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Macroeconomic Variables and Stock Price Behaviour in Nigeria

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Abstract

This study investigates the influence of macroeconomic variables on stock price behaviour in Nigeria. The annual time series data spanning through the period of 1995 to 2021 and historical data research design were adopted for the study. The Augmented Dickey Fuller (ADF) and Phillips-Perron test were used to test for stationarity of the variables. Other econometric tests like Ramsey Reset test, Heteroskedasticity test, Cusum test, Johansen cointegration test, Parsimonious Error Correction model and the fully modified Least Square were used for the data analysis. The findings from the short-run result shows that all the macroeconomic variables adopted for the study have no positive and significant influence on stock price except inflation whose impact is positive and significant. However, the result from the long-run analysis reveals that interest rate and money supply have inverse and insignificant influence on stock price behaviour. Inflation has a positive and insignificant effect while exchange rate has a positive and significant influence on stock price behaviour in Nigeria. The result from the Johansen Cointegration and the fully modified least squares shows evidence of long-run relationship between the Dependent and independent variables. The study therefore suggest that the government through its relevant agencies should formulate good macroeconomic policies in order to enhance stock market performance.

Key words: *Exchange rate, Inflation rate, Macroeconomic variables, Stock prices*

Introduction

Prominent amongst the rationale for investing in stocks quoted on the Stock market is to earn a return that will compensate for the consumptions forgone. Thus, we invest to earn a return in the future. The stock market offers a platform for procuring long term capital for both private and public organizations. Due to the role played by the capital market in providing investment opportunities and avenues for sourcing for capital, it is expected that the capital market should be efficient. The reason is that, the efficiency of the stock market has a role to play regarding the expected returns on stocks traded in the market. (Gbanador, 2018; Gbanador, 2021).

The economic condition of the stock market is commonly defined in relation to the efficiency of the stock market. A capital market is assumed to be efficient if the security's value is a reflection of an adequate calculation of its intrinsic value. This is usually seen in the light of security price responsiveness to information which in the long run translates to security return. From the forgoing, if all the pertinent information is evidenced in the stock values, it will be a futile attempt trying to forecast price changes in the market thereby making it impossible to earn abnormal profits on portfolios. The reason is that, investors can earn only average return on their investment in an efficient capital market (Gbanador, 2021).

The stock is amongst sensitive assets to economic conditions. Thus, any aggressive change in stock prices can have negative implications for an economy, which makes the nexus between macroeconomic variables and stock returns one of the most debated topics in Finance in the past few decades (Barakat, Elgazzar and Hanafy, 2016). The behaviour of stock prices cannot be divorced from the efficiency of the capital market in pricing stocks and the relationship between stock values and volatility. (Gbanador, 2021). Similarly, Umer (2016) is of the opinion that the stock markets are the integral part of the economy and their importance cannot be ignored. So there is a need to identify the determinants of the stock market index which enhance the investors' wealth or ruined it. Many studies identified that the behavior of stock markets is due to the change in the economic indicators.

Empirical evidence suggests that stock prices are specifically sensitive to macroeconomic pronouncements such as monetary policy announcement (Chen & Xie, 2016; Connolly & Kohler, 2004; Ghani & Chaudhary, 2016). Thus, it is a major determinant of investors required rate of return which is what influences investors' investment decision. Malaolu, Ogbuabor & Orji (2013) argued that in addition to specific firm features, factors like government rules and regulations, inflation rate, foreign exchange rate, money supply, market conditions, the behaviour of investors, the environment etc have impact on security price movements.

Globally, in examining the influence of macroeconomic variables on stock price behaviour, there exist divergent views regarding the direction of this influence. A lot of commentaries posits that macroeconomic variables have positive influence on stock prices (Adam & Tweneboah, 2008; Bekhet & Matar, 2013; Josiah & Akpoveta, 2019; Khan & Khan, 2018; Kuwomu, 2012; Osei, 2006; Udo, Odey & Jacob, 2022). Conversely, some studies posits that macroeconomic variables do not positively influence stock prices (Barbic & Jurkic, 2010; Flannery & Protopapadakis, 2002; Hussain, 2009).

Most of the studies conducted on this subject matter in Nigeria utilized interest rate, inflation, and Gross domestic product (see Josiah & Akpoveta, 2019; Okoro, 2017; Udo, Odey & Jacob, 2022). The Researcher's literature search shows that no study conducted in Nigeria included Treasury bill rate amongst the independent variables. Note, the Treasury bill rate being a risk free rate is a very important macroeconomic variable since the instrument offers risk free investment alternative. This created a gap which this study tries to bridge by introducing Treasury bill rate amongst the independent variables. The essence is to assess the influence of macroeconomic variables on stock price behaviour.

2. LITERATURE REVIEW

This study is built on the signalling theory as propounded by Miller and Rock (1985). The theory stipulates that because of the asymmetry of information between the managers and investors, firms usually employ different announcements as a signal to send useful information to the general public such as dividend announcement. Information about macroeconomic variables like monetary policy announcement rate, inflation rate, exchange rate, etc. give signals that influence the security market. The Central Bank of Nigeria is in possession of more information about the economy and its performance than the general public. This situation gives rise the issue of asymmetry of information. Therefore, the public observed the actions or pronouncements by the CBN over time as a medium that signals the dissemination of valuable information. It is expected that this information will send signals to the market which exerts influence on stock prices (Gbanador, 2021).

The second theory upon which this study hinges is the efficient market hypothesis. Fama (1965) developed the efficient market hypothesis. The efficient market hypothesis states that if the stock market is efficient, stock prices will fully reflect all relevant and available information about the stock such that even those with privilege information will find it difficult to outperform the market consistently. Basically, there are three types of stock market efficiency namely; the weak form, semi-strong form and strong form market hypothesis. The weak form market hypothesis posits that stock prices reflect past price data and volume. Therefore, it will be impossible to outperform the market using this information because all investors have the same sets of information. Semi-strong form market hypothesis asserts that stock prices reflect all public available information. By so doing, it will be impossible to beat the market using publicly available information since stock prices quickly react to public information. Finally, the Strong form market hypothesis states that stock prices reflect all private and public available information. Thus, it will be impossible for even those with privilege information to outperform the market (Gbanador & Gbanador, 2018; Gbanador, 2021; Gbanador, 2022).

Another theory upon which this work is built is the Arbitrage pricing theory. Stephen A. Ross propounded the Arbitrage Theory of Capital Asset Pricing popularly called the Arbitrage pricing theory (APT) in 1976. The development of APT came as a result of the criticisms regarding the validity of CAPM in stock pricing. The single factor upon which CAPM is built is the beta which accommodates the non-diversifiable risk. Conversely, the APT provides an alternative model that utilized multiple factor in explaining the factors that influenced asset's returns. APT holds that the return on an asset is a linear function of several factors such as macroeconomic and industrial unique factors. Thus, making this theory very relevant and useful to the study (Gbanador, 2022).

Ibrahim & Musah (2014) conducted an econometric analysis on the effect of macroeconomic fundamentals on stock returns in Ghana. The Johansen multivariate cointegration approach and vector error correction model (VECM) employed for the data analysis. The outcome indicates evidence of a long-run relationship between macroeconomic variables and stock returns while Granger causality test shows causality from any direction between macroeconomic variables and stock prices. The impulse response functions and variance decomposition reveals that amongst the macroeconomic variables, shocks to inflation, money supply and exchange rate do not only explain

a significant proportion of the variance error of stock returns but their effects persist over a long period.

Elly & Oriwo (2012) investigated the nexus between macroeconomic variables on NSE All share index (NASI) in Kenya using Secondary data from March 2008 to March 2012. The lending interest rate, inflation rate and 91 day Treasury bill (T-bill) rate were adopted as proxies for macroeconomic variables. The ordinary least square multiple regression method was used for the data analysis. The findings shows that 91–day T-bill rate has a negative relationship with the NASI while inflation has a weak positive relationship with the NASI. Thus, the study suggests monitoring of the macroeconomic environment since the changes in the macroeconomic variables influence stock market performance.

Khan & Khan (2018) examined the influence of macroeconomic variables on stock prices in Karachi stock exchange using time series secondary data spanning through May 2001 to August 2016 which is equivalent to 184 monthly observations. The ordinary least square multiple regression and the Autoregressive Distributed Lag bound test were adopted for the data analysis. The findings indicated that in the short-run, all the variables are insignificant except exchange rate which is negatively cointegrated with stock prices. Thus, the study suggests that the Central bank should be vigilant while changing the money supply because too much increase in money supply could influence investment as well as stock market.

Mohammad, Ullah, Islam, Alam & Khan (2017) assessed the effect of macroeconomic variables on stock market performance of SAARC countries using the ordinary least square multiple regression model. Annual time series data spanning through the period of 2005 to 2015 were adopted for the study. The stock market index was used as proxy for stock market performance while exchange rate, foreign currency reserve, inflation, interest rate, and money supply were used as proxies for macroeconomic variables. The findings revealed that macroeconomic variables like exchange rate, foreign currency reserve and interest rate are all statistically significant in influencing stock market performance of SAARC countries. Whereas, inflation and money supply do not have a significant relationship with stock market performance.

Josiah & Akpoveta (2019) investigated the effect of macroeconomic variables on stock market returns in Nigeria. The Historical data design was adopted for the study. The Nigerian stock exchange All Shares Index was used to represent the stock market return while, Money supply, exchange rate, prime interest rate, inflation rate, real GDP and financial openness were used as proxies for macroeconomic variables. The data were analyzed using the ordinary least square multiple regression, cointegration Tests, error correction model mechanism and Granger causality tests. The findings indicates a relationship amongst the variables of interest, with stock market returns. Based on the findings, the study suggests that the government and indeed statutory capital market regulators are advised to further open up the Nigerian financial market and economy to more capital inflows needed for further economic and industrial development.

Gay (2016) examined the effect of macroeconomic variables on stock market returns for four emerging economies: Brazil, Russia, India and China. The study employed time series data spanning through the period of March 1999 to June 2006. The stock market index was adopted as proxy for stock market return while exchange rate and oil price were used as proxies for macroeconomic variables. The Box-Jenkins ARIMA model was used to test the relationship

between the dependent and independent variables. The findings indicated no significant relationship between exchange rate and oil price, and the stock market index prices of either BRIC country.

Epaphra & Salema (2018) evaluated the relationship between stock prices and macroeconomic variables in Tanzania using monthly time series data spanning through January 2012 to December 2016. The study adopted average stock prices of selected companies as proxy for stock prices while inflation rate, Treasury bill rate, exchange rate and money supply were used as proxies for macroeconomic variables. The study adopted the ordinary least square multiple regression, Johansen's co-integration and vector error correction models for the data analysis. The empirical analysis reveals that macroeconomic variables and the stock prices are co-integrated across all models and, hence, a long-run equilibrium relationship exists between them.

Malika *et al* (2021) assessed the influence of macroeconomic variables on stock market in the United Kingdom using monthly time series data for the period of pre Global financial crises 2008 (GFC); from January 1999 to December 2007. Interest rate, Consumer Price Index, Exchange rate were used as proxies for macroeconomic variables while the UK's stock price was used to represent the stock market. The ordinary least square multiple regression was used for the data analysis and the findings of Johansen Cointegration, and Granger and Toda Yamamoto (TY) Causality tests indicate respectively that there is no co-integration between the variables, no causal relation is detected from macro factors to stock return, and a unidirectional causal relation is depicted from exchange rate to stock price. While from VAR Granger non Causality/Block Exogeneity Wald Tests results, both inflation (INF) and exchange rate growth (EXCG) Granger cause the UK stock market Return. Moreover, the ARDL specification show a stable long run effect of all considered macroeconomic factors on the UK stock price. Finally, the results of the ECM show that all considered macroeconomic factors drives UK stock price toward long-run equilibrium at a fast speed monthly.

Roy (2020) examined the causal relationship between stock market and macroeconomic variables in India using time series data spanning through the period of 1st April 1979 to 31st May March 2020. The study utilized the Ordinary least square multiple regression for the data analysis. The Johansen cointegration test indicated three co-integrated equations which indicates presence of long-run equilibrium relationships and later confirmed by the VECM analysis when Bombay Stock Exchange is considered as the dependent variable. Even if, the evidence of short-run bilateral causality is observed between import and GDP and presence of uni-directional Granger causality is also seen from export to import.

Udo, Odey & Jacob (2022) assessed the effect of macroeconomic variables on stock market performance in Nigeria using time series data. The all-shares index was used as proxy for Stock market performance while the GDP growth, broad money supply, exchange rate, savings interest rate, and inflation rate were employed as proxies for macroeconomic variables. The Autoregressive Distributive Lag (ARDL) estimation technique was adopted to establish the long run relationship amongst the variables, and the outcome revealed that a long run relationship exists amongst the variables in the estimated model. The outcome therefore, indicated 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.

Similarly, English (2018) evaluated the relationship between macroeconomic factors and stock returns in Nigeria using quarterly time series data spanning through 2000 to 2016. The data analysis was done using the Pairwise econometric technique. The result indicates that return on stock and inflationary rate were seen to have no causal relationship but return on stock was seen to be mutually related with currency conversion rate. Furthermore, returns on stock has a unidirectional causation with money flow thus, shows that inflationary rate and conversion rate have unidirectional causation.

Similarly, Igoni, Ogiri, & Orlu (2020) assessed macroeconomic factors and stock market performance in Nigeria using time series data spanning through the period of 1985 to 2014. The study used exchange rate, inflation, and interest rates as proxies for the independent variables and the stock market capitalization was used to measure stock market performance. The Johansen co-integration and error correction models were used for the analysis. The findings indicates that inflation responded negatively while interest rate and exchange rate were adjusting to the trends of market performance.

3.0 Methodology

The researcher adopted the historical data research design for this study. The historical data research design was adopted for the study due to the nature of the sources of data used for the study. An annual time series data spanning through the period of 1995 to 2021 were obtained from the CBN Statistical Bulletin. The All Shares Index was used to represent the stock market while Interest rate, inflation rate, exchange rate, money supply and Treasury bill rate were used as proxies for macroeconomic variables.

3.1 Model Specification

The functional specification of the model is given as;

$$ASI = f(IR, IFR, EXR, MS, TBR) \quad (1)$$

Where;

ASI = All Shares Index

IR = Interest rate

IFR = Inflation rate

EXR = Exchange rate

MS = Money Supply

TBR = Treasury bill rate

GDP = Gross Domestic product

$$ASI = \beta_0 + \beta_1 IR + \beta_2 IFR + \beta_3 EXR + \beta_4 MS + \beta_5 TBR + U_t \quad (2)$$

GDP, IR, IFR, EXR, MS and IB are as defined in equation (1) while;

$\beta 1$ = Regression Constant

β_1, β_2, β_3, β_4 and β_5 = Regression coefficient.

U_t =Stochastic Error Term

If equation (3) is tested in its logarithmic form (Log-linear) it becomes:

$$LASI= \beta_0 + \beta_1 LIR + \beta_2 LIFR + \beta_3 LEXR + \beta_4 LMS + \beta_5 LTBR + U_t \quad (3)$$

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 > 0$

Where:

L = Logarithmic Form

4.0 RESULTS AND DATA ANALYSIS

The results and analysis of the various tests conducted in this study are discussed in this subsection of the work.

Table 1: Unit Root (Stationarity) Test

Variables	Augmented Dickey-Fuller (ADF)Test Statistic	Mackinnon's Critical Values at 1%, 5% and 10% respectively			Order of Integration	Prob.
LASI	-4.198938	-2.664853	-1.955681	-1.608793	I(1)	0.0002
LIR	-5.619280	-2.664853	-1.955681	-1.608793	I(1)	0.0000
LIFR	-5.668450	-2.664853	-1.955681	-1.608793	I(1)	0.0000
LEXR	-2.560048	-2.664853	-1.955681	-1.608793	I(1)	0.0129
LMS	-3.310318	-2.685718	-1.959071	-1.607456	I(1)	0.0022
LTBR	-3.373946	-2.664853	-1.955681	-1.608793	I(1)	0.0017

Source: Researcher's computation using Eviews 12

The Augmented Dickey-Fuller was utilized to conduct the unit root test as indicated in Table 1 and the result reveals that the variables are stationary at order (1).

Table 2: Unit Root (Stationarity) Test

Variables	Phillips-Perron (PP)Test Statistic	Mackinnon's Critical Values at 1%, 5% and 10% respectively			Order of Integration	Prob.
LASI	-4.607777	-2.660720	-1.955020	-1.609070	I(1)	0.0001
LIR	-6.357141	-2.660720	-1.955020	-1.609070	I(1)	0.0000
LIFR	-14.16478	-2.660720	-1.955020	-1.609070	I(1)	0.0000
LEXR	-3.282244	-2.660720	-1.955020	-1.609070	I(1)	0.0021
LMS	-6.486989	-2.674290	-1.957204	-1.608175	I(1)	0.0000
LTBR	-5.491358	-2.660720	-1.955020	-1.609070	I(1)	0.0000

Source: Researcher's computation using Eviews 12

The Phillips-Perron unit root test was also conducted to test for stationarity of the variables. The test results as shown in Table 2 indicates that all the variables are stationary at order (1). The outcome of the unit root test of these variables in the ADF and PP analyses satisfies the condition for the adoption of Johansen Cointegration test.

Table 3: Johansen Cointegration Test

Date: 09/23/23 Time: 20:22
Sample (adjusted): 1997 2021
Included observations: 22 after adjustments
Trend assumption: Linear deterministic trend
Series: LASI LIR LIFR LEXR LMS
LTBR
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.959495	151.6579	95.75366	0.0000
At most 1 *	0.876873	81.11860	69.81889	0.0048
At most 2	0.562479	35.03876	47.85613	0.4460
At most 3	0.379307	16.85290	29.79707	0.6509
At most 4	0.188971	6.360668	15.49471	0.6529
At most 5	0.076579	1.752746	3.841465	0.1855

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.959495	70.53928	40.07757	0.0000
At most 1 *	0.876873	46.07984	33.87687	0.0011
At most 2	0.562479	18.18586	27.58434	0.4798
At most 3	0.379307	10.49223	21.13162	0.6975
At most 4	0.188971	4.607922	14.26460	0.7903
At most 5	0.076579	1.752746	3.841465	0.1855

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Source: Researcher's computation using Eviews 12

Table 3 shows the Johansen cointegration test results. The Johansen cointegration test as measured by the Trace statistic and Maximum Eigenvalue reveals that there exist two (2) cointegrated equation at 5% level of significance. The implication of this result is that there exist a long-run equilibrium relationship between macroeconomic variables and stock prices in Nigeria.

Table 4: Parsimonious Error Correction Model Result
Dependent Variable: D(LASI)
Method: Least Squares
Date: 09/24/23 Time: 14:56
Sample (adjusted): 1998 2021
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.245087	0.080804	3.033098	0.0230
D(LASI(-1))	0.567395	0.193237	2.936267	0.0261
D(LIR)	-0.641458	0.168362	-3.810003	0.0089
D(LIFR)	0.224971	0.053371	4.215204	0.0056
D(LIFR(-1))	0.085801	0.059327	1.446248	0.1982
D(LIFR(-2))	0.068406	0.055448	1.233696	0.2634
D(LEXR)	-3.152963	1.057899	-2.980401	0.0246
D(LEXR(-1))	1.915166	0.736344	2.600913	0.0406
D(LEXR(-2))	-2.775296	0.948473	-2.926069	0.0264
D(LMS)	-0.033618	0.062879	-0.534643	0.6121
D(LMS(-1))	-0.160618	0.106754	-1.504563	0.1831
D(LTBR)	-0.352220	0.146230	-2.408664	0.0527
D(LTBR(-1))	0.219995	0.157891	1.393332	0.2129

D(LTBR(-2))	0.237175	0.209173	1.133869	0.3001
ECM(-1)	-0.545470	0.158351	-3.444694	0.0137

R-squared	0.901625	Mean dependent var	0.110589
Adjusted R-squared	0.672082	S.D. dependent var	0.312627
S.E. of regression	0.179023	Akaike info criterion	-0.426794
Sum squared resid	0.192296	Schwarz criterion	0.319293
Log likelihood	19.48134	Hannan-Quinn criter.	-0.264874
F-statistic	3.927918	Durbin-Watson stat	2.106340
Prob(F-statistic)	0.050820		

Source: Researcher's computation using Eviews 12

Table 4 shows the short-run parsimonious error model result. The result reveals that interest rate (IR) at current level with a prob. value of 0.0089 and a coefficient of -0.641458 has a negative and significant effect on the all share index (ASI). However, the coefficient indicates that a 1% rise in the value of IR will necessitate a 64.15% fall in the value of stock price. Secondly, inflation rate (IFR) at current level is positively significant based on its prob. value of 0.0056. The coefficient of 0.224971 indicates that a 1% increase in the value of inflation rate will cause a 22.50% increase in the value of stock prices. Meanwhile, IFR lagged 1 period has positive and insignificant effect on ASI. The coefficient of 0.068406 shows that a 1% rise in IFR necessitates a 6.68% rise in ASI. IFR lagged 2 period is also positively insignificant. Thirdly, exchange rate (EXR) at current level has a prob. value of 0.0246 and coefficient of -3.152963 is negatively significant with the ASI. Thus, a 1% increase in the EXR will lead to a 315.30% decrease in the ASI. EXR lagged 1 period with a prob. value of 0.0406 and a coefficient of 1.915166 has a positive and significant influence on the ASI. The coefficient suggest that a 1% increase in EXR will increase ASI by 191.52%. Meanwhile, EXR lagged 2 period switched sign to be negatively significant. Fourthly, current level of Money supply (MS) is negatively insignificant with the ASI. Its coefficient value of -0.033618 indicates that a 1% rise in MS will lead to a 3.36% fall in the value of ASI. The outcome also shows that MS lagged 1 period is negatively insignificant. Finally, Treasury bill rate at current level with a prob. value of 0.0527 is negatively insignificant. Its coefficient of -0.352220 indicates that a 1% increase in TBR will decreased ASI by 3.52%. Furthermore, TBR lagged 1 period reveals a positive and insignificant influence on the ASI. Its coefficient of 0.219995 shows that a 1% increase in TBR will increased ASI by 22%. TBR lagged 2 periods is also positively insignificant. The error correction term is -0.545470 with a prob. value of 0.0137. This means that there is a 57.55% speed of adjustment if there is any disequilibrium in the model from the short run back to the long run annually.

Table 5: Fully Modified Least Squares Result

Dependent Variable: LASI
Method: Fully Modified Least Squares (FMOLS)
Date: 09/24/23 Time: 15:34
Sample (adjusted): 1996 2021
Included observations: 24 after adjustments
Cointegrating equation deterministics: C

Long-run covariance estimate (Bartlett kernel, Newey-West fixed bandwidth
= 3.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LIR	-0.519222	0.364783	-1.423374	0.1717
LIFR	0.160635	0.157558	1.019530	0.3215
LEXR	0.901442	0.273234	3.299153	0.0040
LMS	-0.219481	0.154661	-1.419112	0.1730
LTBR	-0.862083	0.324814	-2.654079	0.0161
C	9.080959	1.966682	4.617400	0.0002

R-squared	0.673661	Mean dependent var	9.908253
Adjusted R-squared	0.583012	S.D. dependent var	0.703922
S.E. of regression	0.454555	Sum squared resid	3.719169
Long-run variance	0.300867		

Source: Researcher's computation using Eviews 12

The fully modified least squares result presented in Table 5 was employed to explain the long-run effect of the variables. The outcome indicates that IR has an inverse and insignificant impact on the ASI. Its coefficient of -0.519222 indicates that that a 1% increase in the value of IR will decrease ASI by 51.92%. The IFR has a positive and insignificant influence on the ASI. Its coefficient of 0.160635 shows that a 1% rise IFR will reduce the ASI by 16.06%. EXR has a positive and significant influence on ASI. The coefficient of 0.901442 indicates that a 1% increase in EXR will increase ASI by 90.14%. Furthermore, MS has a prob. value of 0.1730 and coefficient of -0.219481 indicating that a 1% rise in MS will lead to 21.95% fall in the ASI. Finally, TBR with a prob. value of 0.0002 and a coefficient of -0.862083 has a negative and significant relationship with ASI. Its coefficient indicates that a 1% increase in TBR will decreased ASI by 86.21%. The outcome of the adjusted R^2 of 58.30% suggests that the variations in the value of macroeconomic variables can be explained by the variations in the value of stock prices at 5% level of significance.

Table 6: Correlogram of Residuals Squared

Date: 09/24/23 Time: 15:10
Sample (adjusted): 1998 2021
Q-statistic probabilities adjusted for 14 dynamic regressors

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
. *| . |	. *| . |	1	-0.088	-0.088	0.1879	0.665
. |* . |	. |* . |	2	0.194	0.188	1.1475	0.563
. |* . |	. |**. |	3	0.197	0.237	2.1857	0.535
. |* . |	. |* . |	4	0.091	0.106	2.4232	0.658
. *| . |	.**| . |	5	-0.193	-0.285	3.5432	0.617
. |**. |	. |**. |	6	0.324	0.222	6.9189	0.328
. *| . |	. | . |	7	-0.117	-0.011	7.3928	0.389

. *| . |	. *| . |	8	-0.104	-0.173	7.7919	0.454
. |* . |	. | . |	9	0.097	0.030	8.1737	0.517
. | . |	. | . |	10	-0.018	0.007	8.1885	0.610
. *| . |	. |* . |	11	-0.072	0.095	8.4397	0.673
. | . |	.**| . |	12	-0.038	-0.205	8.5168	0.744

*Probabilities may not be valid for this equation specification.
Source: Authors computation from Eviews 12

The Correlogram of Residuals Squared test was conducted to check the presence of serial correlation. The result obtained from Table 6 indicates no evidence of serial correlation amongst the variables used in constructing the model as the various probability values are greater than 0.05 (P > 0.05).

Table 7 Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.559925	Prob. F(14,6)	0.8260
Obs*R-squared	11.89526	Prob. Chi-Square(14)	0.6147
Scaled explained SS	1.204471	Prob. Chi-Square(14)	1.0000

Source: Researcher's computation from Eviews 12

The Breusch-Pegan-Godfrey test was employed to test the presence of Heteroskedasticity using it F-statistic and the Observed R-Squared. The result shows that this model is Homoskedastic as their values are both higher than the P-value of 0.05. Thus, there is no problem of heteroskedasticity in the result.

Table 8: Ramsey RESET Test

Equation: UNTITLED
Omitted Variables: Squares of fitted values
Specification: D(LASI) C D(LASI(-1)) D(LIR) D(LIFR) D(LIFR(-1)) D(LIFR(
-2)) D(LEXR) D(LEXR(-1)) D(LEXR(-2)) D(LMS) D(LMS(-1)) D(LTBR)
D(LTBR(-1)) D(LTBR(-2)) ECM(-1)

	Value	df	Probability
t-statistic	0.765396	5	0.4786
F-statistic	0.585831	(1, 5)	0.4786
Likelihood ratio	2.326703	1	0.1272

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.020168	1	0.020168

Restricted SSR	0.192296	6	0.032049
Unrestricted SSR	0.172128	5	0.034426

LR test summary:

	Value
Restricted LogL	19.48134
Unrestricted LogL	20.64469

Source: Researcher's computation using Eviews 12

The Ramsey Reset Test shows that the model is stable and well specified.

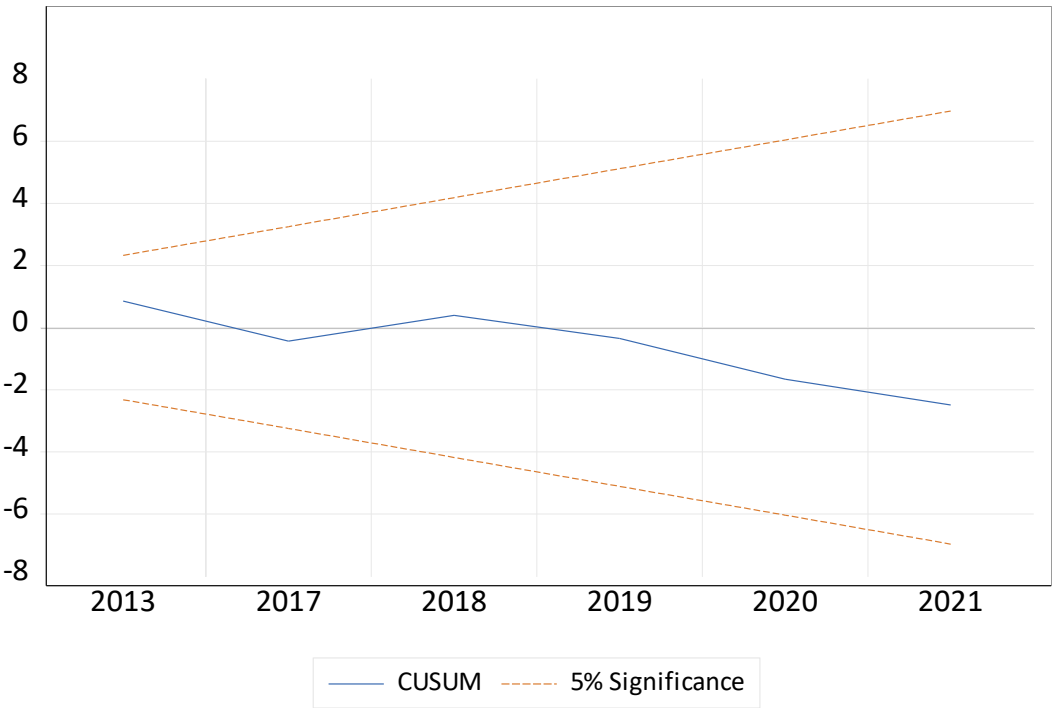

Fig. 1. CUSUM Test of Stability

Source: Researcher's computation from Eviews 12

The CUSUM test was conducted to check the stability of the model and the result reveals that the model is well specified.

5. Discussion of the Findings

The foundation upon which this study is built is to evaluate the influence of macroeconomic variables on stock price behaviour in Nigeria. The findings of the short-run outcome indicates that macroeconomic variables have no positive and significant influence on stock price behaviour in Nigeria. This outcome tallied with the finding Khan & Khan (2018) who examined the influence of macroeconomic variables on stock prices in Karachi stock exchange using time series secondary data spanning through May 2001 to August 2016 which is equivalent to 184 monthly observations

and found no significant relationship in the short-run. The result from the long-run analysis revealed that Interest rate and Money supply have inverse and insignificant influence on stock price behaviour. Inflation has a positive and insignificant effect while exchange rate has a positive and significant influence on stock price behaviour. Finally, Treasury bill rate has a negative and significant relationship with stock price behaviour in Nigeria. However, the result from the Johansen Cointegration and the fully modified least squares shows evidence of long-run relationship between macroeconomic variables and stock price behaviour in Nigeria. This result agrees with Epaphra & Salema (2018), Ibrahim & Musah (2014) and Udo, Odey & Jacob (2022) who conducted similar studies and reported long-run relationship between macroeconomic variables and stock price performance. Furthermore, the outcome of the adjusted R^2 of 58.30% suggests that the variations in the value of macroeconomic variables can be explained by the variations in the value of stock prices at 5% level of significance.

6. Conclusion and Recommendation

Based on the findings, the study concludes that macroeconomic variables have significant influence on stock market behaviour in Nigeria. Therefore, the study suggest the following policy recommendations.

1) The study suggest that the government through its relevant agencies should formulate good macroeconomic policies in order to enhance stock market performance.
2) The Central Bank of Nigeria should use the relevant monetary policy to control money supply. This is also expected to have a multiplier effect on inflation rate.
3) To enhance operations in the real sector, interest rate should be adjusted to single digit.

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