

THE COVID-19 RAGES ON: HOW DID NIGERIAN BANKS' STOCK REACT?

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ABSTRACT

This study was carried out to examine how stocks of Nigerian deposit money banks (DMBs) reacted to the covid-19 pandemic from two perspectives: prices and volume traded on the Nigerian Stock Exchange. The effect of the pandemic on DMBs stock prices and traded volume was examined from three methodical areas: general effect, predictive effect and response to the covid-19 shock. Panel data of stock prices, volume of stocks traded of all the 15 listed Nigerian DMBs and monthly covid-19 data from February, 2020 to August, 2021 were analyzed with panel least square (PLS)s, panel vector autoregressive (PVAR) and impulse response function (IRF). These analytical methods were used to examine how covid-19 statistics, namely, number of confirmed positive cases, number of deaths due to the pandemic and number of discharged covid-19 patients affected Nigerian DMB's stock prices and volume of stocks traded for the period under study. Results of the PLS revealed that while covid-19 positively affected stock prices of the banks, it negatively affected the volume of their stocks that were traded on the Stock Exchange. The PVAR results revealed that none of the covid-19 statistics examined exert long run predictive effect on stock price of Nigerian DMBs during the period, but the number of discharged patients and significantly had predictive affect volume of stocks traded. Both stock prices and volume traded responded swiftly to the shock from number of covid-19 confirmed cases and mildly to the fatalities and number of discharged patients. We conclude that, overall, the covid-19 pandemic significantly affected Nigerian DMB's stock prices and volume traded and recommend that both banks and the NSE develop pandemic management strategies and invest more on technology driven stock trading facilities that will reduce the conventional brick-and-mortar trading during lockdowns

Keywords: Covid-19, Stock Prices, Traded Stock, PLS, PVAR, Impulse Response

1. INTRODUCTION

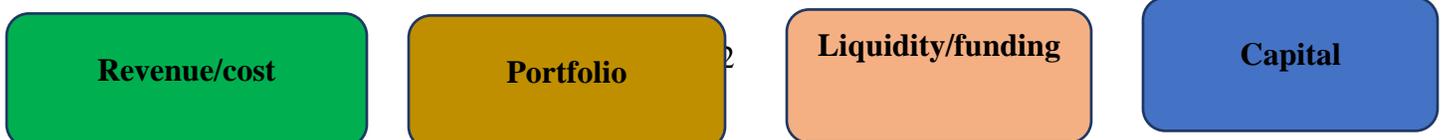
Social distancing, outright quarantining, shutdowns, remote employment, work from home, e-sales and teleconferencing have become the new normal globally, no thanks to the ravaging Covid-19 pandemic. Obviously, the scourge will last longer than expected. To mitigate the devastating health occasioned by the pandemic, national governments put in place some similar strategies [1]. [2] observed that the COVID-19 disaster has prompted spirited policy reactions by countries globally, although such policy responses are not without huge costs. Even when government announcements outlining income support, bail-outs and debt forgiveness/reliefs impacted positively on stock

returns as reported by [3]and [4], inactivity of stock markets due to lockdowns and social distancing declined stock prices significantly.

[5] reported that given the several postulations and predictions concerning the economic impact of the covid-19 problem, there is consensus that the world economy will shrink due to the shutdown of economic activities which causes loss in income, production hours and funds movements. There is bound to be drastic reduction in consumption, investments, trade, employment and rise in food prices. UNCTAD further posited that developing economies will be worse hit because of their weak health infrastructure, large dependence on developed economies (who themselves are hit by the pandemic) for survival. There are three main transmission channels through which the shock from Covid-19 can influence and put pressures on the finances of developing countries: government budgets, international trade and financial sector.

The shutdown in economic activities badly affected corporate organizations also including banks due to massive production and revenue decline. [6] reported that banks particularly which would have cushioned the negative effects of the pandemic by providing financial lifeline were also subjected to the general shortage of funds globally. Although many Central Banks undertook several measures to maintain continuous flow of funds to the productive sectors of the economy, not much could be achieved due the intensity of the human and economic fatalities caused by the Covid-19 [7]. According to [8], the Covid-19 pandemic precipitated several economic and health crises, including the banking industry as business operations were shut down, movements were restricted and social interactions limited. Granted that there were virtual means of banking, however, bank deposits were drastically reduced, assets became low in quality and unattractive. Since there seems to be no immediate end in sight, the effect of Covid-19 pandemic is expected to continue for a long time.

[9] identified some major shocks that banks faced due to the COVID-19 pandemic. These shocks are categorized into four broad areas: revenue/cost; portfolio; liquidity/funding and Figure 1 summarizes the components of shocks in each of these categories



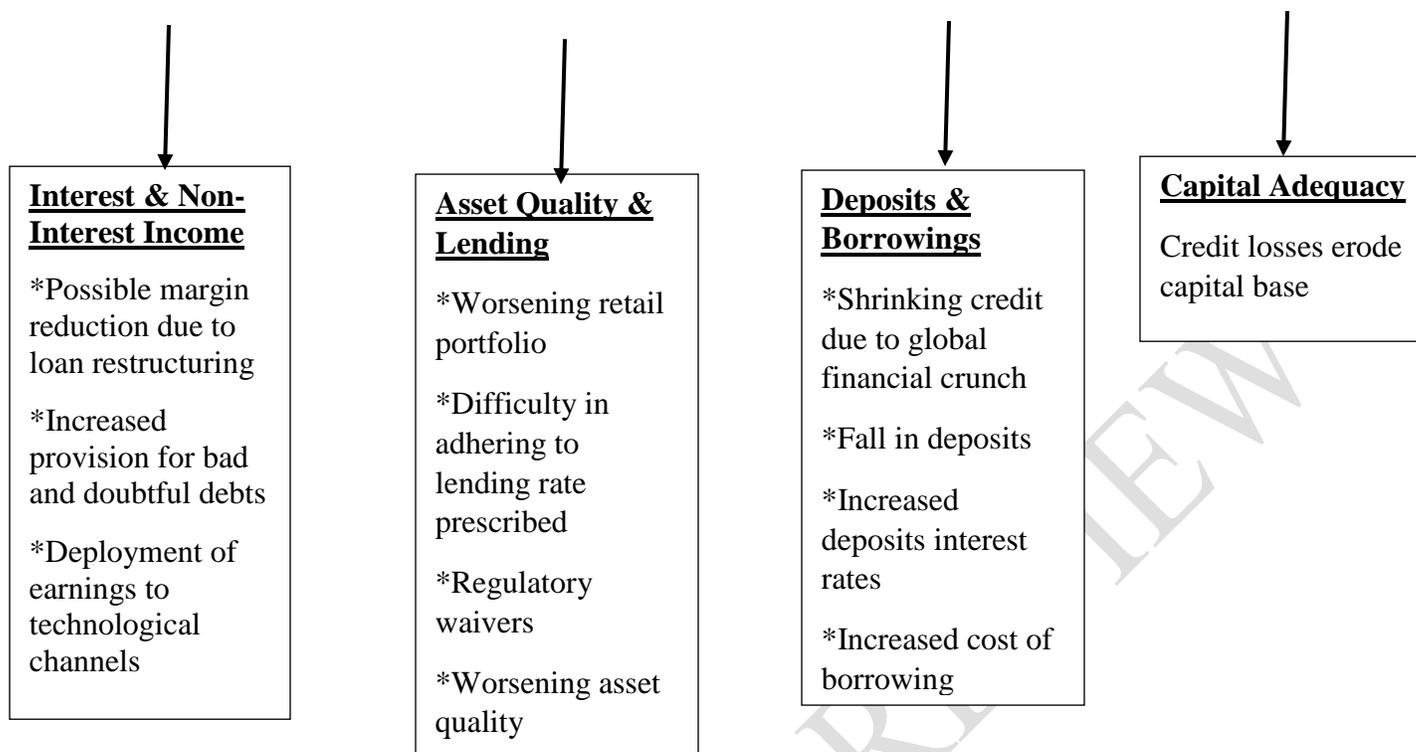


Figure 1: How COVID-19 Shocks Affect the Nigerian Banking Sector
Source: KPMG (2020)

Globally, financial markets reacted to the covid-19 outbreak in a volatile manner [9] According to [10], after the global economic crises of 2008, most banks encountered difficult operating environment, recorded losses, reduced number of staff and their liquidity shrank. Researchers, however, believe that banks are now more prepared to face the challenges associated with global surprises like the Covid pandemic than before having had the bad experience during the economic meltdown [11] The pandemic has revolutionized bank operations so that they are still relevant in intermediation process of making funds flow from suppliers of funds to consumers. In the words of [12] “the COVID-19 pandemic disrupted global economic activities and caused financial system vulnerability worldwide, especially in the developing and emerging economies. [13] however observed that Nigerian stock returns reacted more to global covid-19 pandemic statistics than the domestic statistics in Nigeria. The authors advocated a relaxation of the lockdown due to the pandemic. This study focuses attention on how the stocks of listed DMB’s in Nigeria have hitherto reacted to the covid-19 pandemic since the first case was reported in the country on February, 27, 2020. Specifically, this study addressed the following three objectives:

- i. examine the effect of the covid-19 pandemic on stock prices of deposit money banks in Nigeria

ii. examine the predictive effect of covid-19 pandemic on stock prices of deposit money banks in Nigeria

iii. ascertain how stock prices of Nigerian deposit money banks reacted to the covid-19 pandemic.

Arising from the stated objectives, the research tested for the following hypotheses:

i. covid-19 pandemic did not have significant effect on stock prices of deposit money banks in Nigeria.

ii. covid-19 pandemic did not have significant predictive effect on stock prices of deposit money banks in Nigeria.

iii. Stock prices of Nigerian deposit money banks did not significantly react to the covid-19 pandemic.

2. LITERATURE REVIEW

Pandemics affect all areas of the national life. [14] stated that, obviously, pandemics cause deaths, economic losses and psychological distress. According to the author, a third of the world's deaths is said to be due to infectious diseases and pandemics. This happens notwithstanding the huge invention into world's pharma industry and technology. Urbanization, migration, trades and rising population are factors responsible for prevalence of pandemics across the globe. Towing a general equilibrium line, [15] criticize the common approaches which assessed pandemic effect in terms of economic earnings forgone resulting from mortality. The authors posited that such stance is, at best, myopic because it ignores the consequences of pandemics on other areas of the country: health, human capital and social among others. This broader approach is the general equilibrium perspective of analyzing the global effect of pandemic such as Covid-19. The authors submitted that quarantines, isolations, increased health expenditures and shutdowns impose huge costs on economic and social life of the people, citing Ebola pandemic in Liberia,

[15] argued that lethal diseases put untold stress on fiscal position of less developed and emerging economies because of sudden and sporadic decline in government and private revenues. According to these authors, pandemics induce economic shocks because of shortfall in human resource supply occasioned by illness, deaths and fears. This is apart from shutdowns, restrictions and disruptions. Furthermore, pandemics have been found to cause social and national tensions, demographic shifts, political disturbance and falling standard of living. As bad as the situation appears, [16] identified increased digitalization as a one desirable effect of the covid-19 pandemic,

especially in third world countries. Online facilities have increased remote work and transactions such that life after the pandemic will not remain the same technologically.

Empirical research works on the impact of Covid-19 on economic activities are still few, especially in developing countries like Nigeria. Majority of empirical works in this regard have concentrated on developed economies with little attention to the less-developed. Similarly, there are not much exiting literature on studies that examine the Covid-19 – bank stock price reactions either globally or in Nigeria. The reason for this is obvious: Covid-19 is only a one and half years old and the word is yet to fully recover from its shock and grasp how to actually deal with it. [17] did a review of literature on the strategies employed by banks globally to mitigate the adverse effect of covid-19. The review was done on the comparative effect of two global crises (Covid-19 and economic depression of 2008/2009 on banks performance which is perceived as a major player that is expected to bail out the economy from its doldrum. The author noted that one major strategy employed by banks is digitalization and innovative technology on one hand and product redesigning among others. Amidst the ravaging health and economic effect of the covid-19 crisis, [17] asserted that the pandemic provides an opportunity for further re-strategizing, redesign and innovation of product and service by the banking system.

[13] studied how stock returns reacted to the global and domestic covid-19 cases using panel least squares, panel vector autoregressive and impulse response to analyze daily stock returns of 201 firms listed on the NSE and covid-19 confirmed cases between February, 2020 to June, 2020. The authors discovered that the stock returns of selected firms negatively responded to shocks attributable to global covid-19 statistics than the locally reported figures in Nigeria. It was also found that the reaction of stock returns oscillates between positive and negative swings to the covid-19 shock.

[1] assessed impact of the covid-19 outbreak on stock prices of banks in the world. The authors used global financial data during the pandemic and how announcements on the disease affect the performance of the global banking system. Findings from the study showed that the pandemic and expectations from banks regarding it have put considerable pressure on the banking system resulting in underperforming stocks in the market. Efforts of government and other monetary authorities did not also have uniform effect on banks because of their heterogenous characteristics, including liquidity, capitalization and assets portfolio.

[18] used panel regression to study how Covid-19 crisis affected the stock market indicators of six countries that were most affected by the pandemic during its first wave, namely Japan, Germany, USA, Korea, Singapore, United Kingdom. Results of fixed effect model in the study revealed that stock returns of Asian countries reacted more negatively to the pandemic than other countries considered. These authors submitted that such effect portrayed how pessimistic investors were in times of uncertainties that accompany the Covid-19 scourge. Likewise, [19] investigated effect of Covid-19 pandemic that ravaged Spain, Korea, China, Italy, South Korea, Germany, France, Japan and USA on stock returns. The study discovered that the former had bidirectional spill-over impact on the latter in USA, Asia and Europe.

A global study carried out by [20] to determine short-range influence of Covid-19 on stock indices revealed that announcements made by the World Health Organization (WHO) have effect on stock prices. Specifically, effect of six (6) specific pronouncements by WHO significantly affected stock market indicators in nine (9) countries. [21] evaluated the reaction of USA stock market indices to the Covid-19 and found that the latter impacted the former adversely more than previous pandemics like SARS, H2N2 and H3N2. Another study carried out by [22] to investigate the relationship between the Covid-19 surge and USA and China's financial market performance with regression found that, against expectations, the pandemic positively impacted the markets significantly.

[23]evaluated the performance of stocks of Islamic banks during the COVID-19 crisis in 48 countries across the globe. Using a dataset of 426 banks spanning December 31, 2019 to March 31, 2020, the authors). Using variable return to scale from input and output perspectives (VRS-INP and VRS-OUT and data envelopment (DEA) techniques, the authors studied 38 Islamic and 388 non-Islamic banks and found that Islamic banks' stock returns were between 10% and 13 % more than those of other banks during the Covid-19 pandemic.

In a study of dataset for 896 banks across 53 countries, [1] studied how banks' stock prices respond to the Covid-19 crises. The authors noted that most banks' stocks underperformed during the first major wave of the pandemic (between March and April, 2020). Specifically, it was discovered that the negative effect of Covid-19 on businesses was more on banks than other corporates and non-bank financial firms. More interestingly, [1] discovered that stock prices and returns of bigger, public and highly capitalized banks were more significantly adversely affected because of expectations on them to counter the Covid-19 crises. [24] examined stock price crashes

during the covid-19 outbreak and observed that banks' stock prices having huge "ex-ante" undrawn credit and large "ex-post gross drawdowns" fall faster during the pandemic. decline more. However, the decline is reduced for banks with higher capital cushions because they also reduced their lending despite monetary authorities' measures to mitigate effect of the crisis.

[2] did cross-country study aimed at examining how stock market of 38 developed and emerging countries react to the covid-19 stimulus measures found that stock returns and prices incline to negative reaction to sudden withdrawal of Covid-19 stimulus measures

For obvious reason (newness of the covid pandemic) in Nigeria, few empirical research exist that examine effect of Covid-19 pandemic on stock prices and development in the capital market. [25] in a study to examine how Covid-19 deaths and cases impacted on activities in the Nigerian Stock Exchange (NSE) between March and September 2020 with ARDL and other econometric techniques, found that while confirmed cases of Covid-19 affected the market negatively, number of deaths positively affected it during the period. [26] conducted research aimed at ascertaining how covid-19 affected the Nigerian Stock Exchange from January to April, 2020 using the E-GARCH and Q-GARCH models. Significantly, the authors discovered that outbreak impaired stock returns and other stock market indices. From a global perspective, [27] studied impact of covid-19 contagion on the global economy vis-à-vis Nigeria and found that the disease negatively affected many economies of the world. It was noted by the authors however that while the worldwide confirmed cases of covid-19 negatively affected stock capitalization, its effect on the NSE varied. In both cases, the identified effects were insignificant.

[8] investigated how the covid-19 pandemic impacted banks stocks price in Nigeria during its first wave. Applying VAR, it was found that the pandemic negatively (but insignificantly) affected banks' stock price. However, the pandemic was weak in predicting future stock price behaviour based on the results of variance decomposition. Impliedly, covid-19 affected banks' stock price only in the short-run. Still in Nigeria, [28], while examining the relationship of covid-19 and capitalization of Nigerian stock market between March and May, 2020 found that announcements on covid-19 by the NCDC or the WHO (particularly on confirmed cases) slightly had less than a shocking effect on the development in the Nigerian stock exchange. The effect of the shock on the market was found to lack rippling effect on capitalization but the market quickly recovered from it as earlier reported by [29].

Our present study is premised on the need to continually examine how covid-19 impact the Nigerian stock market with particular emphasis on banks' stocks. Most existing empirical studies on effect of covid-19 on Nigerian stock market have concentrated on aggregated All Share Index and volume of trade in the market. Apart from [8], not many researches have been done to dichotomize covid-19 – stock price relationship on industry or sector basis. Hence, the gap to filled by this study is examining the relationship between covid-19 and stock market performance from two perspectives: stock price and volume of traded stocks of Nigerian banks from the onset of Covid-19 breakout (February, 2020) to August, 2021. A more concise gap is the examination of these relationships on specific bank basis rather than taking aggregate stock index and volume of stocks traded of the banking sector for the period. Also, a second gap on the question of whether changes in stock price and volume traded are caused by changes in covid-19 pandemic statistics (causality) is examined.

3. DATA AND RESEARCH METHODS

We premised this research on the theory of partial equilibrium effect of diseases developed by [30]. The author theorized that the economics lifetime income model can be used to explain how pandemics affect the economic life of the people. Accordingly, [30] argued that productivity will only improve/increase when people have the health, strength and age to work. This opportunity directly affects investment, consumption and income. On the other way, aging workforce, sickly population and distressed people will impair productivity, investment and income.

We pooled individual data of stock prices and volume of traded stocks of all the deposits money banks listed on the Nigerian Stock Exchange (NSE) as at last day of business in August, 2021 and number of confirmed Covid-19 positive cases and recorded between February 1st 2020 and August 31st 2021. These data are sourced from NSE and the Nigerian Centre for Disease Control (NCDC) respectively. We developed two models that expresseffects of Covid-19 pandemic on bank stock and volume of traded stocks in Nigeria. Stock prices and volume of fifteen (15) banks listed on the NSE, including Access, Ecobank, FCMB, Fidelity, FBN Holdings, Guaranty Trust, Jaiz, Polaris, Stanbic IBTC, Sterling, UBA, Union, Unity, Wema and Zenith were collated for the period under study. Using panel/pooled data analytical technique to address the objective of this study is meant to fill a methodical gap in literature as existing empirical works relating to the subject of the study have concentrated on using Time Series data. Generally, a panel least square regression takes the form for dependent and explanatory variables:

$$y_{it} = \alpha + \beta'X_{it} + \mu_{it} \dots\dots\dots (i)$$

With y_{it} being the dependent and X_{it} the explanatory variables. Hence, the relationship between covid-19 and bank stock prices as well as volume of stocks traded by the banks expressed in equation (ii) is established with panel least squares regression.

$$STPi = f(CAS; FAT, DSC) \dots \dots \dots (ii)$$

$$VOLi = f(CAS; FAT, DSC) \dots \dots \dots (iii)$$

Where

STPi = Month-end stock prices of each of deposit money banks on the NSE

VOLi = Volume of traded each bank's stock at month-end

CAS = Monthly total of Covid-19 positive cases confirmed.

FAT = Monthly number of deaths due to Covid-19 infections

DSC = Monthly number of recoveries from Covid-19 infections

Equations (ii) and (iii) can take econometric forms;

$$STPi = a + b_1CAS + b_2FAT + b_3DSC + \mu_i \dots \dots \dots (iv)$$

$$VOLi = a + b_1CAS + b_2FAT + b_3DSC + \mu_i \dots \dots \dots (v)$$

Where:

b_1, b_2, b_3 = regression parameters

μ_i = error term

fixed and random effects models here

We used Im, Pesaran and Shin unit root test to ascertain the order of stationarity of study variables. Thereafter, Panel least squares, panel VAR and impulse response are also used to examine effect of the covid-19 pandemic on Nigerian deposit money banks' stock prices and traded volume between February 2020 and August 2021.

Generally, a panel VAR model takes the form

$$y_{it} = A_{oi}(t) + A_i(e)Y_{t-1} + \mu_{it} \dots \dots \dots (iv)$$

$$i = 1, \dots, N \quad t = 1, \dots, T$$

where

μ_{it} = G x 1 vector of random disturbance

$A(e)$ = polynomial in lag operator

y_{it} = dependent variable for each of banks selected

A_{oi} = Constant for individual i's in the observations

Whereas the panel least squares regression is used for ascertaining effect of covid-19 on DMB's stock prices, the VAR and impulse response function are used to determine the predictive effect of

the latter on the former, the impulse response function is used to ascertain the response of the latter to the former.

4. DATA ANALYSIS AND DISCUSSION

4.1 Effect of Covid-19 on Stock Prices and Traded Stock Volume of DMBs

a) Correlations

Tables 4.1 and 4.2 contain the correlation coefficients between covid-19 data and stock price and volume of stock trade respectively.

Table 4.1 Correlations (Model 1): Covid vs Stock Price

	STP	CAS	FAT	DSC
STP				
CAS	0.038219			
FAT	0.003064	0.791389		
DSC	0.044026	0.816887	0.665272	

Source: Author's Computation (2021)

Table 4.2: Correlations (Model 2): Covid vs Traded Stock Volume

	VOL	CAS	DSC	FAT
VOL				
CAS	-0.072904			
DSC	-0.018596	0.816887		
FAT	-0.128334	0.791389	0.665272	

Source: Author's Computation (2021)

From Table 4.1, it is shown that there is positive but weak correlation between stock price and covid-19 indices (confirmed cases, fatalities and number of discharged, which are 0.033219 (3%), 0.003064 (0.3%) and 0.044026 (4.) respectively). Unsurprisingly, all the covid indices have high positive correlation with each other (CAS//FAT = 79%, CAS/DSC = 82%, DSC/FAT = 67%). Table 4.2 shows that the correlation coefficients of all covid-19 indices with stock trade volume are negative though weak (-0.072904 (-7%), -0.018596 (-1.9%) and -0.128334 (13%) for CAS, DSC and FAT respectively.

b) Test of Unit Root

Table 4.3 contains a summary of Im, Pesaran and Shin panel unit root test for stock and covid-19 variables.

Table 4.3: Extracts from Panel Unit Root Tests (All variables in models 1 and 2)

Method: Im, Pesaran and Shin			
Variable	Statistics	Prob.	Order of Stationarity
STP	-2.60970	0.0045	1(0)
VOL	-4.77976	0.0000	1(0)

CAS	-8.81737	0.0000	1(0)
FAT	-9.79595	0.0000	1(0)
DSC	-5.25101	0.0000	1(0)

Source: Author's Computation (2021)

As revealed in Table 4.3, all the variables tested are stationary at level 1(0) given their $p < 0.05$ level of significance based on Im, Pesaran and Shin stationarity test. Essentially, this common characteristic provides the basis for using panel least squares and panel VAR techniques to analyze the data.

4.2 How Covid-19 Have Affected Deposit Money Banks' Stock Performance in Nigeria

We examine effect of Covid-19 pandemic on banks' stock prices and traded volume for the study period using panel least squares and the predictive effect of the former on the latter through the panel vector auto-regressive (PVAR). Table 4.1 is a summarized panel least squares estimations on the effect of Covid-19 pandemic on stock prices and volume of stocks traded of DMBs in Nigeria as dictated by results of fixed and random effect tests and Hausman test.

4.4 Panel Least Squares Results

Table 4.5: Panel Least Squares and Hausman Test Results (Models 1 and 2)

Variable	Model 1: Dependent Variable = STP				Model 2: Dependent Variable = VOL				Hausman Test	
	Fixed Effect Model		Random Effect Model		Fixed Effect Model		Random Effect Model			
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.	Stat	Prob.
CAS	6.67E-05	0.0262	6.67E-05	0.0262	-0.00082	0.7715	-0.000824	0.7715	0.00000	1.0000
FAT	-0.007153	0.0006	-0.007153	0.0006	0.004562	0.0852	0.004562	0.0852		
DSC	5.17E-05	0.0634	5.17E-05	0.0634	-0.52488	0.0080	-0.524882	0.0080		
C	8.274587	0.0059	8.274587	0.0059	289.1789	0.0000	289.1789	0.0000	Random effect preferred for the two models	
R ²	0.953445		0.076230		0.465687		0.041978			
F-Statistic	321.6532		7.729419		13.68863		4.104211			
Prob (F-Stat)	0.000000		0.000056		0.000000		0.007141			

Source: Author's Computation (2021)

Table 4.5 summarizes results of panel least squares estimations for the effect of Covid-19 pandemic on stock prices of deposit money banks. Results of Hausman test favour random effect model for the two models (STP and VOL). Hence, the number of confirmed covid-19 cases (CAS) has a significant positive effect (coef. 0.000667, $p = 0.0262$) but insignificant effect (coef. -0.00082, $p = 0.7715$) on stock price and volume of traded stocks respectively. The number of deaths due to covid-19 (FAT) has a significant negative effect (coef. -0.007153, $p = 0.0006$) and insignificant effect on volume of stock traded (coef. 0.004562, $p = 0.0852$) on stock price and

trade volume respectively. The number of covid-19 patients successfully discharged (DSC) insignificant effect (coef. 0.000517, $p = 0.0635$) but negative and significant (coef. -0.524882, $p = 0.0080$) on stock price and stock traded volume respectively. As low as 0.076230 (7.6%) and 0.041978 (4.2%) of changes in STP and VOL were actually explained by the covid-19 pandemic during the period. This further confirms the low correlation between stock and covid-19 indices examined. The F-Statistics and its probabilities (0.000056 and 0.007141 for the two models) imply that the models used are reliable.

We use VAR to examine the long-run predictive effect of covid-19 on banks' stock

Table 4.6: Vector Autoregressive Results for Models 1 and 2

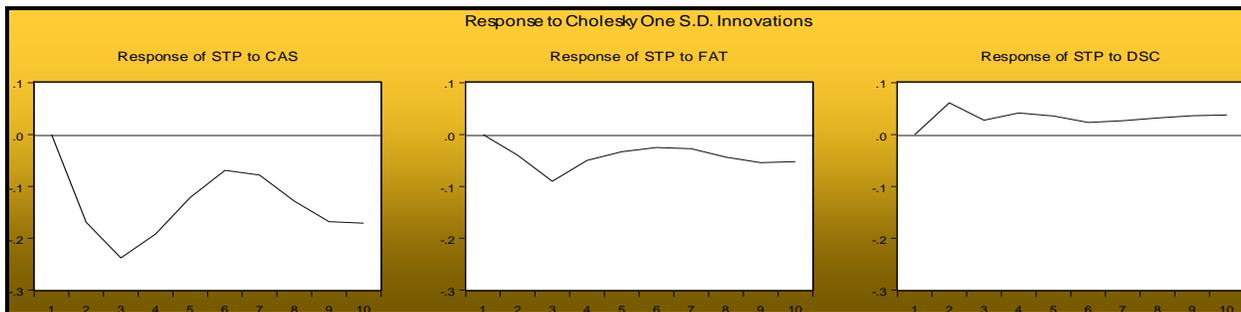
Variable	Model 1: Dependent Var. = STP				Model 2 Dependent Var. = VOL			
	Coefficient	Std. Error	t-Statistic	Prob.	Coefficient	Std. Error	t-Statistic	Prob.
CAS (-1)	-3.48E-05	2.84E-05	-1.2272	0.2209	-0.004131	0.003530	-1.170324	0.2430
CAS (-2)	8.23E-06	3.38E-05	0.2435	0.8078	-0.005133	0.004098	-1.252532	0.2116
FAT (-1)	-0.000375	0.002264	-0.1658	0.8684	0.200450	0.279937	0.716053	0.4746
FAT (-2)	-0.000118	0.001742	-0.0678	0.9460	-0.143250	0.219589	-0.65235	0.5148
DSC (-1)	2.44E-05	3.75E-05	0.6498	0.5164	0.010481	0.004591	2.282929	0.0233
DSC (-2)	-8.66E-06	2.26E-05	-0.3826	0.7023	0.003273	0.002810	1.164903	0.2452
C	0.903163	0.057354	15.747	0.0000	0.451133	0.048013	9.396052	0.0000
R ²	0.783692				0.509596			
F-Statistic	1854.832				31.95345			
Prob (F-Stat)	0.000000				0.000000			

Source: Author's computation (2021)

Table 4.6 summarizes the VAR results that estimate the predictive effect of covid-19 on banks' stock performance in terms of prices and volume traded. As revealed, of all the effects of covid-19 statistics on stock prices and volume recorded, only the effect of number of people discharged (DSC) is positive and significant (coef. = 0.010481; $p = 0.0253 < 0.05$). By implication, all the covid-19 statistics examined did not exert any long run predictive effect on stock price of Nigerian DMBs during the period, but the number of discharged patients positively and significantly affect volume of stocks traded. However, the coefficient of determination, R², indicates that about 78% and 51% of the changes in STP and VOL are explained by CAS, FAT and DSC respectively. The probabilities of F-Statistics of 0.00000 and 0.00000 for the two models show that they are statistically reliable.

4.3. How DMB Stocks Reacted to Covid-19

Figures 4.1 and 4.2 show the responses of STP and VOL to shocks provided by covid-19 statistics respectively.



Figures 4.1: Impulse Response of STP to Covid-19

Source: Authors' Design (2021)

From Figure 4.1, it is revealed that STP wiggles sharply to shocks from number of confirmed covid-19 cases for most part of the period while its response to number of fatalities was milder after a short spike during the early stages of the pandemic. In both cases, STP responded negatively to the shocks in CAS and FAT. In addition, STP's response to the shock through DSC was mild after a brief wriggle at the beginning of the pandemic. The response to the shock was however positive.

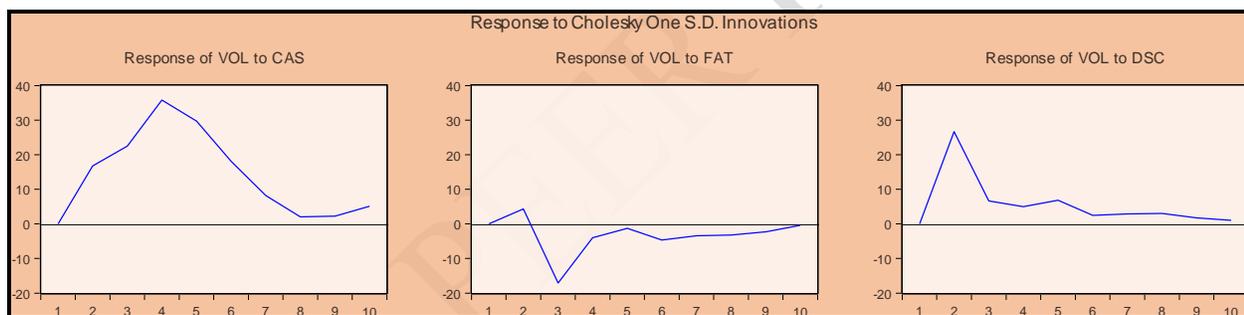


Figure 4.2: Impulse Response of Volume of Stocks Traded to Covid-19

Source: Source: Authors' Design (2021)

Figure 4.2 shows that VOL wiggled sharply to shocks from CAS considerably for almost throughout the period of the pandemic until it ebbed towards the close of it. For FAT, VOL only wiggled to the shock of VOL during the beginning of the pandemic but the shock dissipated thereafter. This is also similar to the response of VOL to shocks from DSC though in the opposite direction.

4. SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

This study was conducted to examine how Nigerian deposit money banks stocks reacted to the covid-19 pandemic in terms of price and volume traded from the inception of the pandemic in February, 2020 to August, 2021. For robust analysis, the study used a panel data of all the 15 (fifteen) deposit money banks listed on the Nigerian Stock Exchange (NSE) as at August 31st,

2021. Previous studies have used aggregate All Share Index (ASI) for the Exchange but the present study used monthly individuals' banks' stock data (price and volume of trade) and covid-19 three main statistics (confirmed cases, number of deaths and number discharged) to ascertain how the latter affected the former and how the former predicted changes and reacted to shocks in the latter during the period.

The relationship between banks' stock prices and volume of stock traded and the covid-19 pandemic was examined from three methodological perspectives: effect (panel least squares), predictive effect (vector autoregressive) and reaction (impulse response). Results of the random effect panel least squares (PLS) showed that while the number of covid-19 confirmed cases positively and significantly affected stock prices of Nigerian deposit money banks, the effect of number of deaths recorded had a significant negative effect on their stock prices. However, the positive effect of number of discharged covid-19 patients was not significant. Therefore, only the effect of number of deaths recorded agrees with the *apriori* expectation. The negative and positive effects of number of confirmed cases and number of deaths respectively on volume of stocks traded are both insignificant. However, the number of discharged cases exerts a negative and significant effect on volume of stocks traded for the banks, hence agrees with the *apriori* expectation. This is in agreement with the mixed results found by [24] and [25] but sharply contradict [13], [1] and [8].

The implication of these results is that the covid-19 pandemic significantly affected the stocks of Nigerian deposit money banks for the period under study. However, while the effect was positive on stock prices, it was negative on the volume of stocks traded by investors. The positive effect of number of confirmed covid-19 cases on the stock prices of the banks is interesting because it is expected that the pandemic should impair stock prices. One probable reason that can be adduced here is that although the stock market was shut down for some periods during the pandemic, banks' stock prices still increased as new positive cases of covid-19 were declared or that the fears and shocks arising from the cases declared jacked up stock prices.

From predictive effect perspective, the VAR results show that the covid-19 pandemic did not exert any predictive effect on stock prices of banks studied although it does on the volume of stocks traded in the short run (lag 1). This finding agrees with that of [8] that the predictive power of covid-19 on stock prices is weak. These findings further confirm the low correlation coefficients between covid-19 statistics and stock variables despite their being cointegrated.

From reaction perspective, results of the impulse response functions show that stock prices of the banks responded considerably to the shocks from number of covid-19 confirmed cases while its reaction to shocks from number of deaths and discharged cases was mild and quickly dissipated. Similarly, the volume of stocks traded reacted sharply to the number of confirmed cases for most part of the covid-19 pandemic but reacted mildly to number of deaths and number of patients discharged.

Afore analyses reveal that there is no empirical evidence that the covid-19 pandemic negatively impacted stock prices of Nigerian deposit money banks as it did on their volume of stocks traded on the Nigerian Stock Exchange. Investors' confidence appeared to still remained high when the stock market was re-opened for business although there was no evidence that the volume of stock traded increased as more covid-19 were reported even when stock prices were positively affected by it.

Based on findings from this research, we conclude that first, the pandemic positively affected stock prices of the deposit money banks studied while it negatively affected their volume of stocks traded. Secondly, the pandemic did not have any significant predictive effect on stock prices though it did on the volume of stocks traded by the banks. In addition, we conclude that the stocks of the DMBs reacted swiftly to the shocks from covid-19 only in terms of number of confirmed cases. It was obvious that the effect of the fears of uncertainty on DMBs stock prices and shocks attributable to the covid-19 attack were more preponderant during the early days of the pandemic especially when considered with respect to number of deaths due to it and the number of patients who recovered from it. Notwithstanding the positive effect of covid-19 on banks' stock prices, this study still advocates pro-active pandemic management strategies by the NSE and the Nigerian deposit money banks especially with respect to the facilities that enable trading in stocks beyond the brick-and-mortar platform provided by the floor of the Nigerian Stock Exchange. The NSE, on its part, should invest more in technology driven stock trading channels and platforms which can ensure that stock trading is not impaired by lockdowns, restrictions and pandemics.

The findings from this research have policy implications for the Nigerian government. Importantly, while we may agree that policies put in place by the government especially total and partial shutdowns, it is evident that such policies did not achieve optimal effect on the Nigerian capital market, at least as reflected in the stock prices of Nigerian banks for the period under study.

This calls for more long-range strategic counter-pandemic plans that can still stimulate the stock market even in times of crises that hinder brick and mortar trading.

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