to examine Jordanian bank corporate governance and performance. The study found that board size, diligence, audit committee size, and diligence affected return on equity. Corporate governance affected performance. The study did not evaluate regression. Ibrahim and Danjuma (2020) examined Nigerian deposit money banks' corporate governance. From 2015 to 2019, panel data regression estimated data from 15 NSE-listed banks. Study links board composition, size, firm size, and ROA of Nigeria's deposit money institutions. Positive board composition affects performance. Quoted deposit money institutions perform better with more non-executive directors. The conclusion didn't match the findings because corporate governance variables didn't include non-executive directors. CEO ownership affected financial results and market return, according to Wu and Dong (2020). The study examined Taiwan Stock Exchange-listed companies from 1996 to 2018. Accounting was utilized to assess financial performance and CEO ownership changes. TEJ database multivariate regression analysis. CEO ownership improved market performance, validating the signaling hypothesis. Investors liked negative stock market signals.

Nigerian bank profitability and corporate governance were examined by Oluwole (2021). Study: 2009-2018. Corporate governance and bank profitability were favorably and strongly correlated. Corporate governance helped Nigerian banks. It was urged to monitor audit committee, board, and meeting sizes. Increasing these characteristics would boost earnings per share, while lowering audit committee sessions would lower it. Studies didn't explain why three of Nigeria's twenty-two deposit money institutions were picked. Ajugwe (2021) studied banking corporate governance. Good company governance reduces risk, enforces risk limits, reduces bad debts, boosts profitability, deposits, and liquidity. Poor corporate governance can lower customer confidence, cause bank runs, and hurt the economy because banks drive economic growth. Study had no overall conclusions.

It is explicit from the study that most of the study use static model but this study employed the both static and dynamic model to explore the effect of board structure on performance of deposit money banks. The study is anchored on agency theory.

3. METHODOLOGY

This study used an expo facto design to determine how board structure affects performance of Nigerian deposit money banks. This study suits this research strategy because data were collected throughout time. The selected deposit money banks' annual reports provided quantitative data. The population of this study included all operating Nigerian deposit money banks which are 24 in number. The study used purposive sampling, which helps the investigation preserve observation-range panel data. The study sampled twelve. To balance the sample, banks without up-to-date were eliminated. The total observation for the study was the number of banks multiplied by the projected 10-year coverage period, 2011–2020. Panel data regression Panel VAR were used as the estimation techniques. The model for this model is specified in equation 3.1 and 3.2 and this is in line with Oyedeko, *et al.,* (2021):

$$ROA_{it} = \pi_0 + \lambda_1 BS_{it} + \lambda_2 BIND_{it} + \lambda_3 BGD_{it} + \lambda_4 GR_{it} + \lambda_5 FA_{it} + \lambda_6 FS_{it} + \varepsilon_{it} \dots\dots\dots\dots 3.1$$

$$CIR_{it} = \pi_0 + \lambda_1 BS_{it} + \lambda_2 BIND_{it} + \lambda_3 BGD_{it} + \lambda_4 GR_{it} + \lambda_5 FA_{it} + \lambda_6 FS_{it} + \varepsilon_{it} \dots\dots\dots\dots 3.2$$

Where: ROA is return on assets, CIR is Cost of income ratio, BS is board size, BIND indicates board independence, BGD is board gender diversity, GR is growth opportunity, FA is firm age, FS firm size, λ_1-λ_7 represent the coefficients of the variables, π_0 represents the constant, i is the deposit money banks, t is the time frame in the study, and ε is the idiosyncratic shock or individual observation error term. The Table 3.1 shows the measurement of the variables.

Table 3.1: Measurement of Variables

Variables	Type	Measurements	Sources
1. Performance: Operational Performance Efficiency Performance	Dependent	Return on assets: ratio net income after tax to total assets. Cost to income ratio	Kuntluru (2019), Mutyala and Shalini (2019)
2. Board Structure: i.Board Size. ii.Board Independence. iii. Board Gender diversity	Independent	i. Logarithm of total number of board of directors. ii. Percentage of the non-executive directors to the board size iii. Proportion of women on the board to board size.	i ii & iii. Dabor, etal. (2015)
3. Control Variables: i. Growth opportunity, ii Firm age iii. Firm size.	Control variables	i. Logarithm of present value of asset minus logarithm of previous value of assets divided by the logarithm of present value of asset. ii. Natural log of the age of firm from the date of incorporation. ii. Natural log of total assets.	Dash and Raithatha (2019), Adetula, *et al.,* (2023). Oyedeko and Adeneye, (2017)

Source: Author's Compilation (2023).

4. RESULT AND DISCUSSION

The descriptive and inferential statistics on board structure and deposit money bank performance in Nigeria are presented here. The descriptive statistics describe the data's behavior and fitness for empirical analysis, while the inferential statistics describe the empirical investigation of the relationships between/among the specified variables, which helps answer the study's objectives and test its hypotheses. Table 4.1 displayed statistical features of each variable.

Table 4.1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
roa	1.5011	2.0211	-9.53	5.62
cir	58.3425	17.8573	21.19	144.16
grt	17.8713	19.3572	-68.23	102.4
fsz	9.1797	.4032	8.19	9.94
bsz	13.8166	3.1860	6	21
bgd	18.0722	10.5561	0	45.45
bid	61.2736	12.4564	36.84	93.75
fma	47.75	26.8281	21	126

Note: *roa, cir, grt, fsz, bsz. bgd, bid, and fma represents return on assets, cost income ratio, growth opportunity, firm size, board size, board gender diversity, board independence, and firm age, respectively.*

Source: Author's Computation (2023) from STATA 16 Software.

Table 1 showed the study's variables' mean, standard deviation, lowest, and maximum values. The mean of all factors was positive. The variables all increased over the sampling period. The deposit money banks' return on assets averaged 1.501167, indicating that their assets were used wisely to generate 150 percent profit. In contrast, the minimum return on asset was -9.53, indicating that some deposit money institutions lost money throughout the sampling period. However, the average efficiency value of cost income ratio was 58.3425, which was high. It meant deposit money institutions functioned at low cost efficiency due to a growth in non-performing loans, poor administration, and poor credit scoring. Another remark, the minimum cost of income ratio was 21.19, indicating good cost efficiency and suggesting some deposit money institutions enhanced their efficiency over the sample period. The growth potential and firm size averaged 17.8713 and 9.1797, respectively, indicating that deposit money banks grew their asset growth and size over the inquiry. Minimum growth opportunity was -68.23, indicating a fall in deposit money bank assets. However, the greatest growth opportunity was 102.4, indicating bank asset growth. The smallest bank size was 8.19 and the largest was 9.94, and deposit money banks were very consistent during the examination. The average board size was 13.8166, meaning deposit money banks had 14 directors. A board of directors with 6 to 21 members was considered greater. Averaging 18.0772, board gender diversity measured the percentage of female directors. Minimum board gender diversity value indicated no female presence on the board of directors, while maximum value was 45.45, indicating about 45% female representation. Thus, deposit money bank boards have minimal female representation, which could impair bank performance. The average board independence value was 61.2736, and it stated that the board had larger external directors with a minimum value of 37% and a high value of 94%. The average firm age was 48, ranging from 21 to 126. The average age of the deposit banks in this study was 48 years, therefore they were not new banks. Despite the average, minimum, and maximum values, standard deviation described the

variables. The standard deviation showed that firm age was the most volatile variable and the least volatile. After describing the variables, the study estimated their association, which was given in Table 2.

4.2.2 Correlation Analysis

The correlation analysis which was conducted through the use of correlation matrix showed the association among the independent variables used in the study. The correlation matrix was conducted separately for independent variables based on the objectives of the study. Thus, the result in each panel report showed the correlation among the independent variables for each objective. Table 4.2 presented the results.

Table 4.2: Correlation Analysis

Variables	bsz	bgd	bid	fma	fsz	grt
Bsz	1.0000					
Bgd	0.0838	1.0000				
bid	-0.4005	0.0231	1.0000			
fma	-0.1737	0.0615	0.2699	1.0000		
fsz	0.2105	0.1682	0.0490	0.2480	1.0000	
grt	0.0430	0.0213	-0.0470	-0.0992	0.0682	1.0000

Source: Author's Computation, (2023)

Panel A demonstrated correlation coefficients between board structure characteristics such board size, gender diversity, independence, company age, size, and development opportunity. The first column revealed the association between board size, gender diversity, independence, company age, size, and development opportunities. First pair showed 0.0838 correlation, second -0.4005, third -0.1737, fourth 0.2105, and fifth 0.0430. In the first column, board size correlated with gender diversity, firm size, and growth opportunity but not with independence and firm age. The second column demonstrated the association between board gender diversity, independence, firm age, size, and development opportunity with correlations of 0.0231, 0.0615, 0.1682, and 0.0213. Board gender diversity correlated linearly with board independence, business age, size, and development opportunities. The third column indicated a correlation of 0.02699, 0.0490, and -0.0470 between board independence, company age, size, and growth. Board independence correlated with business age, size, and development opportunities. The correlation coefficient between firm age, firm size, and growth opportunity was 0.2480 and -0.0992, showing that firm age moved in the same direction as firm size but in the opposite way with firm growth potential. The fifth column of the correlation matrix showed a linear association between company size and growth opportunity with a coefficient of 0.0682. Thus, low correlation coefficients showed that each pair of variables was not totally associated, disproving multicollinearity or perfect collinearity. Our model had no multicollinearity issues.

4.3 Data Interpretation

The results of the estimation were documented in line with the objective of the study for more clarity. The pre-estimation and the estimation results were presented in Table 4.3.

Table 4.3: Diagnostic Test

Statistics	Panel A	Panel B
Poolability Test	5.57	6.27
	(0.000)	(0.000)
LM Test	19.91	21.87
	(0.000)	(0.000)
Hausman Test	15.08	16.38
	(0.0197)	(0.0119)

Note: Figures in () represented the Probability values.
Source: Author's Computation (2023) from STATA 16 Software.

Table 5 revealed board structure affected operational performance. First, it examined if board structure affected Nigerian deposit money banks' operational performance. The fixed effect model result was interpreted according to the pre-estimation test. The Table shows that board size improved operational performance significantly. An increase in board size increased operational effectiveness for Nigerian deposit money institutions. Nigerian deposit money banks' operational performance was negatively and insignificantly affected by board gender diversity. An rise in female directors on Nigerian deposit money banks' boards impacted their operational performance. Operational performance was negatively and insignificantly affected by board independence. The percentage of external directors in Nigerian deposit money banks decreased their operational performance. Positive but minor effects of company size and age on operational performance were also found. It showed that longer incorporation and larger banks did not improve Nigerian deposit money banks' operating performance. Growth opportunity improved the operational performance of Nigerian deposit money institutions. With a coefficient of determination of 0.1860, board size, gender diversity, independence, firm age, firm size, and growth opportunity explained 18.60% of operational performance variation, while other factors not included in the study explained 81.40 percent. Furthermore, the model was significant since F-statistic probability values were less than 0.05 and showed a good generalization from model estimate. The model residuals lacked heteroscedasticity and autocorrelation. The model was fit and met expectations. After that, the study examined how board structure affects efficiency performance, as shown in Table 4.5.

Table 4.5: Efficiency Performance and Board Structure

Variables	Pooled	Fixed Model	Random Model
bsz	-.0372	-.4803	.0614
	(.5494)	(.6368)	(.6054)
	[0.946]	[0.452]	[0.919]
bgd	.4517	.6541	.5594
	(.1476)	(.1768)	(.1707)
	[0.003]	[0.000]	[0.001]
bid	.2406	.0962	.0622
	(.1383)	(.1620)	(.1557)
	[0.085]	[0.554]	[0.689]
fma	-.1855	-3.6296	-.2099
	(.0622)	(.9540)	(.1379)
	[0.004]	[0.000]	[0.128]
fsz	-5.1957	29.8075	-12.6356
	(4.1414)	(15.9957)	(6.7443)
	[0.212]	[0.065]	[0.061]
grt	.0496	.0567	.0925

	(.0799)	(.0690)	(.0705)
	[0.536]	[0.413]	[0.190]
R-squared	0.1674	0.2402	0.1408
F-Statistic	3.79	5.37	
Prof (F-stat)	0.0018	0.0001	
Wald –Chi2			17.05
Prob. (wald-chi2)			0.0091
Serial correlation		7.538	
Prob (Chi2)		0.0190	
Heteroscedasticity		100.09	
		0.0000	

Source: Author's Computation (2023) from STATA 16 Software.

Table 4.5 shows how board structure affects efficiency. That estimation partially answered this study's primary research question and purpose. Thus, the pre-estimation test showed that the fixed effect model outperformed the random effect model. Research interpreted the fixed effect model. Nigerian deposit money banks' efficiency was negatively and insignificantly affected by board size. It implied that an increase in board director size impacted Nigerian deposit money bank efficiency. Differently, board gender diversity improved efficiency performance significantly. A higher representation of women on the board would boost efficiency. Board independence has a beneficial but negligible effect on Nigerian deposit money banks' efficiency. In Nigeria, business age had a negative but substantial effect on deposit money bank efficiency. Furthermore, business size and expansion possibility positively but insignificantly affected deposit money bank efficiency. Expanding bank size and growth possibility improved efficiency. The coefficient of determination showed that board size, gender diversity, independence, firm age, firm size, and growth opportunity caused 24.02 percent of the change in performance efficiency, while other factors caused 75.88 percent. The F-statistic probability was 0.0001, which was significant at 5% and even 1% and rejected the null hypothesis that all coefficients were zero. Thus, the model was significant because the independent variables explained dependent variable fluctuations. The residual exhibited no serial correlation and the model was homoscedastic. It supported the model's apriori assumption and fitness.

4.3.5 Dynamic Effect of Board Structure on Performance

This section provided the details of the dynamic effect of board structure on the operational and efficiency performances of the deposit money banks in Nigeria. The study presented the short run effect of board structure on operational performance in Table 4.6.

Table 4.6: Short Run Dynamic Effect of Board Structure on Operational Performance

Panel A:roa	Coefficients	Standard Error	Z Statistics	Probability
roa(-1)	.0822	.0924	0.89	0.373
bsz (-1)	.0300	.0762	0.39	0.693
bgd(-1)	.0607	.0094	6.46	0.000
bid (-1)	-.0029	.0081	-0.36	0.718
Panel B:bsz				
roa (-1)	.1491	.0703	2.12	0.034
bsz (-1)	.6039	.1116	5.41	0.000
bgd (-1)	.0729	.0172	4.23	0.000
bid (-1)	-.1071	.0296	-3.61	0.000
Panel C:bgd				
Roa (-1)	6.1991	.9208	6.73	0.000
bsz (-1)	-.8341	.5603	-1.49	0.137
bgd (-1)	-.0455	.0863	-0.53	0.598
bid (-1)	.7204	.1370	5.26	0.000

Panel D:bid				
roa (-1)	2.8065	.3681	7.62	0.000
bsz (-1)	-.7100	.5520	-1.29	0.198
bgd (-1)	-.0884	.1069	-0.83	0.408
bid (-1)	.9762	.1043	9.35	0.000

Source: Author's computation, (2023) from STATA 16 Software.

Table 4.6 shows how board structure affects Nigerian deposit money banks' operational effectiveness. Panel A showed that functional performance and board size had a positive but minor effect on operational performance, while board gender diversity had a positive and substantial effect. However, delayed one board independence hurt operational performance. It means that previous operational performance, board size, and gender diversity positively influenced the current operational performance of Nigerian deposit money banks, while previous board independence negatively influenced them. In Panel B, operational effectiveness, board size, and board gender diversity had positive and substantial effects on board size, whereas board independence had a negative but significant influence. The previous values of operational performance, board size, and board gender diversity increased the present board size, while board independence decreased it for Nigerian deposit money banks. Panel C showed that increasing operational performance and board independence significantly increased the board gender diversity of Nigerian deposit money banks, while decreasing board size and gender diversity could insignificantly increase Board gender diversity. In Panel D, operational performance and board independence significantly increased the value of board independence, while board size and gender diversity did not significantly decrease the value of board independence of Nigerian deposit money banks. Using Granger causality, the study examined the cause and effect between each pair of model variables. Results were in Table 4.7.

Table 4.7: Granger Causality between Pair of roa,bsz, bgd and bid

Panel A: roa	chi2	df	Prob > chi2
bsz	0.155	1	0.693
bgd	41.677	1	0.000
bid	0.130	1	0.718
ALL	169.031	3	0.000
Panel B: bsz			
roa	4.499	1	0.034
bgd	17.933	1	0.000
bid	13.051	1	0.000
ALL	71.452	3	0.000
Panel C: bgd			
roa	45.319	1	0.000
bsz	2.216	1	0.137
bid	27.633	1	0.000
ALL	59.139	3	0.000
Panel D: bid			
roa	58.101	1	0.000
bsz	1.654	1	0.198
bgd	0.685	1	0.408
ALL	63.129	3	0.000

Source: Author's computation (2023) from STATA 16 Software.

It was obvious that board size and independence did not affect operational performance in the first compartment because they were insignificant at 5%. In contrast, board gender diversity was significant at 5%, suggesting that it effects operational effectiveness. Board size and independence could not predict operational performance, but board gender diversity could. Board structure—size, gender diversity, and independence—predicted operational performance. In the second compartment, all P-values were significant at 5%, indicating

that operational effectiveness, board gender diversity, and board independence grouped affected board size. In Nigerian deposit money institutions, operational success, board gender diversity, and board independence predicted board size. In the third compartment, all P-values were significant at 5% except board size, and operational success and board independence gave rise to board gender diversity, but board size did not. Operating success and board independence could predict board gender diversity, but board size could not. At 5%, operational performance was noteworthy in the fourth compartment, but board size and gender diversity were not. Board size and gender diversity rejected the null hypothesis that the excluded variable caused equation variable with 95% confidence. Board size and gender diversity could not predict board independence, but operational performance could. After studying board structure's dynamic influence on operational performance and granger causality, the study examined its dynamic effect on efficiency performance and its causality. Tables 4.8 and 4.9 present the results.

Table 4.8: Short Run Dynamic Effect of Board Structure on Efficiency Performance

Panel A: cir	Coefficients	Standard Error	Z-Statistics	Probability
Cir (-1)	.2596	.0708	3.67	0.000
bsz (-1)	1.1222	.4474	2.51	0.012
bgd (-1)	.4128	.0905	4.56	0.000
bid (-1)	.8309	.1048	7.92	0.000
Panel B: bsz				
cir (-1)	.0239	.0112	2.12	0.034
bsz (-1)	.7933	.1433	5.53	0.000
bgd (-1)	.0998	.0207	4.82	0.000
bid (-1)	-.1253	.0292	-4.29	0.000
Panel C: bgd				
cir (-1)	.2329	.0456	5.10	0.000
bsz (-1)	3.5723	.5149	6.94	0.000
bgd (-1)	.9357	.1209	7.74	0.000
bid (-1)	1.5588	.2054	7.59	0.000
Panel D: bid				
cir (-1)	-.1573	.0471	-3.34	0.001
bsz (-1)	1.3919	.3891	3.58	0.000
bgd (-1)	.5668	.0840	6.74	0.000
bid (-1)	1.3255	.1419	9.34	0.000

Source: Author's computation, (2023) from STATA 16 Software.

Table 4.8 showed how board structure affects Nigerian deposit money banks' efficiency. In Panel A, board size, gender diversity, and independence positively and significantly affected efficiency performance. The historical efficiency performance, board size, gender diversity, and independence favorably influenced deposit money institutions' current efficiency performance. In Panel B, efficiency performance, board size, and gender diversity had a positive and substantial effect on board size, whereas board independence had a negative but significant effect. An increase in efficiency performance, board size, and board gender diversity significantly increased the present board size, while a decrease in board independence could significantly decrease the present board size of Nigerian deposit money banks. Panel C showed that Nigerian deposit money banks' board gender diversity improved when efficiency performance, board size, gender diversity, and independence increased. Panel D found that efficiency performance significantly decreased board independence, while board size and gender diversity could insignificantly increase it for Nigerian deposit

money banks. The study examined granger causality between each pair of model variables using the wald test. Table 4.9 showed the result.

Table 4.9: Granger Causality between Pair of cir,bsz, bgd and bid

Panel A: cir	chi2	df	Prob > chi2
Bsz	6.290	1	0.012
bgd	20.774	1	0.000
bid	62.797	1	0.000
ALL	72.231	3	0.000
Panel B: bsz			
cir	4.511	1	0.034
bgd	23.204	1	0.000
bid	18.373	1	0.000
ALL	101.209	3	0.0000
Panel C:bgd			
cir	26.044	1	0.000
bsz	48.118	1	0.000
bid	57.573	1	0.000
ALL	62.798	3	0.000
Panel D: bid			
cir	11.149	1	0.001
bsz	12.791	1	0.000
bgd	45.453	1	0.000
ALL	62.210	3	0.000

Source: Author's computation, (2023) from STATA 16 Software.

Panel A found that board size, gender diversity, and independence were significant at 5%, implying that they increased efficiency performance. Overall, the P-value was less than 5%, indicating that board structure—size, gender diversity, and independence—granted efficiency performance. It meant that board size, gender diversity, and independence could predict Nigerian deposit money institutions' efficiency performance. In Panel B, all P-values were significant at 5%, indicating that efficiency performance, board gender diversity, and board independence granger caused board size. Efficiency, board gender diversity, and board independence predicted the future board size of Nigerian deposit money institutions. All P-values in Panel C were significant at 5%, and efficiency performance, board size, and independence granger caused board gender diversity. It implied that efficiency, board size, and independence could predict board gender diversity. In Panel D, efficiency performance, board size, and board gender diversity were significant at 5%, rejecting the null hypothesis that the excluded variable caused equation variable with 95% confidence. Efficiency performance, board size, and gender diversity could predict board independence.

Discussion of Findings

In Nigerian deposit money institutions, the larger the board size, the better their operational effectiveness (coefficient value of 0.1860 and P-value of 0.007). It supported agency theory that a larger board offers more experienced and diverse members who can improve bank performance. Studies by Al-Homaidi *et al.,* (2019), Warrada and Khaddam (2020), and Oluwole (2021) suggest that board size positively impacts the operational performance of Nigerian deposit money banks. This contradicts Zahroh and Hamidah (2017), Okoye, *et al.,* (2017), and others, who found that board size had a negative and minor influence on Nigerian deposit money banks' operational effectiveness. Board size had a positive but insignificant effect (coefficient value of 0.0300 and P-value of 0.693) on operational performance in the short run, but not in the long run, contradicting the dynamic effect.The study indicated that board size had a negative and minor influence (coefficient value of -0.480 and P-value of 0.452) on Nigerian deposit money banks' efficiency in spite of the

aforementioned. Some findings disputed Khatibi and Nour (2021), Phan and Duong (2021), and others. Board size did not improve efficiency performance, according to agency theory. The dynamic effect supports agency theory because board size had a positive and significant effect (coefficient value of 1.1222 and P-value of 0.012) on efficiency performance in the short run and in the long run. According to Dabor, *et al.,* (2015), Okoye, *et al.,* (2017), Gordini and Rancati (2017), board gender diversity had a negative but insignificant effect on the operational performance of Nigerian deposit money banks (coefficient value of -.0210 and P-value of 0.266). Increasing female representation could lower Nigerian deposit money banks' operating performance. Diverse boards can improve bank performance by strengthening board governance and supervision of executives and managers, although agency theory disagrees. Ehugbo (2021) and Gwaison and Maimako (2021) found that board gender diversity negatively affected performance, but the conclusions were different. Also, board gender diversity had a positive significant effect (coefficient value of 0.0607 and P-value of 0.000) on operational performance in the short run, but in the long run, it explained operational performance's future behavior. In contrast, board gender diversity improved efficiency performance (coefficient value 0.6541 and P-value 0.000). The findings of Appiadjei, *et al.,* (2017), Sarpong-Danquah, *et al.,* (2018), Issa, *et al.,* (2019), Gwaison and Maimako (2021), and others supported agency theory. This refuted Ogunsanwo (2019)'s negative yet significant influence on performance. The dynamic effect showed that board gender diversity had a positive and significant effect (coefficient value of 0.4128 and P-value of 0.000) on efficiency performance in the short run and forecasted the efficiency performance of Nigerian deposit money banks in the long run. Operations were negatively affected by board independence (coefficient value of -0.0189 and P-value of 0.276). These findings support Dabor *et al.,* (2015) and Jahanzeb *et al.,* (2016), while contradicting Zahroh and Hamidah (2017), Okoye *et al.,* (2017), Al-Homaidi *et al.,* (2019), and Ehugbo (2021). The assumption of agency theory was rejected since it stressed that board independence improved monitoring and business performance. This supported the dynamic effect, which showed that board independence had a negative and insignificant effect (coefficient value of -0.0029 and P-value of 0.718) on operational performance in the short run but not in the long run. Board independence had a favorable but small influence (coefficient value of 0.0962 and P-value of 0.554) on Nigerian deposit money banks' efficiency. The findings of Adesanmi *et al.,* (2018) and Ehugbo (2021) were partially corroborated. In the short term, board independence had a positive and significant effect (coefficient value of 0.8309 and P-value of 0.000) on efficiency performance, while in the long term, it predicted the future efficiency performance of Nigerian deposit money banks.

CONCLUSION AND RECOMMENDATION

Considering the empirical findings, this study concluded that there was a statistically significant effect of board structure on the dimension of performance such as operational and efficiency of the deposit money banks in Nigeria. It meant that that board structure significantly determined the operational and efficiency performance of the deposit money banks in Nigeria over a period of time and the board structure could also be used to predict the likelihood of operational and efficiency performance behaviour of the deposit money banks in Nigeria. Based on the findings of the study that board structure had an effect on the operational and efficiency performances of the deposit money banks in Nigeria, the study therefore, recommended that management of deposit money banks should maintain a large boar structure which had the potential of combining high intellectual and well connected directors in order to improve the operational and efficiency performances of the banks.

Thus, Future investigations should go beyond the banking sector by extending the frontier of knowledge to other sectors in Nigeria. Also, other studies should consider the effect of corporate governance on non-financial performance such as customer retention, customer loyalty, among others, in different sectors of the economy.

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