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ANALYSING STOCK MARKET REACTION TO MACROECONOMIC VARIABLES: EVIDENCE FROM NIGERIAN STOCK EXCHANGE (NSE)

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ABSTRACT: *This study examined the impact of some selected macroeconomic variables on stock market performance in the Nigerian Stock Exchange (NSE). The study adopted all share index (ASI) as proxy for stock market performance and the dependent variable, while the selected macroeconomic variables included broad money supply (BMS), interest rate (ITR), inflation rate (IFR), and exchange rate (EXR) used as the independent variables. Secondary data for the variables was sourced from Central Bank of Nigeria (CBN) Statistical Bulletins covering the period 1985 to 2017. The study employed multiple regression technique, Augmented Dickey-Fuller unit root test, Johansen co-integration test and Error Correction Model (ECM) based on the E-views 9.0 software as methods of data analysis. The analysis of data revealed that a long-run equilibrium and short-run dynamic relationships existed between the selected macroeconomic variables and stock market performance in the Nigerian Stock Exchange. Overall, the empirical results showed that all the independent variables had significant influence on stock market performance. The impact of the individual macroeconomic variables indicated that broad money supply and exchange rate had significant positive effect on all share-index, while interest rate and inflation rate exhibited an inverse relationship with all-share index. Based on the findings, the study recommended that the monetary authorities should put in place sound monetary policies that would bring about positive developments in the stock market.*

KEYWORDS: Stock Market, All-Share Index, Money Supply, Interest, Inflation, Exchange Rates

INTRODUCTION

The stock market of any country provides an avenue (trading facilities and the enabling environment) for participants including individual and institutional investors to exchange their holdings such as equity and debt securities. Put differently, a stock exchange is an organised institution where the securities of companies listed on such an exchange are traded freely. The key function of the stock market is to act as an intermediary between savers and borrowers. The stock market in any country is very vital to economic growth and development because it mobilizes the domestic resources in the economy and channels them to productive investments. The gauge of the stock market performance is its market index and a number of factors influence this movement ranging from economic, political, socio-cultural and international (Rafique, Amara, Naseem, & Sultana, 2013).

Arguably, some fundamental macroeconomic variables such as interest rate, exchange rate, inflation rate, etc could play major roles in determining stock prices or stock market index

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movement. It has been noted in some financial jurisdictions that monetary policy and macroeconomic events had a great influence on the volatility of stock prices. This means that macroeconomic variables may influence investors in deciding whether or not to invest on stocks and shares (Gan, Lee, Yong & Zhang, 2006).

Several empirical studies have been conducted on the impact of macroeconomic variables on stock market indices in the past. However, the various past empirical studies on the subject are yet to produce a consensus (Ahmad et al, 2015 and Aigbovo & Izekor, 2015). For instance, Ahmad et al (2015) carried out a review of 92 past empirical studies on stock market returns and macroeconomic variables published in international journals. These included 15 studies conducted in developed countries, 66 in emerging economies, and 11 in group of countries such as Southeast Asia, Asia-Pacific region, Asian Nations, South America, North America, European countries, and Africa. Their study showed that the various studies reviewed revealed mixed findings: where some studies found positive relationships between stock market returns and macroeconomic variables; others found a bit weak links or different results. As observed also by Aigbovo and Izekor (2015), most of the previous studies concluded that stock prices respond to changes in macroeconomic variables but the sign and causal relationship might not hold equal for all the studies.

The lack of consensus or conflicting results of past empirical studies on this topic is an indication of a research gap or need; just as Aigbovo and Izekor (2015) pointed out that more in-depth researches were required for us to understand the macroeconomic factors that might influence stock market performance. The above is the motivation and a justification for this study which was aimed at determining the impact of some selected macroeconomic variables on stock market performance in Nigeria. The study employed the Nigerian Stock Exchange (NSE) All Share Index (ASI) as proxy for stock market performance and the dependent variable. The selected macroeconomic variables include broad money supply (BMS), interest rate (ITR), inflation rate (IFR), and exchange rate (EXR) used as the independent variables. The specific objectives of this study are to: determine the effect of BMS on ASI; examine the impact of ITR on ASI; investigate the influence of IFR on ASI; and evaluate the effect of EXR on ASI. These objectives formed the basis of the research questions addressed as well as the hypotheses tested in this study. The important role the stock market plays in economic growth and development in an economy as an intermediary in the mobilization and channelling of funds from surplus sectors to productive investments underscores the significance of the study. The findings of the study would therefore be of immense benefit to investors, regulatory authority, policy makers, academics, financial consultants, analysts and brokers.

The rest of this paper is divided into four sections. Section two which follows this background introduction deals with the review of related literature. Section three covers the study methodology, and the results of data analysis and discussion of findings are presented in section four, while section five deals with the conclusion and recommendations of the study.

REVIEW OF RELATED LITERATURE

This section presents the review of related literature covering the theoretical framework and past empirical studies to provide the foundation and justification for this study on macroeconomic variables affecting stock market performance in Nigeria. The review is presented in the following sub-sections.

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Theoretical framework

Two major finance theories relating to financial asset pricing are the Capital Asset Pricing Model (CAPM) pioneered by Sharpe (1964) and the Arbitrage Pricing Theory (APT) developed by Ross (1976). These two theories provided the theoretical foundation for this study.

Capital Asset Pricing Model

The Capital Asset Pricing Model (CAPM) is based on the sufficiency of the mean variance framework for investment decision making. It relates the expected return of an asset to its riskiness measured by the variance of the asset's historical rate of return relative to its asset class. The model decomposes a portfolio's risk into systematic and specific risks. Systematic risk is the risk of holding the market portfolio. To the extent that any asset participates in such general market movements, that asset entails systematic risk. Specific risk is the risk which is unique to an individual asset. It represents the component of an asset's return which is not related to general market movements. CAPM assumes that the market compensate investors for taking systematic risk but not for taking specific risk. This is because specific risk can be diversified away. When an investor holds a market portfolio, each individual asset in that portfolio entails specific risk, but through diversification, the investor's net exposure is just the systematic risk (Ouma & Muriu, 2014).

Arbitrage Pricing Theory

The Arbitrage Pricing Theory (APT) is a substitute to CAPM in that both assert a linear relation between assets' expected returns and their covariance with other random variables. The Arbitrage pricing theory means that the expected return of a financial asset can be modelled as a linear function of various macroeconomic factors or theoretical market indices, where sensitivity to changes in each factor is represented by a factor-specific beta coefficient. It is a one-period model in which every investor believes that the stochastic properties of returns of capital assets are consistent with a factor structure. Ross (1976) argues that if equilibrium prices offer no arbitrage opportunities over static portfolios of the assets, then the expected returns are approximately linearly related to the factor loadings. The model assumes that investors would take advantage of arbitrage opportunities in the broader market. Thus an asset's rate of return is a function of the return on alternative investments and other risk factors (Ouma & Muriu, 2014).

Empirical Review

Studies in different countries have attempted to determine the relationship between macroeconomic fundamentals (such as interest rates, inflation rate, exchange rate, domestic and external debt, trade balances and openness, foreign reserves, industrial production, etc) and stock prices, using different approaches. For example, Chen, Roll and Ross (1986), used the Arbitrage Pricing Theory (APT), developed by Ross in 1976) to explain the relationship between some macroeconomic variables and stock returns in the US stock market, and found that industrial production changes in risk premiums, and changes in the term structure are positively related to the expected stock returns, while both the anticipated and unanticipated inflation rates were negatively related to the expected stock returns. Poon and Taylor (1991) did a study similar to that of Chen, Roll and Ross (1986) in the UK market and found that, unlike the US market, macroeconomic variables do not appear to affect share returns in the UK

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market. Poon and Taylor (1991) concluded that, either different macroeconomic factors have influenced share returns in the UK or the methodology employed by Chen, Roll and Ross (1986) was inefficient.

Strohe and Achsani (2002) investigated the relationship between some macroeconomic variables and stock returns in small regional markets such as Norway and Indonesia. The study concluded that stock returns responded negatively to changes in interest rates, but positively to oil prices (Norway being a net oil exporting country), and real economic activity; but there appeared to be an uncertain relationship between inflation rate and stock prices. Using monthly data of Turkey and Canada, and employing descriptive statistics, standard linear generalised autoregressive conditional heteroskedasticity (LGARCH) model and Quardratic generalised autoregressive conditional heteroskedasticity (QGARCH) model, Saryal (2007) studied the impact of inflation on stock market volatility and found that inflation rate had a higher forecasting power for stock market volatility in Turkey, and concluded that increase in inflation rate causes stock market to become more volatile which were coincident with high stock market risk. However, Erdongan and Ozlale (2005) analysed the impact of macroeconomic variables on the Turkish Stock Exchange using weekly data for the period 1991 to 2000. The selected macroeconomic variables were currency in circulation, exchange rate, interbank rate, secondary rate and industrial production, employing a time varying parameter model with GARCH specification. The results were varying for the periods before the 1994 crisis and after. Whereas, before the 1994 crisis, depreciation of local currency led to a decrease in stock market returns, this was not the case after the crisis. Similarly, both industrial production and secondary rates have positive impact on stock market returns before the crisis, but this was not the case thereafter.

Harasheh and Libdeh (2011) examined the correlational and causality relationships of stock prices with gross domestic product, inflation rate, exchange rate, LIBOR, and balance of trade, in Palestine (Palestine Exchange), using quarterly data between 2000 and 2010, and found a significant relationship between all the macroeconomic variables and stock prices. However, the study did not find any causal relationship between any of the macroeconomic variables and stock prices. Haroon and Jabeen (2013) examined the impact of macroeconomic variables on share price behaviour of Karachi Stock Exchange using interest rate proxy by 3-months, 6-months and 12-months treasury bill rate, inflation rate proxy by consumer price index, wholesale price index and sensitive price index as selected macroeconomic variables, while the Karachi Stock Exchange - KSE 100 share index was used as the dependent variables. Monthly time series secondary data for the period 2001 to 2010 was obtained for the study. After regression and correlation analysis, the study revealed that there was significant relationship between macroeconomic variables and KSE-100 share index. On Bombay Stock Exchange (BSE), Shama and Mahendru (2010) investigated the long term relationship between the Bombay Stock Exchange with macroeconomic variables, using gold price, foreign exchange reserve, inflation rate and change in exchange rate with weekly data for the period 2008 to 2009. The results of the study showed that a high correlation existed between exchange rate, gold prices and BSE; whereas the correlation between foreign exchange reserve, inflation rate and BSE, was low.

Maysami and Sim (2001) employed Hendry (1986) approach which allows for influences to the short-run relationship between macroeconomic variables (such as interest rate, inflation rate, money supply, exchange rate, and real activity along with a dummy variable to capture the impact of the 1997 Asian financial crisis) as well as the long run adjustment to equilibrium.

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The results confirmed the influence of macroeconomic variables on the stock market indices in each of the six countries under study, though the type and magnitude of the associations differed depending on the country's financial structure. Islam (2003) replicated the above studies to examine the short-run dynamic adjustment and the long-run equilibrium relationships between four macroeconomic variables (interest rate, inflation rate, exchange rate, and industrial productivity) and the Malaysian Stock Exchange composite index, and concluded that there existed significant short-run (dynamic) and long-run (equilibrium) relationship among the macroeconomic variables and the Malaysian stock returns.

Ndlovu, Faisal, Resatoglu and Tursoy (2018) examined the link between macroeconomic variables and stock price for the Johannesburg Stock Exchange in South Africa using data from 1981 to 2016. The empirical results of the study showed that interest rate, money supply and inflation had positive impact on share prices, whereas exchange rate had a negative effect on stock prices. Kirui, Wawire and Onono (2014) evaluated the effect of macroeconomic variables volatility on stock market returns in the Nairobi Securities Exchange. Quarterly time series data from 2000 to 2012, obtained from the Central Bank of Kenya and the Kenyan National Bureau of Statistics were analysed using Engle-Granger two-step method and Threshold Generalized Autoregressive Conditional Heteroskedasticity (TGARCH) model. The empirical results showed that exchange rate had significant relationship with stock returns, while GDP, inflation and Treasury bill rates indicated an insignificant link with stock returns. Ouma and Muriu (2014) examined the impact of macroeconomic variables on stock returns in Kenya for the period 2003 to 2013. While using the Ordinary Least Squares (OLS) technique for data analysis, the Arbitrage Pricing Theory (APT) and Capital Asset Pricing Model (CAPM) provided the theoretical framework for their study. Based on the empirical findings, the study concluded that: money supply and inflation had significant positive effect on stock market returns; exchange rate had negative impact on stock returns; while interest rate had no relationship with stock returns.

Issahaku, Ustarz and Domanban (2013) investigated the causality link between macroeconomic variables and stock returns in Ghana using monthly time series data from 1995 to 2010. The empirical results of the study established the existence of a causal relationship between inflation, money supply, interest rate, exchange rate and foreign direct investment and stock returns. The implication deduced was that arbitrage profit opportunities existed in the Ghanaian stock market contrary to the dictates of the Efficient Market Hypothesis (EMH). Kuwornu (2012) examined the effect of macroeconomic fundamentals on the Ghanaian stock market returns using monthly data from January 1992 to December, 2008. Macroeconomic variables used in this study are 91-day Treasury bill rate (proxy for interest rate), crude oil price consumer price index (proxy for inflation) and exchange rate. The study used the Johansen Multivariate Co-integrated Procedure. He found that co-integration correlation existed between the variables indicating a long-run equilibrium relationship.

Ayunku and Etale (2015) examined the determinants of stock market development in Nigeria using secondary data collected from CBN Statistical Bulletin and the National Bureau of Statistics covering the period 1977 to 2010. The results of the study indicated that market capitalization, credit to private sector and exchange rate were important determinants of stock market development. It was also revealed that inflation and savings rates exerted negative impact on stock market development. The study recommended among others that regulatory authorities should effectively moderate and control inflation and savings rates in order to achieve macroeconomic stability. In another direction, Ochieng and Oriwo (2012) studied the

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relationship between macroeconomic variables (such as Treasury bill rate, inflation rate, lending interest rate) and stock market performance of the Nigerian Stock Exchange (based on the All-share index) using regression model for the period of 2008 to 2012, and showed a negative relationship between TBR and ASI while inflation has a weak positive relationship with the ASI. Osamwonyi and Evbayiro-Osagie (2012) examined the relationship between macroeconomic variables and the stock market index in Nigerian using Vector Error Correction Model (VECM) for the period 1975-2005. The macroeconomic variables employed include interest rates, exchange rates, fiscal deposit, gross domestic product, and money supply. They found that macroeconomic variables influence the stock market in Nigeria.

Asaolu and Ogunmuyiwa (2011) used annual data of 1986 to 2007 to investigate the impact of macroeconomic variables on Average Share Price (ASP) of Nigerian Stock Market. They used external debt, inflation rate, fiscal deficit, exchange rate, foreign capital inflow, investment, industrial output, and inflation rate as selected macroeconomic variables which were regressed against ASP of the Nigerian Stock Market. The data analysis techniques included ADF test, Granger Causality test, co-integration test, error correction mechanism (ECM). The study revealed no significant relationship between the macroeconomic variables and ASP in the short run. However, they found a significant link on the long run. There was a little contrast in the results of Olukayode and Akinwande (2009) when they investigated the short run and long run shocks exerted by macroeconomic indicators on the Nigerian capital market using annualised data from 1984 to 2007, with consumer price index, broad money supply, treasury bill rate, real output growth, exchange rate as selected macroeconomic variables. The study employed ADF tests, augmented Engle-Granger co-integration test and error correction mechanism. The results respectively indicated that there were both short run and long run relationships between the macroeconomic variables and the Nigerian capital market. The study further revealed that exchange rate, inflation rate, money supply, and real output exerted more influence on the NSE all-share index for the period studied.

METHODOLOGY

This section covers the methodology adopted for the study, which is ex post facto research design since the study relies on already existing time series secondary data. This makes it impossible for the researchers to further manipulate the data. Other sub themes covered in this section include the source of data, definition of variables, model specification and methods of data analysis.

Source of data

Time series secondary data for the study variables covering the period 1985 to 2017 were collected from the annual reports of the Central Bank of Nigeria (CBN) Statistical Bulletins. This source is the most reliable for this type of study. The period covered by the study is 33 years. This was to enable the researchers draw meaningful conclusions on the short run and long run impact of macroeconomic variables on stock market performance.

Definition of variables

The aim of this study was to examine the impact of some selected macroeconomic variables on stock market performance in Nigeria for the period from 1985 to 2017. The study adopted the NSE all-share index (ASI) as proxy for stock market performance and the dependent

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variable. While the selected macroeconomic variables such as broad money supply (BMS), interest rate (ITR), inflation rate (IFR), and exchange rate (EXR) were adopted as the explanatory variables. These variables are briefly defined below.

All share index

The Nigerian Stock Exchange all-share index (ASI) tracks the general market movement of all listed equities on the Exchange, including those listed on the alternative securities market. The ASI is used to proxy stock market performance and employed as the dependent variable in this study.

Broad money supply

Broad money supply (BMS) represented by M2 gives a measure of liquidity in the economy and any change in M2 should therefore have an impact on the investment decisions of individual investor which can affect the stability of the financial market in the short and long run.

Exchange Rate

The fluctuations or rise and fall in the Naira exchange rate against the world's highly traded major currencies may influence significantly the macroeconomic volatility and financial market fragility of the economy.

Inflation rate

Again, the fluctuations in inflation or the consumer price index reduces or increases the purchasing power of investors and thus should have an impact on the financial market stability via asset pricing and exchange rate channels.

Interest rate

Annual Treasury bill interest rates are used as a proxy for the interest rate. The Treasury bill rate acts as the rate of return offered by risk free asset and the shifting of funds between risky equity and risk-free assets by investors and portfolio managers.

Model specification

The functional relationship of the dependent variable and the explanatory variables is expressed in the following model which is an adaptation of a model that has been widely used by previous researchers such as (Ayunku & Etale, 2015; Kirui et al, 2014; Osamwonyi & Evbayiro-Osagie, 2012; Asaolu & Ogunmuyiwa, 2010; Shama & Mahendru, 2010; Islam, 2003 and Maysami & Sims, 2002).

$$ASI = f\ (BMS, ITR, IFR, EXR)$$

The above functional relationship is translated into an econometric equation as follows:

$$ASI = \beta_0 + \beta_1 BMS + \beta_2 ITR + \beta_3 IFR + \beta_4 EXR + \mu \quad (1)$$

Where:

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ASI = All-share index

BMS= Broad money supply (explanatory variable 1)

ITR= Interest rate (explanatory variable 2)

IFR = Inflation rate (explanatory variable 3)

EXR = Exchange rate (explanatory variable 4)

β_0 = intercept or constant

β_1, β_2, β_3 & β_4 = coefficients of the explanatory variables or factor sensitivities

A priori expectations: $\beta_0 > 0$, β_1, β_2, β_3 & $\beta_4 \neq 0$

μ = the error term

Methods of data analysis

The study employed multiple regression technique, Augmented Dickey-Fuller unit root test, Johansen co-integration test and Error Correction Model (ECM) based on the E-views software as methods of data analysis for predicting the relationship between selected macroeconomic variables (BMS, ITR, IFR and EXR) and stock market performance (proxy by ASI) based on the model specified above.

RESULTS OF DATA ANALYSIS AND DISCUSSION

The results of data analysis and the discussion of the findings including the test of hypotheses are presented in this section.

Multiple regression results

The multiple regression technique was used in conjunction with other statistical tools to analyse the study data. This technique possesses the unique property of best linear unbiased estimator including efficiency and consistency when compared with other estimating techniques. The statistics tested for in the regression equation included the coefficient of determination (R^2), the probability of F-statistics, and the Durbin-Watson statistics.

The coefficient of determination (R^2) measures the explanatory power of the independent variables on the dependent variable. The probability of F-statistics test for the overall statistical significance of the regression model, which is used to generalize the hypothesis. While the Durbin-Watson statistics is used to test for autocorrelation in the regression equation.

From the multiple regression results in Table 1 below, the regression equation could be stated as:

ASI = 8.410985 + 0.312850BMS - 0.986504ITR - 0.153198IFR + 0.780559EXR + 0.492254

This indicates that the constant or intercept is 8.41 (approx.), meaning that if all the independent variables (broad money supply, interest rate, inflation rate and exchange rate) are held constant, the dependent variable, ASI (proxy for stock market performance) would grow by 8.41 units

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in an annual basis. BMS and EXR have positive coefficients of 0.31285 and 0780559 with significant probability values of 0.0514 and 0.0018 respectively. Secondly, ITR and IFR have negative coefficients of -0.986504 and -0.153198 with significant probability values of 0.0381 and 0.0474 respectively. The results as it where in Table 1 showed that BMS and EXR had significant positive link with ASI, while ITR and IFR have significant negative effect on ASI.

Whereas all the explanatory variables have significant relationship with the predictive variables as indicated by the probability values; the coefficient of determination R^2 value at 0.95 shows that 95% of changes in the predictive variable are explained by the combined effect of changes in the explanatory variables; and the value of the Adjusted R^2 shows at 92% confidence level that the regression model adopted as the basis of analysis is a good and proper fit.

Table 1: Multiple Regression Results

Dependent Variable: ASI
Number of observations: 33

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.410985	1.762646	4.771794	0.0001
BMS	0.312850	0.153717	2.035236	0.0514
ITR	-0.986504	0.720464	-1.369262	0.0381
IFR	-0.153198	0.294801	0.519665	0.0474
EXR	0.780559	0.226323	3.448868	0.0018

R-squared	0.947596	Mean dependent var.	10.93890
Adjusted R-squared	0.920110	S.D. dependent var.	2.011455
S.E. of regression	0.492254	Akaike info criterion	1.559083
Sum squared resid	6.784787	Schwarz criterion	1.785826
Log likelihood	-20.72486	Hannan-Quinn criter.	1.635375
F-statistic	126.5772	Durbin-Watson stat	1.641080
Prob(F-statistic)	0.000000		

Source: E-views 9.0 output

However, the regression results shown in Table 1 above may be misleading. First, the Durbin-Watson statistic of 1.64 is less than the 2.0 benchmark, indicating that the model suffers from the presence of autocorrelation among the explanatory variables. This could render the results meaningless. Secondly, the results in Table 1 cannot be used to determine whether the time series data of the variables employed are stationary or otherwise to avoid the problem of spurious regression. To avoid any misleading result necessitates further analysis by the use of Augmented Dickey-Fuller unit root, Johansen co-integration test and Error Correction Model.

Augmented Dickey-Fuller (ADF) unit root test

As it is common with time series data it is necessary to verify the order of integration of the series to avoid the problem of spurious regression. This was conducted by using the Augmented Dickey-Fuller (ADF) unit root test to determine the data employed is stationary or otherwise.

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The variables are adjudged to be stationary if the ADF test statistic values are greater than the MacKinnon critical values in absolute terms at 5% level of significance (Dickey-Fuller, 1979).

From the results in table 2 below, it could be seen that all the variables (ASI, BMS, ITR, IFR and EXR) are stationary at first difference as the ADF test statistics values are greater than the MacKinnon critical values in absolute terms at 5% significant level. The order of integration being I(1).

Table 2: Results of Augmented Dickey-Fuller (ADF) unit root test

Variable	ADF test Statistics	Mackinnon Value @ 5%	Order of Integration	Remarks
ASI	-4.152621	-2.960411	I(1)	Stationary
BMS	-7.037550	-2.963972	I(1)	Stationary
ITR	-5.194565	-2.963972	I(1)	Stationary
IFR	-5.628697	-2.963972	I(1)	Stationary
EXR	-4.837432	-2.960411	I(1)	Stationary

Source: E-views 9.0 output

Johansen co-integration test

Since the ADF unit root test results indicated that all the variables are stationary at order I(1), the analysis proceeded further with the Johansen co-integration test. This test was used to determine whether a long run equilibrium relationship exists among the variables of the study (Johansen, 1988).

Table 3: Results of Johansen co-integration tests

Series: ASI BMS EXR IFR ITR
Lags interval (in first differences): 1 to 1
Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.737598	96.06450	69.81889	0.0001
At most 1 *	0.544448	54.59029	47.85613	0.0261
At most 2 *	0.417524	30.21668	29.79707	0.0447
At most 3 *	0.262347	13.46217	15.49471	0.0513
At most 4 *	0.121889	4.029454	3.841466	0.0447

Trace test indicates 4 co-integrating equation(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: E-views 9.0 output

The Johansen co-integration test results in Table 3 above shows that the Trace statistics values are greater than the critical values at 5% level of significance, and indicated 4 co-integrating

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equations. Therefore, the hypothesis of no co-integration was rejected. This means there is a long run relationship between the selected macroeconomic variables (BMS, ITR, IFR and EXR) and ASI proxy for stock market performance.

Error Correction Model (ECM)

Having been able to establish via the co-integration tests that a long-run relationship exists among the variables (Table 3), the study went further to absolve the short run dynamics among the series (Engle & Granger, 1987). This was done by employing the Error Correction Model (ECM). ECM was used to estimate the short run causality link between the dependent variable (ASI) and the independent variables (BMS, ITR, IFR and EXR). Table 4 below presents the results of the parsimonious ECM test.

The results of the parsimonious Error Correction Model in Table 4 below, show a Durbin-Watson statistics value of 1.970871 (which is within the limit the 2.0 benchmark), and therefore indicates a lack of autocorrelation among the explanatory variables. Furthermore, the R^2 value of 0.917432 means that 92% of changes in ASI can be explained by changes in the explanatory variables. Besides, the adjusted R^2 value of 0.891147 suggests at 90% confidence level that the regression model is a proper and good fit in explaining the causality link between ASI and the selected macroeconomic variables (BMS, ITR, IFR and EXR).

Table 4: Parsimonious Error Correction Model Results

Dependent Variable: DASI
Method: Regression estimation
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.94522	1.793811	6.659127	0.0000
DBMS	1.230873	0.721674	1.705579	0.0531
DITR	-7.186288	2.674447	-2.687018	0.0151
DIFR	-1.327524	0.507677	-2.614901	0.0175
DEXR	0.897221	0.211172	4.248768	0.0005
ECM(-1)	-1.061012	0.496084	-2.138775	0.0424

R-squared	0.917432	Mean dependent var	11.54506
Adjusted R-squared	0.891147	S.D. dependent var	1.502101
S.E. of regression	0.332004	Akaike info criterion	0.905113
Sum squared resid	1.984079	Schwarz criterion	1.380900
F-statistic	44.40917	Hannan-Quinn criter.	1.050566
Prob. (F-statistic)	0.000161	Durbin-Watson stat	1.970871

Source: E-views 9.0 output

The ECM coefficient of -1.061012 is correctly signed (and significant at 5% level with a probability of 0.0424) meaning that there is about 106% speed of adjustment in the variables. The F-statistic is 44.40917 with a probability of 0.000161 which is less than 0.05, and therefore significant, implying that the explanatory variables together (as macroeconomic variables,

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exert a significant influence on stock market performance of the Nigerian Stock Exchange. Also the F-statistics further confirms the significance of the composition and inclusion of the variables in the model.

From the ECM results in Table 4 above, the regression equation could be re-stated as:

ASI = 11.94522 + 1.230873BMS - 7.186288ITR - 1.327524IFR + 0.897221EXR + 0.332004. These results were used to test the study hypotheses.

Testing of hypotheses

ASI and BMS

Hypothesis: Broad money supply (BMS) has no significant influence on All Share Index (ASI) proxy for stock market performance. The parsimonious ECM results in Table 4 show that the coefficient of BMS is 1.23 at 5% significant level (with a prob. of 0.0531). This means that the null hypothesis is rejected as the results show that BMS has significant positive influence on ASI. A unit increase in BMS will result in 1.23 units increase in ASI. The economic implication being that with increase in money supply more money is available at the disposal of the public to invest in stock and shares which would lead to increase in stock market performance. This finding agrees with the results of (Ndlovu, et al, 2018 and Ouma & Muriu 2014).

ASI and EXR

Hypothesis: Exchange rate (EXR) has no significant effect on All Share Index (ASI) proxy for stock market performance. The coefficient of EXR in Table 4 is 0.897 at 5% significant level (with a prob. of 0.0005). This also leads to the rejection of the null hypothesis as EXR has significant effect on ASI. Similarly, a unit increase in EXR would bring about 0.9 units increase in ASI, implying that if the exchange rate goes up people will spend less on imported products and channel their savings into investing on stock and shares. The resultant effect would be improvement in stock market performance. This is consistent with the findings of Ayunku & Etale, 2015).

ASI and ITR

Hypothesis: Interest rate (ITR) has no significant impact on All Share Index (ASI) proxy for stock market performance. The coefficient of ITR in Table 4 is -7.186 at 5% significant level (with a prob. of 0.0151). The null hypothesis therefore was rejected as ITR has a significant inverse relationship with ASI. A unit decrease in ITR would bring about 7.19 units increase in ASI, implying that if the interest rate on alternative risk-free fixed income investments are reduced the investing public will be attracted to investing on stock and shares, thereby improving the performance of the stock market. This result agrees with the findings of (Strohe & Achsani, 2002 and Ayunku & Etale, 2015).

ASI and IFR

Hypothesis: Inflation rate (IFR) has no significant influence on All Share Index (ASI) proxy for stock market performance. The coefficient of IFR in Table 4 is -1.328 at 5% significant level (with a prob. of 0.0175). The null hypothesis therefore was rejected as IFR has a significant negative effect on ASI. Again, a unit increases in IFR would bring to about 1.33 units drop in ASI, meaning that if the inflation rate goes up the reduction in the purchasing

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power of the investing public will result to a reduction in investments on stock and shares. This is consistent with the findings of (Saryal, 2007 and Ayunku & Etale, 2015).

The overall implication of these findings is for the regulatory authorities to ensure that there is a general stability in money supply and exchange rates while trying to put the inflationary trends under control and at the same time trying to maintain a stable interest rate regime in the economy in order to achieve improvement in stock market performance to bring about desired economic growth and national development. This calls for the need to put in place sound monetary policies in the economy.

CONCLUSION AND RECOMMENDATIONS

In this final section of the paper is presented the conclusion and recommendations based on the study findings.

Conclusion

This study examined the impact of some selected macroeconomic variables on stock market performance in the Nigerian Stock Exchange (NSE). The study adopted all share index (ASI) as proxy for stock market performance and the dependent variable, while the selected macroeconomic variables included broad money supply (BMS), interest rate (ITR), inflation rate (IFR), and exchange rate (EXR) used as the independent variables. Secondary data for the variables was sourced from Central Bank of Nigeria (CBN) Statistical Bulletins covering the period 1985 to 2017. The study employed multiple regression technique, Augmented Dickey-Fuller unit root test, Johansen co-integration test and Error Correction Model (ECM) based on the E-views 9.0 software as methods of data analysis.

The analysis of data revealed that a long-run equilibrium and short-run dynamic relationships existed between the selected macroeconomic variables and stock market performance in the Nigerian Stock Exchange. Furthermore, the empirical results showed that all the independent variables had significant influence on stock market performance. On the overall, the result of this study is consistent with the study findings of (Maysami & Sim, 2001; Islam, 2003; Harasheh & Libdeh, 2011; Haroon & Jabeen, 2013; Issahaku, Ustarz & Domanban, 2013; Aigbovo & Izekor, 2015, and Ndlovu, Faisal, Resatoglu & Tursoy, 2018).

However, the impact of the individual macroeconomic variables indicated that broad money supply and exchange rate had significant positive effect on all share-index (proxy for stock market performance). While interest rate and inflation rate exhibited an inverse relationship with all share index. It is hoped that students and academics would find this study useful in future researches just as the findings of this study would be of immense benefit to investors, regulatory authority, policy makers, financial consultants, analysts and brokers.

Recommendation

Based on the findings of this study the following recommendations are made:

- Regulatory authorities and policy makers should ensure that there is general stability in money supply and exchange rates, while trying to put the inflationary trends under control and at the same time maintain a stable interest rate regime in the economy in order to

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achieve improvements in stock market performance to bring about desired economic growth and national development.

- Besides, the monetary authorities should put in place sound monetary policies that would bring about positive developments in the stock market.

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