Corporate Governance and Bank Liquidity Creation in Nigeria: Panel Vector Error Correction

Y. A. Soyebo[*1] & M. I. Bamidele[2]

[1] *Lagos State University, Ojo*
[2] *Olabisi Onabanjo University, Ago-Iwoye*

Abstract. The study surveyed the influence of sound corporate governance on banks' liquidity creation in Nigeria using secondary data gleaned from annual reports and accounts of Five (5) quoted Deposit Money Banks (DMBs) in Nigeria between 2013 and 2019. The obtained data were subjected to several preliminary and inferential statistical analyses, the result of the descriptive statistics and PVEC Model revealed that all the specified indicators of Corporate Governance, for example, Board Size, Board Independence, and Audit Committee exact a positive influence on Banks Liquidity creation, while only Board Independence and Audit Committee have a significant influence on Liquidity creation of the selected banks. Thus, the study suggested that bank managers and policymakers must ensure that DMBs continuously design and implement effective corporate governance mechanisms to enhance their liquidity.

Key words: Corporate Governance, Bank Liquidity, Board size, Audit Committee, Board Independence,

1   Introduction

The relevance and uniqueness of banks, especially Deposit Money Banks (DMBs) in the developmental process of an economy cannot be embroidered as they play a requisite role in the mobilization and transmutation of scarce required economic resources among profitable competing economic units to ensure economic advancement. However, they often encounter liquidity problems arising from corporate governance failure, such as granting loans above the stipulated limit to a single obligor limit, frail management support system, poor adaptation to changing business environments, poor non-compliance to rules guiding banking operations Thus, there is a pressing need to reposition the financial sector, the banking industry especially, to be able to adequately fund its obligations Thus, the issue of corporate governance has been viewed globally as a critical factor for sustainable corporate performance. The clear lessons from the debacle in Enron, Parmalat, WorldCom, Barings Bank, African Petroleum, Cadbury Nigeria, etc. have taught the corporate world that no firm is too big to fail (Wang et al., 2021).

The liquidity of financial institutions, particularly banks is largely influenced by the corporate governance practice of such institutions Yun (2009); Delis et al. (2009); Abogun et al. (2013);

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[*]Corresponding author.
Email: usefaith4eva@gmail.com

Yafeh (2000). The study of Dittmar and Mahrt-Smith (2007), observed that businesses with effective corporate governance often have better protection of their cash resources, while those with feeble governance experience excess cash holding that reduces effectiveness. Presently, there are clear indicators that having a sound system in a market, monitoring the affairs of various stakeholders usually yield an equal chance to all participants. Banking Supervision in line with the Basel Committee (Basel, 2009) expects the board of directors to be at the epicenter of banks liquidity management and expect them to design the optimal liquidity risk management. Additionally, they are expected to have a periodic liquidity management appraisal and control. The CBN in its Banks corporate governance codes reported about 40%, including of listed firms in Nigeria including banks, had a standard code of corporate governance in place.

Momentarily, the complexity in Nigeria Banking System is that most DMBs directors often work directly to the expected outcome, through the creation of an ineffective process and practice that they can easily be manipulated and yield requested outcomes for the shareholders. Thereby, exploiting the system with several wrong doings that were in clear deviation from the sound code of corporate governance. Examples of such wrong doings include the absence of a suitable risk management framework, falsification of documents for the acquisition of foreign exchange, and poor liquidity positions. Thus, corporate governance practices have been enforced over the years by various agencies and organizations to avoid penalties and sanctions as well as create a favorable outlook for the banks in a competitive business milieu. Hence, a key puzzle that crosses the mind is the extent of the effect of corporate governance implementation of DMBs efficiency in the liquidity creation process in Nigeria, judging liquidity in light of a banks ability to meet its various financial obligations in due course. The remaining aspect of this paper comprised a fleeting literature review, methods, results, discussion, conclusion, and recommendation.

2   Literature Review

Some research works have been carried out on corporate governance in the financial institutions in Nigeria and other countries. Benvenuto et al. (2021); Chung et al. (2010) explore how the corporate governance index influences the financial performance of selected banks in developed and developing economies using survey data on variables such as return on assets, liquidity, capital adequacy, and size between 2007 and 2018. The result of the empirical analysis revealed that corporate governance measures have a positive, significant influence on banks profitability and capital adequacy.

Sanyaolu et al. (2021) explored the influence of corporate governance on liquidity management selected banks in Nigeria using secondary statistics obtained from annual reports between 2012 and 2018. The Generalized Method of Moment (GMM) analysis result revealed that board size has an inverse but insignificant influence on liquidity management while the board size has a positive but insignificant effect on liquidity management. Safiullah et al. (2020) analyzed the influence of the dual board governance approach on Islamic bank liquidity creation using secondary data obtained from selected banks in diverse countries between 2005 and 2015. The result of the empirical analysis revealed that corporate governance influence liquidity creation as it supports managerial capability while banks with Shariah Supervisory Board (SSB) exhibit an improved on-balance sheet and declining off-balance sheet liquidity creation.

A study explored the influence of banks' corporate governance on liquidity creation in the U.S. using bank holding firm-level data for three phases in the financial crisis era. The inferential

statistical analysis revealed that corporate governance exacts a direct and significant influence in trading activities of banks with large holding companies, while factors such as CEO edification, reward system, career progression, and ownership affect bank liquidity. Another study observed that adherence to corporate governance by Nigerian firms will aid improve efficiency, effectiveness, and responsiveness to sustained economic growth.

Chung et al. (2010) carried out an empirical analysis on the impact of corporate governance on financial market liquidity and the result showed that businesses with sound corporate governance often exhibit reduced spreads, progressive market quality index, lower price influence on trades, and the reduced prospect of information-based transactions.

Abogun et al. (2013) employed the ordinary least squares (OLS) regression analysis in their study and it was found that regular spontaneous examination of the banks has a significant effect on the number of fraud cases reported by banks. They opined that regular spontaneous examination of banks by the regulators has no significant effect on the volume of losses suffered by banks from the occurrence of such frauds. It is important to clearly state that most of the studies in this area investigated the connection between corporate governance and firm performance. The measures of performance commonly used by previous researchers are profitability, operational performance, stock market liquidity, reduced cases of fraud, performing and non-performing loans, and investors confidence. A review of previous studies also showed that few pieces of research have investigated the relationship between corporate governance and liquidity of banks. Other works investigated stock market liquidity and not individual bank liquidity creation (Jain et al., 2011).

3   Methods and Materials

This study adopts an ex-post facto research design since it is characterized by a quantitative analysis of historical financial data. The population of the study comprised all the 14 licensed Deposit Money Banks (DMBs) in Nigeria and covers all their reported economic activities in Nigeria. Secondary data on measures of corporate governance like board size, audit committee size, and liquidity of banks in Nigeria were obtained from five (5) selected DMBs Annual reports and Accounts between 2013 and 2019. This period provides sufficient data essential to reach a valid data analysis and interpretation on the nature of the relationship between corporate governance and bank liquidity creation in Nigeria.

For analysis, the Panel Vector Error Correction model was employed to estimate the influence of specified corporate governance measures on banks liquidity.

Base on the tenet of the agency theory, the baseline equation for this study as operationalized is stated as:

$$Y_{it} = \lambda_0 + \lambda_1 X_{i1} + \lambda_2 X_{i2} + \lambda_3 X_{i3} + \varepsilon_i$$

Where Y = Liquidity of banks (Average bank loan and advances in Billion)

λ_0 = Intercept
X_1 = Board size (DirectorsNumbers in each bank)
X_2 = Board Independence (Ratio of Independent Directors to Total Director)
X_3 = Audit committee size (Average people in the Audit Committee)
ε = Error term $\lambda 1\text{-}3$ = Coefficients

This study adopts the Panel Vector Error Correction Model (PVECM) approach in estimating the influence of corporate governance on bank liquidity creation in Nigeria. It comprises the PVECM result, regression coefficients, standard errors, t-statistics, coefficient of multiple correlations, and the coefficient of determination. The PVECM regression equation provides the functional expression of the relationship between variables while making provision for the variations in industry and prediction on the speed of adjustment to equilibrium by the specified equation.

Also, it employed various descriptive and inferential statistics in estimating the exact nature of the effect of corporate governance on bank liquidity in Nigeria. The descriptive statistics give stylized facts on the features of the variables in the model while the inferential statistics facilitate the establishment of the extent of influence of the selected corporate governance and bank liquidity indicators in Nigeria.

4   Results and Discussion

Table 4.1: Descriptive Statistics

	LIQ	BS	BI	AC
Mean	32.7660	12.7161	0.6376	6.5306
Median	32.1328	12.0000	0.6400	6.0000
Maximum	51.8326	19.0000	0.9300	9.0000
Minimum	16.3133	5.0000	0.4100	6.0000
Std. Dev.	10.2044	3.3116	0.1050	0.7933
Skewness	0.3166	0.1661	0.0547	1.2904
Kurtosis	2.8618	2.5233	3.2820	3.6602
Jarque-Bera	0.8576	0.6893	0.1868	14.4880
Probability	0.6513	0.7085	0.9108	0.0007
Observations	49	49	49	49

Source: Authors Computation (2020) using Eviews 10

Table 1 above showed the descriptive analysis on the specified variables such as the Bank Liquidity (LIQ), Board Size (BS), Board Independence (BI), and Audit Committee (AC). It reveals that the average values of the bank Liquidity, Board Size, Board Independence, and Audit Committee are N 32.8 billion, 13 directors, 0.64 board independence, and 7 directors respectively Meanwhile, the minimum bank liquidity creation for the selected banks was N 16.3 billion while the maximum was N 51.8 billion, the minimum board size was 5 directors while the maximum value of 19 directors. Similarly, the board independence and Audit committee have minimum and maximum values of 0.4100 and 6 and maximum values of 0.93 and 9 directors respectively. Also, the Jarque-Bera statistics and their probability show that liquidity, the board size, and board independence have probability values of 0.65, 0.70, 0.91 respectively. Using the generally

accepted criteria, the data set obtained are normally distributed because their values are greater than the 5% probability level while that of the Audit Committee with the probability of 0.0000 is not normally distributed because its p-value is less than 5% level.
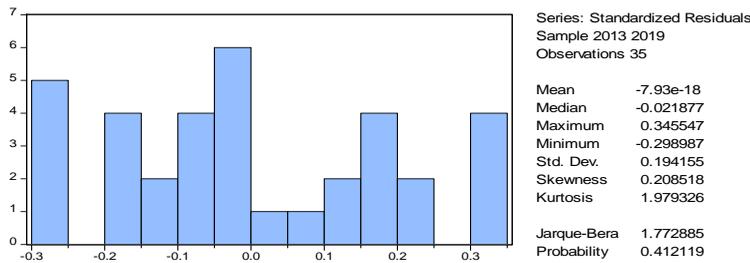

Figure 1: Normality test result

Figure 1 showed that the measures of corporate governance and bank liquidity have an average value of -7.9, median of -0.02, and maximum and minimum values of 0.345 and -0.298. The results also show that the deviation from the mean of the variables is 0.194 with skewness of 0.208 indicative of positive skewness and kurtosis of 1.97 which suggests that the variables are mesokurtic as the obtained value is less than 3. Meanwhile, the Jarque-Bera statistics of 1.77 and probability of 0.412. The result shows that the variables are normally distributed since the probability value is greater than a 5% level of significance.

To explain the exact characteristic of the data used in the study, it tested the stationarity of the data using two main Panel Unit Root test methods. The obtained results are shown in Table 4.2 below:

Table 4.2: Unit Root Test with Individual Intercept

Variables	Levin, Lin & Chu t*	Prob. Values	Stationarity	Im, Pesaranand Shin w-stat	Prob. Values	Stationarity
LIQ	-4.04637	0.0000	I(1)	-4.08417	0.0000	I(1)
AC	-2.52952	0.0057	I(1)	-7.88065	0.0000	I(1)
BI	-7.52076	0.0000	I(1)	-1.86028	0.0314	I(1)
BS	-7.95597	0.0000	I(1)	-4.27872	0.0000	I(1)

Source: Authors Computation (2020) using Eviews 10

Table 4.2 showed that all the selected variables were stationary at the first difference (1) an individual and intercept basis. This necessitates the need to test for the possibility of cointegration in the behavioral pattern of the selected variables, in the long run, using the Pedroni approach and the result of the test is presented in table 4.3 below:

Table 4.3 showed the result of the co-integration test based on the null hypothesis that there is no co-integration among the model variables. This is rejected once the test probability values for individual and group PP, Rho, and ADF are lower than 0.05 level of significance and imply

Table 4.3: Pedroni Co-Integration Test Results

TEST	Individual Statistics	Prob.	Weighted Statistics	Prob.	Group Statistics	Prob.
Panel rho-Statistic	1.009326	0.8436	1.015722	0.8451	1.845681	0.9675
Panel PP-Statistic	-3.071972	0.0011*	-3.000887	0.0013*	-3.687389	0.0001*
Panel ADF-Statistic	-2.523697	0.0058*	-2.479798	0.0066*	-3.181584	0.0007*

Source: Authors Computation (2020) using Eviews 10

the existence of a long-run co-integration in the pattern of the variables. Following the cointegration test, there is a need to establish the optimal lag ideal for this study, and its result is shown in table 4.4 below:

Table 4.4: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-183.91	NA	7.93	13.42	13.61	13.48
1	-149.55	56.43	2.17*	12.11*	13.06*	12.40*
2	-82.22	91.38*	0.06	8.44	10.15	8.96
3	710.69	849.55	5.90	-47.04	-44.57	-46.29

* indicates lag order selected by the criterion
Source: Authors Computation (2020) using Eviews 10

Table 4.4 showed the optimal lag as computed by each criterion and it is apparent that the lag length is 1 as observed from the majority of the criteria. Base on the existence of co-integration, a Panel Vector Error Correction Model analysis is suitable and the obtained result is shown in table 4.5 below:

Table 4.5 showed the result of the Panel VECMresult, with Error Correction factor(-0.3316) which is statistically signed and significant at 5%, showing the equation adjustment speed of the short-run relation to unexpected shocks and implies that 33.16% adjustment speed of the model.

Similarly, the coefficients show the effect of detailed explanatory indicators such as board size, board independence, and audit committee on DMBs liquidity creation in Nigeria. This shows that board size, (0.0051, $p > 0.05$), board independent (0.2005, $p < 0.05$), and audit committee (0.3389, $p < 0.05$)will yield an increase in the bank liquidity creation. This suggests that board independence and audit committee contribute positively towards the bank liquidity at a 5% level of significance. Likewise, the coefficient of determination(R-square) value of 0.8120 indicates that 81.2% of changes in liquidity creation are traceable to changes in key corporate governance indicators such as firm board size, board independence, and audit committee size.

Following the estimation of the PVECM model, this study proceeds to estimate the VEC structural residuals using their general factors and VEC Residual Serial Correlation LM Tests. This is essential to ascertain the model validity and whether they met the VECM standards. Their results are presented in table 4.6, 4.7, and 4.8 below:

Table 4.5: Panel Vector Error Correction Results

Dependent Variable: D(LOG(LIQ))

Method: Panel EGLS (Period SUR)

	Coefficient	Std. Error	t-Statistic	Prob.
ECM(-1)	-0.331611	0.023	-14.42098	0.0000
D(LOG(LIQ(-1)))	0.171614	0.01932	8.881715	0.0000
D(LOG(BS(-1)))	0.00512	0.01464	0.349731	0.7291
D(LOG(BI(-1)))	0.200565	0.04868	4.119927	0.0003
D(LOG(AC(-1)))	0.338984	0.05823	5.821875	0.0000
C	0.07406	0.0108	6.855445	0.0000

Weighted Statistics				
R-squared	0.812022	Mean dependent var		0.21859
Adjusted R-squared	0.779612	S.D. dependent var		2.87965
S.E. of regression	0.843377	Sum squared resid		20.6273
F-statistic	25.05467	Durbin-Watson stat		2.23364
Prob(F-statistic)	0			

Unweighted Statistics				
R-squared	0.199463	Mean dependent var		0.10235
Sum squared resid	1.415762	Durbin-Watson stat		1.69992

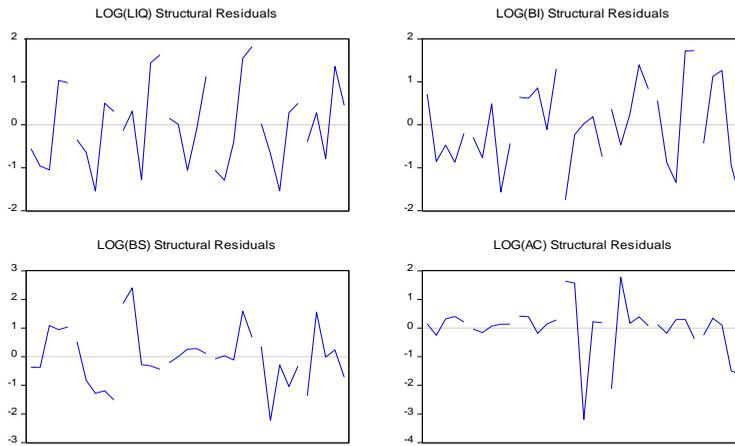*Source: Authors Computation (2020) using Eviews 10*

The result of the residual Serial Correlation LM Tests should a Rao-F statistic is 1.665980, 1.1362, and 0.222 with probability values of 0.07, 0.34, and 0.23 respectively and since the probability value is higher than 0.05 significant levels, it implies that is no autocorrelation in the pattern of the data in the model.

Table 4.8 showed the heteroskedasticity test which reveals that there is equal variance in the model with a chi-square statistic of 105.03 and a probability value of 0.3457 is greater the than 5% level of significance.

5   Conclusion and Recommendation

This article explored the effect of corporate governance on banks liquidity creation in Nigeria between 2013 and 2019 based on the Agency theory using Panel Vector Error Correction Model and the result of the various statistical analysis suggests that Board Independence and Audit Committee have a direct and substantial effect on liquidity creation of banks in Nige-

Table 4.6: VEC Structural Residuals using Generalized Factors

Source: Authors Computation (2020) using Eviews 10

Table 4.7: VEC Residual Serial Correlation LM Tests

Sample: 2013-2019

Included observations: 35

Lag	LRE* stat	df	Prob.	Rao F-stat	Df	Prob.
1	24.80231	16	0.0734	1.665980	(16, 67.8)	0.0754
2	17.76901	16	0.3376	1.136241	(16, 67.8)	0.3416
2	37.77620	32	0.2222	1.224829	(32, 68.0)	0.2390

Edgeworth expansion corrected likelihood ratio statistic.

Table 4.8: Heteroskedasticity Test Results

VEC Residual Heteroskedasticity Tests (Levels and Squares)

Sample: 2013 2019

Included observations: 35

Joint test:	Chi-sq	Df	Prob.
	105.0324	100	0.3457

Source: Authors Computation (2020) using Eviews 10

ria. Based on the findings, corporate governance is a significant aspect of a corporation that management of DMBs should be more aware of it in Nigeria to avoid the repeat of the past financial crisis. It is essential for banks to continually revise their corporate governance mechanism to strengthen their ability to resist shocks and control various operational risks. Thus, the importance of key corporate governance mechanisms such as the Audit Committee and Board independence becomes relevant to these institutions. This study suggests that having the right formation of Board Independence and Audit Committee would enhance the adherence to corporate governance ethics of the bank and improve the liquidity creation ability of DMBs in Nigeria. Based on the submissions above, this study recommends that policymakers in Nigeria should continuously ensure that banks implement effective corporate governance mechanisms to enhance the bank's liquidity creation and encourage DMBs to further entrench financial discipline to enhance their liquidity in the long run.

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