RESEARCH ARTICLE

EFFECTS OF SELECTED MACROECONOMIC VARIABLES ON STOCK MARKET PERFORMANCE IN NIGERIA

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ARTICLE DETAILS

ABSTRACT

In spite of the vital role played by the stock exchange market in the overall national development, it is still performing below expectations in Nigeria owing to several macroeconomic factors. The main objective of this study is to investigate the effects of selected macroeconomic variables on stock market performance in Nigeria. The study employed time-series data obtained from the Central Bank of Nigeria's statistical bulletin and World Development Indicators. Stock market performance was measured using the all-shares index while the identified macroeconomic variables included GDP growth, broad money supply, exchange rate, savings interest rate, and inflation rate. An Autoregressive Distributive Lag (ARDL) estimation technique was used to establish the long run relationship among the variables, and it was revealed that a long run relationship existed among the variables in the estimated model. The result shows that macroeconomic variables such as gross domestic product, broad money supply, exchange rate, and savings interest rate have a positive effect on stock market performance in Nigeria. On the other hand, the results showed that the inflation rate has a negative effect on stock market performance in Nigeria. Predicated on the result, the study recommended that policies to increase gross domestic product, exchange rate, interest rate, and money supply should be implemented because they can lead to an improvement in the performance of the stock market, while the inflation rate should be maintained at a single digit to prevent its negative effect on the performance of the stock market in Nigeria.

KEYWORDS

Exchange Rate, Inflation Rate, Money Supply, Growth

1. INTRODUCTION

The importance of the stock market as an efficient channel for financial intermediation has been well recognized in academic and political circles as a major determinant of economic growth in both developed and developing nations. The pooling of domestic savings and the mobilization of foreign capital for productive investment in a developing economy through the capital market will help to promote an efficient and effective financial system. Mishra and Mishra opined that the capital raising efforts of some domestic enterprises are hindered by illiquidity and the high cost of transactions and may push them to foreign markets (Mishra and Mishra, 2010). Empirical studies have identified three fundamental channels through which capital markets and economic growth can be linked. First, the proportion of savings that is channeled to investment is propelled by capital market development. Second, the development of the capital market may lead to a change in the savings rate and hence influence the investment drive. Third, the efficiency of capital allocation can be increased by capital market development.

The stock exchange market in Nigeria has exhibited tremendous improvement in stock indices as an obvious transformation has been witnessed in the Nigerian stock market (Riman et al., 2008). This is evidenced by the number of public and private participants on the floor of the market. For example, the overall market capitalization had risen consistently from N6.6 billion in 1985 to N285.8 billion in 1996, fell marginally to N281.9 billion in 1997, and rose again to N472.3 billion in 2000. However, market capitalization increased from N662.5 billion in 2001 to N9, 918.2 billion in 2010, then increased steadily from N10, 275.3 billion in 2011 to N19, 077.4 billion in 2015 before plummeting to N16, 185.7 billion in 2016 due to Nigeria's recession. The recovery from the crisis led to an increase in market capitalization from N16,185.7 billion in 2016 to N21,904.0 billion in 2020 (CBN, 2020). In the same vein, statistics have shown that there were improvements in all share indexes in the stock market. In absolute terms, the all-shares index rose from 127.3 basis points in 1985 to 8, 11.0 in 2000 and 24,770.5 in 2010. It further rose to 41,329.2 in 2013 but plummeted to 31,430.5 in 2020 (CBN, 2020).

Nevertheless, certain macroeconomic factors in an economy influence the efficient performance of the stock market. The sensitivity of stock performance can be judged based on the movement of these factors. Predicated on these, foreign investors and governments can make rational decisions on the allocation and timing of acquiring stocks on the floor of the market. The main objective of this study is to investigate the impact of selected macroeconomic variables on stock market performance in Nigeria. The study covers the years 1985 to 2020, using data on an annual basis.

1.1 Trend of Stock Market Indicators in Nigeria, 1985–2020

The analysis of the performance of the stock market in Nigeria is

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undertaken using indicators such as share index and market capitalization. As indicated in figure 1, the all-shares index increased consistently from 127.30 basis points in 1985 to 513.80 basis points in 1990. The all shares index thereafter increased rapidly from 513.80 basis points in 1990 to 1,107.60 basis points in 1992 and further increased to 5,092.20 basis points in 1995. From 1999 to 2000, the All-Shares Index fluctuated between 5,266.40 basis points and 8,111.00 basis points. The all-share index rose again rapidly from 8,111.00 basis points in 2000 to 24,085.80 basis points in 2005, then rose to 57,990.20 basis points in 2007, but fell sharply to 20,827.17 basis points in 2009 due to the global financial crunch. The index fluctuates between 24,770.52 basis points in 2010 and 21,904.04 basis points in 2020 (CBN, 2020).

It was equally shown from the trend that market capitalization rose from N6.60 billion in 1985 to N281.9 billion in 1997, fell marginally to N262.6 billion in 1998, and thereafter rose consistently to N9, 918.2 billion in the year 2010. Market capitalization, however, fell from N17,003.4 billion in 2015 to N16,185.7 billion in 2016 during Nigeria's economic recession but thereafter rose marginally from N21,128.9 billion in 2017 to N21,904.0 billion in 2020 (CBN, 2020). This indicates that trading activities in the Nigerian capital market are unstable. However, different reasons may be attributed to these re-occurring fluctuations as far as the Nigerian economy is concerned.
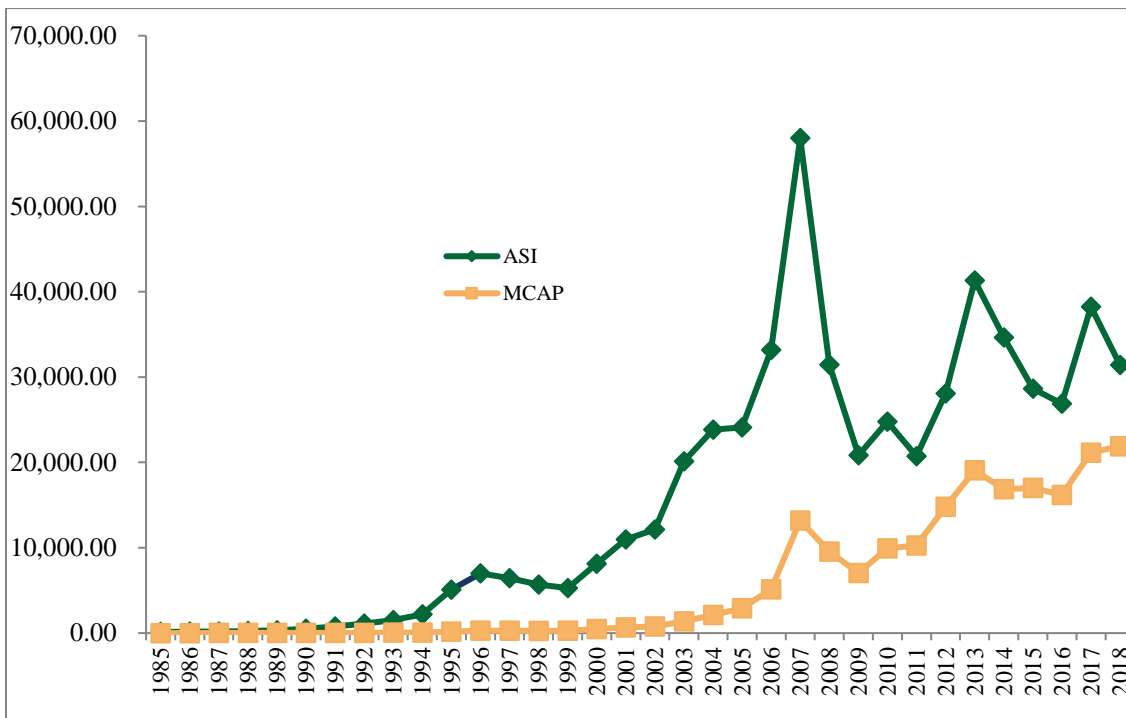

Figure 1: Trend of stock market indicators in Nigeria (Source: Authors' compilation, 2021)
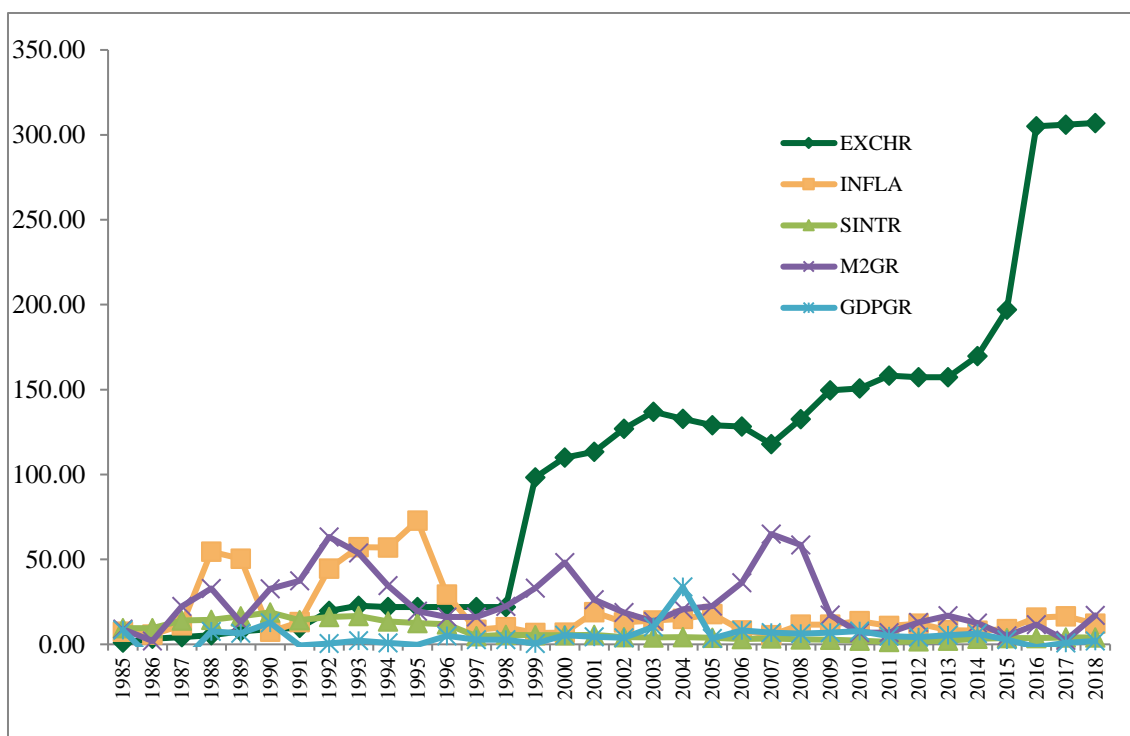

Figure 2: Trend of macroeconomic indicators in Nigeria (Source: Authors' compilation, 2021).

1.2 Trends of Macroeconomic Variables in Nigeria, 1985-2020

The trend of selected macroeconomic variables captured in this study is presented above. The aim is to examine their movements during the

evaluation period. Figure 2 shows the current trend in gross domestic product and other macroeconomic indicators. The figure shows that gross domestic product hovers around a deterministic trend throughout the period under review. GDP increased gradually from 8.3 percent in 1985 to

12.8 percent in 1990. Output growth was contrived during the 1990s, with a negative value of 0.6 percent in 1991 and a positive value of 0.5 percent in 1999. It rose from 3.4 percent in 2005 to 7.3 percent in 2009. This trend was due to a rise in the volume of petroleum production as well as an increase in foreign capital inflows into the Nigerian economy as a result of democratic sustainability in the country. The growth rate of GDP was 2.7 percent in 2015 but trended negative in 2016 at 1.6 percent, thereby plunging the country into recession. In 2019 and 2020, it was 1.9 percent.

The trend in the inflation rate shows that it was 7.4 percent and 57.0 percent between 1985 and 1994 before reaching an all-time high of 72.8 percent in 1995. Between 2001 and 2007, the inflation rate fluctuated between 18.9 percent and 5.4 percent. It was in the single digits in 2014, at 8.1 percent, but increased to 12.1 percent in 2018. Movement in the exchange rate as indicated shows that the exchange rate was N1.00 to 1 US dollar in 1985. Following the liberalization of the Nigerian economy in 1986, the naira exchange rate was devalued against the US dollar. This led to the fall in the exchange rate to N3.3 to 1 US dollar in 1986. And by 1990, N9.00 was exchanged for 1 US dollar. By 2000, the devaluation had become an issue as N110.05 was exchanged for 1 US dollar.

The devaluation of the currency continued unabated up until 2018 when N307.0 was exchanged for 1 US dollar. The growth rate of the money supply increased from 8.9 percent in 1985 to 48.07 percent in 2000. It peaked at 64.92 percent in 2007 before falling to 2.30 percent in 2017. It skyrocketed to 17.10 percent in 2019 and 2020. As shown in Figure 2, the savings deposit rate rose from 9.5 percent in 1985 to 18.8 percent in 1990 but dropped steadily to 5.29 percent in the year 2000. Following the liberalization of interest rates, the savings deposit rate assumed double digits. Savings deposit rates fell from 5.49 percent in 2001 to 1.41 percent in 2011, before rising slightly to 4.07 percent in 2020.

2. THEORETICAL UNDERPINNINGS

This study is rooted in the efficient market hypothesis. This theory was developed by which holds that in an efficient market, stock prices adjust instantaneously to reflect new information such that it becomes difficult for an individual to trade on such information and earn abnormal returns (Fama, 1965). That is, the prices of publicly traded assets reflect both historical and current information. In other words, asset prices adjust instantly to all current information relating to them.

2.1 Empirical Evidence

A group researchers utilized quarterly data from 2000 to 2009 in examining the macroeconomic determinants of stock market development in Kenya (Amadi et al., 2012). The study employed both the co-integration test and the error correction model (ECM) in testing the dynamic relationship between the variables. The autoregressive distributed lay (ARDL) approach was equally used to analyze the stock market's development. The results of the co-integration test showed that there was a long-run equilibrium relationship among the variables in the model. El-Nader and Alraimony studied the major macro-indicators affecting stock market development (El-Nader and Alraimony, 2013).

The error correction model shows that macroeconomic indicators such as gross capital formation growth rate, money supply growth rate, consumer price index, stock market liquidity growth rate, and credit to private sector growth rate have a positive relationship with stock market development, while the growth rate of net remittance has a negative effect on stock market performance. Shafana investigated how macroeconomic variables such as the all-shares index and the Mitarka price index in Sri Lanka influenced stock market performance between 2008 and 2012 using annual data (Shafana, 2013). The result of the analysis indicated that the treasury bill rate, exchange rate, and inflation rate jointly explained about 85.5 percent of the variation in the share price index and 75.2 percent of the Mitarka price index.

Onyinyechi and Mlanga investigated the role of macroeconomic variables in determining the stock market performance in Nigeria using annual time series data covering a period from 2009 to 2018 (Onyinyechi and Mlanga, 2019). The results from the regression analysis indicate that the exchange rate and interest rate do not have a significant impact on the share price index while the inflation rate exerts a significant negative influence on the share price index. On the contrary, and in line with the concept of GDP and stock market performance, GDP significantly and positively impacts the share price index. The study, among others, suggests that the growth of the economy should be maintained to keep the stock market flourishing while macroeconomic variables such as inflation, interest rate and exchange rate should be appropriately regulated by the relevant authorities to curtail all negative influences on stock market performance.

3. METHODOLOGY

The design adopted in this study was an ex post facto (after the fact) design. This is because the events had already taken place before the investigation was carried out. The choice of this design was made because the researchers had no control of the independent variables and inferences about the relationship among the variables are made without the current interaction between the regress and regressors. The design is predicated on various econometric techniques such as the Augmented Dickey-Fuller (ADF) unit root test and the autoregressive distributive lag model, as well as the trend analysis of stylized facts on some of the indicators of variables of concern. The dependent variable for this study is the all-shares index, while the independent variables are interest rate (i.e., savings deposit rate), exchange rate, inflation rate, gross domestic product growth rate, and the growth rate of broad money supply. The model for this study, in its functional form, is expressed as:

$$ASI = f (ASI, GDPGR, M2GR, EXCHR, SINTR, INFLA)$$

$$1$$

Where:

ASI = All shares index, measuring stock market performance in Nigeria (in basis point).

SINT = Savings interest rate, represented by savings deposit rate

INFLA = Inflation rate in Nigeria (in percent)

GDPGR = Gross domestic product in Nigeria (growth rate)

M2GR = Broad money supply in Nigeria (growth rate)

EXCHR = Exchange rate (units of naira per US dollar)

The equation in 3.1 is then written in a linear form as follows.

$$ASI_{t-i} = a_0 + a_1 ASI_{t-i} + a_2 GDPGR_{t-i} + a_3 M2GR_{t-i} + a_4 EXCHR_{t-i} + a_5 SINTR_{t-i} + a_6 INFLA_{t-i} + U_t 2$$

Where: a_0, a_1, a_2, a_3, a_4, a_5, a_6 are the parameters to be estimated; U_t is the random error term; and t-i is the lagged values of the variables captured in the equation, for which i= 0,1, 2..., n. The significance of the lagged values is meant to measure the effect of past values of both the dependent and independent variables on the current value of the dependent variable. The All-Shares Index represents stock market performance, reflecting the composite value of the market characteristics. It is therefore a representative of the performance of the entire stock market. The interest rate used in this study is the savings deposit rate. Also, gross domestic product is used in this study as income. The inflation rate is captured in this study as a measure of macroeconomic instability.

The sources of data were basically secondary, like the publication of the Nigeria Stock Exchange, the Central Bank of Nigeria, and World Development Indicators.

4. RESULTS AND DISCUSSION

4.1 Unit Root Test

We employed the bound testing approach and established the long-run relationship among the variables. However, the validity of the results depends on the stationarity of the time series data. Therefore, the first task is to check for unit root. As indicated in table 1, GDPGR and M2GR were stationary at their levels. In other words, the variables are integrated of order zero (i.e., I(0)). However, EXCHR, SINTR, and INFLA became stationary after first differencing. The aforementioned variables are therefore integrated into order one, i.e., they are I (1). Where some of the variables are I(0) while others are I(1), one suggests the problem of unit root in the equations.

It becomes imperative to perform co-integration tests to determine the presence of an equilibrium relationship amongst the variables. The study adopts the ARDL bound testing technique for co-integration as the variables are integrated into diverse orders (i.e., order zero and order one). The choice of the ARDL is justified by its ability to isolate the issue of order of integration, suitability for small sample investigation, and the provision of unbiased estimates of the long run model with applicable t-statistics. ARDL can be used when there is a mixed order of integration (i.e., a combination of I(0) and I(1) or both). It equally involves just a single equation set up, making it simple to implement and interpret, and different variables can be assigned different lag lengths as they enter the model.

Table 1: ADF unit root test results						
Variables	ADF Level	1st Difference	Order of Integration	1% Critical value	5% Critical value	10% Critical value
ASI	-1.568062	-5.814525	I(1)	-3.737853	-2.991878	-2.635542
GDPGR	-4.485293	-	I(0)	-3.737853	-2.991878	-2.635542
M2GDP	-3.780974	-	I(0)	-3.737853	-2.991878	-2.635542
EXCHR	-0.722698	-4.920822	I(1)	-3.737853	-2.991878	-2.635542
SINTR	-0.959563	-5.811701	I(1)	-3.737853	-2.991878	-2.635542
INFLA	-2.128255	-3.300588	I(1)	-3.737853	-2.991878	-2.635542

Source: Researcher's computation, using Eviews 9.

4.2 Selection Criterion for Lag Length

The efficiency and validity of an error correction model depend on the lag structure. The study used VAR lag order selection criteria to determine the lag lengths. The study employed the Akaike Information Criterion (AIC), and the result shows three optimal lag lengths as shown in table 4.2. In order to reduce the possibility of underestimation whilst maximizing the likelihood of recovering the true lag, the study used three as the maximum lag lengths. Since our sample size is relatively small, the choice of using the AIC approach is appropriate for this study. Thus, our proposed ARDL estimate is based on lag 3 as shown in table 2.

Table 2: Endogenous variables: ASI GDPGR M2GR EXCHR SINTR INFLA						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-940.9687	NA	1.38e+19	61.09476	61.37230	61.18523
1	-843.5325	150.8690	2.74e+17	57.13113	59.07395*	57.76444
2	-807.2984	42.07829	3.58e+17	57.11603	60.72412	58.29218
3	-735.4182	55.64922*	8.50e+16*	54.80117*	60.07455	56.52016*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)   SC: Schwarz information criterion

FPE: Final prediction error   HQ: Hannan-Quinn information criterion

AIC: Akaike information criterion

4.3 Co-Integration Test Results

From the results reported in Table 3, a long-run relationship exists amongst the variables in the estimated equation, given that the value of the F-statistic (8.942) is greater than the critical value at five percent level in both the upper (3.79) and lower (2.62) bounds. Therefore, the null hypothesis of the absence of co-integration is rejected, while the study proceeds to estimate the long-run coefficient of the equation.

Table 3: Co-integration test results					
	5% critical value				
Equation	K	F-Stat	I (0)	I (I)	Outcome
ASI = f(GDPGR, M2GR, EXCHR, SINTR, INFLA)	5	8.942	2.62	3.79	Co-integration

Note: K =number of parameters

Source: Researcher's computation, using Eviews 9.

5. DISCUSSION

The estimated result confirms the presence of a long-run relationship among the variables in the model. It also shows that the speed of adjustments is high in the estimated model. The value of the adjusted R-squared (0.80) implies that the model has good fit and high explanatory power, as it explains about 80 percent of the total variation in the dependent variable, leaving only about 20 percent for those variables not captured in the model. The Durbin-Watson statistic of 2.90 connotes the absence of autocorrelation in the estimated model. The study, therefore, accepts the null hypothesis of no serial correlation in the model. This further implies that the error terms of different periods are not serially correlated. At a 5% level of significance, the F-statistic value of 6.81 indicates that the model is generally reliable and statistically significant.

Based on the results, it showed that the previous one-period value of the all-shares index has a positive and significant impact on its current value in Nigeria. This means that a one percent increase in the one-period lag value of all the shares index will instigate a rise in the current value of all the shares index by 0.43 percent, ceteris paribus. The one-period lag of the all-shares index was statistically significant, implying that the all-shares index is an essential variable that influences stock market performance in Nigeria. As a result, the change in GDP directly affects all share indexes and is statistically significant in the current period. This is an indication of the positive impact of economic growth on stock market performance in Nigeria. However, the relationship between the gross domestic product growth rate and the all-shares index became negative after the first and second period lags.

As a result, a one percent increase in GDP growth rate causes a 22.76 percent increase in all share indexes in the current period, but decreases all share index values by 141.94 and 1211.59 percent, respectively. The non-significance of broad money supply could be justified on the ground that Nigeria's financial system needs to perform better in the area of aggregate money stock for the exchange market to improve. As a result, a 1% increase in the broad money supply causes the all-share index to rise by 225.995 basis points. In absolute terms, a 1% increase in the exchange rate resulted in a 3.02 and 82.95 percent decrease in the all-shares index in the current and second period lags, respectively. Exchange rate and the index of all stocks were positively related after the first period of lag. This variable was found to be statistically insignificant in influencing all share indexes in Nigeria. In Nigeria, a 1% increase in current interest rates and a one-period lag in interest rates resulted in an increase in the all share index of 1248.77 and 855.87 basis points, respectively.

The relationship between the savings interest rate and the all-shares index is indirect after one period lag, with a coefficient of 219.55. Statistically, the variable was insignificant in influencing all share indexes in Nigeria. Further analysis of the results showed that the rate of price changes (inflation) has an indirect effect on all share indexes in the economy. This result is in line with economic theories. In practice, the results showed that a 1% increase in the general price level causes a 17.83 and 238.54 percent drop in all share indexes at the current and first period lags, respectively, rate was found to be statistically significant in influencing all share indexes

in Nigeria after the first period of lag.

6. CONCLUSION

The study was carried out to examine the effect of selected macroeconomic variables such as gross domestic product, broad money supply, exchange rate, saving interest rate, and inflation rate on stock market performance in Nigeria. It is generally acknowledged that the efficient functioning of the stock market is vital to the growth and development of the economy. Therefore, the study concludes that gross domestic product, broad money supply, exchange rate, and saving interest rate have a positive effect on the performance of the stock market in Nigeria, while the inflation rate has a negative effect on the stock market. It further means that these variables are policy variables that must be considered if stock market performance is to improve.

Based on the findings, we recommend the implementation of policies aimed at increasing the aggregate output of the economy. This can be achieved by providing basic infrastructures such as steady electricity supply, functional transport and communication facilities, and a stable political environment in the country. Money supply should be increased to ensure efficient financial deepening of the Nigerian economy. However, caution must be exercised not to embark on an excessive supply of money, as this can trigger inflation and hurt the performance of the stock market.

Hence, money should be channeled through the productive sectors of the economy like infrastructural development and manufacturing. Proper management of the current exchange rate system in Nigeria is relevant. In essence, the devaluation process should be managed properly to avoid a further decline in the performance of the stock market. Caution must be taken in implementing policies that affect interest rates (such as the savings deposit rate and the treasury bill rate). This is because any attempt to increase or decrease it will either attract or scare investment in the financial sector in general and the stock market in particular. Therefore, adequate consultation between stakeholders is required before considering a change in interest rate.

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