POST-COVID-19 PANDEMIC AND BANKING SYSTEM IN NIGERIA

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ABSTRACT

The investigation on the effect of Post COVID-19 pandemic on banking system in Nigeria was carried out by this study. Quarterly time series data spanning from 2018 to 2021 formed the basis of the investigation. The analytical methods employed in this study encompassed the Augmented Dickey-Fuller Unit Root Test, ARDL Bound Test, and various post-estimation tests. The findings of this study revealed that both the number of COVID-19 cases and lockdown status had a significant negative influence on the total assets of banks in the long run. Specifically, COVID-19 cases exhibited a negative yet insignificant effect on liquidity and the loan-to-deposit ratio in the banking sector, while lockdown status significantly impacted bank liquidity. Moreover, lockdown status demonstrated a negative and significant effect on the loan-to-deposit ratio in the banking sector, both in the short and long run. In conclusion, the study suggests that the COVID-19 pandemic has repercussions on the performance of deposit money banks in Nigeria. Consequently, it is recommended that the Central Bank of Nigeria ensures vigilant monitoring of the liquid assets of deposit money banks. Furthermore, there should be regular assessments and reviews of the asset portfolios of deposit money banks by the Central Bank of Nigeria to manage banks' exposure to excessive risk and safeguard depositors' funds, especially during economic downturns. The Central Bank of Nigeria is also advised to introduce a standardized approach to loans, ensuring the effective mobilization of funds to qualified applicants while implementing controls to address loan defaults and maintain the stability of the country's financial system.

Key Words: *Bank Total Assets, Liquidity Ratio, Loan-to-deposit Ratio, Covid-19 Cases, Lockdown Status*

INTRODUCTION

The effect of the pandemic which intensified per time occasioned total lock down thereby necessitating the need for reduction in the scale of operation for every business particularly banks operating in the country. Banks no doubt perform their functions by heavily relying on interpersonal communication which was critically constrained with the banned movement observed practically all day. Similarly, banks operated in few branches and with flexible working hours for over seven (7) months thereby deforming the modalities of banking which has been in place for decades (Iwedi, Gbarabe & Uruah, 2020). This ultimately triggers economic crunch in the financial system which has had deleterious effect thereby reducing deposit money banks interest in lending money, this which reflects the irresponsiveness of the banking system further aggravates financial stress in the countries and expose banks to lack of funds, inadequate capital for sustenance, poor asset base, reducing profitability which shoots up the vulnerability of banks

and the entire sector to poor financial performance (Jesuwunmi, Nzewi, Adewoyin & Agbadua, 2019).

Banking system as an institution with basic operations covering deposit taking and loan disbursement, it maintains a primary role in the mobilization of capital, creating financial intermediation and affecting the general situation and stability of the financial sector. Hence, any noticeable fault in the banking system would occasion lack of credit and increase in cost of financial intermediation thereby causing unfavorable economic variation with adverse effect on the real economy (Merton, 1993 in Jibrin, Adegbe & Ogbonnaya-Orji, 2020). Hence, detecting and managing potential risks in the banking sector as required of the central bank and financial system regulators is the best bet for every economy. However, in the case of Nigerian banking system; its ineffectuality and vulnerability to economic shocks has been on the increase over the years, this explains the relatively increased effect exerted on the Nigerian banking system (Jahn & Kick, 2012).

The micro and macroeconomic environment in Nigeria cannot be ignored in the discussion of the effectiveness of the banking system and its gradual decline since it has remained extremely vulnerable to economic shocks, which were made worse by the emergence of COVID-19. Nigeria's economic crises have made it more apparent that the country may have an unstable financial system even in the face of stable inflation; this proves that consolidated economic growth is impossible to achieve without establishing a sound banking system, since stable financial systems are prerequisites to sound banking systems (Jesuwunmiet al. 2019). More evidently, the one time Governor of the CBN, Professor Charles Soludo at the early times of the 2008 financial crisis affirmed that the Nigeria banking sector is robust and sound enough to tackle the adverse effect of the crisis as they maintain a good leverage and guard from the global financial system; Surprisingly, the claim made by Professor Soludo was disproved by some scholars across nations, most notably following the stress examination that the succeeding governor of the CBN conducted in 2009 and which revealed that the majority of the sector's banks had underperformed (Fidelity Bank, 2017; Gbadebo, 2014). However, the banking sector which has remained committed to consolidating its stability and effectuality was struck by the COVID-19 pandemic which cascaded the reach of the bank as movement even to banks were restricted in the bid to reduce crowd and permit social distancing, these were approaches adopted to reduce the spread of the virus; this literally affected deposit mobilization hence reducing loan-to-deposit ratio as banks also strive to survive at such delicate time. In fact, capital adequacy measures was made a little more severe as cash reserve ratio was increased by the Central Bank thus making the sector excessively liquid with almost no return earned by banks on their liquid assets; similarly, a very high level of credit losses was noticed in the sector which noticeably affected quality of asset, liquidity and availbility of capital of deposit money banks thereby impeding the satisfaction of customers' needs (Iwedi*et al.,* 2020).

Consequently, the performance of the banking sector in the second quarter of 2020; even though some financial institutions utilised online and electronic platforms towards guaranteeing service delivery and increase their profitability level, the profitability of several other banks declined sharply hence hampering the productivity and performance of the sector as the intermediation role of the sector was in a way prevented which ultimately influenced adversely the growth of the

economy of Nigeria Iwedi*et al.,* 2020). Again, the pandemic caused the risk of payment default for both corporate and retail customers of the banking sector hence increasing the exposure of the sector to non-performing loans especially in the second quarter of 2020 which totaled N1.218 trillion, a significant increase from N1.059 trillion the sector maintained in 2019. This confirms the severity of capital adequacy which ultimately and critically increased the doubt about the sustainability of the performance of deposit money banks and the sector largely; this also called for an urgent reformation which often imprints an indelible change on the going concern of several banks in the banking sector (Iwedi & Lenyie, 2021).

No doubt several investigations on how COVID-19 affects the banking industry has been conducted; however, additional studies are necessary to fully understand the pandemic's effects on the banking system and their potential ripple effects on the overall economy. Ayodele, Akinyede, Ojedele and Afolabi (2021) and Omaliko, Amnim, Okeke and Obora (2021) assessed the impact of the COVID-19 pandemic on the profitability and performance of Nigerian firms, ostensibly ignoring the banking system, a crucial sector that propels the country's economy. Iwedi and Lenyie (2021) reportedly looked into COVID-19, oil price shock, and banking system funding, as well as their effects on the Nigerian economy. Similarly, Anastasia etal. (2022) and Katusiime, (2021) focused on Covid-19 and profitability of banks according less interest in the association between COVID-19 and how it shaped and moderated the banking system particularly in Nigeria. Furthermore, Iwedi*et al*., (2020) focused on the impact of COVID-19 on stock price of quoted banking firms in Nigeria giving less regard to the implication of the pandemic on the soundness of the financial industry in terms of its assets and ability to carry out its basic intermediation roles.

Premised on this gap, this study intends to extend the availabilty of studies on the influence of COVID-19 pandemic on banking system in Nigeria by considering its impact on the soundness of banks asset and intermediation role.

LITERATURE REVIEW

COVID-19 Pandemic

COVID-19 pandemic became a global phenomenon as result of its effect on all economies of the world. It is a type of Virus whose victims are exposed to respiratory illness mostly affected by all especially the aged people and Individuals with underlying health issues (World Health Organisation, 2020). The emergence of this pandemic in later period in year 2019 was traceable to the economy of China in Wuhan and lasted for about a year in all the countries with drastical increase in death rate. The World Health Organization (2020) has emphasized that COVID-19 can spread quickly through the nose, mucous discharge, and salivary droplets, particularly through coughs and sneezes. NCDC (2020) added that COVID-19 takes two to fourteen days to incubate. However, in a bid to exacerbate the spread of this virus, many preventive measures were enforced by the government of each Countries globally such as; usage of sanitizers, washing of hands regularly; hydrochloroquine usage as well as the use of other medications without clinical trials (Addi, Benksim, Amine & Cherkaoui, 2020).

Due to the contagious nature of the virus, the health of human beings and business activities were threatened globally. Many offices, market place, churches, mosque, banks, retail shops even some hospitals with inadequate equipments were shut down. Moreover, international transactions were also at a low key or outright lock down which equally led to rise in inflation rate, scarcity of petrol, exchange rate shock and total economic meltdown globally (Omaliko, Amnim, Okeke and Obiora, 2021). Most of the financial resources of various economies were diverted to tackling this deadly virus which on the longrun had ripple effect on level of earnings and performances of businesses in all economies of the world including developed countries such as USA and China. In all of this, Bai, Yao, Wei, Tian, Jin, Chen, and Wang (2020) come to the conclusion that the high rate of viral spread among individuals globally may be explained by the virus's symptomatic and asymptomatic characteristics.

The effect of Covid-19 on all economies of the world cannot be exhausted in this study, as such, this study concentrates on the influence of this pandemic on Nigerian banking industry.

The impact of the COVID-19 on the banking system

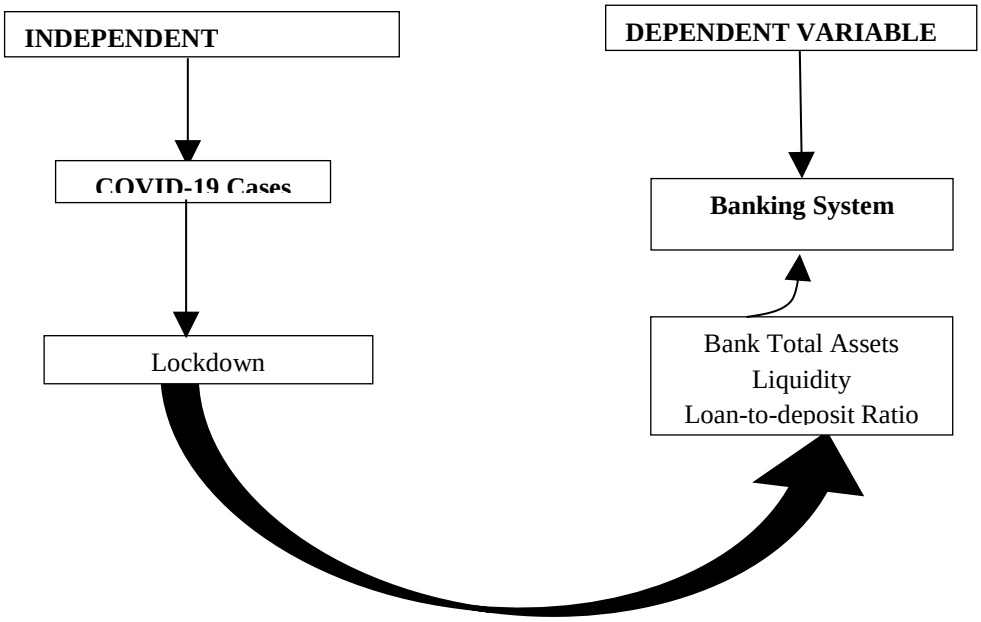
Despite being in a difficult situation after the 2008 financial crisis, banks still have a unique role to play, according to Yip and Bocken (2020), especially when it comes to sustainable development. When compared to the financial crisis of 2009, the financial system has experienced less losses. One of the top responsibilities has been to make sure deposit money institutions continue to provide the populace with access to liquidity, in addition to closely monitoring the amount of external debt (Funke & Tsang, 2020). Germany offers a successful example, having established a practice of providing liquidity. German banks help businesses and entrepreneurs get through this challenging time by doing this. When they offered loans to businesses during the 2008–2009 financial crisis, they likewise employed this strategy. Germany offers a successful example, having established a practice of providing liquidity. German banks help businesses and entrepreneurs get through this challenging time by doing this. When they offered loans to businesses during the 2008–2009 financial crisis, they likewise employed this strategy. Numerous changes, including new processes and procedures, are occurring in the banking industry as a result of the COVID-19 epidemic. They had to maintain people's access to financial resources and refrain from closing all of their branches due to the vital nature of banking services. In various nations and territories, throughout the outbreak, about 25% of bank offices have closed due to staffing shortages, employee safety concerns, and a general decline in business. Within the remaining 75 percent, a considerable number of banks are operating under reduced hours and with a diminished staff, as highlighted by KPMG (2020). In the face of these challenges, it is crucial for banks to carefully consider the strategies that will shape their future. According to PWC (2020), the focus of business continuity planning should center on survival issues, including the adjustment of branch hours and staffing configurations, altering the times at which services are provided, transitioning in-branch visits to appointment-only, and temporarily closing some branches. The

implementation of these changes in their operational approach will undoubtedly exert a lasting influence on the future landscape of the banking system.

Banks that have a substantial loan exposure either before or after the pandemic, particularly to small businesses and export-oriented industries, may see a large rise in the number of defaults (Barua & Barua, 2021). Disemadi and Shaleh (2020) highlight that another important consideration is the borrower's performance and capacity to meet their loan obligations. The financial challenges faced by many individuals due to the COVID-19 pandemic have the potential to disrupt the overall performance of the banking system. Specifically, the diminished performance and capability of these debtors may immediately raise credit risk, which for instance, undoubtedly affects Indonesia's banking industry's operations and stability (Disemadi & Shaleh 2020)

Conceptual Framework

Figure 1: The conceptual framework evidencing the COVID-19 pandemic and banking system in Nigeria.



Source: Author's design (2023)

This framework evidences the connection of COVID-19 pandemic and the Nigerian banking system. The pandemic at that time translated to lockdown which became intense in the bid to

control the spread of COVID-19. The increasing cases and the consequent lockdown that it introduced marred the operations of banks thus constraining their profitability as deposit which formed part of the major source of revenue for DMBs was relatively low, this in effect caused reduction in the amount of loan mobilized into the economy from the banking system as most banks maintained relatively low liquidity. Ultimately, the disrupted activities in the banking sector and the implication it had on the sector in no little way reduced the performance and assets of DMBs in the banking sector which this study sets out to establish.

Theoretical Framework

The buffer theory of capital sufficiency, first presented by Calem and Rob in 1996, serves as the foundation for this investigation. According to the hypothesis, a bank that is getting close to the needed minimum capital ratio would be motivated to increase capital and lower risk in order to save money on regulatory fines that would result from a capital requirements non-compliance. According to Ikpefan (2013), banks would rather retain buffer capital in order to lessen the likelihood of falling short of the required minimum capital, particularly in cases where the capital adequacy ratio is very dynamic. In recent years, capital adequacy has evolved from a tool for banking supervision to one for monetary policy and the achievement of financial stability. According to Section 7(2) of the BOFIA, a bank's license may be revoked if it does not meet the capital adequacy requirements within a time frame that the CBN may decide. In accordance with Section 13, the bank must always retain capital funds that are unaffected by losses in a ratio equal to all of its assets, all of its liabilities, or both of its assets and liabilities, as determined by the CBN and all of its offices in and outside of Nigeria (Akani & Lucky, 2015). According to a report by the Bank for International Settlement (BIS 2011), Basel III's counter-cyclical capital

adequacy buffer regulations emphasize the need for capital buffers in order for banks to regain customers' trust during tumultuous times.Therefore, it is unjustified to argue that banks' competing goals of safety, profitability, and liquidity can only be balanced when they have sufficient capital to withstand and absorb shocks from the macroeconomic and monetary domains in which they operate (Adamgbo, Toby, Momodu & Imegi, 2019).

REVIEW OF RELATED STUDIES

Consequent to the era of Covid-19 Pandemic globally, many studies have aimed to investigate its impact on the business activities of economies across various sectors. As an example, Salehi (2022) conducted an assessment of the Covid-19 pandemic's influence on the performance of the banking system within the Canadian banking industry. The gathered data underwent analysis using correlation analysis and structural equation analysis. The study's results revealed that, during the pandemic period, the average profitability and efficiency of Canadian banks experienced a slight decrease, although the decline was not statistically significant. Additionally, there was a marginal increase in business risk during this period, which gradually returned to pre-crisis levels. Notably, certain indicators, including the average Return on Equity (ROE), Return on Investment (ROI), Earnings Per Share (EPS), and others, demonstrated an improved position compared to the pre-crisis levels after

A thorough investigation was carried out by Gazi, Nahiduzzaman, Harymawan, Masud, and Dhar (2022) to look at the effects of COVID-19 on the financial performance and profitability of Bangladesh's banking industry. A mixed-methods strategy was used in the study, combining quantitative and qualitative research designs. Data prior to the pandemic (2010–2019) and pandemic (2020–2021) periods were gathered and subjected to pooled Ordinary Least Squares (OLS) regression analysis.The study's conclusions showed that, both before the pandemic and during COVID-19, the non-performing loan ratio and bank size significantly exert negative impact on the performance and profitability of listed private commercial banks in Bangladesh.The banks' performance was impacted by the capital adequacy ratio in the same ways, but the loan to deposit ratio only noticeably reduced return on assets during the COVID-19 period. The integrated results demonstrate that, during the pandemic, the liquid asset to total assets ratio had a significant and negative impact on the banks' performance; however, there was little correlation between the ratio and performance prior to the epidemic.

In their study, Anastasia, Blessing, and Oghenetega (2022) examined the COVID-19 pandemic and the financial firms' performance in Nigeria in 2019 and 2020. Ordinary least square regression analysis was used to analyze the collected data. The study's conclusions showed a significant and favorable influence on Nigerian banks' financial performance in addition to a considerable positive impact on bank capital adequacy ratios. Ayodele, Akinyede, Ojedele, and Afolabi (2021) investigated the Nigeran financial market and the COVID-19 epidemic. The study employed a mixed-methods (qualitative and quantitative) research design. The Johansen co-integration test and the Ordinary Least Squares (OLS) regression technique were used to estimate the data. The examination of the study's findings reveals that the number of COVID-19 cases is directly correlated with the foreign exchange rate, but inversely correlated with the capital market's All-Share Index Volume and interbank money market rate.

On the other hand, Dong (2021) found that the COVID-19 pandemic significantly affect the US and Chinese banks' bottom lines while evaluating the effect of COVID-19 on the US and Chinese banking industries. Both a qualitative and quantitative research design were used in the study. OLS regression modeling and moderation analysis were used to obtain and estimate quarterly data for the years 2018

through 2020. Concurrently, the findings demonstrate that Chinese banks fared better financially during the epidemic than American banks, and that both Chinese and American Banks' Return on Assets (ROA) during the crisis is significantly influenced by their capital and efficiency ratios. Similarly, Katusiime (2021) assessed bank profitability in Uganda and COVID-19 in low-income nations.

The research design used in the study was both qualitative and quantitative. The study collected quarterly time series data from 2000 to 2021. Using the autoregressive distributed lag (ARDL Bound) testing method for co-integration, the acquired data was examined. According to the study's findings, the COVID 19 pandemic only significantly lowers bank profitability over the long term. In the short term, non-performing loan ratios, liquidity ratios, and market sensitivity risk all significantly and adversely affect bank profitability, while lending rates and Treasury Bill interest rates significantly increase it. Hence, the study suggested that policies for enhancing the

efficiency, profitability and resilience of the banking system should be factored in bank-specific and macroeconomic factors affecting bank performance.

Considering the Nigerian economy, Omaliko, Amnim, Okeke and Obiora (2021) assessed how the COVID-19 epidemic affected the liquidity and profitability of Nigerian businesses. The study employed an ex-post facto research design. The study used panel data from 2017–2018 and 2019–2020. The t-test was used to estimate the collected data. The study's conclusions showed that the COVID-19 pandemic had a major negative impact on the liquidity and profitability of businesses in Nigeria. It also showed that the government's partial and complete lockdowns during the pandemic made it harder for businesses to obtain inputs from local markets and made it more difficult for them to import and export goods, which had a negative impact on the businesses' profitability and liquidity. Given that the COVID-19 epidemic has had a major influence on the purchase of supplies of raw materials from China specifically and other countries generally, it is advised that the government boost its support for local raw material supply in light of these results.

COVID-19 and the oil price shock's effects on the funding of Nigeria's banking sector were examined by Iwedi and Lenyie (2021). The study used monthly time series data that covered the months of February 2020 to June 2020. The unit root test, Johansen cointegration test, OLS regression, and descriptive analysis were used to examine the collected data. According to the study's findings, Nigeria's banking sector contributes positively to COVID-19 confirmed cases. The research also showed a strong negative link between the shock to the world oil price and the funding of Nigeria's economy by the banking industry. Therefore, it is concluded that COVID-19 Pandemic and the oil price shock are significant factors that have affected the banking sector's capacity to finance the Nigerian economy.

Shahimi, Hanafi, and Yusof (2021) analysed the effect of COVID-19 on the financial performance of Malaysian financially troubled enterprises. In particular, the study evaluated the effects of leverage, liquidity, and the Covid-19 epidemic on the financial performance of Malaysian financially troubled companies. In this study, a combination of qualitative and quantitative research design was used. For the study, quarterly panel data from 232019Q2 to 2020Q3 was utilized. Pooled OLS regression analysis and descriptive statistics were used to analyze the study's data. The research findings indicate that the debt ratio, current ratio, and net working capital have a significant impact on financial performance. Additionally, there is no significant evidence to suggest that the Covid-19 pandemic has an impact on the performance of financially distressed firms. As such, this study concludes that the Covid-19 pandemic had no bearing on the financial performance of financially challenged firms, but rather that poor management practices were the only cause.

Kocha, Iwedi, and Barisua (2020) examined Nigeria's banking system liquidity, the COVID-19 outbreak, and the shock to oil prices from June 2019 to June 30 2020. By employing pairwise Granger causality test the study's conclusions showed that changes in Nigeria's banking system liquidity were positively impacted by COVID-19; conversely, the study's findings showed that there was a negatively

significant relationship between oil price and banking system liquidity. These findings also suggested that there may be a bidirectional causal association between COVID-19 and banking system liquidity, however, there is no proof that the shock to the oil price causes the banking system's liquidity to increase or decrease. The analysis finds that COVID-19 and oil price shocks had a significant impact on the liquidity of the banking sector. The conclusions of Kocha, Iwedi, and Barisua (2020) were not corroborated by the research conducted by Iwedi, Gbarabe, and Uruah (2020) on the effect of COVID-19 on the stock price of quoted banking corporations in Nigeria. Despite being statistically insignificant, Iwedi (2020) found a negative correlation between COVID-19 and the stock price of Nigerian banking companies that are quoted. In the study, the authors employed both qualitative and quantitative research designs. The study examined monthly time series data from January 2020 to September 2020 and employed impulse response analysis, variance decomposition testing, and vector autoregressive analysis. Additionally, they found that COVID-19 had no predictive power for future changes in the stock prices of mentioned banking companies.

Following these reviews, it could be observed that most of the studies investigated the effect of the Covid-19 pandemic on Banking system during the crisis. However, this study fills this gap by extending the scope of study beyond the period of the crisis. Also variables such as lockdown status and Covid 19 cases are used to capture the pandemic on the soundness and inter-mediation role of Nigerian Deposit Money banks. Moreso, most of the studies concentrated on the profitability of the banks with little attention on the bank size and inter-mediation role. This is carried out to update the findings of previous studies on the impact of the pandemic on Banking system in Nigeria.

METHODOLOGY

In examining the effect of covid-19 pandemic on banking system in Nigeria, this study modifies the model of Ayodele, Akinyede, Ojedele and Afolabi (2021) which assessed COVID-19 pandemic and the Nigerian financial market. Ayodele *et al* (2021) captured Covid-19 with the number of confirmed cases and lock down while financial market was captured with Open Buy Back Rate, all share index volume and foreign exchange market. For simplicity, the model of Ayodele *et al* (2021) is demonstrated below:

$$OBBR = \beta_0 + \beta_1 logCvd + \beta_2 LDS + e \quad \ldots\ldots 1$$

$$logASIV = \beta_0 + \beta_1 logCvd + \beta_2 LDS + e \quad \ldots\ldots 2$$

$$PFXM = \beta_0 + \beta_1 logCvd + \beta_2 LDS + e \quad \ldots\ldots .3$$

Where:
OBBR = Open Buy Back Rate

PXFM = Foreign Exchange Market (Dollar to Nigerian Naira rate)

ASIV = All-Share Index Volume

β_0 = constant or intercept

β_1 to β_2 = regression coefficients
e = error term

However, the modification became urgent considering the specific effect the pandemic on the major and most peculiar sector of the Nigerian economy; and its system which was not particularly covered in the model of Ayodele *et al* (2021). Albeit, covid-19 cases were used in measuring the covid-19 pandemic while lockdown and gross fixed capital formation were considered as a control variable. Based on this premise and in line with the outlined objectives of this study, the modified model captures bank total assets, liquidity ratio and loan-to deposit ratio of the Nigeria banking sector; the model is demonstrated below for clarity:

$\text{logBTA} = \alpha_0 + \alpha_1 logCvd + \alpha_2 LDS + \varepsilon_t$ 4

$\text{LIQ} = \alpha_0 + \beta_1 logCvd + \alpha_2 LDS + \varepsilon_t$ 5

$\text{LDR} = \alpha_0 + \alpha_1 logCvd + \alpha_2 LDS + \varepsilon_t$ 6

Where logBTA is log of bank total assets, LIQ is liquidity ratio, LDR is loan-to-deposit ratio, logCvd is log of confirmed covid-19 cases, LDS which represents lockdown status was considered as a control variable in the study. α_0 is constant or intercept term, α_1 to α_2 is regression coefficients and ε_t is error term.

Sources of Data and Estimation Techniques

Secondary data was employed in this study given the nature of economic research. The Nigeria Bureau of Statistics and the Central Bank of Nigeria (CBN) Statistical Bulletin are the main sources of the data. The quarterly data collected from these sources covers the years 2018–2021, allowing us to examine the pre- and post-pandemic effects on Nigeria's 24 deposit money institutions. This study used a number of econometric techniques to monitor the relationship between the Covid Pandemic and the banking system's performance in Nigeria. The long-term link between the variables was ascertained using Autoregressive Distributed Lag (ARDL), while the stationary state of the variables was investigated using the Augmented Dickey Fuller Unit Root Test.

RESULTS AND DISCUSSION

Unit Root Analysis

A summary of the unit root test results, which were used to determine the variables' stationary qualities, or predictability properties, are shown in this section. As may be seen in table 1 below, the test revealed the variables' respective orders of integration.

Table 1: Summary of Unit Root Test Result

At Level				At First Difference			
Variables	**ADF statistics**	**1% critical value**	**5% critical value**	**ADF statistics**	**1% critical value**	**5% critical value**	**Order of integration**
CVD	2.232811	-3.959148	-3.081002	-4.567431	-4.200056	-3.175352	I(I)
BTA	-4.942053	-3.959148	-3.081002	-3.836405	-4.004425	-3.098896	I(0)
LIQ	-13.119991	-4.121990	-3.144920	-12.001041	-4.200056	-3.175352	I(0)
LDR	-3.119990	-2.121990	-3.104920	-2.001041	-4.200056	-3.175352	I(I)
LDS	0.573326	-3.959148	-3.081002	-5.254978	-4.004425	-3.098896	I(1)

Source: Author's Computation, (2023)

Table 1 displays the results of the unit root test along with critical values at the 1% and 5% significant levels, respectively, coupled with the Augmented Dickey Fuller (ADF) test statistics. The result indicated that two of the variables are stationary at level since the provided ADF statistics are smaller than the critical values at 1% and 5%, respectively while the others are stationary at first difference. All of the variables, however, exhibit stationarity at both level and first difference, suggesting that they are integrated at both level I (0) and order one I (1).

ARDL Bounds Test

Table 2: Bound Test Result - Model 1

ARDL Bounds Test

Test Statistic	Value	K
F-statistic	7.698728	2

Critical Value Bounds

Significance	I0 Bound	I1 Bound
5%	3.79	4.85

Source: Author's Computation, (2023)

Result from Table 2 presents whether the independent variables (Covid -19 cases and lock down status) have a long-run relationship with the dependent variable (Banks Total asset reveals the F-statistics value as 7.9567. However, the critical bonds value reported that the lower bond value @5% is 3.79 while the upper bound value shows @ 5% is 4.85. This implies that since lower bound and upper bound falls below the value of F-statistic, there exist a long run relationship among the variables. Hence, we proceed to estimating long run relationship with parsimonious error correction mechanism using autoregressive distributed lag (ARDL).

Autoregressive Distributed Lag (ARDL)

$\log BTA = \alpha_0 + \alpha_1 logCvd + \alpha_2 LDS + \varepsilon_t$ 7

Table 3: ARDL Result

Series: *BTACvd LDS*

Variables	**Coefficient**	**Std. Error**	**t-statistics**	**Probability**
D(CVD(-2))	-0.060231	0.351832	0.171194	0.0683
D(BTA)	8.785608	6.646706	-0.013229	0.0898
D(LDS)	-2615.556	1918.864	-1.363075	0.0100
ECT	0.132471	0.248292	0.533529	0.0082
C	-1974.927	15790.10	-0.125074	0.0036

R^2=0.3254, *Adjusted* R^2=0.2218, Durbin-Watson=1.9332

Source: *Author's Computation, (2023)*

Table 3 displays the estimation result of the error correction model. It indicates that, in the short term, the covid-19 cases have a negative and insignificant effect on the total assets of banks, with a coefficient estimate of -0.0602 (p=0.0683>0.05), whereas the lockdown status has a negative and significant effect, with a coefficient estimate of -2615.556 (p=0.0100<0.05). About 13% of the short run inconsistencies are rectified over time and incorporated into the long run dynamic each year, considering the coefficient of the reported one period lag error correction term, which stood at 0.13 with a probability value of 0.0082. All things being equal, lockdown status and COVID-19 instances can account for almost 22% of the systematic fluctuation in banks' total assets as depicted by the adjusted R^2 result.

Table 4: Bound Test Result - Model 2

ARDL Bounds Test

Test Statistic	Value	K
F-statistic	14.96957	2

Critical Value Bounds

Significance	I0 Bound	I1 Bound
5%	3.1	3.87

Source: ***Author's Computation, (2023)***

Result from the bound test conducted to examine whether the independent variables (Covid -19 cases and lock down status) have a long-run relationship with the dependent variable (liquidity) reveals the F-statistics value of 14.96957. However, the critical bonds value reported that the lower bond value @5% is 3.1 while the upper bound value shows 3.87 @5%. This indicates a long run relationship exist among the variables.

$LIQ = \alpha_0 + \beta_1 logCvd + \alpha_2 LDS + \varepsilon_t$ ……..……..……..8

Table 5: ARDL Result

Series: *LIQCvd LDS*

Variables	**Coefficient**	**Std. Error**	**t-statistics**	**Probability**
D(CVD(-2))	-0.249361	0.348367	-0.715800	0.4973
D(LIQ)	2.954406	2.165606	1.368487	0.2135
D(LIQ(-1))	3.053406	1.767806	1.732652	0.1268
D(LDS)	-3318.678	1678.419	-1.977264	0.0885
ECT	0.409290	0.325636	1.256893	0.2491
C	3643.983	13892.68	0.262295	0.8006

R^2=0.5552, *Adjusted* R^2=0.2375, Durbin-Watson=2.3559

Source: *Author's Computation, (2023)*

With a coefficient estimate of -0.2493 (p=0.4973>0.05) for Covid-19 cases and a lockdown status of -3318.678 (p=0.0885>0.05), respectively, the error correction model estimation result displayed in Table 5 indicates that, in the short run, COVID-19 cases have a negative, insignificant effect on banks' total assets. About 40% of the short run inconsistencies are rectified and integrated into the long run dynamic each year, however this is not significant. This is shown by the coefficient of the reported one period lagged error correction term, which stood at 0.40 with a probability value of 0.2491. Also, R-square statistics of 0.23 showed that, when all other factors are held constant, covid19 instances and lockdown status together account for almost 23% of the systematic fluctuation in bank liquidity.

Table 6: Bound Test Result - Model 3

ARDL Bounds Test

Test Statistic	**Value**	**K**

F-statistic	11.99338	2

Critical Value Bounds

Significance	I0 Bound	I1 Bound
5%	4.87	5.85

Source: ***Author's Computation, (2023)***

Result from the bound test conducted to examine whether the independent variables (Covid -19 cases and lock down status) have a long-run relationship with the dependent variable (loan to deposit rate) reveals the F-statistics value of 11.99338 However, the critical bonds value reported that the lower bond value @5% is 4.87 while the upper bound value @5% is 5.85. This implies that the null hypothesis of no cointegration is rejected since the value of F-statistics is greater than the values of the lower and upper

bound at all levels. Hence, we proceed to estimating the long relationship with parsimonious error correction mechanism using autoregressive distributed lag (ARDL).

$LDR = \alpha_0 + \beta_1 logCvd + \alpha_2 LDS + \varepsilon_t$ ……..…….……9

Table 7: ARDL Result

Series: *LDRCvd LDS*

Variables	**Coefficient**	**Std. Error**	**t-statistics**	**Probability**
D(CVD(-2))	-0.239528	0.338372	-0.707884	0.5019
D(LDR)	955.7356	1584.163	0.603306	0.5653
D(LDR(-1))	2975.925	1579.321	1.884307	0.1015
D(LDS)	-3634.263	1836.853	-1.978527	0.0884
ECT	0.313218	0.263407	1.189103	0.2732
C	363.2635	14194.17	0.025592	0.9803

R^2=0.5726, *Adjusted* R^2=0.2673, Durbin-Watson=1.9920

Source: *Author's Computation, (2023)*

In the short run, the result in table 7 shows that covid-19 cases have a significantly negative effect on banks' loan-to-deposit ratios, with a coefficient estimate of -0.2395 (p=0.5019>0.05). In contrast, lockdown status has a negative but insignificant effect with a coefficient estimate of -3634.263 (p=0.0884>0.05). About 31% of the short run inconsistencies are rectified and incorporated into the long run dynamic each year as shown by the coefficient of the reported one period lag error correction term, which stood at 0.31 with a probability value of 0.2732. About

57% of the systematic variance in banks' loan to deposit ratio may be explained collectively by covid-19 instances and lockdown status, according to R-square statistics of 0.57 shown in Table 7.

Post Estimation Test

Table 8: Post Estimation Result

Normality Test		
Statistics	***Values***	***Probability***
Jarque-Bera Stat	0.40355739	0.8172
Serial Correlation LM Test		
Statistics	***Values***	***Probability***
F-statistic	0.2947	0.7517
Heteroscedasticity Test		
Statistics	***Values***	***Probability***
F-statistic	0.4381	0.7787

Source: ***Author's Computation, (2023)***

At 0.5739 (p=0.4035>0.05), the estimated models' error term's Jarque-bera statistics value was found. With respect to the probability value, the outcome showed that there is insufficient evidence to reject the null hypothesis that the error term of the estimated model is normally distributed, hence confirming that it the model is normally distributed. F-statistics and probability values of 2.2947 and 0.7517, respectively, were found in the Breusch-Godfrey serial correlation LM test result shown in table 4.8. This implies that there is insufficient evidence to refute the null hypothesis that there is no serial connection between the estimated models' consecutive error term values. Therefore, the derived models do not exhibit serial autocorrelation.

The result of the Heteroscedasticity Test shows a f-statistics and probability values of 0.4381 and 0.7787 respectively. The implication is that the model is free of heteroscedasticity problem since the probabilty value is greater than 5% significant level.

Discussion of Findings

Results of estimation carried out in this study in the bid to quest to investigate the effect of COVID-19 pandemic on banking system in Nigeria. First, results showed that covid-19 cases exerts negative insignificant effect on banks total assets thus suggesting that as covid-19 cases increases, banks total assets fall. Similarly, findings revealed that as lockdown status deepens banks total assets scale down; this is consistent with the findings of Elnahass *et al*. (2021). During the pandemic, the accretion of covid-19 cases aggravated the pandemic which imposed severe threat on the survival of the banking system; although loan was increasingly granted to businesses, corporate firms and households but the reduced prosperity and performance of most business at the time occasioned massive increase in the nonperforming loan of banks. Again, findings from

the study evidenced that covid-19 cases exerts positive significant effect on liquidity or liquid assets in the banking sector while lockdown exerts negative effect on banks total assets implying that a covid-19 gets increasingly severe and lockdown reduces, liquidity in the banking sector appreciates; this aligns with the findings established by Ghosh and Saima (2021). The banking sector in its bid to boost the productivity of sectors particularly the MSMEs towards enhancing sectoral output provided; in fact, in causing the effectiveness of this move, the CBN extended the deadline for minimum capital requirement which further encouraged deposit money banks to release funds in form of loan to corporate firms. This in a no little way reduced the liquidity position of DMBs particularly liquid assets such as cash as they are constantly released to individuals, households and businesses. Although banks that has explored alternatives such as investing in risky assets to improve their soundness and performance which includes boosting liquid assets maintained relatively improved liquidity; besides, banks that leverages highly primarily on earnings from its operations may fail as the banking system was grossly affected.

Lastly, discoveries from the study also revealed that covid-19 cases exerts positive effect on loan to deposit ratio in the banking sector while lockdown status exerts negative effect on loan to deposit ratio in the banking sector; although the findings of Shodrokova, Asngari and Hidayat (2023) negated this finding, this may be due to the peculiarity of the economy in which their study was conducted. Considering the height of economic uncertainty that existed in the Nigerian economy during the pandemic, individuals and household's propensity to save reduced drastically thus imposing poverty on most households and threat to the prosperity of businesses; hence, individuals and business firms instead of depositing obtained loans from the banking sector.

CONCLUSIONS AND RECOMMENDATIONS

The covid-19 pandemic ushered in numerous changes in the banking sector as it significantly interplayed with the financial soundness of deposit money banks which almost rendered the Nigerian banking system highly ineffective which has almost dragged down public confidence as major features of the banking sector was grossly and adversely affected. Findings from this study further proved that covid-19 cases exerts negative effect on banks total assets and lockdown status exerted negative effect on banks total assets both in the long and short run; covid-19 cases exerts positive significant effect on liquidity or liquid assets in the banking sector and lockdown status exerts negative effect on banks liquidity both in the long and short run and covid-19 cases exerts positive effect on loan to deposit ratio in the banking sector while lockdown status exerts negative effect on loan to deposit ratio in the banking sector both in the long and short run. Hence, this study concludes that covid-19 pandemic exerts noticeable effect on the banking system in Nigeria. Premised on these conclusions, it is therefore urgent that:

i. The Central Bank of Nigeria should guarantee that deposit money banks' liquid assets are adequately monitored. This would prevent bank management from focusing on profit maximization rather than improving performance and the bank's overall function in the economy.

ii. Moreso, Nigerian regulatory authorities should conduct periodic evaluations and assessments of deposit money banks' asset portfolios in order to manage the banks' exposure to high-risk assets, safeguard depositor funds, and prevent the nation's financial system from collapsing during a downturn in the economy.

iii. Central Bank of Nigeria should introduce a standard modality for loan that would ensure the mobilization of funds to qualified loan applicants while ensuring that controls are available to tackle loan default; this instead of the changing prime lending rate would guarantee reduced loan default and improved soundness of the banking system

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