COVID-19 Pandemic and Stock Market Performance in Nigeria

Nurudeen A. LAWAL[1], Kunle B. OSINUSI[2] and Jamiu O. BADMUS[3]

Department of Economics, College of Social and Management Sciences, Tai Solarin University of Education (TASUED), Ogun State, Nigeria

Email: [1]naf_lawal@yahoo.com; [2]osinusikb@tasued.edu.ng; [3]muhammedjamiubadmus@gmail.com

Abstract

This study investigates the effect of government intervention to the global pandemic on stock market performance in Nigeria. It employs daily data of the NSE All Share Index, WTI spot price and exchange rate data spanning from 6th of June, 2019 to 28th of September, 2020 and a dummy series that takes value of 1s from 30th of March, 2020 upward and 0s for the periods before the announcement of the lockdown restriction. Result from the ARDL model reveals that government policies have negative and significant transitory effects on stock returns however, the long run model shows existence of positive and significant relationship between the variables. The implication of our findings is relevant for predicting profitability and the performance of stock market in Nigeria particularly in turbulent periods.

Keywords: Stock returns; COVID-19 pandemic; government policies.

Introduction

The global pandemic which emerged in Wuhan city of China and extended to other parts of the world, including Nigeria, is admitted to be the worst ever economic crisis after the 1930 Great depression. The advent of the pandemic in Nigeria started with an index case on the 27th

of February 2020 before more cases erupted, which led to fear and panic in the country. The outbreak of the virus led to the collapse of different spheres of the global world due to fear and the implementation of different policies (such as lockdown restriction, social distancing, curfew, stimulus package, etc.) to curb the spread of the virus. These policies have been assumed to be the main drivers that curb the spread of the virus, however certain factors remain unverified. The issue of government intervention through restriction of movement and its subsequent effect on the returns of financial investors in Nigeria seemed not be in the limelight of research.

Due to the outbreak of the disease, several studies have emerged to examine its consequential effects on different economic sectors and indicators. Baker et al. (2020); Phan and Narayan (2020); Salisu and Akanni (2020); Salisu and Vo (2020); Xiong, Wu, Hou and Zhang (2020); Albuquerque, Koskinen, Yang and Zhang (2020); He, Sun, Zhang and Li (2020); Ji, Zhang and Zhao (2020); Conlon, Corbet and McGee (2020); Ashraf (2020a); and Mishra, Rath and Dash (2020) evaluated stock return and responses to COVID-19. Ding, Levine, Lin and Xie (2020) looked at community immunity while Altig et al. (2020) and Sharif, Aloui and Yarovaya (2020) addressed economic and policy uncertainty caused by the virus. Salisu, Ebuh and Usman (2020) and Prabheesh, Padhan and Garg (2020) entertained the issue of COVID-19 through the oil price-stock market nexus, while Narayan, Phan and Liu (2020) and Ashraf (2020b) were more concerned about government interventions during the period and its influence on stock returns. Iyke (2020a); Devpura and Narayan (2020); Narayan (2020); and Mensi, Sensoy, Vo and Kang (2020) focused on oil price fluctuation while Villarreal-Samaniego (2020) and Iyke (2020b) addressed the issue of exchange rate fluctuation during the COVID-19 period.

Meanwhile, despite the novelty of the COVID-19 pandemic, the literature on stock market performance has welcomed adequate empirical studies for policy references. For example, by studying the influence of government actions in response to the COVID-19 pandemic, Narayan, Phan and Liu (2020) gave a concise empirical explanation of the response of stock returns of G7 stock markets to COVID-19 pandemic policies in those countries. This paper constructed three models for each government intervention, namely, lockdown restriction, stimulus

package and travel ban, and the findings revealed that of all the models, only the rough restriction intervention safeguarded the stock investors from the effects of COVID-19. Ashraf (2020b) developed an empirical study of the effects of government directives such as social distancing, quarantine policies, palliative packages and awareness programmes on the stock returns of 77 countries using daily observations from the 22nd of January 2020 to the 17th of April, (2020). The study found that putting an end to social gatherings had an unmediated influence on returns, meanwhile, daily reduction in COVID-19 cases have had a considerable positive impact on stock market returns. However, other measures turned out to have positive effects on the stock returns of some selected markets. Mazur, Dang and Vega (2020) examined the interaction between the COVID-19 pandemic and US stock market crash, which showed that stocks react differently to external shocks due to COVID-19, but there was significant evidence that natural gas, food, healthcare and software stocks yielded profitable returns during the pandemic while the stocks of losers in the market reacted to nonlinear fluctuations which led to negative returns. Espinosa-Mendez and Arias (2020) on the other hand, concentrated on the movement of a composite index of stocks listed on the European market in order to account for the external shock caused by the global pandemic. The study found evidence of imitative behaviour by the more clueless brokers to follow the patterns of top gainers in the market.

The novelty of the global pandemic paved way for the development of the global fear index constructed by Salisu and Akanni (2020). The study came up with new evidence that the developed index is relevant for forecasting the stock returns of the OECD countries during the period of the pandemic. Al-Awadhi, Al-Saifi, Al-Awadhi and Alhamadi (2020) explored the influence of COVID-19 on a panel of 1579 stocks listed on the Chinese stock exchange market for daily observation spanning the period 10th January 2020 to 16th March (2020). Just as expected that growth in fear and panic might disrupt the smooth functioning of the market, the study reported that both reported confirmed daily cases and death cases had significant negative influence on the stock returns of the observed stocks. Similarly, Baig, Butt, Haroon and Rizvi (2020) examined the impact of death cases, panic and lockdowns that resulted from COVID-19 pandemic on the viability of the US equity markets. The study found evidence that both reported

confirmed daily cases and death cases were the main drivers of instability in the stock market. Ashraf (2020a) gave an empirical justification of stock markets reactions to COVID-19 daily confirmed and death cases. The study confirmed that stock market returns react negatively to the indicators, although the significance of the response is more profound for daily new cases. Also, the response of stock returns differs across the time horizon, in the sense that the birth stage of the virus recorded stronger reactive response of the stock index to the pandemic than in the subsequent period.

From the prior studies, there is evidence that the COVID-19 pandemic as an external shock affected the returns of investors in the capital market. Also, the literature on the COVID-19 pandemic as well as its effects on stock market performance has been extensively reviewed but little or no attention has been paid to the effect of government intervention through lockdown on business activities and peoples' movement on stock returns of financial agents in the Nigerian Stock Exchange. Thus, this study developed a simple error correction framework by constructing a dummy variable to capture government intervention and evaluate its transitory and permanent effects on the returns of investors in the Nigerian Stock Exchange. This study is relevant for both government and financial investors, in order to understand the importance of government intervention in the financial market during turbulent periods.

The remaining sections of this paper are arranged thus: the next section opens up the methodology; the next section presents the data employed and the summary statistics of the series, followed by a documentation of the empirical analysis and conclusion as well as policy implications.

Methodology

The empirical model specification of this study follows that of Narayan, Phan and Liu (2020), however, oil price is considered as a global commodity which influence changes in stock returns. The model also accommodates exchange rate so as to account for the relevance of currency in the stock exchange market. Thus, we specify our empirical model in an autoregressive distributed lag framework as follows:

$$\Delta SR_t = \theta + \sum_{k=1}^{a} \varphi_{1k} \Delta SR_{t-k} + \sum_{k=0}^{b} \varphi_{2k} \Delta GOVT_{t-k} + \sum_{k=0}^{c} \varphi_{3k} \Delta OR_{t-k} + \sum_{k=0}^{d} \varphi_{4k} \Delta EXR_{t-k} + \rho SR_{t-1} + \omega GOVT_{t-1} + \Psi OR_{t-1} + \Phi EXR_{t-1} + \epsilon_t \quad (1)$$

where:

SR = stock returns

$GOVT$ = dummy variable for government lockdown directive

OR = oil price returns

EXR = exchange rate returns

The dummy series of government lockdown restriction assume 0 for periods prior to lockdown restriction and 1 thereafter. Since we are more concerned about its effects on stock returns, a negative estimate indicates that government intervention through lockdown reduces the stock returns of the investors while a positive estimate justifies positive higher returns due to government intervention. Equation (1) contains the long-run and short-run estimates, where the values of ω, Ψ and Φ are expressed on ρ to generate the long-run parameters of government lockdown directive $(-\omega/\rho)$, oil price return $(-\Psi/\rho)$ and exchange rate return $(-\Phi/\rho)$, due to the fact that $\Delta SR_t = \Delta GOVT_t = \Delta OR_t = \Delta EXR_t = 0$ in the long run. However, the short-term estimates are φ_1 to φ_4 while a, b, c and d represent the lag order for each variable, which were chosen using the Schwarz Information Criterion (SIC).

To determine the speed of adjustment in an error correction framework, equation (1) is specified with the inclusion of speed of adjustment term as follows:

$$\Delta SR_t = \theta + \sum_{k=1}^{a} \varphi_{1k} \Delta SR_{t-k} + \sum_{k=0}^{b} \varphi_{2k} \Delta GOVT_{t-k} + \sum_{k=0}^{c} \varphi_{3k} \Delta OR_{t-k} + \sum_{k=0}^{d} \varphi_{4k} \Delta EXR_{t-k} + \delta ect_{t-1} \quad (2)$$

where $ect_{t-1}$is a one-time lagged error correction term that narrates the adjustment period of the variables to long-run equilibrium. Following the specification in equation (2), adjustment to long-run equilibrium is inferred if the ect_{t-1} is significant and negative. Thus, the null hypothesis is stated as ect_{t-1}= 0 against an alternative hypothesis of $ect_{t-1} < 0$. This is complemented by the bounds test to cointegration. To infer long-run cointegration, the F-statistic must be greater than the upper band critical values, however, if the F-statistic is less than the lower critical values, a short-run relationship exists while the test becomes inconclusive if the statistic value stands in-between the upper and lower band critical values.

Data and Summary Statistics

This study analysed the influence of government policies on stock market performance in Nigeria from 6th June 2019 to 28th September (2020). The data for the Nigerian Stock Exchange (NSE) All Share Index and naira exchange rate to the dollar were sourced from investing.com via https://ng.investing.com/indices/nse-all-share-historical-data and https://ng.investing.com/currencies/usd-ngn-historical-data, respectively, while data on global oil price proxied by West Texas Intermediate (WTI) spot price was sourced from the web portal of the US Energy Information Administration via http://www.eia.gov/dnav/pet/pet_spt_s1_d.htm. To capture government lockdown policy, we adopted the date for the announcement of the lockdown directive, which was 30th March 2020, where periods prior to the date connote period without lockdown policy and periods thereafter represent time period with government restriction. The date of the lockdown directive was obtained from Wikipedia.

The descriptive analysis of the return series of the variables is presented in Table 1. The results reveal that all the returns series were characterized with fat-tailed and left-skewed distribution, which was supported by the outcome of the Jarque-Bera statistic that the returns are not normally distributed over time. The preliminary testing for empirical analysis was carried out through the Augmented Dickey-Fuller unit root test. The outcome of the test revealed level stationarity of all the returns series, since the returns process was a log of the first differencing operator. Due to the evidence of stationarity, we proceeded to develop the Autoregressive Distributed Lag (ARDL) model by Pesaran, Shin and Smith (2001), which complements the major thrust of this study.

Table 1: Summary of statistics

Variables	SR	OR	EXR
Mean	-0.0005	0.0013	0.0007
Median	-0.0005	0.0005	0.0000
Standard Deviation	0.0087	0.0619	0.0113
Skewness	-0.6021	1.1042	15.6114
Kurtosis	9.2641	18.8418	264.8350
Jarque-Bera	554.3852***	3464.492***	947379.1***
ADF	-8.5794***	-12.0156***	-21.0949***

Notes: The return values of stock returns (SR), oil price returns (OR) and exchange rate returns (EXR) are calculated as $r_t = \log\left(\frac{p_t}{p_{t-1}}\right) \times 100$.

The Augmented Dickey Fuller (ADF) unit root test shows the stationarity of the series at levels.

*** denote significance at 1% level.

Empirical analysis

The estimation process of the empirical model started with the analysis of the bounds test to cointegration. The results (see Table 2) reveal evidence of long-run association among the stock returns, dummy variable of government intervention, oil price and exchange rate returns since the F-statistic is larger than the upper and lower bound limit at 1, 5 and 10% levels.

Table 2: Cointegration test

F-statistic	41.2881	
Critical Values	Lower Bound	Upper Bound
1%	3.65	4.66
5%	2.79	3.67
10%	2.37	3.20

Note: The table reports the Pesaran et al. (2001) bounds test to cointegration estimates with a null of no levels relationship at 1%, 5% and 10% significant levels.

Since the outcome of the cointegration test justified the existence of a long-run relationship among the variables, we then proceeded further to estimate the ARDL model for the long-run and short-run parameters of the variables. This is presented in Table 3.

Going by the result of the short-run estimates, the lag effect of stock returns on the current short run is negative and statistically significant, which implies that previous stock returns had a negative effect on the current stock return. Government intervention through lockdown restriction to cushion the effects of the COVID-19 pandemic, had a negative effect on stock returns. The higher lags of the government intervention seem to have had negative and positive effects on stock returns of firms but the positive effect was not significant. This clearly shows that the short-run effects of federal government implementation of lockdown on businesses, commercial and private airlines, closure of borders and airports and restriction of peoples' movement had an immediate significant negative relationship with the stock returns since the firms found it difficult to operate due to fear, panic and federal government directives. The oil returns had a short-run positive and significant impact on the stock returns while there is evidence that exchange rate devaluation had a negative effect on the stock returns of the firms in the same period.

Turning to the long-term estimates, the intention was to investigate whether the short-run estimate transcends the long-run parameters. The lower section of Table 3 reports the long-run estimates, where evidence of long-run positive and significant impact of government lockdown restriction on stock returns was found. This implies that investors were able to hedge against the threat posed by

government lockdown policies in the long run, having studied the guidelines of the policies. The gradual ease of the lockdown phases also contributed to the recovery of the stock market for investors to make profitable gain in the market. The long-run estimates of oil returns and exchange rate returns maintained their initial short-term influence on stock returns, which implies that fluctuations in oil prices and the exchange rate had the same transitory and permanent effects on stock returns of financial agents on the Nigerian Stock Exchange.

Table 3: Regression result of the ARDL model

Short-run Estimates: ΔSR				
Variables	Coefficient	Standard Error	t-statistics	Probability
ΔSR(-1)	-0.6267***	0.0501	-12.5022	0.0000
ΔGOVT	-0.0229***	0.0076	-3.0164	0.0028
ΔGOVT(-1)	0.0103	0.0077	1.3236	0.1866
ΔGOVT(-2)	-0.0245***	0.0080	-3.0464	0.0025
ΔOR	0.0387***	0.0074	5.2415	0.0000
ΔEXR	-0.1337***	0.0373	-3.5896	0.0004
Long-run Estimates: SR				
GOVT	0.0030**	0.0014	2.1223	0.0346
OR	0.0618***	0.0132	4.6870	0.0000
EXR	-0.2134***	0.0621	-3.4386	0.0007
C	-0.0012	0.0009	-1.4623	0.1447

Notes: The table presents the full estimates of the long-run and short-run relationships among stock returns (SR), government intervention (GOVT), oil price returns (OR) and exchange rate returns (EXR).

** and *** represent the significant levels at 5% and 1%, respectively.

Table 4 presents the diagnostic tests. The speed of adjustment of the variables was measured as a one-time lag error correction term (ECT). The result shows that despite short-run disequilibrium, the variables were able to adjust back to equilibrium in the long run at the degree of 63%. Thus, this complements the result of the bounds test to cointegration, implying the existence of co-integrating long-run relationships among the variables. Having reported an error correction term, we proceeded to interpret other post-estimation tests to ascertain

whether the successive error terms were normally distributed, serially uncorrelated, homoscedastic and linearly specified. The test for normality revealed non-normal distribution of the error terms due to significance of the estimate. The Breusch-Godfrey LM test presented evidence of serial independence and the ARCH LM test also revealed the non-rejection of the null hypothesis of homoscedasticity in the error terms. The Ramsey Regression Equation Specification Error Test (RESET) was significant, which revealed the rejection of the null hypothesis of linear specification of the estimated model. Lastly, we tested for the stability of the estimated model through the CUSUM and CUSUMSQ residual tests. To ascertain the stability of the estimated model, the blue line plot of the CUSUM and CUSUMSQ estimates must lie in-between the two red straight lines of 5% significance level. Based on the reported stability tests, the estimated model is stable since the blue line lay in-between the straight red lines that denote 5% level of significance.

Table 4: Diagnostic Tests

Tests	Statistic	Probability
ECT(-1)	-0.6267	0.0000
Normality	74.7904	0.0000
Breusch-Godfrey LM	0.7566	0.4701
ARCH	1.2536	0.1907
Ramsey RESET	9.206	0.0026

Note: The table presents the post-estimation tests for the estimated model.

*** indicate significance level at 1%.

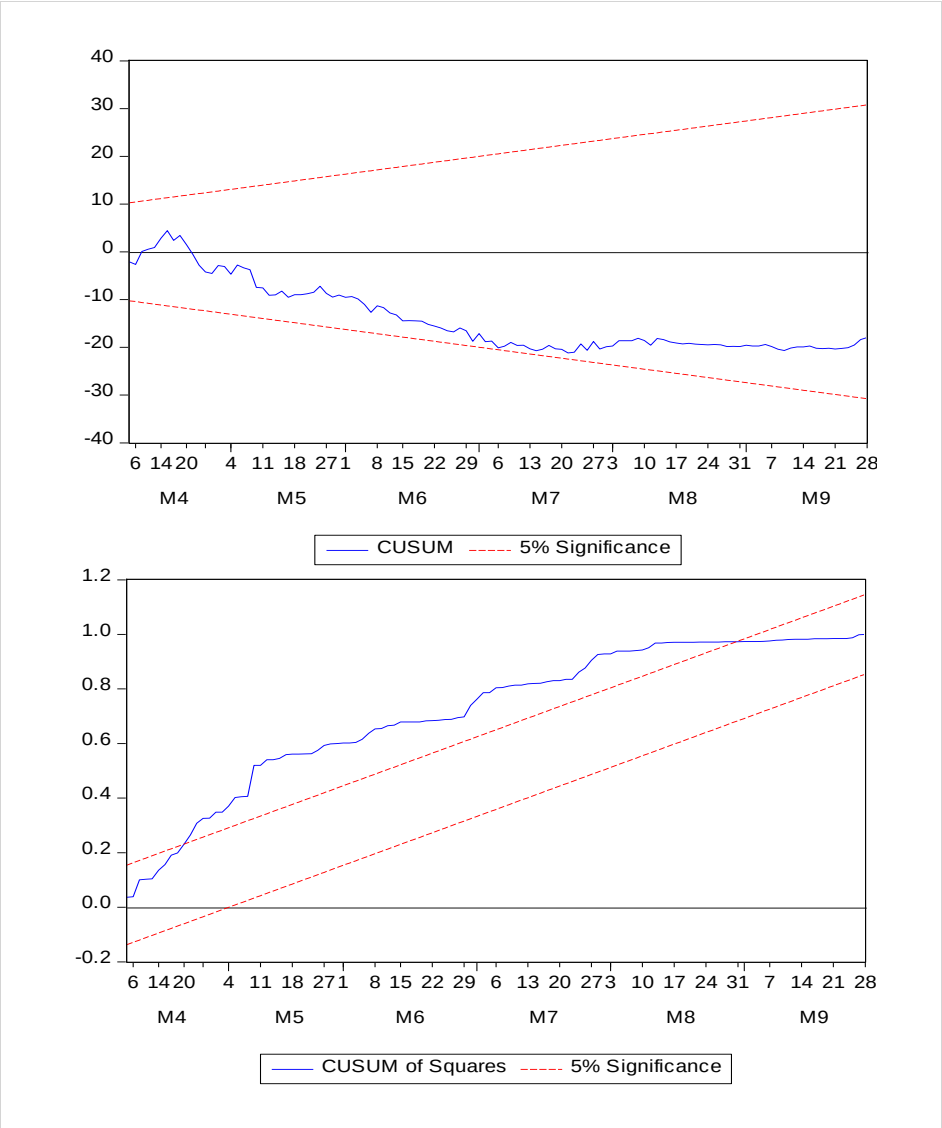

Figure 1: Cumulative sum and squared residual tests for stability

Conclusion

This study investigated the consequential effects of Nigeria's government intervention of lockdown restriction during the COVID-19 pandemic on stock returns of financial investors on the Nigerian Stock

Exchange (NSE). A simple linear Autoregressive Distributed Lag (ARDL) model was developed using daily time series of the NSE All Share Index, WTI spot price and exchange rate data spanning 6th June 2019 to 28th September (2020). Also, a dummy series was developed that took value of 1s from 30th March 2020 upward and the period before was represented by 0. This is due to the fact that the federal government announced the implementation of the lockdown restriction in the country on the said date of partitioning.

The estimates of the short-run and long-run model revealed that government intervention had a negative transitory influence on stock returns, however, the long-term relationship was positive. Also, the result indicated that oil price and exchange rate had short-term and long-term positive and negative influences respectively on stock returns in Nigeria. The findings of this study contribute to the literature on government interventionary policies in response to the COVID-19 pandemic; stock market performance in turbulent periods and oil price and exchange rate fluctuations in Nigeria. The evidence documented in this study is useful to both financial investors and policy makers. On the part of policy makers, it is important to note that the implementation of precautionary policies to curb the spread of diseases is essential at the early stage of the outbreak to control the disease. Relating the scenario to investors, they should uphold their investment conscience during trying times for the cushion effect of government preventive measures to stabilize the performance of the financial market. This way, investors would be able gain from the accrued profit in the market.

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