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Analysis of the Impact of Key Macroeconomic Variables on Stock Market Development in Nigeria

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Abstract
The study investigates the impact of key macroeconomic variables on stock development in Nigeria. The macroeconomic variables investigated include money supply, inflation, interest rate, exchange rate, trade openness and all share index from 1986 to 2019. The Augmented Dickey Fuller and Phillips Perron and Auto regressive Distributive Lag (ARD)model. Based on the findings the long run relationship indicates that money supply has a positive and statistically significant impact on all share index. Furthermore, the exchange rate has positive but statistically insignificant effects on all share indices. The interest rate indicates positive and statistically significant effects on all share indices. Trade openness indicates positive but statistically insignificant effect on all share index in Nigeria. Inflation rate shows negative and statistically insignificant effect on all share index in Nigeria. Interestingly, the error correction term (ECT) met all its theoretical and statistical requirements of both in the sign and size. It measures the speed of adjustment towards equilibrium after the initial deviation is corrected. The ECT coefficient is -0.201711and significant at 5%, this indicates that at 20 % of the disequilibrium due to the shock in the previous years is adjusted back to the long run equilibrium in the current year. Based on the findings, the current study recommends that regulatory authorities and policy makers should ensure general stability in money supply and exchange rates by promoting trade in the economy.

Keywords: Macroeconomic Variables, Stock Development, Share Index, Nigeria.

1. Introduction

The economic development of all nations requires availability of long-term capital. The stock market is one of the most vital components of a free-market economy, as it helps to arrange capital for the companies from shareholders in exchange for shares in ownership to the investors. In the pre-1970 era, Nigerian stock market was less explored because the economy was basically agrarian and the various regional governments largely achieved food security (Maku and Atanda, 2009). Nigeria realized the need to encourage private capital for development early enough with the establishment of the Nigerian Stock Exchange (NSE) (formerly called the Lagos Stock Exchange) in 1961 as a base to develop the capital market. Since the deregulation of the economy in 1986, the stock market has grown very significantly.

Stock prices can be considered as an indicator of a country's economic status and social mood and are seen as a leading indicator of real economic activity. Share prices also affect the wealth of households and their consumption, savings and investment decisions. Thus, it can be said that the stock market is an integral part of the financial system of any economy, as it plays a significant role in channelizing funds, connecting savers and investors, which led to economic growth of the economy. Further, it is believed that there exist many factors to which the stock market reacts, factors like the economic, political and socio-cultural behavior of any country. Hence, investors carefully watch the performance of the stock markets by observing the composite market index, before investing in funds. The market index acts as the yardstick to compare the performance of individual portfolios and provides investors for forecasting future trends in the market. Especially the stock markets of emerging economies are likely to be sensitive

to fundamental changes in macroeconomic structure and policies, which plays an important role in achieving financial stability. The performance of the stock market can be measured using Market Capitalization which measures stock market size; Stock Market Liquidity, which measures the ability of investors to buy and sell securities easily. Others are All Share Index (ASI) which reflects the performance and condition of the stock market and Turnover Ratio which is the index of comparison for market liquidity rating and the level of transaction costs (Daferighe & Charlie, 2012).

Many scholars have used macroeconomic factors to explain stock return and found that changes in interest rate are associated with risk premium. They interpreted the observation to reflect changes in the rate of inflation, given the finding of Fama (1977) that changes in the rate of inflation are fully reflected in interest rates (Emenuga, 1994). This line of thought is what researchers in the field of finance refer to as the macroeconomic approach. It is a method of using factor analysis techniques to determine the factors affecting asset returns. The focus of the macroeconomic approach is to examine how stock market is affected by macroeconomic variables. This approach maintains that movement of stock prices are influenced by changes in money supply, interest rate, inflation rate, exchange rate, international crude oil prices, external debt, and external reserve and so on. There have been controversies among scholars, researchers and finance professionals with regards to what triggers movement in stock prices from their fundamental value. If the rate of interest paid by depositing money banks to depositors is increased, investors will pull out their funds from the capital market to patronize the banks for quick immediate returns, the lesser investment in the stock market (Winful, Sarpong & Sarfo, 2016). This interaction decreases stock market performance as well as the productivity of the economy at large. On the other hand, the high interest rate increases the cost of borrowing and at the same time reduces corporate profit and dividends, thereby affecting share prices of firms. High inflation rate increases the standard of living which moves scarce resources from investment in stocks to household consumption. The inflationary economic situation results in a decrease in the demand for investment in financial assets. The relationship between inflation and stock market performance can be positive or negative depending on whether the economy is confronted with foreseen or unforeseen inflation (Talla, 2013). These have generated questions and led to efforts to find out if market and economic fundamental are responsible for such deviations.

2. Literature Review

Syed (2021) examined the symmetric and asymmetric impact of macroeconomic variables on the Indian stock prices (SPs) of the Bombay Stock Exchange index. An autoregressive distribution lag and non-autoregressive distribution lag approach is used for the full sample covering the period from January 2000 to June 2019 and later this sample is further subdivided into before and after the crisis period to study the variations in result. The findings show that macroeconomic variables and SP have a symmetric relation in the long run whereas an asymmetric relationship in the short run when the whole sample is analyzed. However, when data are segregated into "before and after" crisis period this relationship turns to be asymmetric in long run too, meaning that in the long run, the negative and positive changes in a macroeconomic variable do not affect SPs similarly.

Okorie, et al (2021) modelled the relationships across Nigeria inflation, exchange rate, and Stock Market Returns A positive relationship is found to exist between Nigeria inflation and the exchange rate of Nigeria Naira versus USD, a negligible positive relationship exists between Nigeria inflation and her stock market returns, and a weak positive relationship exists between the exchange rate of Nigeria Naira versus USD and her stock market returns. Eighteen months forecast for each of the time series and the

value at risk estimates for the Nigeria stock market returns are given. The Nigeria stock market is confirmed to be weak form inefficient.

Ho (2017) examined the macroeconomic determinants of stock market development in Malaysia during the period 1981-2015. Specifically, it examines the impact of banking sector development, economic performance, inflation rate, foreign direct investment and trade openness on the development of Malaysian stock market. This paper contributed to the existing literature by investigating the macroeconomic determinants of stock market development in Malaysia using the ARDL bounds testing procedure. The results find that economic performance and trade openness have positive long-run impacts, whereas banking sector development has a negative long-run impact on stock market development. In the short run, the results find that the previous period of banking sector development, and the current and previous periods of trade openness have positive impacts on stock market development, whereas inflation rate exerts a negative impact

Similarly, Gray (2016) studied the effect of macroeconomic variables on stock market returns for four Emerging Economies: Brazil, Russia, India, And China. The goal of the study was to investigate the time-series relationship between stock market index prices and the macroeconomic variables of exchange rate and oil price using the Box-Jenkins ARIMA model which did not reveal a significant relationship. This is not unexpected, as other international and domestic macroeconomic variables (e.g., production, inflation, dividend yield, interest rates, trade balance, rate structure) may also have a role in the determination of stock price expectations.

3. Methodology

The studies examine the impact of key macroeconomic variables and stock market development in emerging market evidence from Nigeria from 1986 to 2019. The study relies heavily on secondary data (time series) sourced from the various institutions. Data on GDP, money supply (M2), interest rate and exchange rate were sourced ``from central bank of Nigeria (CBN). Data of all share index was sourced from Securities and Exchange Commission (SEC) and Nigeria Stock Exchange (NSE). Data on inflation was sourced from National bureau of statistics (NBS), as no field work is carried out. This is because data and information required for this study are hardly obtained anywhere outside the official quarter.

Econometric Model

The econometric model that incorporates the relationship between key macroeconomic variables and stock market development in Nigeria for this study based on the adopted model is specified as:

$ASI=\beta_0+\beta_1 M2+\beta_2 EXCH+\beta_3 INT+\beta_4 TOP+\beta_5 INFL + \mu_t$…… (1)

Where: ASI = NSE all share index;
EXCH= Official Exchange rate
INT= Interest Rate
M_2= Annual growth rate of Broad money supply
INFL= Inflation
TOP = Trade openness
$ß_0$= Intercept
ß1-5= slope of the explanatory variables
u = Stochastic or error term.

The incorporated variables are transformed in terms of unit of measurement to avoid multicollinearity and misspecification error in the specified model (1). The specification of the model is to establish the relationship between stock development and key macroeconomic variables. To determine the patterns

revealed in the data collected regarding the selected variables, the study employs ARDL model, SVAR model to examine the relationship between macroeconomic variables and stock market development. The characteristics of time series data to be used for the estimation of the model were examined and tested.

ARDL Model and Error Correction Mechanism

When variables are found to be stationary at different order of cointegration then the suitable test for such model is ARDL. However, one must test for both cointegration and stability to ensure long-run relationship among the variables and that the data-generation process conforms with the model, respectively. If the variables are cointegrated then there is the need to test for ECM which shows how much of the disequilibrium is being corrected over a period; what is called 'adjustment effect' (Asteriou & Hall, 2007). ECM possesses advantages of resolving the problem of spurious regression because it eliminates trend in the variables involved; and that the disequilibrium error term is stationary variable, which is prevented from exploding over time (Asteriou & Hall, 2007). The general autoregressive distributed lag (ARDL) ECM is presented in equation

$$\Delta y_t = \mu + \sum_{i=1}^{n-1} a_i \Delta y_{t-i} + \sum_{i=0}^{m-1} \Upsilon_i \Delta x_{t-i} - \pi \hat{e}_{t-1} + \varepsilon_t \quad \ldots\ldots (2)$$

Where Δ is the difference operator, y_t is a vector of dependent variable, x_{t-1} is the matrix of lag values of explanatory variables and π is the adjustment effect or error correction coefficient which is expected to be negative for the error to be corrected. Specifically, the ECM model to be tested is specified in equation

$$\Delta ASI_t = \mu + \sum_{i=1}^{n-1} a_i \Delta ASI_{t-1} + \sum_{i=0}^{m-1} \beta_i \Delta MS_{t-i} + \sum_{i=0}^{m-1} \Upsilon_i \Delta EXH_{t-i} + \sum_{i=0}^{m-1} u_i \Delta INT_{t-i} + \sum_{i=0}^{m-1} v_i \Delta TOP_{t-i} + \sum_{i=0}^{m-1} w_i \Delta INF_{t-i} - \pi \hat{e}_{t-1} + \varepsilon_t \quad \ldots\ldots (3)$$

If π = 1 then 100% of the adjustment takes place within single period (instantaneous/full adjustment). If $\pi = 0$ then there is no adjustment. Thus, any other value is interpreted; accordingly, a value of π closer to *1* implies quick adjustment, and value closer to0implies slow adjustment. To select the most fitted model lag length is chosen automatically by Akaike Information Criterion (AIC).

The null and alternative hypothesis for bound test concerning the test for cointegration is:

Ho: a_i=β_i=Υ1=$u_i = v_i = \omega_i$= 0 (No long run relationship).

H1:$a_i \neq \beta_i \neq$Υ1$\neq u_i \neq v_i \neq \omega_i \neq 0$ (there is a long run relationship).

4. Results and Discussion

Table 1: Descriptive Statistics

Statistics	ASI	MS	EXH	INT	TOP	INF
Mean	17053.80	7059.994	108.0126	13.76471	35.23471	19.70000
Median	13595.88	1792.343	119.7685	13.50000	35.26000	12.40000
Std. Dev.	15286.38	9041.940	91.70817	3.836103	10.31445	18.05968
Skewness	0.512	1.033	0.669	0.721	-0.431	1.656
Kurtosis	2.147	2.609	2.743	4.897	2.924	4.375
Jarque-Bera	2.517	6.273	2.630	8.052	1.062	18.23
Probability	0.284	0.043	0.268	0.017	0.588	0.000
Observations	34	34	34	34	34	34

Source: researcher computation using E-views 10(2024).

From table 1, the results show that the standard deviations of the variables employed are not far away from their means except for interest rate and trade openness. The result of Skewness in table 1 indicates

all the variables are positively skewed to the right except trade openness which is negatively skewed. For kurtosis to be normally distributed is 3, that is either the distribution is peak (leptokurtic) or flat (platykurtic). The result also shows that all the variables are normally distributed because their kurtosis values are less than 3 except for inflation and interest rate. The Jarque-Bera test for normality is also estimated. The distribution under the null hypothesis is that the series is not normally distributed. If the probability value of Jarque-Bera statistics is greater than 0.05 we reject the null hypothesis and conclude that the series is normally distributed. The results in table1 indicate the acceptance of null hypothesis for money supply, interest rate and inflation and reject the hypothesis of all share index, exchange rate and trade openness because their probabilities value are greater than 5% which this means that are normally distributed.

Unit Root Test

Table 2: Augmented Dickey Fuller (ADF), Phillips Perron (PP) and KPSS

	Test at Level		**Test at first difference**	
Variables	**ADF test**	**PP test**	**ADF test**	**PP test**
ASI	-2.737906	-2.766148	-5.908403	-5.695029
MS	-0.002879	0.058165	-3.455419	-6.392296
EXH	-1.370984	-1.641069	-4.163186	-3.917167
INT	-3.768794	-3.768794	-	-
TOP	-3.408540	-3.354820***		
INFL	-3.184	-3.352	-6.140	-6.337

Source: researcher computation using E-views 10(2024).
*** indicates stationary or non-stationary at 5% level of significance.*

Table 2 presents the results of unit root tests of Augmented Dickey Fuller (ADF) and Phillips Perron (PP). For ADF and PP unit root test, the result shows that interest rate and trade openness are stationary at level while all share index, money supply, exchange rate and inflation rate are stationary at first difference, in other words it is I (1) process. Therefore, there is a mixture of order of integration in ADF and PP test.

Bound Test for Long Run

This test is conducted to ensure that the variables employed in the model are related in the long run. The result of the one – tail F- statistics and critical values of I (0) and I (1) bounds (for lower and upper bounds respectively) are presented in table 3

Table 3: Result of the cointegration Bound Test

	Statistics	**Value**	**Critical**	**Value**	**Bounds**	
			1%	2.5%	5%	10%
F-statistic	6.312596**	I (0) Bound	3.06	2.7	2.39	2.03
		I (1) Bound	4.15	3.75	3.38	3

Source: researcher computation using E-views 10(2021).
***indicates statically significant at 5% for all bounds.*

From table 3, the results of the cointegration bound test indicate a higher value of F statistic than any of the critical values of all bounds. Therefore, there is strong evidence of cointegration in the model. This gives way of employing Autoregressive Distributive Lag model (ARDL) in the study.

Results of Autoregressive Distributed Lag (ARDL) Model

After conducting the unit root tests, it suggests the use of ARDL model, this section presents the results of the model as demonstrated in chapter three. The appropriate model (number of lags) is selected automatically using Akaike Information Criterion (AIC) which is seen as more parsimonious. Below, both short-run and long-run parameters of the model are presented. The results of the diagnostics checks are also presented.

Short Run Relationship

Table 4: Short run parameters of the ARDL Model

Variables	Coefficient	Std error	t- statistics	Prob.
D(EXH)	-0.365911	0.136391	-2.682805	0.0136
D(INT)	0.213990	0.159202	1.344139	0.1926
D (INT (-1))	-0.469351	0.154133	-3.045097	0.0059
R-squared	0. 785			
Adjusted R-squared	0.792			
Serial correlation	0.972			
Heteroscedasticity	0.541			
Normality test	0.936			
Ramsey test	0.144			

Source: researcher computation using E-views 10(2024).

The result from table 4 indicates short run relationship among the variables employed in the analysis, exchange rate itself shows negative and statistically significant effects on all share index in the short run in Nigeria, this is counter the economic theory which established the existence of positive relationship between exchange rate and all share index in Nigeria. Interest rate itself shows positive but statistically insignificant effect on all share index in Nigeria in the short run, this is contrary to economic a priori expectation which confirm the negative relationship between interest rate and all share index in Nigeria, at lag 1 shows negative and statistically insignificant effect on all share index in Nigeria. The R-squared and its adjusted value are 0.785, this implies that 78% change in all share index is explained by money supply, exchange rate, interest rate, and inflation rate and trade openness in Nigeria. The model also passed all the post estimation tests like heteroscedasticity, serial correlation, Normality and Ramsey test because their probability values are greater than 5%.

Long Run and Error Correction Result

Evidence from the bound test result in table 4, indicates a long-run relationship among the variables in the ARDL model; hence, the next task is to compute the cointegrating and long-run form of the model. This is done to enable the researcher to observe whether there exists long-run among share index, money supply, exchange rate, interest rate, inflation rate and trade openness in Nigeria. Thus, the result is presented in Table 5.

Table 5: ARDL Cointegrating and Long run Form Results

Variables	Coefficient	Std error	t- statistics	Prob.
MS	0.024688	0.606011	0.040739	0.0967
EXH	0.709279	0.848637	0.835786	0.4123
INT	0.895611	1.781162	0.064256	0.0298
TOP	0.522310	1.046385	0.499157	0.6226
INF	-0.331004	0.392118	-0.844142	0.4077
ECM	-0.201711	0.026897	-7.499299	0.0000

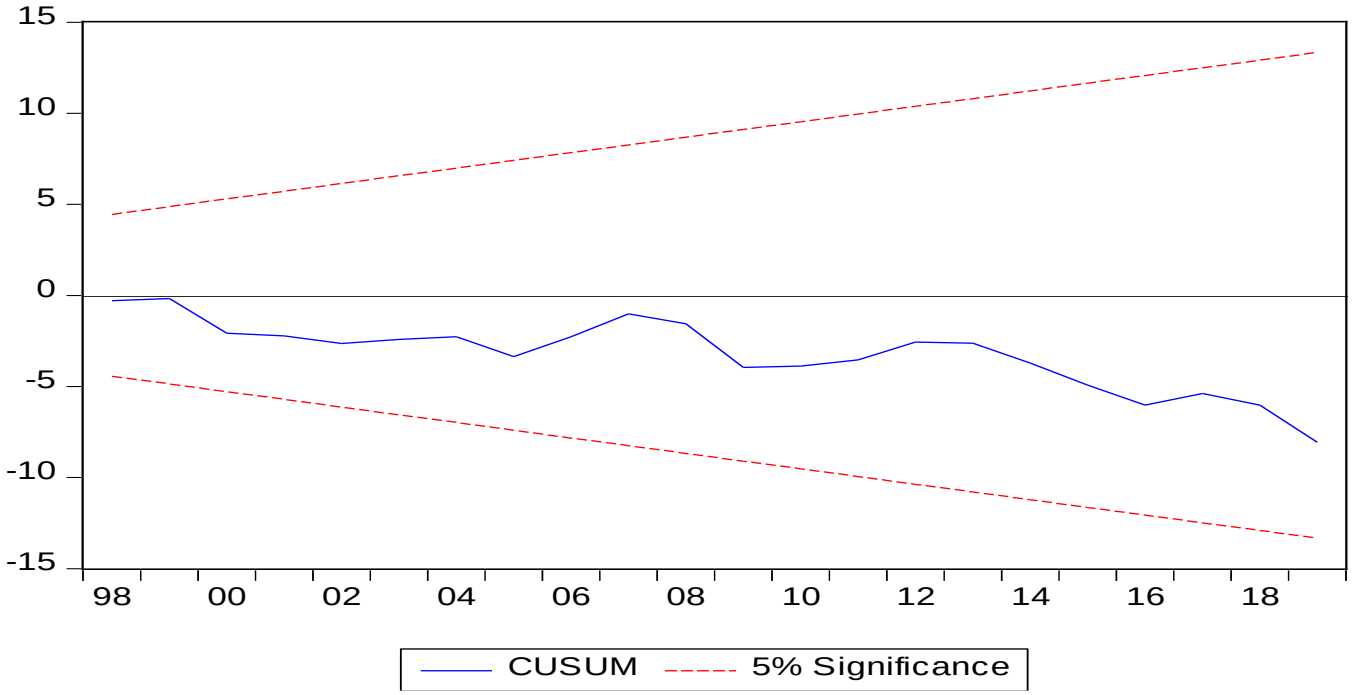
Source: researcher computation using E-views 10 (2024).

The result from table 5 indicates that money supply has positive and statistically significant impact on all share index in Nigeria in the long run. This finding is in line with economic a priori expectation which indicates a positive relationship between money supply and all share index. Furthermore, exchange rate shows positive but statistically insignificant effects on all share index in Nigeria in the long run, which is consistence with the economic theory which suggests the existence of negative relationship between exchange rate and all share index. Interest rate indicates positive and statistically significant effects on all share index in Nigeria in the long run. This also counters economic theory which suggests a negative relationship between interest rate and all share index. Trade openness indicates positive but statistically insignificant effect on all share index in Nigeria in the long run. Inflation rate shows negative and statistically insignificant effect on all share index in Nigeria, this is in line with economic a priori expectation which assumed a negative relationship between inflation and all share index.

Interestingly, the error correction term (ECT) met all its theoretical and statistical requirements of both in the sign and size. It measures the speed of adjustment towards equilibrium after the initial deviation is corrected. The ECT coefficient is -0.201711and significant at 5%, this indicates that at 20 % of the disequilibrium due to the shock in the previous years is adjusted back to the long run equilibrium in the current year.

Stability Test

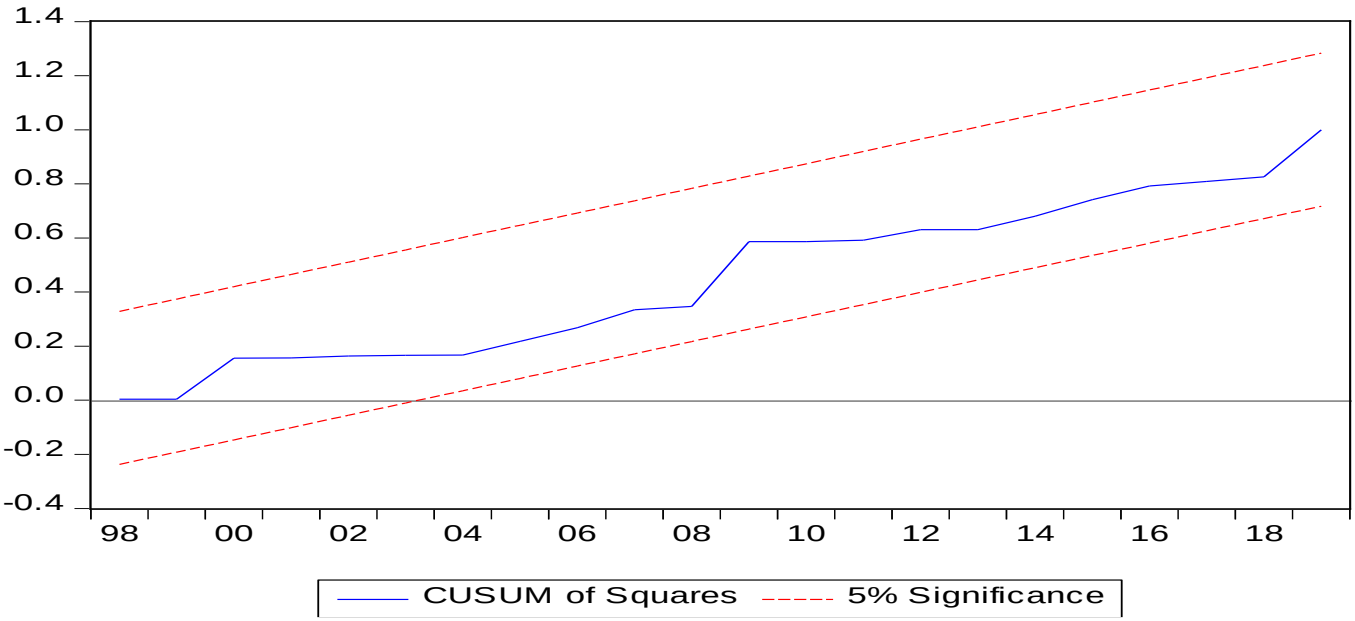
Stability test of the model is employed to ensure the data generating process is compatible with the estimated coefficients of the model. It shows plots of the residuals about the zero line, within the range of plus/minus. The test suggests that residuals outside the standard error bands indicate instability in the parameters of the equation which make which will lead to spurious regression.



Researcher computation using E-views 10(2024).

Figure 1 CUSUM Plot Recurve Residuals of ARDL model.

From Figure 1, the CUSUM plot is within 5% level of significant, this means that the model is stable.



Researcher computation using E-views 10 (2024).

Figure 2 CUSUM Square Plot Recurve Residuals of ARDL model.

From Figure 2, the CUSUM Square plot is within 5% level of significant, this means that the model is stable.

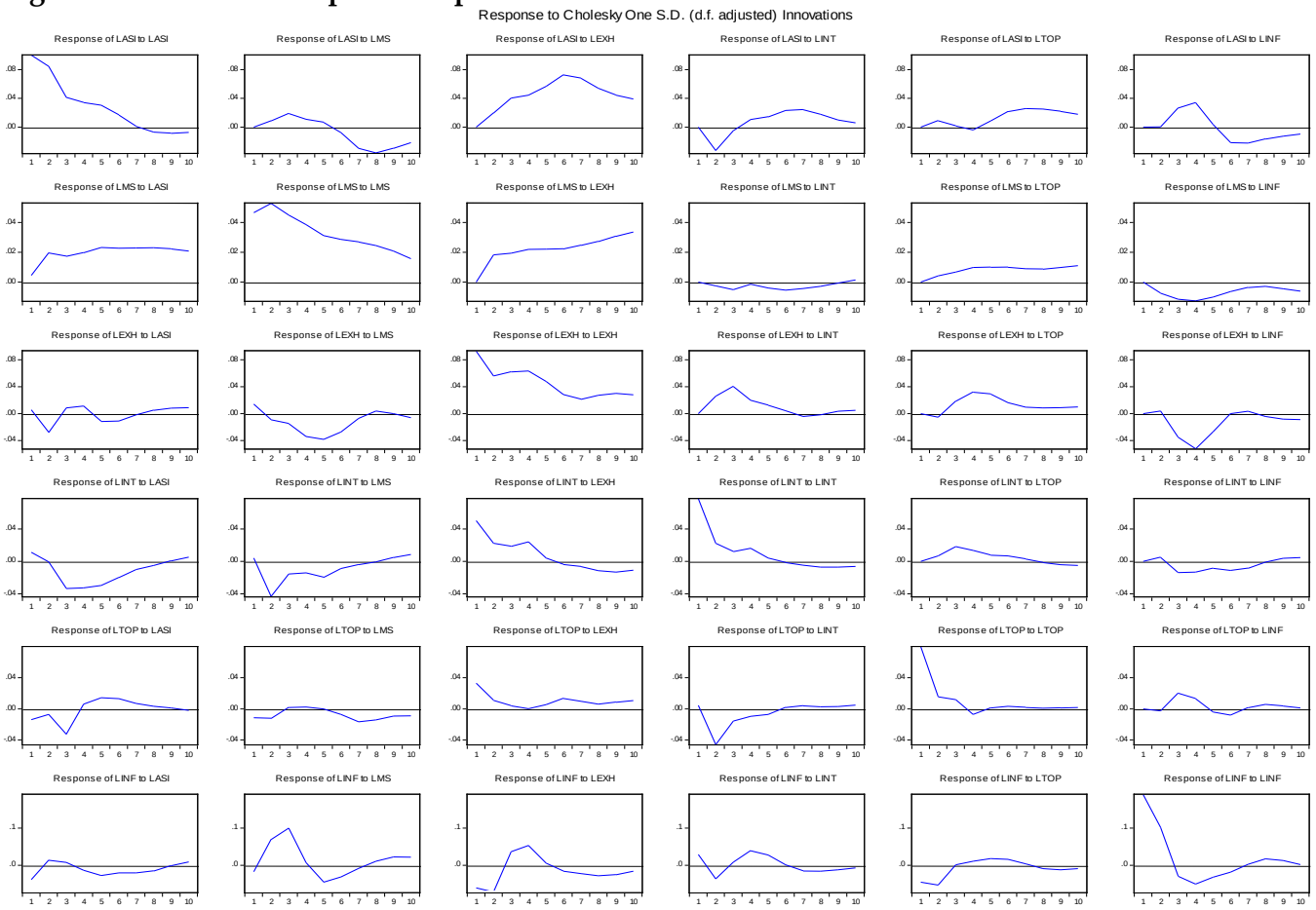
Structural VAR Result

To achieve our stated objective, the study employed structural VAR analysis in order to examine the contemporaneous relationship among the variables of interest.

Impulse Response Functions (IRF)

Impulse Response Functions (IRFs) are one of the useful tools of the unrestricted VAR approach for examining the interaction between the variables in this study. They reflect how individual variables respond to shocks from other variables in the system. When graphically presented, the IFRs give a visual representation of the behavior of variables in response to shocks. The results can be presented in figure 3 below.

Figure 3: Generalized Impulse Response



Source: researcher computation using E-views 10.

From figure 3, dynamic movements of each to one standard error shock to each other variables, particularly to the all-share index are analyzed by using orthogonalized impulse response functions (IFRs). Presented in the graphs above. There are six shocks namely, all share index (shock 1), exchange rate (shock 2), inflation rate (shock 3), interest rate (shock 4), money supply (shock 5) and trade openness (shock 6). Each shock occurs over a 10-period time. According to the findings presented above, one unit

response of all share index to its own is positive in period one to seven and die negatively. The innovation of all share index to money supply is positive in period 1 to 5 and negatively. The response of all share index to exchange rate is positive throughout the horizon period. The one-unit response of all share index to the interest rate is negative from period 1 to 3 and changes to a positive upper 10. The response of all share index to trade openness is positive in period 1 to 3, negative in period 4 and positive. The response of all share index to the inflation rate is positive from period 1 to 5 and die negatively.

The one-unit response of money supply to all share index is positive throughout the horizon period. The response of money supply to the exchange rate is positive throughout the period. The shocks effect of money supply to interest rates is negative throughout the period. The one-unit response of money supply to trade openness is positive throughout the period. The response to the money supply to inflation is negative throughout the period. The response of the exchange rate to share index is negative at period 1 to 2, positive at period 3 to 4, negative at period 5 to 7 and die positively. The response of the exchange rate to money supply is positive in period 1, negative period 2 to 7 and dies positively. The shocks effect of exchange rate to interest rate is positive at period 1 to 6 and negatively. The effects of the exchange rate on trade openness are negative in periods 1 to 2 and die positively. The response of the exchange rate to inflation is positive in periods 1 to 2, negative 3 to 6 and dies positively.

The shocks effect of interest rate to all share index is positive in period 1 to 2, negative to 3 to 8 and die positively. The shocks effects of interest rate to exchange rate are positive 1 to 5 and die negatively. The shocks effect of interest rate to trade openness is positive 1 to 7 and dies negatively. The response of interest rate to inflation is positive 1 to 2, negative 3 to 8 and dies positive. The shocks effect of trade openness to all share index is negative in period 1 to 4 and dies positively. The shocks effect of trade openness to money supply is negative throughout the period. The effect of trade openness on the exchange rate is positive throughout the period. The response of trade openness to interest rate is positive at period 1, negative 2 to 6 and dies positively. The response trade openness to inflation is negative 1 to 4, negative 5 to 7 and die negatively. The response of inflation to all share index is negative in period 1, positive 2 to 3, negative 4 to 9 and die positively. The responses of inflation to money supply are positive in period 1 to 4, negative 5 to 7 and die positively. The response to inflation to the exchange rate is positive in period 1, negative 2 to 3, positive 4 to 6 and die negatively. Inflation to trade openness is negative 1 to 3 positive 4 to 7 and die negative.

Variance Decomposition

Forecast error variance decompositions are presented which help to identify the main channels of effects for the individual variables. The numbers under each variable represent the percentage of variance of the variable analyzed that was attributable to variable over 10 years periods. It tells us the proportion of movement in a sequence that occurs due to its own shocks versus shocks to other variables in the model. In other words, it shows the apportionment of forecasting errors of a variable to itself and other variables in the system. The variance of the share index itself is always caused by 100 percent in the first year. The fluctuation in share index in both the short-run and long-run are explained by its own shock, approximately 81 percent in the 3period and only to fall to about 38 percent up to10 periods. The shock is attributable to money supply, exchange rate interest rate, trade openness and inflation (7%, 40%, 5%, 4% and 5 % in the long run).

Money supply in the short run explained itself by 99 percent; in 3 periods it was 80 percent it continues to fall in long run to 52 percent in the 10 periods. The shock attributable to exchange rate interest rate, trade openness and inflation is (23%, 0.04%, 3% and 2% in the long run). Exchange rate in the short run explained itself by 97 percent, in 3 periods was 74 percent it continues to fall in long run to 23 percent in

the 10 periods. The shock attributable to interest rate, trade openness and inflation is (7%, 6%, and 11% in the long run). Interest rate can only explain itself by 69 percent, in 3 periods was 47 percent it continues to fall in the long run to 35 percent in the 10 periods. The shock attributable to all share index, money supply, exchange rate, trade openness and inflation is (19%, 14%, 22%, 3%, and 3% in the long run). Trade openness can only explain itself by 4 percent, which is very minimal, in 3 periods it was 6 percent it continues to fall in long run to 5 percent in the 10 periods. The shock attributable to all share index, money supply, exchange rate, interest rate and inflation is (12%, 16%, 12%, 17%, and 5% in the long run).

Inflation can only explain itself by 80 percent in 3 periods was 57 percent it continues to fall in long run to 50 percent in the 10 periods. The shock attributable to all share index, money supply, exchange rate, interest rate and trade openness is (3%, 19%, 15%, 5%, and 5% in the long run).

Diagnostic Test

The diagnostic test is conducted to check the consistency and reliability of the estimated coefficients included in the model. Test such as auto Correlation, heteroscedasticity and normality test, SVAR stability tests are also conducted.

VAR Residual Serial Correlation LM Test

Table 7: Serial Correlation Test Result

Lag	LRE* stat	Df	Prob.	Rao F-stat	df	Prob.
1	34.81647	36	0.5248	0.932194	(36, 37.9)	0.5828
2	39.12248	36	0.3314	1.094158	(36, 37.9)	0.3919
3	32.14956	36	0.6523	0.838070	(36, 37.9)	0.7018

Source: researcher computation using E-views 10(2021).

The serial correlation test reported in table 7 indicates that there is no serial correlation at 5% level of significance.

Heteroscedasticity Test

The test was employed to test whether the residuals of the estimated model are heteroscedastic or homoscedastic.

Table 8: Heteroscedasticity Test

Joint Test: Heteroscedasticity Test		**Result**
Chi-sq	Df	Prob.
526.3260	504	0.2376

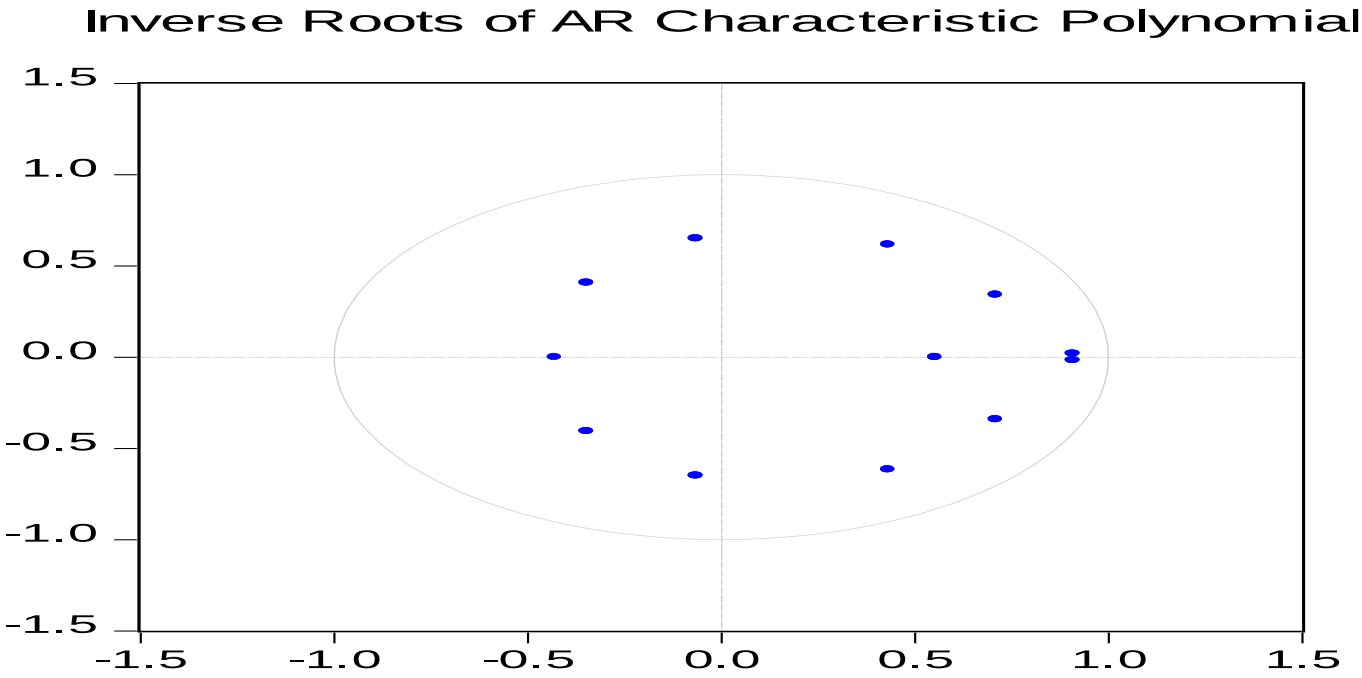
Source: researcher computation using E-views 10(202).

The result from Table 8 indicates that the model is free from heteroscedasticity problem.

VAR Stability Test

VAR stability test was employed to check whether all the Eigen values are less than one or all the moduli are lies inside the unit circle.

Figure 4: VAR Stability Test



Source: researcher computation using E-views 10(2021).

A VAR model is said to be stable if all its module, that is polynomial characteristics, are less than unity and if they lie within a unit circle.

5. Conclusion and Recommendations

The study investigates the impact of key macroeconomic variables on stock development in Nigeria. The macroeconomic variables investigated include money supply, inflation, interest rate, exchange rate, trade openness and all share index from 1986 to 2019. The statistical properties of data were tested using Augmented Dickey Fuller and Phillips Perron. The test indicated that interest rate and trade openness are stationary at level while all share index, money supply, exchange rate and inflation rate are stationary at first difference. Akaike information criteria (AIC) was used, the model is free from heteroscedasticity and serial correlation. Bound test for long run shows that f- statistics is 6.31which is more than upper and lower bound critical values at 1%, 2.5%, 5%, and 10%. This indicated that there is a long-term relationship among the variables employed.

The short run result shows that exchange rate itself shows negative and statistically significant effects on all share index in Nigeria. Interest rate itself shows positive but statistically insignificant effect on all share index in Nigeria, at lag 1 shows negative and statistically insignificant effect. The R-squared and its adjusted value are very high 0.7852, this implies that 78% change in all share index is explained by money supply, exchange rate, interest rate, inflation rate and trade openness in Nigeria. The model also is beautiful as it passed the all the post estimation test like heteroscedasticity, serial correlation, Normality and Ramsey test because their probability values are greater than 5%.

The long run relationship indicates that money supply has positive and statistically significant impact on all share index in Nigeria. Furthermore, exchange rate shows positive but statistically insignificant effects on all share index in Nigeria. Interest rate indicates positive and statistically significant effects on

all share index in Nigeria. Trade openness indicates positive but statistically insignificant effect on all share index in Nigeria. Inflation rate shows negative and statistically insignificant effect on all share index in Nigeria. Interestingly, the error correction term (ECT) met all its theoretical and statistical requirements of both in the sign and size. It measures the speed of adjustment towards equilibrium after the initial deviation is corrected. The ECT coefficient is -0.201711and significant at 5%, this indicates that at 20 % of the disequilibrium due to the shock in the previous years is adjusted back to the long run equilibrium in the current year.

The impulse response function shows that the response of money supply to all share index is positive over a period of 10. The response of the exchange rate to share index is negative at period 1 to 2, positive at period 3 to 4, negative at period 5 to 7 and die positively. The shocks effect of interest rate to all share index is positive in period 1 to 2, negative to 3 to 8 and die positively. The shocks effect of trade openness to all share index is negative in period 1 to 4 and dies positively. The response of inflation to all share index is negative in period 1, positive 2 to 3, negative 4 to 9 and die positively.

Based on the findings, the current study offered the following recommendations:

i. The study found that there is a positive relationship between money supply and all share index. It therefore recommended that the Central bank of Nigeria should re ensure that there is general stability in money supply. This will help to achieve improvements in stock market performance.
ii. The positive and insignificant effects of exchange rate on all share index suggest that the Central bank of Nigeria should ensure stability in exchange rate by promote trade, tourism and foreign investment.
iii. The study also found that interest rate has positive and significant effect on all share index. It suggested that the Central bank of Nigeria should institute an interest rate targeting policy framework to drive the macroeconomic indicators which determines the ultimate All share index. This sufficiently helps to maintain Nigerian stock market to economic conditions in the country where lots of savings and retirement savings are invested.
iv. The study found a negative and insignificance relationship between inflation and all share index. The study recommended that the Central bank of Nigeria and Fiscal authorities should adopt inflation targeting tool as an economic growth measure to stabilize the stock market and the economy in general.
v. The result also indicates a positive relationship between trade openness and all share index. It finally recommended that the Central bank of Nigeria and Fiscal authorities should embark on the liberalization policies and eases all trade barriers to encourage trade amongst its trading partners.

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